AGENDA | REGULAR TOWN COUNCIL MEETING

April 27, 2021 at 6:00 PM
Council Chambers - Apex Town Hall, 73 Hunter Street

Town Council and Administration

Mayor: Jacques K. Gilbert | Mayor Pro Tem: Nicole L. Dozier
Council Members: Brett D. Gantt; Audra M. Killingsworth; Cheryl F. Stallings; Terry Mahaffey
Interim Town Manager: Ralph Clark | Assistant Town Managers: Shawn Purvis and Marty Stone
Town Clerk: Donna B. Hosch, MMC | Town Attorney: Laurie L. Hohe

COMMENCEMENT

Call to Order | Invocation | Pledge of Allegiance

PRESENTATIONS

PR1 Allyson Coltrane, Long Range Transit Planner II

Staff will present informational updates on transit plans and services related to the Town; including information on GoApex Route 1, regional transit services, and Wake Transit updates.

PR2 Christine Hilt, President (CLH design, p.a.) and Alice Reese, Project Manager (CLH design, p.a.)

Presentation by CLH design, p.a. in regards to the proposed columbarium wall at the Apex Town Cemetery.

PR3 Tom Colwell, Chairperson

Presentation by Tom Colwell in regards to the Apex Sculpture Walk.

PR4 Jacques K. Gilbert, Mayor

Presentation of the 52nd Annual Professional Municipal Clerks Week Proclamation

PR5 Mayor Jacques K. Gilbert

Presentation of the Proclamation declaring April 30, 2021 as Arbor Day in the Town of Apex

CONSENT AGENDA

All Consent Agenda items are considered routine, to be enacted by one motion with the adoption of the Consent Agenda, and without discussion. If a Council Member requests discussion of an item, the item may be removed from the Consent Agenda and considered separately. The Mayor will present the Consent Agenda to be set prior to taking action on the following items:

CN1 Donna Hosch, Town Clerk

Motion to approve the Apex Tax Report dated 03/03/2021

CN2 Russell Dalton, Senior Transportation Engineer

Motion to approve Supplement to Interlocal Agreement with Town of Cary authorizing an additional $617,413.50 reimbursement from Town of Cary toward construction of Lake Pine Drive Improvements, U-5537.

CN3 Amanda Bunce, Current Planning Manager

Motion to approve the Statement of the Apex Town Council pursuant to G.S. 160D-605(a) addressing action on the Unified Development Ordinance (UDO) Amendment of April 13, 2021.

CN4 Shannon Cox, Long Range Planning Manager

Possible motion to approve, and to authorize the Interim Town Manager to sign and execute, the municipal agreement for NCDOT Administered – Transit-Oriented Development Planning.

CN5 Dianne Khin, Director of Planning and Community Development

Motion to adopt a resolution Directing the Town Clerk to Investigate Petition Received, to accept the Certificate of Sufficiency by the Town Clerk and to adopt a Resolution Setting Date of Public Hearing for May 11, 2021 on the Question of Annexation – Apex Town Council's intent to annex HARP-BARR, LLC, Memphis & Maddox, LLC, Sweet Willie, LLC, William Douglas and Jean S. Poe, Daryl and Jeanne Poe properties containing 157.234 acres located at 6401 Apex Barbecue Road and 1216 & 1330 South Salem Street, Annexation #706 into the Town's corporate limits.

CN6 Dianne Khin, Planning and Community Development Director

Possible motion to approve update to the Historical Marker Program application to allow 1" letters.

CN7 Brian Meyer, Deputy Town Attorney; Mitchell McKinney, Deputy Police Chief

Motion to approve a Resolution adopting an Involuntary Commitment Custody and Transportation Agreement.

CN8 Colleen Merays, Downtown & Small Business Development Coordinator

Motion to amend the approved date of (Sunday, July 4, 2021) for the Annual 4th of July Celebration to (Saturday, July 3, 2021).

CN9 Shawn Purvis, Assistant Town Manager

Motion to approve Pipeline Accommodation Agreement with Colonial Pipeline Company and authorize the Town Manager to execute the same and to approve Budget Amendment #19 for the agreement

CN10 Jose Martinez, Public Works Director; Shawn Purvis, Assistant Town Manager

Motion to approve closing of sidewalks as identified on the pedestrian safety plan for Highline Building and to temporarily mark three spaces on the west side of Salem St. as a loading zone of 8 am – 5 pm, Mon. – Fri. until the loading zone can reopen on Saunders St.

REGULAR MEETING AGENDA

Mayor Gilbert will call for additional Agenda items from Council or Staff and set the Regular Meeting Agenda prior to Council actions.

PUBLIC FORUM

Public Forum allows the public an opportunity to address the Town Council. The speaker is requested not to address items that appear as Public Hearings scheduled on the Regular Agenda. The Mayor will recognize those who would like to speak at the appropriate time. Large groups are asked to select a representative to speak for the entire group. Comments must be limited to 3 minutes to allow others the opportunity to speak.

PUBLIC HEARINGS

PH1 Allyson Coltrane, Long Range Transit Planner II

Public hearing and possible motion regarding proposed amendments to the Transit Plan map related to GoApex Route 1.

PH2 Shelly Mayo, Planner II

Quasi-Judicial Public Hearing and possible motion regarding a Major Site Plan for Felton Grove High School located at 8550 Stephenson Road. This item was continued from the April 13, 2021 meeting.

PH3 Sarah Van Every, Senior Planner

Public Hearing and possible motion to approve Rezoning Application #21CZ08 Cash Corporate Center Amendment. The applicants, Town of Apex and Jack 1, LLC., seek to rezone approximately 121.30 acres located at 0 Pristine Water Drive, 2100 Production Drive, 0 and 1201 Burma Drive (PINs 0751138504, 0751244221, 0751143089, and a portion of former PIN 0751136687) from Light Industrial-Conditional Zoning (LI-CZ #18CZ19) to Light Industrial-Conditional Zoning (PUD-CZ).

PH4 Vance Holloman, Finance Director

Public hearing concerning the validity and advisability of issuing up to $42 million of General Obligation Street and Sidewalk Improvement Bonds and a possible motion to adopt and publish the bond order introduced at the April 13th Council meeting.

OLD BUSINESS

UNFINISHED BUSINESS

UB1 Liz Loftin, Senior Planner

Public hearing and possible motion to adopt an Ordinance on the Question of Annexation – Apex Town Council's intent to annex Edwin A. Goodwin, Testamentary Trust/Judy G. Hackney, Trustee (Hackney Tracts) property containing 2.867 acres located at 2600 Olive Chapel Road, Annexation #701 into the Town's corporate limits.

UB2 Liz Loftin, Senior Planner

Possible motion to approve Rezoning Application #20CZ14 Hackney PUD and Ordinance. The applicant, Brendie Vega, WithersRavenel, seeks to rezone approximately 73.64 acres located at 0, 2500, and 2600 Olive Chapel Road (PINs 0721492629, 0722406699, & 0722411102) from Rural Residential (RR) and Wake County R-80W to Planned Unit Development-Conditional Zoning (PUD-CZ). This item was continued from the March 25, 2021 meeting.

UB3 Vance Holloman, Finance Director

Motion to approve a Resolution providing for the Sale and Issuance of a $5,000,000 Town of Apex, North Carolina General Obligation Street and Sidewalk Improvement Bond, Series 2021. The resolution also authorizes the execution and delivery of a Bond Purchase Agreement with Pinnacle Bank.

UB4 Vance Holloman, Finance Director

Motion to approve proposed guidelines for the Town's Customer Assistance Program, approve an agreement with Western Wake Crisis Ministries to assist the Town in determining eligibility of customers to participate in the program and authorize staff to execute that agreement. Also to approve Budget Ordinance Amendment No. 18 which appropriates funds to provide assistance to eligible customers and pay associated administrative cost.

NEW BUSINESS

NB1 Dianne Khin, Director of Planning and Community Development

Possible motion to approve Tree Planting Grant Program. The Tree Planting Grant Program is designed to provide incentive funds to tenants and property owners to install trees on residential private properties within Apex's corporate limits. The grant can provide up to 100% of the cost of the tree purchase and installation, up to a maximum of $750 per property.

NB2 Colleen Merays, Downtown & Small Business Development Coordinator

Possible motion to approve the Special Event Permit requests and Town Co-Sponsorship requests for 2021.

NB3 Shawn Purvis, Assistant Town Manager

Possible motion to approve a Road and Utility Infrastructure Reimbursement Agreement with BIN – APEX LLC and to authorize the Town Manager to execute the same

UPDATES BY TOWN MANAGER

TM1 Ralph Clark, Interim Town Manager

Updates on Town operations by Interim Town Manager Ralph Clark

CLOSED SESSION

WORK SESSION

ADJOURNMENT

| Agenda Item | **cover sheet**

for consideration by the Apex Town Council

Item Type: PRESENTATION

Meeting Date: April 27, 2021

Item Details

Presenter(s): Allyson Coltrane, Long Range Transit Planner II

Department(s): Planning and Community Development

Requested Motion

Staff will present informational updates on transit plans and services related to the Town; including information on GoApex Route 1, regional transit services, and Wake Transit updates.

Approval Recommended?

Not Applicable

Item Details

Not Applicable

Attachments

- Not Applicable

| Agenda Item | **cover sheet**

for consideration by the Apex Town Council

Item Type: PRESENTATION

Meeting Date: April 27,2021

Item Details

Presenter(s): Christine Hilt, President (CLH design, p.a.) and Alice Reese, Project Manager (CLH design, p.a.)

Department(s): Public Works & Transportation

Requested Motion

Presentation by CLH design, p.a. in regards to the proposed columbarium wall at the Apex Town Cemetery.

Approval Recommended?

N/A

Item Details

The Town of Apex's maintained cemetery is currently out of plots to sell to the public. The only plots that can be sold are the ones that citizens sell back to the town and there is a waiting list for these plots.

The Town has been working on the design of a columbarium wall that is proposed to be constructed in two phases. The first phase will include parking improvements plus 780 niches for sale. The columbarium was designed to be an amenity which serves as a gateway into the cemetery while being designed to fit within the existing footprint.

Attachments

- Presentation (will be copied into folder once delivered by CLH)

Apex Cemetery Columbarium Project

Master Plan and Phase I

April 13, 2021

Presented by

CLH DESIGN

Columbarium Buildout

Presented by

Columbarium Phase One

Universal design

Gateway entrance to Cemetery

780 niche capacity

Parking lot upgrades

Presented by

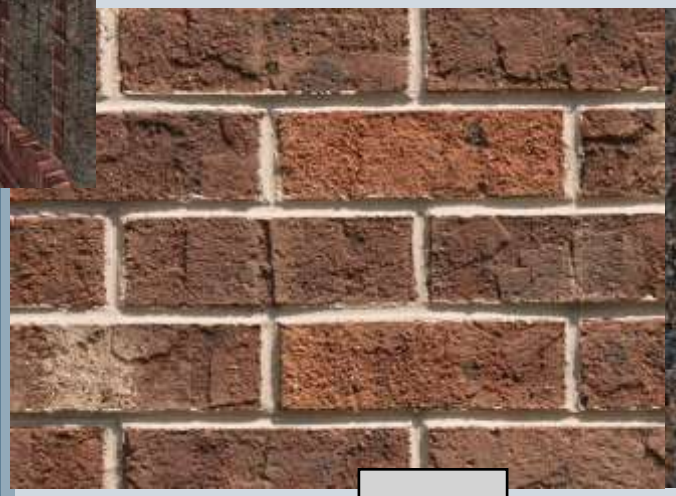
CLH DESIGN

Presented by

CLH DESIGN

Phase One Views

Columbarium
Color Option A



Georgian Red Brick

Dark Granite Niche Covers

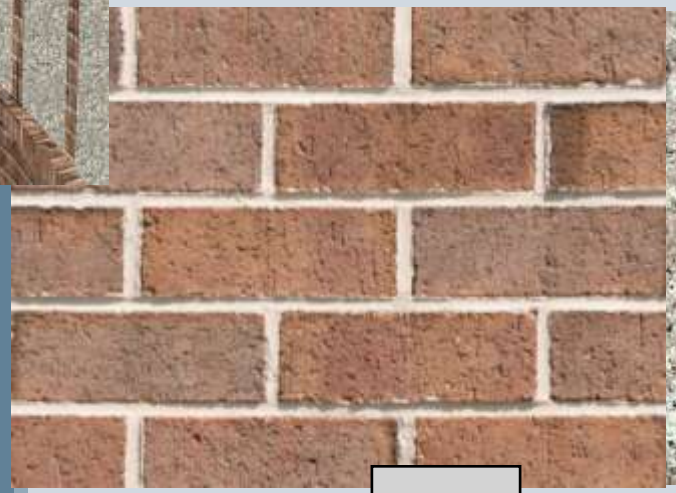
Ember Plank Style Paver

Presented by

CLH DESIGN

Town of Apex Columbarium Project

Columbarium
Color Option B



Asheville Brown Brick

Light Granite Niche Covers

Grey Plank Style Paver

Presented by

CLH DESIGN

Town of Apex Columbarium Project

Columbarium Phase One Cost Estimate

OPINION OF PROBABLE CONSTRUCTION COST SITE WORK	DATE	PHASE
PROJECT NAME: Apex Cemetery Columbarium - Phase One - North Side	PROJECT NO: 19-170	Concept
LOCATION: Apex, NC	BY: CLH	

CLH Design, PA

Cost Summary

Division 01 - General Requirements			
01-10 - General Conditions		41,215.92	
01-21 - Site Work Allowances		320.00	
Subtotal - General Requirements			41,535.92
Division 02 - Site Demolition			
02-41 - Site Demolition		10,495.00	
Subtotal - Site Demolition			10,495.00
Division 31 - Earth Moving			
31-10 - Site Clearing		5,000.00	
31-20 - Grading		23,000.00	
31-25 - Erosion & Sediment Control		17,380.00	
Subtotal - Earth Moving			45,380.00
Division 32 - Site Improvements			
32-12 - Asphalt Paving		55,500.00	
32-13 - Concrete Paving		18,000.00	
32-14 - Unit Paving		4,440.00	
32-17 - Paving Specialties		45,870.00	
32-18 - Off-Site Roadway Improvements		0.00	
32-31 - Fences & Gates		0.00	
32-32 - Steps and Walls		115,270.00	
32-40 - Site Furnishings		99,400.00	
32-50 - Exterior Athletic & Rec. Equip.		0.00	
32-80 - Irrigation		14,850.00	
32-90 - Landscaping		17,584.00	
Subtotal - Site Improvements			370,914.00
Division 33 - Site Utilities			
33-10 - Water Systems		0.00	
33-30 - Sanitary Sewer		0.00	
33-40 - Storm Drainage		19,660.00	
33-90 - Off-Site Utility Improvements		0.00	
Subtotal - Site Utilities			19,660.00
Lighting Allowance			
Lighting Improvements		20,000.00	
Subtotal - Lighting			20,000.00
Subtotal - Site Work			507,984.92
Contingency	10 %	50798.492	50,800.00
Grand Total - Site Work			$558,784.92
Niches	780 EA	250.00	195,000.00
Grand Total - Site Work			$753,784.92

Columbarium Phase One Fund Raising

Average price of area columbarium niches:	$ 4,250/niche*
Low end cost of area columbarium niches:	$ 2,200/niche*

Recommended price per niche to pay for Apex Columbarium design and construction costs: $ 1,400/780 total Phase One niches

- Covers the cost to build Phase One
- Covers about 50-60% of the cost for building Phase Two of the columbarium**
- Phase Two should be fully paid for at approximately 60% occupancy of total Columbarium (Phase One + Phase Two)

**25% larger niche size than Apex Columbarium*

*** Assumes Phase Two costs range from $400,000 - $500,000*

| Agenda Item | **cover sheet**

for consideration by the Apex Town Council

Item Type: PRESENTATION

Meeting Date: April 27,2021

Item Details

Presenter(s): Tom Colwell, Chairperson

Department(s): Public Art Committee

Requested Motion

Presentation by Tom Colwell in regards to the Apex Sculpture Walk.

Approval Recommended?

N/A

Item Details

Overview of the 9 sculptures being placed in locations around town including the Town Campus, Hunter Street Park and the historic downtown area.

Attachments

- N/A

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: PRESENTATION

Meeting Date: April 27, 2021

Item Details

Presenter(s): Jacques K. Gilbert, Mayor

Department(s): Governing Body

Requested Motion

Presentation of the 52nd Annual Professional Municipal Clerks Week Proclamation

Approval Recommended?

N/A

Item Details

N/A

Attachments

- Proclamation

Town of Apex, North Carolina

Proclamation

from the Office of the Mayor

52nd ANNUAL PROFESSIONAL MUNICIPAL CLERKS WEEK

WHEREAS, the office of the municipal clerk, a time honored and vital part of local government, exists throughout the world; and

WHEREAS, the office of the municipal clerk is the oldest among public servants; and

WHEREAS, the office of the municipal clerk provides the professional link between the citizens, the local governing bodies, and agencies of government at other levels; and

WHEREAS, municipal clerks have pledged to be ever mindful of their neutrality and impartiality, rendering equal service to all; and

WHEREAS, the municipal clerk serves as the information center on functions of local government and community; and

WHEREAS, municipal clerks continually strive to improve administration of the affairs of the Office of the Town Clerk through participation in education programs, seminars, workshops, and the annual meetings of their state, municipal, and international professional organizations; and

WHEREAS, it is fitting that we recognize the accomplishments of the office of the municipal clerk.

NOW, THEREFORE, I, Jacques K. Gilbert, Mayor of the Town of Apex do recognize the week of May 2 through May 8, 2021, as Professional Municipal Clerks Week, and further extend appreciation to our Town Clerk, Donna B. Hosch, MMC, and Deputy Town Clerk Jontesca Silver, CMC, and to all Municipal Clerks for the vital services they perform and their exemplary dedication to the communities they represent.

IN WITNESS THEREOF, I have hereunto set my hand
and caused the Seal of the Town of Apex, North Carolina
to be affixed this the 27th day of April 2021

_____

Jacques K. Gilbert, Mayor

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: PRESENTATION

Meeting Date: April 27,2021

Item Details

Presenter(s): Mayor Jacques K. Gilbert

Department(s): Governing Body

Requested Motion

Presentation of the Proclamation declaring April 30, 2021 as Arbor Day in the Town of Apex

Approval Recommended?

N/A

Item Details

N/A

Attachments

- Proclamation

Town of Apex, North Carolina

Proclamation

from the Office of the Mayor

ARBOR DAY IN THE TOWN OF APEX

WHEREAS, in 1872, J. Sterling Morton proposed to the Nebraska Board of Agriculture that a special day be set aside for the planting of trees; and

WHEREAS, this holiday called Arbor Day was first observed with the planting of more than a million trees; and

WHEREAS, Arbor Day is now observed throughout the nation and the world; and

WHEREAS, trees can reduce the erosion of our precious topsoil by wind and water, cut heating and cooling costs, moderate the temperature, clean the air, produce life-giving oxygen, and provide habitat for wildlife; and

WHEREAS, trees in our town increase property values, enhance the economic vitality of business areas, and beautify our community; and

WHEREAS, the Apex Town Council and the Tree Citizen Advisory Panel (Tree CAP) will commemorate Arbor Day by planting six trees, one for each year designated as a Tree City USA, at Clairmont Park on April 30, 2021.

NOW, THEREFORE, I, Jacques K. Gilbert, Mayor of the Town of Apex, do hereby proclaim April 30, 2021 as Arbor Day in the Town of Apex, and urge all citizens to celebrate our Arbor Day and to support efforts to protect our trees and woodlands.

IN WITNESS THEREOF, I have hereunto set my hand
and caused the Seal of the Town of Apex, North Carolina
to be affixed this the 27th day of April 2021.

Jacques K. Gilbert, Mayor

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: CONSENT AGENDA

Meeting Date: April 27, 2021

Item Details

Presenter(s): Donna Hosch, Town Clerk

Department(s): Office of the Town Clerk

Requested Motion

Motion to approve the Apex Tax Report dated 03/03/2021

Approval Recommended?

Yes

Item Details

At its regular meeting held on April 5, 2021, the Wake County Board of Commissioners approved the Apex Tax Report dated 03/03/2021.

Attachments

- Tax Report

Board Report

Return

Date : 04/05/2021

Approved By : Kim Rabacher

TO : WAKE COUNTY BOARD OF COMMISSIONERS

RE: CONSIDERATION OF REFUND FOR TAXES, INTEREST AND PENALTIES FOR APEX

No.	Name of Tax Payer	Account Number	Tax and Penalties		Total Rebate	Total Refund	Request Status
1	CORELOGIC PO BOX 9202 COPPELL TX, 75019	0000222189- 2020- 2020- 000000	City County	508.64 803.10	1,311.74	1,311.74	Refund
	Marcus D. Kinrade		Total City Rebated	508.64			
	Wake County Tax Administrator		Total County Rebated	803.10			
	MDK		**Total Rebate/Refund**		1,311.74	1,311.74	

CC:

***Refund amount may differ from rebated total due to released interest or application of payment to any balance due on the account.**

Print Lock

WAKE COUNTY
NORTH CAROLINA

Wake County Tax Administration
Rebate Details
02/01/2021 - 02/28/2021
APEX

DATE	TIME	PAGE
03/03/2021	9:01:30 PM	1

REBATE NUMBER	PROPERTY	CITY TAG	LATE LIST	BILLED INTEREST	TOTAL REBATED	PROCESS DATE	ACCOUNT NUMBER	TAX YEAR	YEAR FOR	BILLING TYPE	OWNER
BUSINESS ACCOUNTS											
778168	0.00	0.00	129.04	0.00	129.04	02/05/2021	0006809832	2020	2020	006000	DELL MARKETING LP
778169	0.00	0.00	230.71	0.00	230.71	02/05/2021	0006920043	2020	2020	000000	LIGHT WAVE DENTAL MANAGEMENT NC LLC
778422	118.75	0.00	11.88	0.00	130.63	02/09/2021	0006884309	2020	2020	000000	STARBUCKS CORPORATION
778035	2.08	0.00	0.21	0.00	2.29	02/04/2021	0006449109	2020	2020	000000	FAITHFUL SOFTWARE COMPANY INC
SUBTOTALS FOR BUSINESS ACCOUNTS	**120.83**	**0.00**	**371.84**	**0.00**	**492.67**		**4**	**Properties Rebated**			
BUSINESS REAL ESTATE ACCOUNTS											
778917	5.70	0.00	0.00	0.00	5.70	02/15/2021	0000436803	2020	2020	000000	JORDAN POINTE HOMEOWNERS ASSOCIATION INC
778918	5.70	0.00	0.00	0.00	5.70	02/15/2021	0000433111	2020	2020	000000	JORDAN POINTE HOMEOWNERS ASSOCIATION INC
778919	5.70	0.00	0.00	0.00	5.70	02/15/2021	0000436805	2020	2020	000000	JORDAN POINTE HOMEOWNERS ASSOCIATION INC
777649	4,486.03	0.00	0.00	0.00	4,486.03	02/01/2021	0000310439	2020	2020	000000	TARGET CORPORATION
777644	319.17	0.00	0.00	0.00	319.17	02/01/2021	0000206601	2020	2020	000000	AMERIFOODS ENTERPRISE INC
777582	15,223.56	0.00	0.00	0.00	15,223.56	02/01/2021	0000333870	2020	2020	000000	HH TRINITY APEX INVESTMENTS LLC

REBATE NUMBER	PROPERTY	CITY TAG	LATE LIST	BILLED INTEREST	TOTAL REBATED	PROCESS DATE	ACCOUNT NUMBER	TAX YEAR	YEAR FOR	BILLING TYPE	OWNER
BUSINESS REAL ESTATE ACCOUNTS											
777581	1,564.23	0.00	0.00	0.00	1,564.23	02/01/2021	0000330768	2020	2020	000000	HH TRINITY APEX INVESTMENTS LLC
778899	333.45	0.00	0.00	0.00	333.45	02/15/2021	0000447644	2020	2020	000000	MIDDLETON OWNERS ASSOCIATION INC
777576	4,334.88	0.00	0.00	0.00	4,334.88	02/01/2021	0000230648	2020	2020	000000	HH TRINITY APEX INVESTMENTS LLC
777571	1,164.46	0.00	0.00	0.00	1,164.46	02/01/2021	0000080854	2020	2020	000000	APEX LODGING LLC
778916	5.70	0.00	0.00	0.00	5.70	02/15/2021	0000436804	2020	2020	000000	JORDAN POINTE HOMEOWNERS ASSOCIATION INC
778907	3,711.56	0.00	0.00	0.00	3,711.56	02/15/2021	0000064492	2020	2020	000000	CRESTMONT OWNERS ASSOCIATION INC
777554	2,382.72	0.00	0.00	0.00	2,382.72	02/01/2021	0000025766	2020	2020	000000	HH TRINITY APEX INVESTMENTS LLC
777569	1,214.46	0.00	0.00	0.00	1,214.46	02/01/2021	0000070841	2020	2020	000000	HH TRINITY APEX INVESTMENTS LLC
777564	8,094.58	0.00	0.00	0.00	8,094.58	02/01/2021	0000054612	2020	2020	000000	VERIDEA APEX PARCEL 10 LLC
SUBTOTALS FOR BUSINESS REAL ESTATE ACCOUNTS	**42,851.90**	**0.00**	**0.00**	**0.00**	**42,851.90**	**15**	**Properties Rebated**				
INDIVIDUAL PROPERTY ACCOUNTS											
779915	64.48	25.00	0.00	0.00	89.48	02/26/2021	0006887807	2020	2019	000000	STARR, GEORGE JOSEPH
779127	3.05	0.00	0.30	0.00	3.35	02/17/2021	0006822358	2020	2020	000000	BROWN, RANDY EUGENE
777624	34.47	0.00	0.00	0.00	34.47	02/01/2021	0006913556	2020	2019	000000	HAUB, JEAN PAUL

REBATE NUMBER	PROPERTY	CITY TAG	LATE LIST	BILLED INTEREST	TOTAL REBATED	PROCESS DATE	ACCOUNT NUMBER	TAX YEAR	YEAR FOR	BILLING TYPE	OWNER
INDIVIDUAL PROPERTY ACCOUNTS											
778549	37.95	0.00	0.00	0.00	37.95	02/10/2021	0006892737	2020	2019	000000	CHIONG, ERIC ECLARINAL
778188	1.90	30.00	0.00	0.00	31.90	02/05/2021	0006480056	2020	2020	000000	KING, TOMMY C
778148	3.79	0.00	0.00	0.00	3.79	02/05/2021	0006903261	2020	2019	000000	GIULIANI, TRACY JEAN
778147	2.56	0.00	0.00	0.00	2.56	02/05/2021	0006901846	2020	2019	000000	MCCALL, NATHAN RANDOLPH FERRIS
SUBTOTALS FOR INDIVIDUAL PROPERTY ACCOUNTS	**148.20**	**55.00**	**0.30**	**0.00**	**203.50**	**7**	**Properties Rebated**				
INDIVIDUAL REAL ESTATE ACCOUNTS											
779375	508.64	0.00	0.00	0.00	508.64	02/25/2021	0000222189	2020	2020	000000	GALBICKA, ANTHONY
778305	214.72	0.00	0.00	0.00	214.72	02/08/2021	0000218855	2020	2020	000000	MILLER, STEPHEN J
SUBTOTALS FOR INDIVIDUAL REAL ESTATE ACCOUNTS	**723.36**	**0.00**	**0.00**	**0.00**	**723.36**	**2**	**Properties Rebated**				
TOTAL REBATED FOR APEX	**43,844.29**	**55.00**	**372.14**	**0.00**	**44,271.43**	**28**	**Properties Rebated for City**				

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: CONSENT AGENDA

Meeting Date: April 27,2021

Item Details

Presenter(s): Russell Dalton, Senior Transportation Engineer

Department(s): Public Works and Transportation

Requested Motion

Motion to approve Supplement to Interlocal Agreement with Town of Cary authorizing an additional $617,413.50 reimbursement from Town of Cary toward construction of Lake Pine Drive Improvements, U-5537.

Approval Recommended?

Yes

Item Details

Town of Cary has committed to providing an additional reimbursement of $617,413.50 toward construction of Lake Pine Drive Improvements according to the attached Supplement to Interlocal Agreement. Town of Apex previously requested and received additional federal funds allowing reimbursement of up to 50% of the construction funding shortfall for the project. The Supplement to Interlocal Agreement would provide an additional 25% reimbursement of the total shortfall, matching Apex's share of the construction funding shortfall. Apex has already awarded the construction contract and the contractor is scheduled to start this month when utility conflicts are resolved.

Town Council appropriated the additional funding for the project from Fund Balance on 2/9/21. The Town of Cary's reimbursement will go back to Fund Balance.

Attachments

- Supplement to Interlocal Agreement, Lake Pine Drive Improvements

SUPPLEMENT TO INTERLOCAL AGREEMENT

This **SUPPLEMENT TO INTERLOCAL AGREEMENT** dated as of _____, 2021 (the *"Supplement"*) between the **TOWN OF APEX, NORTH CAROLINA**, a municipal corporation organized under the laws of the State of North Carolina (*"Apex"*) and the **TOWN OF CARY, NORTH CAROLINA**, a municipal corporation organized under the laws of the State of North Carolina (*"Cary"* and collectively with Apex, the *"Towns"*).

WITNESSETH

WHEREAS, under Article 20 of Chapter 160A of the North Carolina General Statutes, as amended (the *"Interlocal Act"*), municipalities are authorized to enter into interlocal cooperation undertakings with other local governments for the joint exercise of any power, function, public enterprise, right, privilege, or immunity of local governments in North Carolina; and

WHEREAS, the Towns have each begun planning for and designing improvements to SR 1521 ("Lake Pine Drive"), located in Wake County, North Carolina, and starting from north of Pine Plaza Drive and MacGregor Pines Drive to the Apex Town limit, north of Versailles Drive, which will include widening Lake Pine Drive from two-lanes to three-lanes in certain sections, connecting sidewalks located on Lake Pine Drive, constructing a 10-foot street-side trail on the east side of Lake Pine Drive as part of Cary's greenway system, and providing a high-visibility crosswalk at Versailles Drive (the "Project"); and

WHEREAS, on or about November 17, 2015 the Towns entered into an Interlocal Agreement (the "Agreement") detailing each Town's responsibilities and obligations in the construction of the Project as well as the respective contributions to the financing and construction of the Project; and

WHEREAS, Apex has entered into an agreement with the North Carolina Department of Transportation (DOT), dated October 31, 2013, for the design costs associated with the Project, which was attached to the Agreement; and

WHEREAS, pursuant to the Agreement, Apex has entered into a contract with a design consultant for the design phase of the Project; and

WHEREAS, Apex shall be responsible for entering into a supplemental agreement with DOT for the construction phase of the Project, the form of which was attached to the Agreement; and

WHEREAS, Apex shall be responsible for the entering into and administering a construction contract for the construction phase of the Project; and

WHEREAS, Cary has agreed to assist Apex in financing the planning, design, and construction costs associated with the Project by reimbursing Apex in an amount equal to one-half of Apex's share of the planning, design, and construction costs associated with the Project and reimbursing Apex one-half of the internal review costs charged to Apex by DOT; and

WHEREAS, the Towns have determined that they can achieve significant cost savings by cooperating to construct the Project and entering into a single construction contract for the Project; and

WHEREAS, the Agreement contemplated the possibility that the Project costs could exceed the budget approved in the Agreement and in such event Apex could request additional funds from DOT and Cary to be memorialized through the execution of a supplemental interlocal agreement; and

WHEREAS, the Project costs are estimated to exceed the budget approved in the Agreement and the parties to this Supplement desire to amend the financial contributions of each Town as set forth herein.

NOW THEREFORE, the parties hereto agree as follows:

1. ***Contributions and Financing***.

Section 4.1 of the Agreement provides the specific contributions of Apex and Cary as well as federal contributions. Due to inflation in construction costs and other factors identified in the attached letter to NC Capital Area MPO, an estimated construction budget shortfall of $2,469,654.00 is expected. Apex is therefore requesting up to $1,234,827 in additional federal funds. Financial specifics of the request are as shown below:

Federal Funds Remaining (80% of anticipated construction cost)	$462,821.00
Remaining Local Match (20% of anticipated construction cost) Already Committed	$115,705.00
Contractor's Bid 11/5/20 (with 5% contingency added)	($2,845,500.00)
CEI Contract Proposal	($202,680.00)
Construction Funding Shortfall	($2,469,654.00)
CAMPO Additional Funds Request (50% of shortfall)	***$1,234,827.00***
Additional Required Local Match (50% of shortfall)	***$1,234,827.00***

Per the Agreement, if Project costs exceed the approved budget in the Agreement Apex may request and Cary may agree to contribute funds in excess of that designated in the Agreement. Apex and Cary hereby agree to contribute additional funds to the Project as shown below and Cary shall reimburse Apex for portions of Apex contributions as follows:

Construction Funding Shortfall	$2,468,654.00
CAMPO Additional Funds	$1,234,827.00
Apex Contribution	$617,413.50
Cary Reimbursement to Apex	$617,413.50

2. ***Execution in Multiple Counterparts/Electronic Version of Supplement.*** This Supplement may be executed in multiple counterparts, each of which constitutes a completed document. Apex and Cary may convert a signed original of the Supplement to an electronic record pursuant to a North Carolina Department of Cultural Resources approved procedure and process for converting paper records to electronic records for record retention purposes. Such electronic record of the Supplement shall be deemed for all purposes to be an original signed Supplement.

3. ***Effective Date***. This Supplement shall take effect upon its execution by Apex and Cary and shall terminate according to the terms of the Agreement. Failure on the part of one party to comply with any of the provisions of this Supplement shall be grounds for the other

party to terminate this Supplement and, if applicable, seek payment of any of the contributions agreed to in the Agreement.

4. The Agreement is not modified except as provided herein. To the degree they do not conflict, the terms and conditions of the Agreement shall apply to this Supplement.

IN WITNESS WHEREOF, the Town of Cary and the Town of Apex, both pursuant to resolutions of their respective governing boards spread upon their minutes, have caused this Supplement to be executed by their duly authorized officers and their official seals affixed, as applicable, the day and year first written above.

TOWN OF APEX, NORTH CAROLINA

[SEAL]

By:_____
Town Manager

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

_____
Deputy Finance Officer

TOWN OF CARY, NORTH CAROLINA

[SEAL]

By:_____
Deputy Manager

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

_____
Deputy Finance Officer

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: CONSENT AGENDA

Meeting Date: April 27, 2021

Item Details

Presenter(s): Amanda Bunce, Current Planning Manager

Department(s): Planning and Community Development

Requested Motion

Motion to approve the Statement of the Apex Town Council pursuant to G.S. 160D-605(a) addressing action on the Unified Development Ordinance (UDO) Amendment of April 13, 2021.

Approval Recommended?

The Planning and Community Development Department recommends approval.

Item Details

Attachments

- Statement of Town Council

STATEMENT OF THE APEX TOWN COUNCIL PURSUANT TO G.S. 160D-605(a) ADDRESSING ACTION ON THE UNIFIED DEVELOPMENT ORDINANCE (UDO) AMENDMENT OF APRIL 13, 2021

Pursuant to G.S. §160D-601 and Sec. 2.2.11.E of the Unified Development Ordinance, the Planning and Community Development Director for the Town of Apex, Dianne Khin, caused proper notice to be given (by publication and posting), of a public hearing on UDO Amendments before the Town Council on the 23rd day of March 2021.

The Apex Town Council held a public hearing on the 13th day of April 2021. Amanda Bunce, Current Planning Manager, presented the Planning Board's vote to recommend approval by a vote of 6-0 at the public hearing.

All persons who desired to present information relevant to the UDO Amendments and who were residents of Apex or its extraterritorial jurisdiction were allowed to present evidence at the public hearing before the Apex Town Council. No one who wanted to speak was turned away.

The Town Council on the 13th day of April 2021 by a vote of 4 to 0 approved the Ordinance for UDO Amendments.

The Apex Town Council finds from information and testimony provided at the public hearing that the approval of the various UDO Amendments of April 13, 2021 is consistent with the Advance Apex: The 2045 Plan and reasonable and in the public interest for the following reason(s):

1. The amendment to UDO Sec. 4.2.2 *Use Table* adds the use "Medical or dental laboratory" as a permitted use in the Downtown Business (B2) in non-storefront locations and the Planned Commercial (PC) zoning districts in order to provide more flexibility in where such use may locate. The amendments to UDO Sec. 4.4.5.D *Supplemental Standards, Office and Research* clarify that the use "Medical or dental laboratory" is permitted as an accessory use in all zoning districts and states that it is allowed as a primary use in the Downtown Business (B2) subject to certain supplemental standards that address safety of chemicals stored on site and ensure that there is adequate separation between the same use.
2. The amendment to UDO Sec. 8.2.7.B *Fence/Wall Height* corrects a typographical error in a reference to another section in the UDO.

_____
Jacques K. Gilbert
Mayor

ATTEST:

_____
Donna B. Hosch, MMC, NCCMC
Town Clerk

_____
Date

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: CONSENT AGENDA

Meeting Date: April 27, 2021

Item Details

Presenter(s): Shannon Cox, Long Range Planning Manager

Department(s): Planning and Community Development

Requested Motion

Possible motion to approve, and to authorize the Interim Town Manager to sign and execute, the municipal agreement for NCDOT Administered – Transit-Oriented Development Planning.

Approval Recommended?

Yes – Planning and Community Development staff recommend approval.

Former Town Manager, Drew Havens, previously recommended approval through a commitment letter required as part of the NCDOT grant application.

Item Details

The North Carolina Department of Transportation's Integrated Mobility Division has been awarded a Federal Transit Administration Grant of up to a maximum award of $900,000 for the 2020 Pilot Program for Transit-Oriented Development (TOD) along the S-line corridor. The grant requires matching municipal funds to augment federal funds. The agreement stipulates that the Town of Apex will provide $40,000 in matching funds to participate in the TOD Plan for the S-Line corridor. The Town of Apex is among several other municipalities along the S-Line corridor that intend to participate in the plan, including the City of Sanford, the City of Raleigh, the Town of Wake Forest and others. The Project will complete TOD planning activities near potential passenger rail station areas along the S-Line corridor. The study will seek to encourage TOD, leverage public investment in commuter and passenger rail, augment safety and economic development efforts and maximize opportunities for value capture. The plan is anticipated to be completed over a 2-year period.

Attachments

- Municipal Agreement for NCDOT Administered – Transit-Oriented Development Planning
- Letter of Commitment from Drew Havens, former Town Manager

NORTH CAROLINA

WAKE COUNTY

NCDOT ADMINISTERED – TRANSIT-ORIENTED DEVELOPMENT PLANNING

DATE: 4/9/2021

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

AND

WBS Elements: 49619.1.1.6

TOWN OF APEX

THIS MUNICIPAL AGREEMENT is made and entered into on the last date executed below, by and between the North Carolina Department of Transportation, an agency of the State of North Carolina, hereinafter referred to as the "Department" and the Town of Apex, hereinafter referred to as the "Municipality".

W I T N E S S E T H:

WHEREAS, the Department's Integrated Mobility Division (IMD) has been awarded a Federal Transit Administration (FTA) Grant up to a maximum award amount of $900,000 for the 2020 Pilot Program for Transit-Oriented Development (TOD) along the S-line corridor; and

WHEREAS, the Department has allocated state matching funds to augment the federal funds available for these activities; and

WHEREAS, the Department has coordinated with participating municipalities to leverage funding; and,

WHEREAS, the Municipality has agreed to participate in the cost of the project as hereinafter set out; and

WHEREAS, this Agreement is made under the authority granted to the Department by the North Carolina General Assembly including, but not limited to, the following applicable legislation: General Statutes of North Carolina (NCGS) Section 136-66.1, Section 136-71.6, Section 160A-296 and 297, Section 136-18, Section 136-41.3 and Section 20-169, to participate in the planning, construction and/or implementation of the Project approved by the Board of Transportation;

NOW, THEREFORE, the parties hereto, each in consideration of the promises and undertakings of the other as herein provided, do hereby covenant and agree, each with the other, as follows:

SCOPE OF THE PROJECT

1. The Project consists of a planning study that will complete transit-oriented development (TOD) planning activities near potential passenger rail station areas along the S-Line corridor. The study will seek to encourage TOD, leverage public investment in commuter and passenger rail, augment safety/economic development efforts of the USDOT ROUTES initiative and maximize opportunities for value capture.

RESPONSIBILITIES

2. The Department will

    - Procure a consultant to develop the study and administer the contract and associated funding.
    - Convene stakeholders to address challenges of coordination, building consensus and forming a shared corridor vision among multiple jurisdictions.
    - Establish a Project governance committee to assist with development of scope, consultant information gathering activities and review of deliverables.

3. The Municipality shall

    - Have a formal role on the Project governance committee.
    - Actively participate in critical study decisions, help to build corridor consensus and provide review of deliverables.
    - Participate in funding per Provision #8.

PROJECT DOCUMENTS / DELIVERABLES

4. The Department anticipates the following Project Deliverables. Said list may be amended at the request of the Project governance committee:

    - Project Management Plan
    - Community Engagement
    - Information Gathering and Review of Existing Conditions
    - Corridor-Wide Market Study
    - Vision Summary
    - Implementation Plan

- Comprehensive TOD Plan

5. All documents, including digital files, will become the property of the Department. Any and all original graphics, technical drawings, photographs, maps, GIS files, and promotional items produced for the plan or for any public meetings shall be available for use by the Department in other publications, on the IMD website and for display purposes. The Department shall be credited for its participation in all documents, publicity, announcements, and materials prepared for/by the municipality for public meetings.
6. The Municipality shall receive digital files and hard copies of the approved Study. The Municipality shall be responsible for the distribution of the final documents to the appropriate local agencies and interested parties.

TIME FRAMES

7. The Department anticipates project completion within two years of agreement execution. The period of performance for the FTA funds extends to March 2025. It is important that the Municipality provide necessary support and responses to the Department in a timely manner. Any delays on the part of the Municipality may affect the ability of the Department to provide financial support for the Project.

FUNDING

8. The estimated cost of the Project is $1,505,000. The Municipality shall participate in a maximum amount of $40,000. The Municipality shall submit a check for $40,000 to the Department upon **partial execution** of this Agreement. Upon completion of the Project, if actual costs exceed $1,505,000, the Department will be responsible for the overrun. If the actual cost of Project is less than the estimated cost, then the Department will return any overpayment to the Municipality.

ADDITIONAL PROVISIONS

9. The Department shall not be liable and shall be held harmless from any and all claims that might arise on account of the Municipality negligence and/or responsibilities under the terms of this agreement and/or project.
10. All terms and conditions of this Agreement are dependent upon, and, subject to the allocation of funds for the purpose set forth in the Agreement and the Agreement shall automatically terminate if funds cease to be available.

11. If the other party to this agreement is a Municipality and fails for any reason to reimburse the Department in accordance with the provisions for payment hereinabove provided, NCGS 136-41.3 authorizes the Department to withhold so much of the Municipality's share of funds allocated to Municipality by NCGS 136-41.1, until such time as the Department has received payment in full.

12. This Agreement contains the entire agreement between the parties and there are no understandings or agreements, verbal or otherwise, regarding this Agreement except as expressly set forth herein.

13. The parties hereby acknowledge that the individual executing the Agreement on their behalf is authorized to execute this Agreement on their behalf and to bind the respective entities to the terms contained herein and that he has read this Agreement, conferred with his attorney, and fully understands its contents.

14. The other party to this Agreement shall comply with Title VI of the Civil Rights Act of 1964 (Title 49 CFR, Subtitle A, Part 21) and related nondiscrimination authorities. Title VI and related authorities prohibit discrimination on the basis of race, color, national origin, disability, gender, and age in all programs or activities of any recipient of Federal assistance.

15. A copy or facsimile copy of the signature of any party shall be deemed an original with each fully executed copy of the Agreement as binding as an original, and the parties agree that this Agreement can be executed in counterparts, as duplicate originals, with facsimile signatures sufficient to evidence an agreement to be bound by the terms of the Agreement.

16. By Executive Order 24, issued by Governor Perdue, and N.C. G.S.§ 133-32, it is unlawful for any vendor or contractor (i.e. architect, bidder, contractor, construction manager, design professional, engineer, landlord, offeror, seller, subcontractor, supplier, or vendor), to make gifts or to give favors to any State employee of the Governor's Cabinet Agencies (i.e., Administration, Commerce, Correction, Crime Control and Public Safety, Cultural Resources, Environment and Natural Resources, Health and Human Services, Juvenile Justice and Delinquency Prevention, Revenue, Transportation, and the Office of the Governor).

IT IS UNDERSTOOD AND AGREED upon that the approval of the Project by the Department is subject to the conditions of this Agreement.

IN WITNESS WHEREOF, this Agreement has been executed, in duplicate, the day and year heretofore set out, on the part of the Department and the Municipality by authority duly given.

ATTEST:

BY: _____

TITLE: _____

Town of Apex

BY: _____

TITLE: _____

DATE: _____

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

This Agreement has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

_____
(FINANCE OFFICER)

(SEAL)

Federal Tax Identification Number

_____

Remittance Address:

Town of Apex

_____

_____

DEPARTMENT OF TRANSPORTATION

BY: _____
(DEPUTY SECRETARY FOR MULTIMODAL TRANSPORTATION)

DATE: _____

PRESENTED TO BOARD OF TRANSPORTATION ITEM O: _____

October 20, 2020

The Honorable K. Jane Williams
Acting Administrator
Federal Transit Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Dear Acting Administrator Williams:

The Town of Apex is writing in support of the **S-Line Passenger Rail TOD Planning** application for the Federal Transit Administration's fiscal year 2020 Pilot Program for Transit-Oriented Development (TOD) Planning grant program.

A comprehensive effort to facilitate TOD planning along the S-Line rail corridor in North Carolina will help communities integrate land use, economic development, and transportation connectivity as new passenger rail services develop. The portion of the S-Line from Sanford to Ridgway, NC will strengthen connections between Lee, Wake, Vance and Warren Counties, urban economic centers and the Northeast Corridor. It also builds on the recently awarded Consolidated Rail Infrastructure and Safety Improvements (CRISI) grant from the Federal Railroad Administration (FRA) to acquire the S-Line corridor.

TOD planning will enhance economic development, maximize ridership, improve multimodal connectivity, and increase access to opportunities and services for our residents. NCDOT has worked closely with our community to understand the potential benefits and impacts that passenger rail service will have. We appreciate the partnership we have with NCDOT on this project and fully support their efforts to seek TOD planning funds through this grant opportunity. Furthermore, given the tremendous benefits anticipated for our community, we are happy to commit $40,000 in local funding to support this application.

The value of proactive planning cannot be understated given the regional and transformative nature of the S-Line project. This is a wonderful opportunity to identify and plan for infrastructure needs and foster long-term economic impact for the rural and urban areas of North Carolina which the S-Line will serve.

Thank you for your consideration of this project.

Sincerely,

Drew Havens

Drew Havens
Town Manager

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: CONSENT AGENDA

Meeting Date: April 27, 2021

Item Details

Presenter(s): Dianne Khin, Director of Planning and Community Development

Department(s): Planning and Community Development

Requested Motion

Motion to adopt a resolution Directing the Town Clerk to Investigate Petition Received, to accept the Certificate of Sufficiency by the Town Clerk and to adopt a Resolution Setting Date of Public Hearing for May 11, 2021 on the Question of Annexation – Apex Town Council's intent to annex HARP-BARR, LLC, Memphis & Maddox, LLC, Sweet Willie, LLC, William Douglas and Jean S. Poe, Daryl and Jeanne Poe properties containing 157.234 acres located at 6401 Apex Barbecue Road and 1216 & 1330 South Salem Street, Annexation #706 into the Town's corporate limits.

Approval Recommended?

Yes, by the Planning and Community Development Department.

Item Details

The Town Clerk certifies to the investigation of said annexation. Adoption of the Resolution authorizes the Town Clerk to advertise said public hearing by electronic means and on the Town of Apex's website.

Attachments

- Annexation Petition
- Legal Description
- Vicinity Map
- Resolution Directing the Town Clerk to Investigate Petition
- Certificate of Sufficiency by the Town Clerk
- Resolution Setting Date of Public Hearing

RESOLUTION DIRECTING THE TOWN CLERK
TO INVESTIGATE PETITION RECEIVED UNDER G.S.§ 160A-31

Annexation Petition# 706
HARP-BARR, LLC, Memphis & Maddox, LLC, Sweet Willie, LLC, William Douglas and Jean S. Poe, and Daryl and Jeanne Poe (6401 Apex Barbecue Road, 1216 South Salem Street, and 1330 South Salem Street)

WHEREAS, G.S. §160-A 31 provides that the sufficiency of the petition shall be investigated by the Town Clerk before further annexation proceedings may take place; and

WHEREAS, the Town Council of the Town of Apex deems it advisable to proceed in response to this request for annexation;

NOW, THEREFORE, BE IT RESOLVED by the Town Council of the Town of Apex, that the Town Clerk is hereby directed to investigate the sufficiency of the above-described petition and to certify to the Town Council the result of her investigation.

This the 27th day of April 2021.

_____
Jacques K. Gilbert
Mayor

ATTEST:

_____
Donna B. Hosch, MMC, NCCMC
Town Clerk

CERTIFICATE OF SUFFICIENCY BY THE TOWN CLERK

Annexation Petition #706
HARP-BARR, LLC, Memphis & Maddox, LLC, Sweet Willie, LLC, William Douglas and Jean S. Poe, and Daryl and Jeanne Poe (6401 Apex Barbecue Road, 1216 South Salem Street, and 1330 South Salem Street)

To: The Town Council of the Town of Apex, North Carolina

I, Donna B. Hosch, Town Clerk, do hereby certify that I have investigated the annexation petition attached hereto, and have found, as a fact, that said petition is signed by all owners of real property lying in the area described therein, in accordance with G.S.§ 160A-31, as amended.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the Town of Apex, North Carolina this 27th day of April 2021.

_____
Donna B. Hosch, MMC, NCCMC
Town Clerk

(Seal)

PETITION FOR VOLUNTARY ANNEXATION

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Application #:	706	Submittal Date:	3/18/2021
Fee Paid	$ 3/26/2021	Check #	119656

TO THE TOWN COUNCIL APEX, NORTH CAROLINA

1. We, the undersigned owners of real property, respectfully request that the area described in Part 4 below be annexed to the Town of Apex, Wake County, North Carolina.
2. The area to be annexed is ■ contiguous, ☐ non-contiguous (satellite) to the Town of Apex, North Carolina and the boundaries are as contained in the metes and bounds description attached hereto.
3. If contiguous, this annexation will include all intervening rights-of-way for streets, railroads, and other areas as stated in G.S. 160A-31(f), unless otherwise stated in the annexation amendment.

OWNER INFORMATION

HARP-BARR LLC MEMPHIS & MADDOX LLC & SWEET WILLIE, LLC	0731662438
Owner Name (Please Print)	Property PIN or Deed Book & Page #
	dougpoe@bellsouth.net
Phone	E-mail Address
William Douglas Poe and Jean S. Poe	0731766588
Owner Name (Please Print)	Property PIN or Deed Book & Page #
	dougpoe@bellsouth.net
Phone	E-mail Address
Daryl Poe and Jeanne Poe	0731676714
Owner Name (Please Print)	Property PIN or Deed Book & Page #
	dougpoe@bellsouth.net
Phone	E-mail Address

SURVEYOR INFORMATION

Surveyor: McAdams; Tim Mersinger

Phone: 919-361-5000 Fax:

E-mail Address: mersinger@mcadamsco.com

ANNEXATION SUMMARY CHART

Property Information		Reason(s) for annexation (select all that apply)	
Total Acreage to be annexed:	157.234	Need water service due to well failure	☐
Population of acreage to be annexed:	New development	Need sewer service due to septic system failure	☐
Existing # of housing units:	0	Water service (new construction)	☑
Proposed # of housing units:	1,500	Sewer service (new construction)	☑
Zoning District*:	PUD-CZ	Receive Town Services	☑

*If the property to be annexed is not within the Town of Apex's Extraterritorial Jurisdiction, the applicant must also submit a rezoning application with the petition for voluntary annexation to establish an Apex zoning designation. Please contact the Planning Department for questions.

PETITION FOR VOLUNTARY ANNEXATION

Application #: 706 Submittal Date: 3/18/2021

COMPLETE IF IN A LIMITED LIABILITY COMPANY

In witness whereof, Memphis & Maddox LLC, a limited liability company, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this the 23 day of February, 20 21.

Name of Limited Liability Company MEMPHIS & MADDOX LLC

By: _____
Signature of Member/Manager

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Susan Garrott, a Notary Public for the above State and County, this the 23 day of February, 20 21.

Susan Garrott
Notary Public

SEAL

My Commission Expires: 12/2/2024

COMPLETE IF IN A PARTNERSHIP

In witness whereof, _____, a partnership, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this the _____ day of _____, 20_____.

Name of Partnership _____

By: _____
Signature of General Partner

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, _____, a Notary Public for the above State and County, this the _____day of _____, 20____.

_____
Notary Public

SEAL

My Commission Expires: _____

PETITION FOR VOLUNTARY ANNEXATION

Application #: 706 Submittal Date: 3/18/2021

COMPLETE IF IN A LIMITED LIABILITY COMPANY

In witness whereof, Harp-Barr, LLC a limited liability company, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this the 23 day of Feb, 2021.

Name of Limited Liability Company HARP-BARR LLC

By: William Douglas Poe
Signature of Member/Manager

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, William Douglas Poe, a Notary Public for the above State and County, this the 23 day of, Feb, 2021

Notary Public

SEAL

SANDRA N. SHECKELLS NOTARY My Comm. Expires Sept. 4, 2021 WAKE COUNTY, N.C. PUBLIC

My Commission Expires: 9-4-2021

COMPLETE IF IN A PARTNERSHIP

In witness whereof, _____, a partnership, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this the _____ day of _____, 20_____.

Name of Partnership _____

By: _____
Signature of General Partner

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, _____, a Notary Public for the above State and County, this the _____day of _____, 20____.

Notary Public

SEAL

My Commission Expires: _____

PETITION FOR VOLUNTARY ANNEXATION

Application #: 706 Submittal Date: 3/18/2021

COMPLETE IF IN A LIMITED LIABILITY COMPANY

In witness whereof, Sweet Willie, LLC a limited liability company, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this the 23 day of Feb, 2021.

Name of Limited Liability Company Sweet Willie LLC

By: _____
Signature of Member/Manager

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, William Poe, a Notary Public for the above State and County, this the 23 day of, Feb, 2021.

_____
Notary Public

SEAL

SANDRA N. SHECKELLS NOTARY My Comm. Expires Sept. 4, 2021 PUBLIC WAKE COUNTY, N.C.

My Commission Expires: 9-4-2021

COMPLETE IF IN A PARTNERSHIP

In witness whereof, _____, a partnership, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this the _____ day of _____, 20_____.

Name of Partnership _____

By: _____
Signature of General Partner

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, _____, a Notary Public for the above State and County, this the _____day of _____, 20____.

_____
Notary Public

SEAL

My Commission Expires: _____

PETITION FOR VOLUNTARY ANNEXATION

Application #: 706 Submittal Date: 3/18/2021

COMPLETE IF SIGNED BY INDIVIDUALS:

All individual owners must sign. (If additional signatures are necessary, please attach an additional sheet.)

William Douglas Poe — Please Print
William Douglas Poe — Signature

Jean S Poe — Please Print
Jean S. Poe — Signature

_____ — Please Print
_____ — Signature

_____ — Please Print
_____ — Signature

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, William Douglas Poe & Jean S Poe, a Notary Public for the above State and County, this the 23 day of, Feb, 2021.

Notary Public

SEAL

SANDRA N. SHECKELLS NOTARY PUBLIC WAKE COUNTY, N.C. My Comm. Expires Sept. 4, 2021

My Commission Expires: 9-4-2021

COMPLETE IF A CORPORATION:

In witness whereof, said corporation has caused this instrument to be executed by its President and attested by its Secretary by order of its Board of Directors, this the _____ day of _____, 20____.

Corporate Name _____

SEAL

By: _____
President (Signature)

Attest:

_____
Secretary (Signature)

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, _____, a Notary Public for the above State and County, this the _____ day of _____, 20____.

Notary Public

SEAL

My Commission Expires: _____

PETITION FOR VOLUNTARY ANNEXATION

Application #: 706 Submittal Date: 3/18/2021

COMPLETE IF SIGNED BY INDIVIDUALS:

All individual owners must sign. (If additional signatures are necessary, please attach an additional sheet.)

Daryl Poe Daryl Poe Please Print	Daryl Poe Signature
Jeanne Poe Jeanne Poe Please Print	Jeanne Poe Signature
Please Print	Signature
Please Print	Signature

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Susan Garrott, a Notary Public for the above State and County, this the 23 day of February, 2021.

Susan Garrott
Notary Public

SEAL

My Commission Expires: 12/2/2024

COMPLETE IF A CORPORATION:

In witness whereof, said corporation has caused this instrument to be executed by its President and attested by its Secretary by order of its Board of Directors, this the _____ day of _____, 20____.

Corporate Name _____

SEAL

By: _____
President (Signature)

Attest:

_____
Secretary (Signature)

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, _____, a Notary Public for the above State and County, this the _____day of _____, 20____.

_____
Notary Public

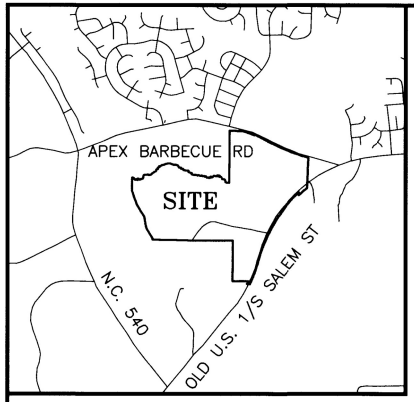
SEAL

My Commission Expires: _____

BEGINNING AT AN IRON PIPE IN THE NORTHERN PROPERTY LINE OF THE DARYL POE AND JEANNE POE TRACT; THENCE SOUTH 88°15'40" EAST 294.44 FEET TO A POINT; THENCE SOUTH 88°15'40" EAST 73.53 FEET TO AN IRON PIPE IN THE SOUTHERN RIGHT OF WAY OF APEX BARBEQUE ROAD(VARIABLE WIDTH PUBLIC RIGHT OF WAY); THENCE SOUTH 88°17'21" EAST 166.15 FEET TO A POINT; THENCE SOUTH 66°51'11" EAST 52.41 FEET TO A POINT; THENCE SOUTH 66°15'45" EAST 53.82 FEET TO A POINT; THENCE SOUTH 65°14'19" EAST 41.62 FEET TO A POINT; THENCE NORTH 25°36'46" EAST 2.86 FEET TO A POINT; THENCE SOUTH 63°01'58" EAST 36.23 FEET TO A POINT; THENCE SOUTH 62°43'11" EAST 52.42 FEET TO A POINT; THENCE SOUTH 62°34'50" EAST 52.21 FEET TO A POINT; THENCE SOUTH 62°33'45" EAST 50.32 FEET TO A POINT; THENCE SOUTH 62°31'05" EAST 52.09 FEET TO A POINT; THENCE SOUTH 62°41'02" EAST 38.46 FEET TO A POINT; THENCE NORTH 27°30'20" EAST 20.00 FEET TO A POINT IN THE NORTHERN RIGHT OF WAY OF APEX BARBEQUE ROAD (VARIALBE WITH PUBLC RIGHT OF WAY); THENCE WITH SAID RIGHT OF WAY SOUTH 63°45'54" EAST 15.27 FEET TO A POINT; THENCE SOUTH 63°11'11" EAST 52.92 FEET TO A POINT; THENCE SOUTH 63°46'38" EAST 52.45 FEET TO A POINT; THENCE SOUTH 64°11'18" EAST 51.01 FEET TO A POINT; THENCE SOUTH 64°51'58" EAST 49.52 FEET TO A POINT; THENCE SOUTH 65°24'55" EAST 50.07 FEET TO A POINT; THENCE SOUTH 66°04'16" EAST 48.34 FEET TO A POINT; THENCE SOUTH 66°24'38" EAST 50.08 FEET TO A POINT; THENCE SOUTH 66°41'38" EAST 50.19 FEET TO A POINT; THENCE SOUTH 66°15'39" EAST 38.64 FEET TO AN IRON PIPE; THENCE LEAVING SAID RIGHT OF WAY SOUTH 45°09'49" WEST 21.52 FEET TO A POINT; THENCE SOUTH 66°29'41" EAST 17.50 FEET TO A POINT; THENCE SOUTH 66°51'15" EAST 51.02 FEET TO A POINT; THENCE SOUTH 67°29'37" EAST 46.49 FEET TO A POINT; THENCE SOUTH 69°10'44" EAST 47.69 FEET TO A POINT; THENCE SOUTH 70°48'55" EAST 47.97 FEET TO A POINT; THENCE SOUTH 72°26'29" EAST 49.98 FEET TO A POINT; THENCE SOUTH 73°56'45" EAST 48.27 FEET TO A POINT; THENCE SOUTH 74°36'34" EAST 49.46 FEET TO A POINT; THENCE SOUTH 74°35'50" EAST 50.79 FEET TO A POINT; THENCE SOUTH 74°07'44" EAST 48.03 FEET TO A POINT; THENCE SOUTH 73°53'30" EAST 1.43 FEET TO A POINT; THENCE SOUTH 00°46'03" WEST 62.04 FEET TO AN IRON PIPE; THENCE SOUTH 02°10'02" WEST 684.03 FEET TO A POINT; THENCE WITH A CURVE TO THE LEFT WITH AN ARC LENGTH OF 91.26 FEET, WITH A RADIUS OF 2927.20 FEET, WITH A CHORD BEARING OF SOUTH 49°51'06" WEST, WITH A CHORD LENGTH OF 91.25 FEET TO A POINT; THENCE WITH A COMPOUND CURVE TO THE LEFT WITH AN ARC LENGTH OF 156.33 FEET, WITH A RADIUS OF 2830.49 FEET, WITH A CHORD BEARING OF SOUTH 47°19'16" WEST, WITH A CHORD LENGTH OF 156.31 FEET TO A POINT; THENCE NORTH 01°41'10" EAST 71.72 FEET TO AN IRON PIPE; THENCE SOUTH 46°03'02" WEST 85.16 FEET TO A POINT; THENCE SOUTH 44°07'53" WEST 101.67 FEET TO A POINT; THENCE SOUTH 42°07'43" WEST 101.98 FEET TO A POINT; THENCE SOUTH 40°06'18" WEST 101.05 FEET TO A POINT; THENCE SOUTH 38°00'20" WEST 102.25 FEET TO AN IRON PIPE; THENCE SOUTH 36°10'22" WEST 101.61 FEET TO A POINT; THENCE SOUTH 34°13'40" WEST 101.88 FEET TO A POINT; THENCE SOUTH 32°20'31" WEST 101.40 FEET TO A POINT; THENCE SOUTH 30°52'45" WEST 101.44 FEET TO AN IRON PIPE; THENCE SOUTH 29°32'30" WEST 100.74 FEET TO A POINT; THENCE SOUTH 28°00'14" WEST 101.56 FEET TO A POINT; THENCE SOUTH 26°31'43" WEST 101.76 FEET TO A POINT; THENCE SOUTH 24°59'56" WEST 101.74 FEET TO A POINT; THENCE SOUTH 23°14'59" WEST 38.23 FEET TO AN IRON PIPE; THENCE SOUTH 23°13'26" WEST 63.12 FEET TO A POINT; THENCE SOUTH 21°18'46" WEST 102.56 FEET TO A POINT; THENCE SOUTH 19°14'15" WEST 102.34 FEET TO A POINT; THENCE SOUTH 17°17'15" WEST 101.06 FEET TO A POINT; THENCE SOUTH 16°16'37" WEST 100.94 FEET TO A POINT; THENCE SOUTH 16°30'48" WEST 99.68 FEET TO AN IRON PIPE; THENCE SOUTH 17°33'06" WEST 98.63 FEET TO A POINT; THENCE SOUTH 19°12'54" WEST 98.15 FEET TO A POINT; THENCE SOUTH 21°07'08" WEST 99.78 FEET TO A POINT; THENCE SOUTH 23°11'04" WEST 97.92 FEET TO A POINT; THENCE SOUTH 24°54'47" WEST 38.40 FEET TO A POINT; THENCE SOUTH 25°36'27" WEST 22.58 FEET TO AN IRON PIPE; THENCE NORTH 89°17'29" WEST 64.48 FEET TO AN IRON PIPE; THENCE WITH A CURVE TO THE LEFT WITH AN ARC LENGTH OF 66.11 FEET, WITH A RADIUS OF 2804.10 FEET, WITH A CHORD BEARING OF NORTH 25°32'13" EAST, WITH A CHORD LENGTH OF 66.11 FEET TO A

POINT; THENCE NORTH 89°17'29" WEST 353.78 FEET TO A CONCRETE MONUMENT; THENCE NORTH 00°17'39" EAST 911.20 FEET TO AN IRON PIPE; THENCE SOUTH 89°59'35" WEST 879.26 FEET TO AN IRON PIPE; THENCE NORTH 88°24'26" WEST 416.05 FEET TO AN IRON PIPE; THENCE NORTH 88°58'59" WEST 428.33 FEET TO AN IRON PIPE; THENCE NORTH 89°42'10" WEST 67.13 FEET TO AN IRON PIPE IN THE EASTERN RIGHT OF WAY OF N.C. HIGHWAY 540 (VARIABLE WIDTH PUBLIC RIGHT OF WAY); THENCE WITH SAID RIGHT OF WAY NORTH 14°10'11" WEST 25.98 FEET TO A CONCRETE MONUMENT; THENCE NORTH 29°27'03" WEST 279.28 FEET TO A CONCRETE MONUMENT; THENCE NORTH 10°30'20" WEST 258.11 FEET TO A CONCRETE MONUMENT; THENCE NORTH 31°49'46" WEST 302.09 FEET TO A CONCRETE MONUMENT; THENCE NORTH 19°25'27" WEST 348.05 FEET TO AN IRON PIPE; THENCE NORTH 01°06'22" EAST 289.07 FEET TO AN IRON PIPE IN THE CENTERLINE OF A CREEK; THENCE WITH SAID CENTERLINE SOUTH 62°05'16" EAST 8.68 FEET TO A POINT; THENCE SOUTH 75°58'33" EAST 23.59 FEET TO A POINT; THENCE SOUTH 54°32'13" EAST 16.14 FEET TO A POINT; THENCE SOUTH 28°27'52" EAST 21.06 FEET TO A POINT; THENCE SOUTH 52°11'00" EAST 19.37 FEET TO A POINT; THENCE NORTH 80°16'49" EAST 16.94 FEET TO A POINT; THENCE NORTH 27°19'34" EAST 14.43 FEET TO A POINT; THENCE NORTH 74°27'19" EAST 9.44 FEET TO A POINT; THENCE SOUTH 50°24'04" EAST 7.19 FEET TO A POINT; THENCE SOUTH 36°21'02" EAST 23.88 FEET TO A POINT; THENCE NORTH 39°19'42" EAST 12.17 FEET TO A POINT; THENCE NORTH 05°51'07" WEST 17.89 FEET TO A POINT; THENCE NORTH 50°03'59" EAST 8.76 FEET TO A POINT; THENCE SOUTH 73°12'41" EAST 16.32 FEET TO A POINT; THENCE SOUTH 21°18'53" EAST 18.47 FEET TO A POINT; THENCE SOUTH 72°13'16" EAST 13.54 FEET TO A POINT; THENCE NORTH 61°51'46" EAST 21.65 FEET TO A POINT; THENCE NORTH 74°00'24" EAST 50.54 FEET TO A POINT; THENCE NORTH 19°57'12" EAST 44.74 FEET TO A POINT; THENCE NORTH 06°03'59" WEST 20.11 FEET TO A POINT; THENCE NORTH 35°44'44" EAST 23.04 FEET TO A POINT; THENCE NORTH 69°35'37" EAST 22.30 FEET TO A POINT; THENCE SOUTH 84°36'00" EAST 31.56 FEET TO A POINT; THENCE NORTH 68°46'46" EAST 23.80 FEET TO A POINT; THENCE NORTH 88°42'18" EAST 17.10 FEET TO A POINT; THENCE SOUTH 54°50'03" EAST 18.40 FEET TO A POINT; THENCE NORTH 80°46'03" EAST 40.56 FEET TO A POINT; THENCE NORTH 58°20'09" EAST 25.29 FEET TO A POINT; THENCE NORTH 44°32'26" EAST 24.34 FEET TO A POINT; THENCE NORTH 71°02'31" EAST 19.10 FEET TO A POINT; THENCE NORTH 47°24'16" EAST 37.55 FEET TO A POINT; THENCE NORTH 81°51'36" EAST 25.80 FEET TO A POINT; THENCE NORTH 36°15'39" EAST 27.41 FEET TO A POINT; THENCE NORTH 20°21'02" WEST 17.38 FEET TO A POINT; THENCE NORTH 11°59'13" EAST 2.08 FEET TO A POINT; THENCE NORTH 58°12'58" EAST 29.12 FEET TO A POINT; THENCE NORTH 82°43'32" EAST 21.16 FEET TO A POINT; THENCE NORTH 05°01'51" WEST 12.48 FEET TO A POINT; THENCE NORTH 77°16'23" WEST 12.42 FEET TO A POINT; THENCE NORTH 37°17'58" EAST 22.50 FEET TO A POINT; THENCE NORTH 73°27'07" EAST 34.86 FEET TO A POINT; THENCE NORTH 03°15'44" EAST 13.46 FEET TO A POINT; THENCE NORTH 45°09'32" WEST 11.24 FEET TO A POINT; THENCE NORTH 53°48'21" EAST 6.23 FEET TO A POINT; THENCE SOUTH 68°53'55" EAST 13.88 FEET TO A POINT; THENCE NORTH 60°34'12" EAST 52.94 FEET TO A POINT; THENCE NORTH 78°46'01" EAST 46.77 FEET TO A POINT; THENCE NORTH 67°46'44" EAST 48.56 FEET TO A POINT; THENCE NORTH 74°58'45" EAST 43.00 FEET TO A POINT; THENCE SOUTH 89°36'23" EAST 38.18 FEET TO A POINT; THENCE SOUTH 79°42'51" EAST 22.68 FEET TO A POINT; THENCE SOUTH 29°26'17" EAST 17.84 FEET TO A POINT; THENCE NORTH 69°48'36" EAST 16.45 FEET TO A POINT; THENCE SOUTH 68°17'51" EAST 51.96 FEET TO A POINT; THENCE NORTH 73°12'05" EAST 27.64 FEET TO A POINT; THENCE SOUTH 79°24'02" EAST 15.42 FEET TO A POINT; THENCE SOUTH 74°12'31" EAST 45.28 FEET TO A POINT; THENCE SOUTH 39°16'28" EAST 36.13 FEET TO A POINT; THENCE SOUTH 08°43'30" WEST 18.30 FEET TO A POINT; THENCE SOUTH 50°53'39" EAST 18.00 FEET TO A POINT; THENCE NORTH 88°17'02" EAST 36.36 FEET TO A POINT; THENCE SOUTH 13°58'03" EAST 21.80 FEET TO A POINT; THENCE SOUTH 81°03'00" EAST 42.96 FEET TO A POINT; THENCE SOUTH 30°57'25" EAST 26.88 FEET TO A POINT; THENCE SOUTH 75°54'58" EAST 40.54 FEET TO A POINT; THENCE SOUTH 70°25'00" EAST 15.28 FEET TO A POINT; THENCE NORTH 84°19'40" EAST 27.52 FEET TO A POINT; THENCE SOUTH 80°36'18" EAST 37.25 FEET

TO A POINT; THENCE SOUTH 42°44'12" WEST 13.86 FEET TO A POINT; THENCE SOUTH 64°51'55" WEST 13.95 FEET TO A POINT; THENCE SOUTH 64°16'15" EAST 26.38 FEET TO A POINT; THENCE SOUTH 51°02'50" EAST 20.28 FEET TO A POINT; THENCE SOUTH 76°30'27" EAST 49.09 FEET TO A POINT; THENCE SOUTH 02°56'27" WEST 22.78 FEET TO A POINT; THENCE SOUTH 68°53'00" EAST 39.44 FEET TO A POINT; THENCE SOUTH 74°05'57" EAST 21.64 FEET TO A POINT; THENCE NORTH 54°46'33" EAST 12.67 FEET TO A POINT; THENCE SOUTH 78°44'03" EAST 50.69 FEET TO A POINT; THENCE SOUTH 17°24'42" EAST 10.77 FEET TO A POINT; THENCE NORTH 81°02'40" EAST 18.57 FEET TO A POINT; THENCE NORTH 57°30'16" EAST 25.96 FEET TO A POINT; THENCE SOUTH 49°12'49" EAST 22.49 FEET TO A POINT; THENCE SOUTH 75°13'50" EAST 36.68 FEET TO A POINT; THENCE NORTH 43°03'04" EAST 18.03 FEET TO A POINT; THENCE SOUTH 43°29'16" EAST 25.33 FEET TO A POINT; THENCE NORTH 84°54'55" EAST 33.14 FEET TO A POINT; THENCE SOUTH 49°52'36" EAST 29.02 FEET TO A POINT; THENCE NORTH 47°30'27" EAST 22.64 FEET TO A POINT; THENCE SOUTH 44°10'50" EAST 48.34 FEET TO A POINT; THENCE NORTH 77°35'58" EAST 27.83 FEET TO A POINT; THENCE SOUTH 44°55'44" EAST 20.62 FEET TO A POINT; THENCE NORTH 67°39'06" EAST 23.64 FEET TO A POINT; THENCE NORTH 09°17'48" WEST 14.71 FEET TO A POINT; THENCE NORTH 56°08'00" EAST 16.99 FEET TO A POINT; THENCE SOUTH 84°08'50" EAST 9.11 FEET TO A POINT; THENCE SOUTH 21°28'59" EAST 19.37 FEET TO A POINT; THENCE NORTH 77°01'03" EAST 25.20 FEET TO A POINT; THENCE NORTH 52°22'39" EAST 13.09 FEET TO A POINT; THENCE NORTH 34°19'37" EAST 31.41 FEET TO A POINT; THENCE SOUTH 83°30'24" EAST 9.86 FEET TO A POINT; THENCE SOUTH 73°18'34" EAST 60.44 FEET TO A POINT; THENCE NORTH 25°37'49" EAST 32.53 FEET TO A POINT; THENCE SOUTH 40°49'03" EAST 28.47 FEET TO A POINT; THENCE NORTH 36°58'17" EAST 21.69 FEET TO A POINT; THENCE SOUTH 76°44'46" EAST 21.44 FEET TO A POINT; THENCE SOUTH 14°26'49" WEST 27.21 FEET TO A POINT; THENCE SOUTH 86°41'52" EAST 6.78 FEET TO A POINT; THENCE NORTH 87°14'33" EAST 24.64 FEET TO A POINT; THENCE SOUTH 40°22'08" EAST 36.29 FEET TO A POINT; THENCE SOUTH 13°37'04" EAST 24.06 FEET TO A POINT; THENCE SOUTH 82°58'59" EAST 35.03 FEET TO A POINT; THENCE SOUTH 73°33'17" EAST 23.68 FEET TO A POINT; THENCE SOUTH 25°37'21" EAST 34.01 FEET TO A POINT; THENCE SOUTH 06°57'32" EAST 21.00 FEET TO A POINT; THENCE SOUTH 53°23'42" EAST 38.38 FEET TO A POINT; THENCE SOUTH 83°14'09" EAST 8.53 FEET TO A POINT; THENCE NORTH 33°23'35" EAST 11.26 FEET TO A POINT; THENCE SOUTH 68°50'30" EAST 18.96 FEET TO A POINT; THENCE NORTH 81°37'03" EAST 18.18 FEET TO A POINT; THENCE SOUTH 39°21'14" EAST 5.22 FEET TO A POINT; THENCE LEAVING THE CENTERLIN OF SAID CREEK NORTH 00°20'56" EAST 1168.68 FEET TO THE POINT AND PLACE OF BEGINNING CONTAINING 6,849,127 SQUARE FEET, 157.234 ACRES AND BEING THE SAME AREA AS SHOWN ON THE PLAT BY THE JOHN R MCADAMS COMPANY TITLED ANNEXATION MAP OF DEPOT 499 DATED NOVEMBER 19TH, 2020.



GENERAL NOTES

1. THIS IS A SURVEY OF AN EXISTING PARCEL(S) OF LAND. THIS IS AN ANNEXATION SURVEY.
2. BEARINGS FOR THIS SURVEY ARE BASED ON NAD 83(2001).
3. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES.
4. ZONING: PUD-CZ
5. AREA BY COORDINATE GEOMETRY.
6. FLOOD NOTE: THIS PROPERTY IS NOT LOCATED IN A SPECIAL FLOOD HAZARD ZONE. IT IS LOCATED IN ZONE "X" AS DEFINED BY F.E.M.A F.I.R.M COMMUNITY PANEL #3720073100J DATED MAY 2, 2006.
7. UTILITY STATEMENT
   THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

SURVEYOR'S CERTIFICATE

I, JAMES S. ARMSTRONG, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTION RECORDED IN BOOK 12121, PAGE 472); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION FOUND IN BOOK ____, PAGE ____ ; THAT THE RATIO OF PRECISION OR POSITIONAL ACCURACY AS CALCULATED IS 1:55,804+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER AND SEAL THIS 7th DAY OF April, A.D., 2021.

JAMES S. ARMSTRONG, PROFESSIONAL LAND SURVEYOR L-4411

TYPE OF PLAT

I HEREBY CERTIFY THIS PLAT OF THE FOLLOWING TYPE:
G.S. 47-30 (F)(11)(C)(1). THAT THE SURVEY IS OF AN EXISTING PARCEL OR PARCELS OF LAND OR ONE OR MORE EXISTING EASEMENTS AND DOES NOT CREATE A NEW STREET OR CHANGE AN EXISTING STREET. FOR THE PURPOSES OF THIS SUBSECTION AN "EXISTING PARCEL" OR "EXISTING EASEMENT" IS AN AREA OF LAND DESCRIBED IN A SINGLE, LEGAL DESCRIPTION OR LEGALLY RECORDED SUBDIVISION THAT HAS BEEN OR MAY BE LEGALLY CONVEYED TO A NEW OWNER BY DEED IN ITS EXISTING CONFIGURATION.

PROFESSIONAL LAND SURVEYOR

CURVE TABLE					
CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	
C1	2927.20'	91.26'	91.25'	S 49°51'06" W	
C2	2830.49'	156.33'	156.31'	S 47°19'16" W	
C3	2804.10'	66.11'	66.11'	N 25°32'13" E	

LINE TABLE		
LINE	BEARING	DISTANCE
L1	S 88°15'40" E	73.53'
L2	S 88°17'21" E	166.15'
L3	S 66°51'11" E	52.41'
L4	S 66°15'45" E	53.82'
L5	S 65°14'19" E	41.82'
L6	N 25°36'46" E	2.86'
L7	S 63°01'58" E	36.23'
L8	S 62°43'11" E	52.42'
L9	S 62°34'50" E	52.21'
L10	S 62°33'45" E	50.32'
L11	S 62°31'05" E	52.09'
L12	S 62°41'02" E	38.46'
L13	N 27°30'20" E	20.00'
L14	S 63°45'54" E	15.27'
L15	S 63°11'11" E	52.92'
L16	S 63°46'38" E	52.45'
L17	S 64°11'18" E	51.01'
L18	S 64°51'58" E	49.52'
L19	S 65°24'55" E	50.07'
L20	S 66°04'16" E	48.34'
L21	S 66°24'38" E	50.08'
L22	S 66°41'38" E	50.19'
L23	S 66°15'39" E	38.64'
L24	S 45°09'49" W	21.52'
L25	S 66°29'41" E	17.50'
L26	S 66°51'15" E	51.02'
L27	S 67°29'37" E	46.49'
L28	S 69°10'44" E	47.69'
L29	S 70°48'55" E	47.97'
L30	S 72°26'29" E	49.98'
L31	S 73°56'45" E	48.27'
L32	S 74°36'34" E	49.46'
L33	S 74°35'50" E	50.79'
L34	S 74°07'44" E	48.03'
L35	S 73°53'30" E	1.43'
L36	S 00°46'03" W	62.04'
L37	N 01°41'10" E	71.72'
L38	S 46°03'02" W	85.16'
L39	S 44°07'53" W	101.67'
L40	S 42°07'43" W	101.98'
L41	S 40°08'18" W	101.05'
L42	S 38°00'20" W	102.25'
L43	S 36°10'22" W	101.61'
L44	S 34°13'40" W	101.88'
L45	S 32°20'31" W	101.40'
L46	S 30°52'45" W	101.44'
L47	S 29°32'30" W	100.74'
L48	S 28°00'14" W	101.56'
L49	S 26°31'43" W	101.76'
L50	S 24°59'56" W	101.74'
L51	S 23°14'59" W	38.23'
L52	S 23°13'26" W	63.12'
L53	S 21°18'46" W	102.56'
L54	S 19°14'15" W	102.34'
L55	S 17°17'15" W	101.06'
L56	S 16°16'37" W	100.94'
L57	S 16°30'48" W	99.68'
L58	S 17°33'06" W	98.63'
L59	S 19°12'54" W	98.15'
L60	S 21°07'08" W	99.78'
L61	S 23°11'04" W	97.92'
L62	S 24°54'47" W	38.40'
L63	S 25°36'27" W	22.58'
L64	N 89°17'29" W	64.48'
L65	N 89°42'10" W	67.13'
L66	N 14°10'11" W	25.98'
L67	N 29°27'03" W	279.28'
L68	N 10°30'20" W	258.11'
L69	N 31°49'46" W	302.09'
L70	N 19°25'27" W	348.05'
L71	N 01°06'22" E	289.07'
L72	S 62°05'16" E	8.68'
L73	S 75°58'33" E	23.59'
L74	S 54°32'13" E	16.14'
L75	S 28°27'52" E	21.06'
L76	S 52°11'00" E	19.37'
L77	N 80°16'49" E	16.94'
L78	N 27°19'34" E	14.43'
L79	N 74°27'19" E	9.44'
L80	S 50°24'04" E	7.19'
L81	S 36°21'02" E	23.88'
L82	N 39°19'42" E	12.17'
L83	N 05°51'07" W	17.89'
L84	N 50°03'59" E	8.76'
L85	S 73°12'41" E	16.32'
L86	S 21°18'53" E	18.47'
L87	S 72°13'16" E	13.54'
L88	N 61°51'46" E	21.65'
L89	N 74°00'24" E	50.54'
L90	N 19°57'12" E	44.74'
L91	N 06°03'59" W	20.11'
L92	N 35°44'44" E	23.04'
L93	N 69°35'37" E	22.30'
L94	S 84°36'00" E	31.56'
L95	N 68°46'46" E	23.80'
L96	N 88°42'18" E	17.10'
L97	S 54°50'03" E	18.40'
L98	N 80°48'03" E	40.56'
L99	N 58°20'09" E	25.29'
L100	N 44°32'26" E	24.34'
L101	N 71°02'31" E	19.10'
L102	N 47°24'16" E	37.55'
L103	N 81°51'36" E	25.80'
L104	N 36°15'39" E	27.41'
L105	N 20°21'02" W	17.38'
L106	N 11°59'13" E	2.08'
L107	N 58°12'58" E	29.12'
L108	N 82°43'32" E	21.16'
L109	N 05°01'51" W	12.48'
L110	N 77°16'23" W	12.42'
L111	N 37°17'58" E	22.50'
L112	N 73°27'07" E	34.86'
L113	N 05°15'44" E	13.46'
L114	N 45°09'32" W	11.24'
L115	N 53°48'21" E	6.23'
L116	S 68°53'55" E	13.88'
L117	N 60°34'12" E	52.94'
L118	N 78°46'01" E	46.77'
L119	N 67°48'44" E	48.56'
L120	N 74°58'45" E	43.00'
L121	S 89°36'23" E	38.18'
L122	S 79°42'51" E	22.68'
L123	S 29°26'17" E	17.84'
L124	N 69°48'36" E	16.45'
L125	S 68°17'51" E	51.96'
L126	N 73°12'05" E	27.64'
L127	S 79°24'02" E	15.42'
L128	S 74°12'31" E	45.28'
L129	S 39°16'28" E	36.13'
L130	S 08°43'30" W	18.30'
L131	S 50°53'39" E	18.00'
L132	N 88°17'02" E	36.36'
L133	S 13°58'03" E	21.80'
L134	S 81°03'00" E	42.96'
L135	S 30°57'25" E	26.88'
L136	S 75°54'58" E	40.54'
L137	S 70°25'00" E	15.28'
L138	N 84°19'40" E	27.52'
L139	S 80°36'18" E	37.25'
L140	S 42°44'12" W	13.86'
L141	S 64°51'55" W	13.95'
L142	S 64°16'15" E	26.36'
L143	S 51°02'50" E	20.28'
L144	S 76°30'27" E	49.09'
L145	S 02°56'27" W	22.78'
L146	S 68°53'00" E	39.44'
L147	S 74°05'57" E	21.64'
L148	N 54°48'33" E	12.67'
L149	S 78°44'03" E	50.69'
L150	S 17°24'42" E	10.77'
L151	N 81°02'40" E	18.57'
L152	N 57°30'16" E	25.96'
L153	S 49°12'49" E	22.49'
L154	S 75°13'50" E	36.68'
L155	N 43°03'04" E	18.03'
L156	S 43°29'16" E	25.33'
L157	N 84°54'55" E	33.14'
L158	S 49°52'36" E	29.02'
L159	N 47°30'27" E	22.64'
L160	S 44°10'50" E	48.34'
L161	N 77°35'56" E	27.83'
L162	S 44°55'44" E	20.62'
L163	N 67°39'06" E	23.64'
L164	N 09°17'48" W	14.71'
L165	N 56°08'00" E	16.99'
L166	S 84°08'50" E	9.11'
L167	S 21°28'59" E	19.37'
L168	N 77°01'03" E	25.20'
L169	N 52°22'39" E	13.09'
L170	N 34°19'37" E	31.41'
L171	S 83°30'24" E	9.86'
L172	S 73°18'34" E	60.44'
L173	N 25°37'49" E	32.53'
L174	S 40°49'03" E	28.47'
L175	N 36°58'17" E	21.69'
L176	S 76°44'46" E	21.44'
L177	S 41°26'49" W	27.21'
L178	S 86°41'52" E	6.78'
L179	N 87°14'33" E	24.64'
L180	S 40°22'08" E	36.29'
L181	S 13°37'04" E	24.06'
L182	S 82°58'59" E	35.03'
L183	S 73°33'17" E	23.68'
L184	S 25°37'21" E	34.01'
L185	S 06°57'32" E	21.00'
L186	S 53°23'42" E	38.38'
L187	S 83°14'09" E	8.53'
L188	N 33°23'35" E	11.26'
L189	S 68°50'30" E	18.96'
L190	N 81°37'03" E	18.18'
L191	S 39°21'14" E	5.22'

McAdams
The John R. McAdams Company, Inc.
2905 Meridian Parkway
Durham, NC 27713

phone 919. 361. 5000
fax 919. 361. 2269
license number: C-0293, C-187

www.mcadamsco.com

CLIENT

LENNAR CAROLINAS, LLC

DEPOT 499
ANNEXATION PLAT
WHITE OAK TOWNSHIP, WAKE COUNTY, NC

NORTH CAROLINA PROFESSIONAL SEAL L-4411 LAND SURVEYOR JAMES S. ARMSTRONG

REVISIONS

NO.	DATE

PLAN INFORMATION

PROJECT NO.	LEN-19090
FILENAME	LEN19090-F1
CHECKED BY	JSA
DRAWN BY	TAM
SCALE	N/A
DATE	11-19-2020

SHEET

SHEET TITLE

1-3

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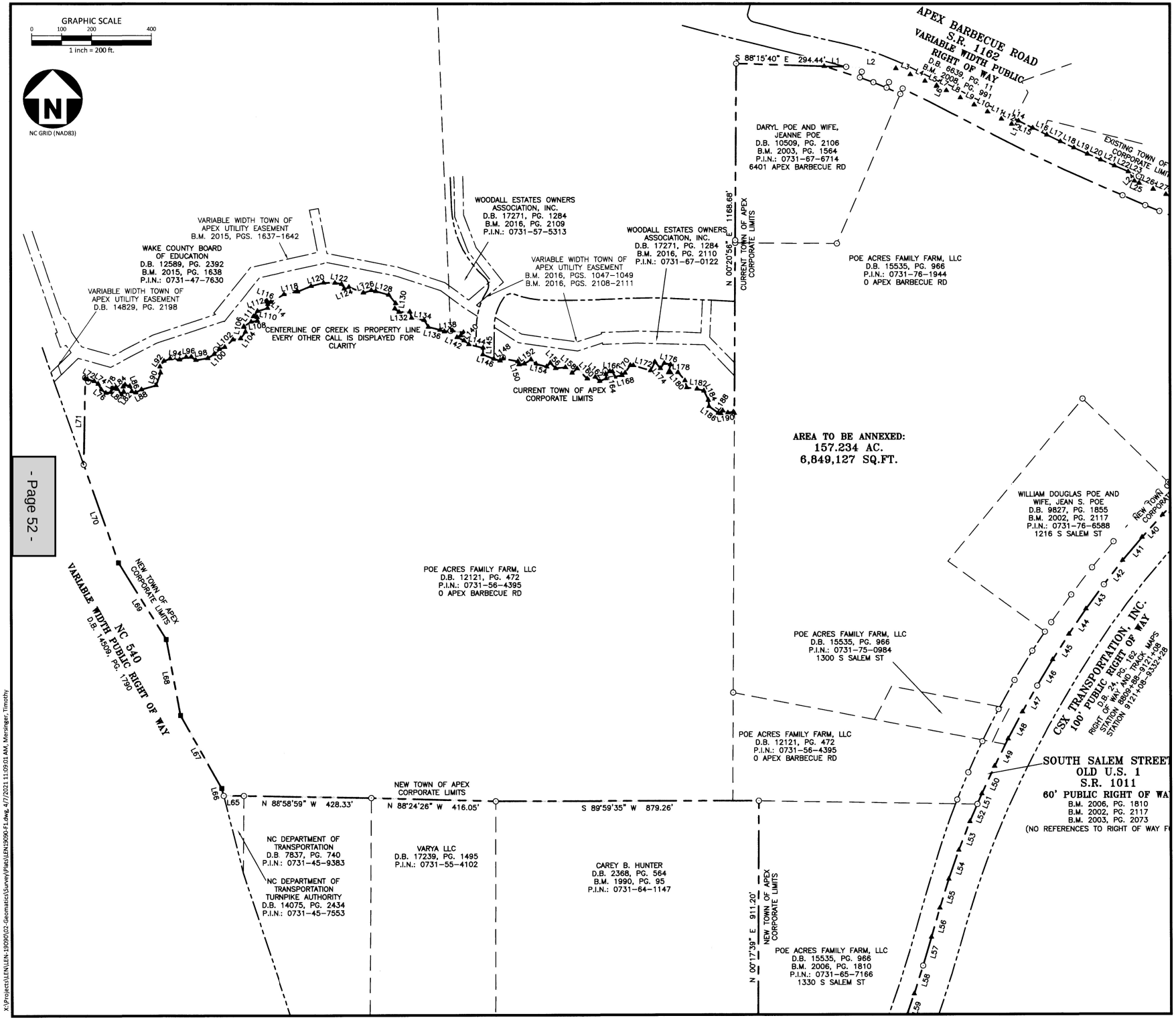

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DEPOT 499
ANNEXATION PLAT

WHITE OAK TOWNSHIP, WAKE COUNTY, NC

NORTH CAROLINA PROFESSIONAL SEAL L-4411 JAMES S. ARMSTRONG

REVISIONS 4.7.21

NO.	DATE

PLAN INFORMATION

PROJECT NO.	LEN-19090
FILENAME	LEN19090-F1
CHECKED BY	JSA
DRAWN BY	TAM
SCALE	1"=200'
DATE	11-19-2020

SHEET

SHEET TITLE

2-3

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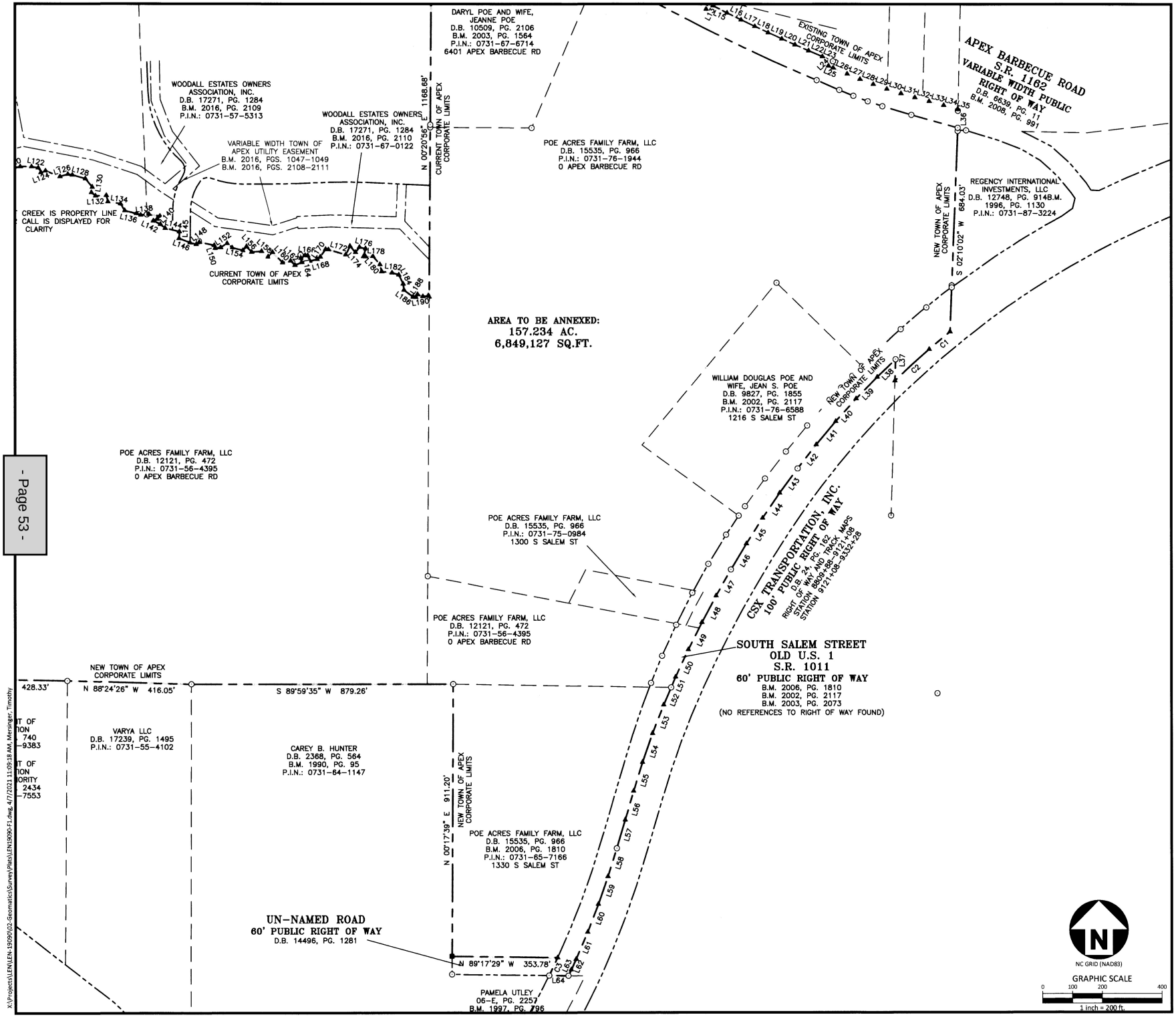

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CLIENT

LENNAR CAROLINAS, LLC

DEPOT 499
ANNEXATION PLAT

WHITE OAK TOWNSHIP, WAKE COUNTY, NC

NORTH CAROLINA PROFESSIONAL SEAL 041111 LAND SURVEYOR JAMES S. ARMSTRONG

4.7.21

REVISIONS

NO.	DATE

PLAN INFORMATION

PROJECT NO.	LEN-19090
FILENAME	LEN19090-F1
CHECKED BY	JSA
DRAWN BY	TAM
SCALE	1"=200'
DATE	11-19-2020

SHEET

SHEET TITLE

3-3

Wake County Real Estate Data
Account Summary

Real Estate ID **0055913** PIN # **0731662438**

Location Address
1330 S SALEM ST

Property Description
POE ACRES FAMILY FARMS LLC PROP

Property Owner	Owner's Mailing Address	Property Location Address
HARP-BARR LLC **MEMPHIS & MADDOX LLC** (Use the Deeds link to view any additional owners)	**1216 S SALEM ST** **APEX NC 27502-7243**	**1330 S SALEM ST** **APEX NC 27502-7245**

Administrative Data		**Transfer Information**		**Assessed Value**	
Old Map #	**646--**				
Map/Scale	**0731 11**	Deed Date	**12/17/2020**	Land Value Assessed	**$9,245,313**
VCS	**20AP900**	Book & Page	**18244 2083**	Bldg. Value Assessed	**$125,630**
City		Revenue Stamps			
Fire District	**23**	Pkg Sale Date			
Township	**WHITE OAK**	Pkg Sale Price		Tax Relief	
Land Class	**AGR-FARM**	Land Sale Date			
ETJ	**AP**	Land Sale Price		Land Use Value	**$153,911**
Spec Dist(s)				Use Value Deferment	**$9,091,402**
Zoning	**RA**	**Improvement Summary**		Historic Deferment	
History ID 1				Total Deferred Value	**$9,091,402**
History ID 2		Total Units	**1**		
Acreage	**138.64**	Recycle Units	**1**		
Permit Date		Apt/SC Sqft		Use/Hist/Tax Relief	**$279,541**
Permit #		Heated Area	**1,834**	Assessed	
				Total Value Assessed*	**$9,370,943**

*Wake County assessed building and land values reflect the market value as of January 1, 2020, which is the date of the last county-wide revaluation. Any inflation, deflation or other economic changes occurring after this date does not affect the assessed value of the property and cannot be lawfully considered when reviewing the value for adjustment.

The January 1, 2020 values will remain in effect until the next county-wide revaluation. Until that time, any real estate accounts created or new construction built is assessed according to the 2020 Schedule of Values.

For questions regarding the information displayed on this site, please contact the Department of Tax Administration at Taxhelp@wakegov.com or call 919-856-5400.

Wake County Real Estate Data
Account Summary

Real Estate ID **0055927** PIN # **0731766588**

Location Address
1216 S SALEM ST

Property Description
RCMB WM BLD JEAN BM2002-02117

Property Owner	Owner's Mailing Address	Property Location Address
POE, WILLIAM DOUGLAS & JEAN S (Use the Deeds link to view any additional owners)	**1216 S SALEM ST** **APEX NC 27502-7243**	**1216 S SALEM ST** **APEX NC 27502-7243**

Administrative Data		**Transfer Information**		**Assessed Value**	
Old Map #	**647-00000-0009**				
Map/Scale	**0731 12**	Deed Date	**12/31/2002**	Land Value Assessed	**$509,500**
VCS	**20AP900**	Book & Page	**09827 1855**	Bldg. Value Assessed	**$118,612**
City		Revenue Stamps			
Fire District	**23**	Pkg Sale Date	**10/6/1983**		
Township	**WHITE OAK**	Pkg Sale Price		Tax Relief	
Land Class	**R-<10-HS**	Land Sale Date			
ETJ	**AP**	Land Sale Price		Land Use Value	
Spec Dist(s)				Use Value Deferment	
Zoning	**RA**	**Improvement Summary**		Historic Deferment	
History ID 1				Total Deferred Value	
History ID 2		Total Units	**1**		
Acreage	**6.06**	Recycle Units	**1**		
Permit Date		Apt/SC Sqft		Use/Hist/Tax Relief	
Permit #		Heated Area	**1,667**	Assessed	
				Total Value Assessed*	**$628,112**

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Wake County Real Estate Data
Account Summary

Real Estate ID **0288728** PIN # **0731676714**

Location Address
6401 APEX BARBECUE RD

Property Description
LO1 PROP KATHERINE MAYNARD POE 03-1564

Property Owner	Owner's Mailing Address	Property Location Address
POE, DARYL & JEANNE (Use the Deeds link to view any additional owners)	**6401 APEX BARBECUE RD** **APEX NC 27502-7772**	**6401 APEX BARBECUE RD** **APEX NC 27502-7772**

Administrative Data		**Transfer Information**		**Assessed Value**	
Old Map #	**647-00000-0000**				
Map/Scale	**0731 11**	Deed Date	**10/24/2003**	Land Value Assessed	**$433,000**
VCS	**20AP900**	Book & Page	**10509 2106**	Bldg. Value Assessed	**$187,670**
City		Revenue Stamps			
Fire District	**23**	Pkg Sale Date			
Township	**WHITE OAK**	Pkg Sale Price		Tax Relief	
Land Class	**R-<10-HS**	Land Sale Date			
ETJ	**AP**	Land Sale Price		Land Use Value	
Spec Dist(s)				Use Value Deferment	
Zoning	**RA**	**Improvement Summary**		Historic Deferment	
History ID 1				Total Deferred Value	
History ID 2		Total Units	**1**		
Acreage	**6.05**	Recycle Units	**1**		
Permit Date	**11/10/2003**	Apt/SC Sqft		Use/Hist/Tax Relief	
Permit #	**0000002146**	Heated Area	**1,578**	Assessed	
				Total Value Assessed*	**$620,670**

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The January 1, 2020 values will remain in effect until the next county-wide revaluation. Until that time, any real estate accounts created or new construction built is assessed according to the 2020 Schedule of Values.

For questions regarding the information displayed on this site, please contact the Department of Tax Administration at Taxhelp@wakegov.com or call 919-856-5400.

RESOLUTION SETTING DATE OF PUBLIC HEARING
ON THE QUESTION OF ANNEXATION PURSUANT TO G.S.§ 160A-31 AS AMENDED

Annexation Petition #706
HARP-BARR, LLC, Memphis & Maddox, LLC, Sweet Willie, LLC, William Douglas and Jean S. Poe, and Daryl and Jeanne Poe (6401 Apex Barbecue Road, 1216 South Salem Street, and 1330 South Salem Street)

WHEREAS, a petition requesting annexation of the area described herein has been received; and

WHEREAS, the Town Council of Apex, North Carolina has by Resolution directed the Town Clerk to investigate the sufficiency thereof; and

WHEREAS, Certification by the Town Clerk as to the sufficiency of said petition has been made;

NOW, THEREFORE, BE IT RESOLVED by the Town Council of the Town of Apex, North Carolina that:

Section 1. A public hearing on the question of annexation of the area described herein will be held at the Apex Town Hall at 6 o'clock p.m. on the May 11, 2021.

Section 2. The area proposed for annexation is described as attached.

Section 3. Notice of said public hearing shall be published on the Town of Apex Website, www.apexnc.org, Public Notice, at least ten (10) days prior to the date of said public hearing.

This the 27th day of April 2021.

_____
Jacques K. Gilbert, Mayor

ATTEST:

_____
Donna B. Hosch, MMC, NCCMC, Town Clerk

BEGINNING AT AN IRON PIPE IN THE NORTHERN PROPERTY LINE OF THE DARYL POE AND JEANNE POE TRACT; THENCE SOUTH 88°15'40" EAST 294.44 FEET TO A POINT; THENCE SOUTH 88°15'40" EAST 73.53 FEET TO AN IRON PIPE IN THE SOUTHERN RIGHT OF WAY OF APEX BARBEQUE ROAD(VARIABLE WIDTH PUBLIC RIGHT OF WAY); THENCE SOUTH 88°17'21" EAST 166.15 FEET TO A POINT; THENCE SOUTH 66°51'11" EAST 52.41 FEET TO A POINT; THENCE SOUTH 66°15'45" EAST 53.82 FEET TO A POINT; THENCE SOUTH 65°14'19" EAST 41.62 FEET TO A POINT; THENCE NORTH 25°36'46" EAST 2.86 FEET TO A POINT; THENCE SOUTH 63°01'58" EAST 36.23 FEET TO A POINT; THENCE SOUTH 62°43'11" EAST 52.42 FEET TO A POINT; THENCE SOUTH 62°34'50" EAST 52.21 FEET TO A POINT; THENCE SOUTH 62°33'45" EAST 50.32 FEET TO A POINT; THENCE SOUTH 62°31'05" EAST 52.09 FEET TO A POINT; THENCE SOUTH 62°41'02" EAST 38.46 FEET TO A POINT; THENCE NORTH 27°30'20" EAST 20.00 FEET TO A POINT IN THE NORTHERN RIGHT OF WAY OF APEX BARBEQUE ROAD (VARIALBE WITH PUBLC RIGHT OF WAY); THENCE WITH SAID RIGHT OF WAY SOUTH 63°45'54" EAST 15.27 FEET TO A POINT; THENCE SOUTH 63°11'11" EAST 52.92 FEET TO A POINT; THENCE SOUTH 63°46'38" EAST 52.45 FEET TO A POINT; THENCE SOUTH 64°11'18" EAST 51.01 FEET TO A POINT; THENCE SOUTH 64°51'58" EAST 49.52 FEET TO A POINT; THENCE SOUTH 65°24'55" EAST 50.07 FEET TO A POINT; THENCE SOUTH 66°04'16" EAST 48.34 FEET TO A POINT; THENCE SOUTH 66°24'38" EAST 50.08 FEET TO A POINT; THENCE SOUTH 66°41'38" EAST 50.19 FEET TO A POINT; THENCE SOUTH 66°15'39" EAST 38.64 FEET TO AN IRON PIPE; THENCE LEAVING SAID RIGHT OF WAY SOUTH 45°09'49" WEST 21.52 FEET TO A POINT; THENCE SOUTH 66°29'41" EAST 17.50 FEET TO A POINT; THENCE SOUTH 66°51'15" EAST 51.02 FEET TO A POINT; THENCE SOUTH 67°29'37" EAST 46.49 FEET TO A POINT; THENCE SOUTH 69°10'44" EAST 47.69 FEET TO A POINT; THENCE SOUTH 70°48'55" EAST 47.97 FEET TO A POINT; THENCE SOUTH 72°26'29" EAST 49.98 FEET TO A POINT; THENCE SOUTH 73°56'45" EAST 48.27 FEET TO A POINT; THENCE SOUTH 74°36'34" EAST 49.46 FEET TO A POINT; THENCE SOUTH 74°35'50" EAST 50.79 FEET TO A POINT; THENCE SOUTH 74°07'44" EAST 48.03 FEET TO A POINT; THENCE SOUTH 73°53'30" EAST 1.43 FEET TO A POINT; THENCE SOUTH 00°46'03" WEST 62.04 FEET TO AN IRON PIPE; THENCE SOUTH 02°10'02" WEST 684.03 FEET TO A POINT; THENCE WITH A CURVE TO THE LEFT WITH AN ARC LENGTH OF 91.26 FEET, WITH A RADIUS OF 2927.20 FEET, WITH A CHORD BEARING OF SOUTH 49°51'06" WEST, WITH A CHORD LENGTH OF 91.25 FEET TO A POINT; THENCE WITH A COMPOUND CURVE TO THE LEFT WITH AN ARC LENGTH OF 156.33 FEET, WITH A RADIUS OF 2830.49 FEET, WITH A CHORD BEARING OF SOUTH 47°19'16" WEST, WITH A CHORD LENGTH OF 156.31 FEET TO A POINT; THENCE NORTH 01°41'10" EAST 71.72 FEET TO AN IRON PIPE; THENCE SOUTH 46°03'02" WEST 85.16 FEET TO A POINT; THENCE SOUTH 44°07'53" WEST 101.67 FEET TO A POINT; THENCE SOUTH 42°07'43" WEST 101.98 FEET TO A POINT; THENCE SOUTH 40°06'18" WEST 101.05 FEET TO A POINT; THENCE SOUTH 38°00'20" WEST 102.25 FEET TO AN IRON PIPE; THENCE SOUTH 36°10'22" WEST 101.61 FEET TO A POINT; THENCE SOUTH 34°13'40" WEST 101.88 FEET TO A POINT; THENCE SOUTH 32°20'31" WEST 101.40 FEET TO A POINT; THENCE SOUTH 30°52'45" WEST 101.44 FEET TO AN IRON PIPE; THENCE SOUTH 29°32'30" WEST 100.74 FEET TO A POINT; THENCE SOUTH 28°00'14" WEST 101.56 FEET TO A POINT; THENCE SOUTH 26°31'43" WEST 101.76 FEET TO A POINT; THENCE SOUTH 24°59'56" WEST 101.74 FEET TO A POINT; THENCE SOUTH 23°14'59" WEST 38.23 FEET TO AN IRON PIPE; THENCE SOUTH 23°13'26" WEST 63.12 FEET TO A POINT; THENCE SOUTH 21°18'46" WEST 102.56 FEET TO A POINT; THENCE SOUTH 19°14'15" WEST 102.34 FEET TO A POINT; THENCE SOUTH 17°17'15" WEST 101.06 FEET TO A POINT; THENCE SOUTH 16°16'37" WEST 100.94 FEET TO A POINT; THENCE SOUTH 16°30'48" WEST 99.68 FEET TO AN IRON PIPE; THENCE SOUTH 17°33'06" WEST 98.63 FEET TO A POINT; THENCE SOUTH 19°12'54" WEST 98.15 FEET TO A POINT; THENCE SOUTH 21°07'08" WEST 99.78 FEET TO A POINT; THENCE SOUTH 23°11'04" WEST 97.92 FEET TO A POINT; THENCE SOUTH 24°54'47" WEST 38.40 FEET TO A POINT; THENCE SOUTH 25°36'27" WEST 22.58 FEET TO AN IRON PIPE; THENCE NORTH 89°17'29" WEST 64.48 FEET TO AN IRON PIPE; THENCE WITH A CURVE TO THE LEFT WITH AN ARC LENGTH OF 66.11 FEET, WITH A RADIUS OF 2804.10 FEET, WITH A CHORD BEARING OF NORTH 25°32'13" EAST, WITH A CHORD LENGTH OF 66.11 FEET TO A

POINT; THENCE NORTH 89°17'29" WEST 353.78 FEET TO A CONCRETE MONUMENT; THENCE NORTH 00°17'39" EAST 911.20 FEET TO AN IRON PIPE; THENCE SOUTH 89°59'35" WEST 879.26 FEET TO AN IRON PIPE; THENCE NORTH 88°24'26" WEST 416.05 FEET TO AN IRON PIPE; THENCE NORTH 88°58'59" WEST 428.33 FEET TO AN IRON PIPE; THENCE NORTH 89°42'10" WEST 67.13 FEET TO AN IRON PIPE IN THE EASTERN RIGHT OF WAY OF N.C. HIGHWAY 540 (VARIABLE WIDTH PUBLIC RIGHT OF WAY); THENCE WITH SAID RIGHT OF WAY NORTH 14°10'11" WEST 25.98 FEET TO A CONCRETE MONUMENT; THENCE NORTH 29°27'03" WEST 279.28 FEET TO A CONCRETE MONUMENT; THENCE NORTH 10°30'20" WEST 258.11 FEET TO A CONCRETE MONUMENT; THENCE NORTH 31°49'46" WEST 302.09 FEET TO A CONCRETE MONUMENT; THENCE NORTH 19°25'27" WEST 348.05 FEET TO AN IRON PIPE; THENCE NORTH 01°06'22" EAST 289.07 FEET TO AN IRON PIPE IN THE CENTERLINE OF A CREEK; THENCE WITH SAID CENTERLINE SOUTH 62°05'16" EAST 8.68 FEET TO A POINT; THENCE SOUTH 75°58'33" EAST 23.59 FEET TO A POINT; THENCE SOUTH 54°32'13" EAST 16.14 FEET TO A POINT; THENCE SOUTH 28°27'52" EAST 21.06 FEET TO A POINT; THENCE SOUTH 52°11'00" EAST 19.37 FEET TO A POINT; THENCE NORTH 80°16'49" EAST 16.94 FEET TO A POINT; THENCE NORTH 27°19'34" EAST 14.43 FEET TO A POINT; THENCE NORTH 74°27'19" EAST 9.44 FEET TO A POINT; THENCE SOUTH 50°24'04" EAST 7.19 FEET TO A POINT; THENCE SOUTH 36°21'02" EAST 23.88 FEET TO A POINT; THENCE NORTH 39°19'42" EAST 12.17 FEET TO A POINT; THENCE NORTH 05°51'07" WEST 17.89 FEET TO A POINT; THENCE NORTH 50°03'59" EAST 8.76 FEET TO A POINT; THENCE SOUTH 73°12'41" EAST 16.32 FEET TO A POINT; THENCE SOUTH 21°18'53" EAST 18.47 FEET TO A POINT; THENCE SOUTH 72°13'16" EAST 13.54 FEET TO A POINT; THENCE NORTH 61°51'46" EAST 21.65 FEET TO A POINT; THENCE NORTH 74°00'24" EAST 50.54 FEET TO A POINT; THENCE NORTH 19°57'12" EAST 44.74 FEET TO A POINT; THENCE NORTH 06°03'59" WEST 20.11 FEET TO A POINT; THENCE NORTH 35°44'44" EAST 23.04 FEET TO A POINT; THENCE NORTH 69°35'37" EAST 22.30 FEET TO A POINT; THENCE SOUTH 84°36'00" EAST 31.56 FEET TO A POINT; THENCE NORTH 68°46'46" EAST 23.80 FEET TO A POINT; THENCE NORTH 88°42'18" EAST 17.10 FEET TO A POINT; THENCE SOUTH 54°50'03" EAST 18.40 FEET TO A POINT; THENCE NORTH 80°46'03" EAST 40.56 FEET TO A POINT; THENCE NORTH 58°20'09" EAST 25.29 FEET TO A POINT; THENCE NORTH 44°32'26" EAST 24.34 FEET TO A POINT; THENCE NORTH 71°02'31" EAST 19.10 FEET TO A POINT; THENCE NORTH 47°24'16" EAST 37.55 FEET TO A POINT; THENCE NORTH 81°51'36" EAST 25.80 FEET TO A POINT; THENCE NORTH 36°15'39" EAST 27.41 FEET TO A POINT; THENCE NORTH 20°21'02" WEST 17.38 FEET TO A POINT; THENCE NORTH 11°59'13" EAST 2.08 FEET TO A POINT; THENCE NORTH 58°12'58" EAST 29.12 FEET TO A POINT; THENCE NORTH 82°43'32" EAST 21.16 FEET TO A POINT; THENCE NORTH 05°01'51" WEST 12.48 FEET TO A POINT; THENCE NORTH 77°16'23" WEST 12.42 FEET TO A POINT; THENCE NORTH 37°17'58" EAST 22.50 FEET TO A POINT; THENCE NORTH 73°27'07" EAST 34.86 FEET TO A POINT; THENCE NORTH 03°15'44" EAST 13.46 FEET TO A POINT; THENCE NORTH 45°09'32" WEST 11.24 FEET TO A POINT; THENCE NORTH 53°48'21" EAST 6.23 FEET TO A POINT; THENCE SOUTH 68°53'55" EAST 13.88 FEET TO A POINT; THENCE NORTH 60°34'12" EAST 52.94 FEET TO A POINT; THENCE NORTH 78°46'01" EAST 46.77 FEET TO A POINT; THENCE NORTH 67°46'44" EAST 48.56 FEET TO A POINT; THENCE NORTH 74°58'45" EAST 43.00 FEET TO A POINT; THENCE SOUTH 89°36'23" EAST 38.18 FEET TO A POINT; THENCE SOUTH 79°42'51" EAST 22.68 FEET TO A POINT; THENCE SOUTH 29°26'17" EAST 17.84 FEET TO A POINT; THENCE NORTH 69°48'36" EAST 16.45 FEET TO A POINT; THENCE SOUTH 68°17'51" EAST 51.96 FEET TO A POINT; THENCE NORTH 73°12'05" EAST 27.64 FEET TO A POINT; THENCE SOUTH 79°24'02" EAST 15.42 FEET TO A POINT; THENCE SOUTH 74°12'31" EAST 45.28 FEET TO A POINT; THENCE SOUTH 39°16'28" EAST 36.13 FEET TO A POINT; THENCE SOUTH 08°43'30" WEST 18.30 FEET TO A POINT; THENCE SOUTH 50°53'39" EAST 18.00 FEET TO A POINT; THENCE NORTH 88°17'02" EAST 36.36 FEET TO A POINT; THENCE SOUTH 13°58'03" EAST 21.80 FEET TO A POINT; THENCE SOUTH 81°03'00" EAST 42.96 FEET TO A POINT; THENCE SOUTH 30°57'25" EAST 26.88 FEET TO A POINT; THENCE SOUTH 75°54'58" EAST 40.54 FEET TO A POINT; THENCE SOUTH 70°25'00" EAST 15.28 FEET TO A POINT; THENCE NORTH 84°19'40" EAST 27.52 FEET TO A POINT; THENCE SOUTH 80°36'18" EAST 37.25 FEET

TO A POINT; THENCE SOUTH 42°44'12" WEST 13.86 FEET TO A POINT; THENCE SOUTH 64°51'55" WEST 13.95 FEET TO A POINT; THENCE SOUTH 64°16'15" EAST 26.38 FEET TO A POINT; THENCE SOUTH 51°02'50" EAST 20.28 FEET TO A POINT; THENCE SOUTH 76°30'27" EAST 49.09 FEET TO A POINT; THENCE SOUTH 02°56'27" WEST 22.78 FEET TO A POINT; THENCE SOUTH 68°53'00" EAST 39.44 FEET TO A POINT; THENCE SOUTH 74°05'57" EAST 21.64 FEET TO A POINT; THENCE NORTH 54°46'33" EAST 12.67 FEET TO A POINT; THENCE SOUTH 78°44'03" EAST 50.69 FEET TO A POINT; THENCE SOUTH 17°24'42" EAST 10.77 FEET TO A POINT; THENCE NORTH 81°02'40" EAST 18.57 FEET TO A POINT; THENCE NORTH 57°30'16" EAST 25.96 FEET TO A POINT; THENCE SOUTH 49°12'49" EAST 22.49 FEET TO A POINT; THENCE SOUTH 75°13'50" EAST 36.68 FEET TO A POINT; THENCE NORTH 43°03'04" EAST 18.03 FEET TO A POINT; THENCE SOUTH 43°29'16" EAST 25.33 FEET TO A POINT; THENCE NORTH 84°54'55" EAST 33.14 FEET TO A POINT; THENCE SOUTH 49°52'36" EAST 29.02 FEET TO A POINT; THENCE NORTH 47°30'27" EAST 22.64 FEET TO A POINT; THENCE SOUTH 44°10'50" EAST 48.34 FEET TO A POINT; THENCE NORTH 77°35'58" EAST 27.83 FEET TO A POINT; THENCE SOUTH 44°55'44" EAST 20.62 FEET TO A POINT; THENCE NORTH 67°39'06" EAST 23.64 FEET TO A POINT; THENCE NORTH 09°17'48" WEST 14.71 FEET TO A POINT; THENCE NORTH 56°08'00" EAST 16.99 FEET TO A POINT; THENCE SOUTH 84°08'50" EAST 9.11 FEET TO A POINT; THENCE SOUTH 21°28'59" EAST 19.37 FEET TO A POINT; THENCE NORTH 77°01'03" EAST 25.20 FEET TO A POINT; THENCE NORTH 52°22'39" EAST 13.09 FEET TO A POINT; THENCE NORTH 34°19'37" EAST 31.41 FEET TO A POINT; THENCE SOUTH 83°30'24" EAST 9.86 FEET TO A POINT; THENCE SOUTH 73°18'34" EAST 60.44 FEET TO A POINT; THENCE NORTH 25°37'49" EAST 32.53 FEET TO A POINT; THENCE SOUTH 40°49'03" EAST 28.47 FEET TO A POINT; THENCE NORTH 36°58'17" EAST 21.69 FEET TO A POINT; THENCE SOUTH 76°44'46" EAST 21.44 FEET TO A POINT; THENCE SOUTH 14°26'49" WEST 27.21 FEET TO A POINT; THENCE SOUTH 86°41'52" EAST 6.78 FEET TO A POINT; THENCE NORTH 87°14'33" EAST 24.64 FEET TO A POINT; THENCE SOUTH 40°22'08" EAST 36.29 FEET TO A POINT; THENCE SOUTH 13°37'04" EAST 24.06 FEET TO A POINT; THENCE SOUTH 82°58'59" EAST 35.03 FEET TO A POINT; THENCE SOUTH 73°33'17" EAST 23.68 FEET TO A POINT; THENCE SOUTH 25°37'21" EAST 34.01 FEET TO A POINT; THENCE SOUTH 06°57'32" EAST 21.00 FEET TO A POINT; THENCE SOUTH 53°23'42" EAST 38.38 FEET TO A POINT; THENCE SOUTH 83°14'09" EAST 8.53 FEET TO A POINT; THENCE NORTH 33°23'35" EAST 11.26 FEET TO A POINT; THENCE SOUTH 68°50'30" EAST 18.96 FEET TO A POINT; THENCE NORTH 81°37'03" EAST 18.18 FEET TO A POINT; THENCE SOUTH 39°21'14" EAST 5.22 FEET TO A POINT; THENCE LEAVING THE CENTERLIN OF SAID CREEK NORTH 00°20'56" EAST 1168.68 FEET TO THE POINT AND PLACE OF BEGINNING CONTAINING 6,849,127 SQUARE FEET, 157.234 ACRES AND BEING THE SAME AREA AS SHOWN ON THE PLAT BY THE JOHN R MCADAMS COMPANY TITLED ANNEXATION MAP OF DEPOT 499 DATED NOVEMBER 19TH, 2020.

PETITION FOR VOLUNTARY ANNEXATION

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Application #:	706	Submittal Date:	3/18/2021
Fee Paid	$ 3/26/2021	Check #	119656

TO THE TOWN COUNCIL APEX, NORTH CAROLINA

1. We, the undersigned owners of real property, respectfully request that the area described in Part 4 below be annexed to the Town of Apex, Wake County, North Carolina.
2. The area to be annexed is ■ contiguous, ☐ non-contiguous (satellite) to the Town of Apex, North Carolina and the boundaries are as contained in the metes and bounds description attached hereto.
3. If contiguous, this annexation will include all intervening rights-of-way for streets, railroads, and other areas as stated in G.S. 160A-31(f), unless otherwise stated in the annexation amendment.

OWNER INFORMATION

HARP-BARR LLC MEMPHIS & MADDOX LLC & SWEET WILLIE, LLC	0731662438
Owner Name (Please Print)	Property PIN or Deed Book & Page #
	dougpoe@bellsouth.net
Phone	E-mail Address
William Douglas Poe and Jean S. Poe	0731766588
Owner Name (Please Print)	Property PIN or Deed Book & Page #
	dougpoe@bellsouth.net
Phone	E-mail Address
Daryl Poe and Jeanne Poe	0731676714
Owner Name (Please Print)	Property PIN or Deed Book & Page #
	dougpoe@bellsouth.net
Phone	E-mail Address

SURVEYOR INFORMATION

Surveyor: McAdams; Tim Mersinger

Phone: 919-361-5000 Fax:

E-mail Address: mersinger@mcadamsco.com

ANNEXATION SUMMARY CHART

Property Information		Reason(s) for annexation (select all that apply)	
Total Acreage to be annexed:	157.234	Need water service due to well failure	☐
Population of acreage to be annexed:	New development	Need sewer service due to septic system failure	☐
Existing # of housing units:	0	Water service (new construction)	☑
Proposed # of housing units:	1,500	Sewer service (new construction)	☑
Zoning District*:	PUD-CZ	Receive Town Services	☑

*If the property to be annexed is not within the Town of Apex's Extraterritorial Jurisdiction, the applicant must also submit a rezoning application with the petition for voluntary annexation to establish an Apex zoning designation. Please contact the Planning Department for questions.

PETITION FOR VOLUNTARY ANNEXATION

Application #: 706 Submittal Date: 3/18/2021

COMPLETE IF IN A LIMITED LIABILITY COMPANY

In witness whereof, Memphis & Maddox LLC a limited liability company, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this the 23 day of February, 20 21.

Name of Limited Liability Company MEMPHIS & MADDOX LLC

By: _____
Signature of Member/Manager

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Susan Garrott, a Notary Public for the above State and County, this the 23 day of February, 20 21.

Susan Garrott
Notary Public

SEAL

My Commission Expires: 12/2/2024

COMPLETE IF IN A PARTNERSHIP

In witness whereof, _____, a partnership, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this the _____ day of _____, 20_____.

Name of Partnership _____

By: _____
Signature of General Partner

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, _____, a Notary Public for the above State and County, this the _____day of _____, 20____.

_____
Notary Public

SEAL

My Commission Expires: _____

PETITION FOR VOLUNTARY ANNEXATION

Application #: 706 Submittal Date: 3/18/2021

COMPLETE IF IN A LIMITED LIABILITY COMPANY

In witness whereof, Harp-Barr, LLC a limited liability company, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this the 23 day of Feb, 2021.

Name of Limited Liability Company HARP-BARR LLC

By: William Douglas Poe
Signature of Member/Manager

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, William Douglas Poe, a Notary Public for the above State and County, this the 23 day of, Feb, 2021

Notary Public

SEAL

SANDRA N. SHECKELLS NOTARY My Comm. Expires Sept. 4, 2021 PUBLIC WAKE COUNTY, N.C.

My Commission Expires: 9-4-2021

COMPLETE IF IN A PARTNERSHIP

In witness whereof, _____, a partnership, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this the _____ day of _____, 20_____.

Name of Partnership _____

By: _____
Signature of General Partner

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, _____, a Notary Public for the above State and County, this the _____day of _____, 20____.

Notary Public

SEAL

My Commission Expires: _____

PETITION FOR VOLUNTARY ANNEXATION

Application #: 706 Submittal Date: 3/18/2021

COMPLETE IF IN A LIMITED LIABILITY COMPANY

In witness whereof, Sweet Willie, LLC a limited liability company, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this the 23 day of Feb, 2021.

Name of Limited Liability Company Sweet Willie LLC

By: _____
Signature of Member/Manager

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, William Poe, a Notary Public for the above State and County, this the 23 day of, Feb, 2021.

_____
Notary Public

SEAL

SANDRA N. SHECKELLS NOTARY PUBLIC WAKE COUNTY, N.C. My Comm. Expires Sept. 4, 2021

My Commission Expires: 9-4-2021

COMPLETE IF IN A PARTNERSHIP

In witness whereof, _____, a partnership, caused this instrument to be executed in its name by a member/manager pursuant to authority duly given, this the _____ day of _____, 20_____.

Name of Partnership _____

By: _____
Signature of General Partner

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, _____, a Notary Public for the above State and County, this the _____day of _____, 20____.

_____
Notary Public

SEAL

My Commission Expires: _____

PETITION FOR VOLUNTARY ANNEXATION

Application #: 706 Submittal Date: 3/18/2021

COMPLETE IF SIGNED BY INDIVIDUALS:

All individual owners must sign. (If additional signatures are necessary, please attach an additional sheet.)

William Douglas Poe — Please Print
William Douglas Poe — Signature

Jean S Poe — Please Print
Jean S. Poe — Signature

_____ — Please Print
_____ — Signature

_____ — Please Print
_____ — Signature

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, William Douglas Poe & Jean S Poe, a Notary Public for the above State and County, this the 23 day of, Feb, 2021.

_____
Notary Public

SEAL

SANDRA N. SHECKELLS NOTARY PUBLIC WAKE COUNTY, N.C. My Comm. Expires Sept. 4, 2021

My Commission Expires: 9-4-2021

COMPLETE IF A CORPORATION:

In witness whereof, said corporation has caused this instrument to be executed by its President and attested by its Secretary by order of its Board of Directors, this the _____ day of _____, 20_____.

Corporate Name _____

SEAL

By: _____
President (Signature)

Attest:

_____
Secretary (Signature)

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, _____, a Notary Public for the above State and County, this the _____ day of _____, 20____.

_____
Notary Public

SEAL

My Commission Expires: _____

PETITION FOR VOLUNTARY ANNEXATION

Application #: 706 Submittal Date: 3/18/2021

COMPLETE IF SIGNED BY INDIVIDUALS:

All individual owners must sign. (If additional signatures are necessary, please attach an additional sheet.)

Daryl Poe (Please Print)	Daryl Poe (Signature)
Jeanne Poe (Please Print)	Jeanne Poe (Signature)
(Please Print)	(Signature)
(Please Print)	(Signature)

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Susan Garrott, a Notary Public for the above State and County, this the 23 day of February, 2021.

Susan Garrott
Notary Public

Susan Garrott Notary Public Wake County, NC SEAL

My Commission Expires: 12/2/2024

COMPLETE IF A CORPORATION:

In witness whereof, said corporation has caused this instrument to be executed by its President and attested by its Secretary by order of its Board of Directors, this the _____ day of _____, 20____.

Corporate Name _____

SEAL

By: _____
President (Signature)

Attest:

_____
Secretary (Signature)

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, _____, a Notary Public for the above State and County, this the _____day of _____, 20____.

_____
Notary Public

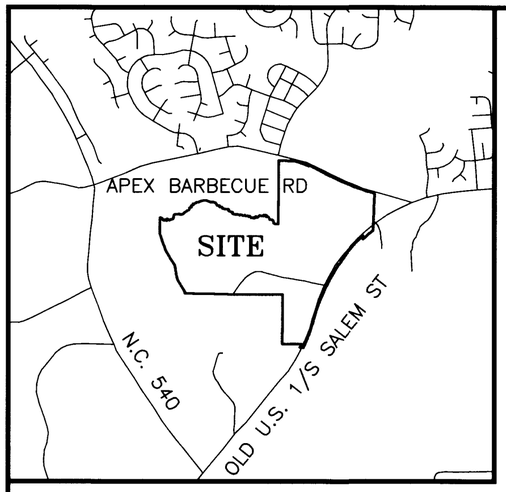
SEAL

My Commission Expires: _____

BEGINNING AT AN IRON PIPE IN THE NORTHERN PROPERTY LINE OF THE DARYL POE AND JEANNE POE TRACT; THENCE SOUTH 88°15'40" EAST 294.44 FEET TO A POINT; THENCE SOUTH 88°15'40" EAST 73.53 FEET TO AN IRON PIPE IN THE SOUTHERN RIGHT OF WAY OF APEX BARBEQUE ROAD(VARIABLE WIDTH PUBLIC RIGHT OF WAY); THENCE SOUTH 88°17'21" EAST 166.15 FEET TO A POINT; THENCE SOUTH 66°51'11" EAST 52.41 FEET TO A POINT; THENCE SOUTH 66°15'45" EAST 53.82 FEET TO A POINT; THENCE SOUTH 65°14'19" EAST 41.62 FEET TO A POINT; THENCE NORTH 25°36'46" EAST 2.86 FEET TO A POINT; THENCE SOUTH 63°01'58" EAST 36.23 FEET TO A POINT; THENCE SOUTH 62°43'11" EAST 52.42 FEET TO A POINT; THENCE SOUTH 62°34'50" EAST 52.21 FEET TO A POINT; THENCE SOUTH 62°33'45" EAST 50.32 FEET TO A POINT; THENCE SOUTH 62°31'05" EAST 52.09 FEET TO A POINT; THENCE SOUTH 62°41'02" EAST 38.46 FEET TO A POINT; THENCE NORTH 27°30'20" EAST 20.00 FEET TO A POINT IN THE NORTHERN RIGHT OF WAY OF APEX BARBEQUE ROAD (VARIALBE WITH PUBLC RIGHT OF WAY); THENCE WITH SAID RIGHT OF WAY SOUTH 63°45'54" EAST 15.27 FEET TO A POINT; THENCE SOUTH 63°11'11" EAST 52.92 FEET TO A POINT; THENCE SOUTH 63°46'38" EAST 52.45 FEET TO A POINT; THENCE SOUTH 64°11'18" EAST 51.01 FEET TO A POINT; THENCE SOUTH 64°51'58" EAST 49.52 FEET TO A POINT; THENCE SOUTH 65°24'55" EAST 50.07 FEET TO A POINT; THENCE SOUTH 66°04'16" EAST 48.34 FEET TO A POINT; THENCE SOUTH 66°24'38" EAST 50.08 FEET TO A POINT; THENCE SOUTH 66°41'38" EAST 50.19 FEET TO A POINT; THENCE SOUTH 66°15'39" EAST 38.64 FEET TO AN IRON PIPE; THENCE LEAVING SAID RIGHT OF WAY SOUTH 45°09'49" WEST 21.52 FEET TO A POINT; THENCE SOUTH 66°29'41" EAST 17.50 FEET TO A POINT; THENCE SOUTH 66°51'15" EAST 51.02 FEET TO A POINT; THENCE SOUTH 67°29'37" EAST 46.49 FEET TO A POINT; THENCE SOUTH 69°10'44" EAST 47.69 FEET TO A POINT; THENCE SOUTH 70°48'55" EAST 47.97 FEET TO A POINT; THENCE SOUTH 72°26'29" EAST 49.98 FEET TO A POINT; THENCE SOUTH 73°56'45" EAST 48.27 FEET TO A POINT; THENCE SOUTH 74°36'34" EAST 49.46 FEET TO A POINT; THENCE SOUTH 74°35'50" EAST 50.79 FEET TO A POINT; THENCE SOUTH 74°07'44" EAST 48.03 FEET TO A POINT; THENCE SOUTH 73°53'30" EAST 1.43 FEET TO A POINT; THENCE SOUTH 00°46'03" WEST 62.04 FEET TO AN IRON PIPE; THENCE SOUTH 02°10'02" WEST 684.03 FEET TO A POINT; THENCE WITH A CURVE TO THE LEFT WITH AN ARC LENGTH OF 91.26 FEET, WITH A RADIUS OF 2927.20 FEET, WITH A CHORD BEARING OF SOUTH 49°51'06" WEST, WITH A CHORD LENGTH OF 91.25 FEET TO A POINT; THENCE WITH A COMPOUND CURVE TO THE LEFT WITH AN ARC LENGTH OF 156.33 FEET, WITH A RADIUS OF 2830.49 FEET, WITH A CHORD BEARING OF SOUTH 47°19'16" WEST, WITH A CHORD LENGTH OF 156.31 FEET TO A POINT; THENCE NORTH 01°41'10" EAST 71.72 FEET TO AN IRON PIPE; THENCE SOUTH 46°03'02" WEST 85.16 FEET TO A POINT; THENCE SOUTH 44°07'53" WEST 101.67 FEET TO A POINT; THENCE SOUTH 42°07'43" WEST 101.98 FEET TO A POINT; THENCE SOUTH 40°06'18" WEST 101.05 FEET TO A POINT; THENCE SOUTH 38°00'20" WEST 102.25 FEET TO AN IRON PIPE; THENCE SOUTH 36°10'22" WEST 101.61 FEET TO A POINT; THENCE SOUTH 34°13'40" WEST 101.88 FEET TO A POINT; THENCE SOUTH 32°20'31" WEST 101.40 FEET TO A POINT; THENCE SOUTH 30°52'45" WEST 101.44 FEET TO AN IRON PIPE; THENCE SOUTH 29°32'30" WEST 100.74 FEET TO A POINT; THENCE SOUTH 28°00'14" WEST 101.56 FEET TO A POINT; THENCE SOUTH 26°31'43" WEST 101.76 FEET TO A POINT; THENCE SOUTH 24°59'56" WEST 101.74 FEET TO A POINT; THENCE SOUTH 23°14'59" WEST 38.23 FEET TO AN IRON PIPE; THENCE SOUTH 23°13'26" WEST 63.12 FEET TO A POINT; THENCE SOUTH 21°18'46" WEST 102.56 FEET TO A POINT; THENCE SOUTH 19°14'15" WEST 102.34 FEET TO A POINT; THENCE SOUTH 17°17'15" WEST 101.06 FEET TO A POINT; THENCE SOUTH 16°16'37" WEST 100.94 FEET TO A POINT; THENCE SOUTH 16°30'48" WEST 99.68 FEET TO AN IRON PIPE; THENCE SOUTH 17°33'06" WEST 98.63 FEET TO A POINT; THENCE SOUTH 19°12'54" WEST 98.15 FEET TO A POINT; THENCE SOUTH 21°07'08" WEST 99.78 FEET TO A POINT; THENCE SOUTH 23°11'04" WEST 97.92 FEET TO A POINT; THENCE SOUTH 24°54'47" WEST 38.40 FEET TO A POINT; THENCE SOUTH 25°36'27" WEST 22.58 FEET TO AN IRON PIPE; THENCE NORTH 89°17'29" WEST 64.48 FEET TO AN IRON PIPE; THENCE WITH A CURVE TO THE LEFT WITH AN ARC LENGTH OF 66.11 FEET, WITH A RADIUS OF 2804.10 FEET, WITH A CHORD BEARING OF NORTH 25°32'13" EAST, WITH A CHORD LENGTH OF 66.11 FEET TO A

POINT; THENCE NORTH 89°17'29" WEST 353.78 FEET TO A CONCRETE MONUMENT; THENCE NORTH 00°17'39" EAST 911.20 FEET TO AN IRON PIPE; THENCE SOUTH 89°59'35" WEST 879.26 FEET TO AN IRON PIPE; THENCE NORTH 88°24'26" WEST 416.05 FEET TO AN IRON PIPE; THENCE NORTH 88°58'59" WEST 428.33 FEET TO AN IRON PIPE; THENCE NORTH 89°42'10" WEST 67.13 FEET TO AN IRON PIPE IN THE EASTERN RIGHT OF WAY OF N.C. HIGHWAY 540 (VARIABLE WIDTH PUBLIC RIGHT OF WAY); THENCE WITH SAID RIGHT OF WAY NORTH 14°10'11" WEST 25.98 FEET TO A CONCRETE MONUMENT; THENCE NORTH 29°27'03" WEST 279.28 FEET TO A CONCRETE MONUMENT; THENCE NORTH 10°30'20" WEST 258.11 FEET TO A CONCRETE MONUMENT; THENCE NORTH 31°49'46" WEST 302.09 FEET TO A CONCRETE MONUMENT; THENCE NORTH 19°25'27" WEST 348.05 FEET TO AN IRON PIPE; THENCE NORTH 01°06'22" EAST 289.07 FEET TO AN IRON PIPE IN THE CENTERLINE OF A CREEK; THENCE WITH SAID CENTERLINE SOUTH 62°05'16" EAST 8.68 FEET TO A POINT; THENCE SOUTH 75°58'33" EAST 23.59 FEET TO A POINT; THENCE SOUTH 54°32'13" EAST 16.14 FEET TO A POINT; THENCE SOUTH 28°27'52" EAST 21.06 FEET TO A POINT; THENCE SOUTH 52°11'00" EAST 19.37 FEET TO A POINT; THENCE NORTH 80°16'49" EAST 16.94 FEET TO A POINT; THENCE NORTH 27°19'34" EAST 14.43 FEET TO A POINT; THENCE NORTH 74°27'19" EAST 9.44 FEET TO A POINT; THENCE SOUTH 50°24'04" EAST 7.19 FEET TO A POINT; THENCE SOUTH 36°21'02" EAST 23.88 FEET TO A POINT; THENCE NORTH 39°19'42" EAST 12.17 FEET TO A POINT; THENCE NORTH 05°51'07" WEST 17.89 FEET TO A POINT; THENCE NORTH 50°03'59" EAST 8.76 FEET TO A POINT; THENCE SOUTH 73°12'41" EAST 16.32 FEET TO A POINT; THENCE SOUTH 21°18'53" EAST 18.47 FEET TO A POINT; THENCE SOUTH 72°13'16" EAST 13.54 FEET TO A POINT; THENCE NORTH 61°51'46" EAST 21.65 FEET TO A POINT; THENCE NORTH 74°00'24" EAST 50.54 FEET TO A POINT; THENCE NORTH 19°57'12" EAST 44.74 FEET TO A POINT; THENCE NORTH 06°03'59" WEST 20.11 FEET TO A POINT; THENCE NORTH 35°44'44" EAST 23.04 FEET TO A POINT; THENCE NORTH 69°35'37" EAST 22.30 FEET TO A POINT; THENCE SOUTH 84°36'00" EAST 31.56 FEET TO A POINT; THENCE NORTH 68°46'46" EAST 23.80 FEET TO A POINT; THENCE NORTH 88°42'18" EAST 17.10 FEET TO A POINT; THENCE SOUTH 54°50'03" EAST 18.40 FEET TO A POINT; THENCE NORTH 80°46'03" EAST 40.56 FEET TO A POINT; THENCE NORTH 58°20'09" EAST 25.29 FEET TO A POINT; THENCE NORTH 44°32'26" EAST 24.34 FEET TO A POINT; THENCE NORTH 71°02'31" EAST 19.10 FEET TO A POINT; THENCE NORTH 47°24'16" EAST 37.55 FEET TO A POINT; THENCE NORTH 81°51'36" EAST 25.80 FEET TO A POINT; THENCE NORTH 36°15'39" EAST 27.41 FEET TO A POINT; THENCE NORTH 20°21'02" WEST 17.38 FEET TO A POINT; THENCE NORTH 11°59'13" EAST 2.08 FEET TO A POINT; THENCE NORTH 58°12'58" EAST 29.12 FEET TO A POINT; THENCE NORTH 82°43'32" EAST 21.16 FEET TO A POINT; THENCE NORTH 05°01'51" WEST 12.48 FEET TO A POINT; THENCE NORTH 77°16'23" WEST 12.42 FEET TO A POINT; THENCE NORTH 37°17'58" EAST 22.50 FEET TO A POINT; THENCE NORTH 73°27'07" EAST 34.86 FEET TO A POINT; THENCE NORTH 03°15'44" EAST 13.46 FEET TO A POINT; THENCE NORTH 45°09'32" WEST 11.24 FEET TO A POINT; THENCE NORTH 53°48'21" EAST 6.23 FEET TO A POINT; THENCE SOUTH 68°53'55" EAST 13.88 FEET TO A POINT; THENCE NORTH 60°34'12" EAST 52.94 FEET TO A POINT; THENCE NORTH 78°46'01" EAST 46.77 FEET TO A POINT; THENCE NORTH 67°46'44" EAST 48.56 FEET TO A POINT; THENCE NORTH 74°58'45" EAST 43.00 FEET TO A POINT; THENCE SOUTH 89°36'23" EAST 38.18 FEET TO A POINT; THENCE SOUTH 79°42'51" EAST 22.68 FEET TO A POINT; THENCE SOUTH 29°26'17" EAST 17.84 FEET TO A POINT; THENCE NORTH 69°48'36" EAST 16.45 FEET TO A POINT; THENCE SOUTH 68°17'51" EAST 51.96 FEET TO A POINT; THENCE NORTH 73°12'05" EAST 27.64 FEET TO A POINT; THENCE SOUTH 79°24'02" EAST 15.42 FEET TO A POINT; THENCE SOUTH 74°12'31" EAST 45.28 FEET TO A POINT; THENCE SOUTH 39°16'28" EAST 36.13 FEET TO A POINT; THENCE SOUTH 08°43'30" WEST 18.30 FEET TO A POINT; THENCE SOUTH 50°53'39" EAST 18.00 FEET TO A POINT; THENCE NORTH 88°17'02" EAST 36.36 FEET TO A POINT; THENCE SOUTH 13°58'03" EAST 21.80 FEET TO A POINT; THENCE SOUTH 81°03'00" EAST 42.96 FEET TO A POINT; THENCE SOUTH 30°57'25" EAST 26.88 FEET TO A POINT; THENCE SOUTH 75°54'58" EAST 40.54 FEET TO A POINT; THENCE SOUTH 70°25'00" EAST 15.28 FEET TO A POINT; THENCE NORTH 84°19'40" EAST 27.52 FEET TO A POINT; THENCE SOUTH 80°36'18" EAST 37.25 FEET

TO A POINT; THENCE SOUTH 42°44'12" WEST 13.86 FEET TO A POINT; THENCE SOUTH 64°51'55" WEST 13.95 FEET TO A POINT; THENCE SOUTH 64°16'15" EAST 26.38 FEET TO A POINT; THENCE SOUTH 51°02'50" EAST 20.28 FEET TO A POINT; THENCE SOUTH 76°30'27" EAST 49.09 FEET TO A POINT; THENCE SOUTH 02°56'27" WEST 22.78 FEET TO A POINT; THENCE SOUTH 68°53'00" EAST 39.44 FEET TO A POINT; THENCE SOUTH 74°05'57" EAST 21.64 FEET TO A POINT; THENCE NORTH 54°46'33" EAST 12.67 FEET TO A POINT; THENCE SOUTH 78°44'03" EAST 50.69 FEET TO A POINT; THENCE SOUTH 17°24'42" EAST 10.77 FEET TO A POINT; THENCE NORTH 81°02'40" EAST 18.57 FEET TO A POINT; THENCE NORTH 57°30'16" EAST 25.96 FEET TO A POINT; THENCE SOUTH 49°12'49" EAST 22.49 FEET TO A POINT; THENCE SOUTH 75°13'50" EAST 36.68 FEET TO A POINT; THENCE NORTH 43°03'04" EAST 18.03 FEET TO A POINT; THENCE SOUTH 43°29'16" EAST 25.33 FEET TO A POINT; THENCE NORTH 84°54'55" EAST 33.14 FEET TO A POINT; THENCE SOUTH 49°52'36" EAST 29.02 FEET TO A POINT; THENCE NORTH 47°30'27" EAST 22.64 FEET TO A POINT; THENCE SOUTH 44°10'50" EAST 48.34 FEET TO A POINT; THENCE NORTH 77°35'58" EAST 27.83 FEET TO A POINT; THENCE SOUTH 44°55'44" EAST 20.62 FEET TO A POINT; THENCE NORTH 67°39'06" EAST 23.64 FEET TO A POINT; THENCE NORTH 09°17'48" WEST 14.71 FEET TO A POINT; THENCE NORTH 56°08'00" EAST 16.99 FEET TO A POINT; THENCE SOUTH 84°08'50" EAST 9.11 FEET TO A POINT; THENCE SOUTH 21°28'59" EAST 19.37 FEET TO A POINT; THENCE NORTH 77°01'03" EAST 25.20 FEET TO A POINT; THENCE NORTH 52°22'39" EAST 13.09 FEET TO A POINT; THENCE NORTH 34°19'37" EAST 31.41 FEET TO A POINT; THENCE SOUTH 83°30'24" EAST 9.86 FEET TO A POINT; THENCE SOUTH 73°18'34" EAST 60.44 FEET TO A POINT; THENCE NORTH 25°37'49" EAST 32.53 FEET TO A POINT; THENCE SOUTH 40°49'03" EAST 28.47 FEET TO A POINT; THENCE NORTH 36°58'17" EAST 21.69 FEET TO A POINT; THENCE SOUTH 76°44'46" EAST 21.44 FEET TO A POINT; THENCE SOUTH 14°26'49" WEST 27.21 FEET TO A POINT; THENCE SOUTH 86°41'52" EAST 6.78 FEET TO A POINT; THENCE NORTH 87°14'33" EAST 24.64 FEET TO A POINT; THENCE SOUTH 40°22'08" EAST 36.29 FEET TO A POINT; THENCE SOUTH 13°37'04" EAST 24.06 FEET TO A POINT; THENCE SOUTH 82°58'59" EAST 35.03 FEET TO A POINT; THENCE SOUTH 73°33'17" EAST 23.68 FEET TO A POINT; THENCE SOUTH 25°37'21" EAST 34.01 FEET TO A POINT; THENCE SOUTH 06°57'32" EAST 21.00 FEET TO A POINT; THENCE SOUTH 53°23'42" EAST 38.38 FEET TO A POINT; THENCE SOUTH 83°14'09" EAST 8.53 FEET TO A POINT; THENCE NORTH 33°23'35" EAST 11.26 FEET TO A POINT; THENCE SOUTH 68°50'30" EAST 18.96 FEET TO A POINT; THENCE NORTH 81°37'03" EAST 18.18 FEET TO A POINT; THENCE SOUTH 39°21'14" EAST 5.22 FEET TO A POINT; THENCE LEAVING THE CENTERLIN OF SAID CREEK NORTH 00°20'56" EAST 1168.68 FEET TO THE POINT AND PLACE OF BEGINNING CONTAINING 6,849,127 SQUARE FEET, 157.234 ACRES AND BEING THE SAME AREA AS SHOWN ON THE PLAT BY THE JOHN R MCADAMS COMPANY TITLED ANNEXATION MAP OF DEPOT 499 DATED NOVEMBER 19TH, 2020.



GENERAL NOTES

1. THIS IS A SURVEY OF AN EXISTING PARCEL(S) OF LAND. THIS IS AN ANNEXATION SURVEY.
2. BEARINGS FOR THIS SURVEY ARE BASED ON NAD 83(2001).
3. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES.
4. ZONING: PUD-CZ
5. AREA BY COORDINATE GEOMETRY.
6. FLOOD NOTE: THIS PROPERTY IS NOT LOCATED IN A SPECIAL FLOOD HAZARD ZONE. IT IS LOCATED IN ZONE "X" AS DEFINED BY F.E.M.A F.I.R.M COMMUNITY PANEL #3720073100j DATED MAY 2, 2006.
7. UTILITY STATEMENT
   THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

SURVEYOR'S CERTIFICATE

I, JAMES S. ARMSTRONG, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTION RECORDED IN BOOK 12121, PAGE 472); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION FOUND IN BOOK ____, PAGE ____ ; THAT THE RATIO OF PRECISION OR POSITIONAL ACCURACY AS CALCULATED IS 1:55,804+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER AND SEAL THIS 7th DAY OF April, A.D., 2021.

JAMES S. ARMSTRONG, PROFESSIONAL LAND SURVEYOR L-4411

TYPE OF PLAT

I HEREBY CERTIFY THIS PLAT OF THE FOLLOWING TYPE: G.S. 47-30 (F)(11)(C)(1). THAT THE SURVEY IS OF AN EXISTING PARCEL OR PARCELS OF LAND OR ONE OR MORE EXISTING EASEMENTS AND DOES NOT CREATE A NEW STREET OR CHANGE AN EXISTING STREET. FOR THE PURPOSES OF THIS SUBSECTION AN "EXISTING PARCEL" OR "EXISTING EASEMENT" IS AN AREA OF LAND DESCRIBED IN A SINGLE, LEGAL DESCRIPTION OR LEGALLY RECORDED SUBDIVISION THAT HAS BEEN OR MAY BE LEGALLY CONVEYED TO A NEW OWNER BY DEED IN ITS EXISTING CONFIGURATION.

PROFESSIONAL LAND SURVEYOR

LINE TABLE			LINE TABLE		
LINE	BEARING	DISTANCE	LINE	BEARING	DISTANCE
L1	S 88°15'40" E	73.53'	L122	S 79°42'51" E	22.68'
L2	S 88°17'21" E	166.15'	L123	S 29°26'17" E	17.84'
L3	S 66°51'11" E	52.41'	L124	N 69°48'36" E	16.45'
L4	S 66°15'45" E	53.82'	L125	S 68°17'51" E	51.96'
L5	S 65°14'19" E	41.62'	L126	N 73°12'05" E	27.64'
L6	N 25°36'46" E	2.86'	L127	S 79°24'02" E	15.42'
L7	S 63°01'58" E	36.23'	L128	S 74°12'31" E	45.28'
L8	S 62°43'11" E	52.42'	L129	S 39°16'28" E	36.13'
L9	S 62°34'50" E	52.21'	L130	S 08°43'30" W	18.30'
L10	S 62°33'45" E	50.32'	L131	S 50°53'39" E	18.00'
L11	S 62°31'05" E	52.09'	L132	N 88°17'02" E	36.36'
L12	S 62°41'02" E	38.46'	L133	S 13°58'03" E	21.80'
L13	N 27°30'20" E	20.00'	L134	S 81°03'00" E	42.96'
L14	S 63°45'54" E	15.27'	L135	S 30°57'25" E	26.88'
L15	S 63°11'11" E	52.92'	L136	S 75°54'58" E	40.54'
L16	S 63°46'38" E	52.45'	L137	S 70°25'00" E	15.28'
L17	S 64°11'18" E	51.01'	L138	N 84°19'40" E	27.52'
L18	S 64°51'58" E	49.52'	L139	S 80°36'18" E	37.25'
L19	S 65°24'55" E	50.07'	L140	S 42°44'12" W	13.86'
L20	S 66°04'16" E	48.34'	L141	S 64°51'55" W	13.95'
L21	S 66°24'38" E	50.08'	L142	S 64°16'15" E	26.38'
L22	S 66°41'38" E	50.19'	L143	S 51°02'50" E	20.28'
L23	S 66°15'39" E	38.64'	L144	S 76°30'27" E	49.09'
L24	S 45°09'49" W	21.52'	L145	S 02°56'27" W	22.78'
L25	S 66°29'41" E	17.50'	L146	S 68°53'00" E	39.44'
L26	S 66°51'15" E	51.02'	L147	S 74°05'57" E	21.64'
L27	S 67°29'37" E	46.49'	L148	N 54°46'33" E	12.67'
L28	S 69°10'44" E	47.69'	L149	S 78°44'03" E	50.69'
L29	S 70°48'55" E	47.97'	L150	S 17°24'42" E	10.77'
L30	S 72°26'29" E	49.98'	L151	N 81°02'40" E	18.57'
L31	S 73°56'45" E	48.27'	L152	N 57°30'16" E	25.96'
L32	S 74°36'34" E	49.46'	L153	S 49°12'49" E	22.49'
L33	S 74°35'50" E	50.79'	L154	S 75°13'50" E	36.68'
L34	S 74°07'44" E	48.03'	L155	N 43°03'04" E	18.03'
L35	S 73°53'30" E	1.43'	L156	S 43°29'16" E	25.33'
L36	S 00°46'03" W	62.04'	L157	N 84°54'55" E	33.14'
L37	N 01°41'10" E	71.72'	L158	S 49°52'36" E	29.02'
L38	S 46°03'02" W	85.16'	L159	N 47°30'27" E	22.64'
L39	S 44°07'53" W	101.67'	L160	S 44°10'50" E	48.34'
L40	S 42°07'43" W	101.98'	L161	N 77°35'58" E	27.83'
L41	S 40°06'18" W	101.05'	L162	S 44°55'44" E	20.62'
L42	S 38°00'20" W	102.25'	L163	N 67°39'06" E	23.64'
L43	S 36°10'22" W	101.61'	L164	N 09°17'48" W	14.71'
L44	S 34°13'40" W	101.88'	L165	N 56°08'00" E	16.99'
L45	S 32°20'31" W	101.40'	L166	S 84°08'50" E	9.11'
L46	S 30°52'45" W	101.44'	L167	S 21°28'59" E	19.37'
L47	S 29°32'30" W	100.74'	L168	N 77°01'03" E	25.20'
L48	S 28°00'14" W	101.56'	L169	N 52°22'39" E	13.09'
L49	S 26°31'43" W	101.76'	L170	N 34°19'37" E	31.41'
L50	S 24°59'56" W	101.74'	L171	S 83°30'24" E	9.86'
L51	S 23°14'59" W	38.23'	L172	S 73°18'34" E	60.44'
L52	S 23°13'26" W	63.12'	L173	N 25°37'49" E	32.53'
L53	S 21°18'46" W	102.56'	L174	S 40°49'03" E	28.47'
L54	S 19°14'15" W	102.34'	L175	N 36°58'17" E	21.69'
L55	S 17°17'15" W	101.06'	L176	S 76°44'46" E	21.44'
L56	S 16°16'37" W	100.94'	L177	S 14°26'49" W	27.21'
L57	S 16°30'48" W	99.68'	L178	S 86°41'52" E	6.78'
L58	S 17°33'06" W	98.63'	L179	N 87°14'33" E	24.64'
L59	S 19°12'54" W	98.15'	L180	S 40°22'08" E	36.29'
L60	S 21°07'08" W	99.78'	L181	S 13°37'04" E	24.06'
L61	S 23°11'04" W	97.92'	L182	S 82°58'59" E	35.03'
L62	S 24°54'47" W	38.40'	L183	S 73°33'17" E	23.68'
L63	S 25°36'27" W	22.58'	L184	S 25°37'21" E	34.01'
L64	N 89°17'29" W	64.48'	L185	S 06°57'32" E	21.00'
L65	N 89°42'10" W	67.13'	L186	S 53°23'42" E	38.38'
L66	N 14°10'11" W	25.98'	L187	S 83°14'09" E	8.53'
L67	N 29°27'03" W	279.28'	L188	N 33°23'35" E	11.26'
L68	N 10°30'20" W	258.11'	L189	S 68°50'30" E	18.96'
L69	N 31°49'46" W	302.09'	L190	N 81°37'03" E	18.18'
L70	N 19°25'27" W	348.05'	L191	S 39°21'14" E	5.22'
L71	N 01°06'22" E	289.07'			
L72	S 62°05'16" E	8.68'			
L73	S 75°58'33" E	23.59'			
L74	S 54°32'13" E	16.14'			
L75	S 28°27'52" E	21.06'			
L76	S 52°11'00" E	19.37'			
L77	N 80°16'49" E	16.94'			
L78	N 27°19'34" E	14.43'			
L79	N 74°27'19" E	9.44'			
L80	S 50°24'04" E	7.19'			
L81	S 36°21'02" E	23.88'			
L82	N 39°19'42" E	12.17'			
L83	N 05°51'07" W	17.89'			
L84	N 50°03'59" E	8.76'			
L85	S 73°12'41" E	16.32'			
L86	S 21°18'53" E	18.47'			
L87	S 72°13'16" E	13.54'			
L88	N 61°51'46" E	21.65'			
L89	N 74°00'24" E	50.54'			
L90	N 19°57'12" E	44.74'			
L91	N 06°03'59" W	20.11'			
L92	N 35°44'44" E	23.04'			
L93	N 69°35'37" E	22.30'			
L94	S 84°36'00" E	31.56'			
L95	N 68°46'46" E	23.80'			
L96	N 88°42'18" E	17.10'			
L97	S 54°50'03" E	18.40'			
L98	N 80°46'03" E	40.56'			
L99	N 58°20'09" E	25.29'			
L100	N 44°32'26" E	24.34'			
L101	N 71°02'31" E	19.10'			
L102	N 47°24'16" E	37.55'			
L103	N 81°51'36" E	25.80'			
L104	N 36°15'39" E	27.41'			
L105	N 20°21'02" W	17.38'			
L106	N 11°59'13" E	2.08'			
L107	N 58°12'58" E	29.12'			
L108	N 82°43'32" E	21.16'			
L109	N 05°01'51" W	12.48'			
L110	N 77°16'23" W	12.42'			
L111	N 37°17'58" E	22.50'			
L112	N 73°27'07" E	34.86'			
L113	N 03°15'44" E	13.46'			
L114	N 45°09'32" W	11.24'			
L115	N 53°48'21" E	6.23'			
L116	S 68°53'55" E	13.88'			
L117	N 60°34'12" E	52.94'			
L118	N 78°46'01" E	46.77'			
L119	N 67°46'44" E	48.56'			
L120	N 74°58'45" E	43.00'			
L121	S 89°36'23" E	38.18'			

CURVE TABLE				
CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING
C1	2927.20'	91.26'	91.25'	S 49°51'06" W
C2	2830.49'	156.33'	156.31'	S 47°19'16" W
C3	2804.10'	66.11'	66.11'	N 25°32'13" E

McADAMS
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Durham, NC 27713

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fax 919. 361. 2269
license number: C-0293, C-187

www.mcadamsco.com

CLIENT

LENNAR CAROLINAS, LLC

DEPOT 499
ANNEXATION PLAT

WHITE OAK TOWNSHIP, WAKE COUNTY, NC

NORTH CAROLINA PROFESSIONAL SEAL L-4411 LAND SURVEYOR JAMES S. ARMSTRONG

REVISIONS

NO.	DATE

PLAN INFORMATION

PROJECT NO.	LEN-19090
FILENAME	LEN19090-F1
CHECKED BY	JSA
DRAWN BY	TAM
SCALE	N/A
DATE	11-19-2020

SHEET

SHEET TITLE

1-3

X:\Projects\LEN\LEN-19090\02-Geomatics\Survey\Plats\LEN19090-F1.dwg, 4/7/2021 11:08:09 AM, Mersinger, Timothy

GRAPHIC SCALE
0 100 200 400
1 inch = 200 ft.

NC GRID (NAD83)

APEX BARBECUE ROAD
S.R. 1162
VARIABLE WIDTH PUBLIC
RIGHT OF WAY
D.B. 6639, PG. 11
B.M. 2008, PG. 991

S 88°15'40" E 294.44'

DARYL POE AND WIFE,
JEANNE POE
D.B. 10509, PG. 2106
B.M. 2003, PG. 1564
P.I.N.: 0731-67-6714
6401 APEX BARBECUE RD

N 00°20'56" E 1168.68'

CURRENT TOWN OF APEX
CORPORATE LIMITS

EXISTING TOWN OF APEX
CORPORATE LIMITS

WOODALL ESTATES OWNERS
ASSOCIATION, INC.
D.B. 17271, PG. 1284
B.M. 2016, PG. 2109
P.I.N.: 0731-57-5313

WOODALL ESTATES OWNERS
ASSOCIATION, INC.
D.B. 17271, PG. 1284
B.M. 2016, PG. 2110
P.I.N.: 0731-67-0122

VARIABLE WIDTH TOWN OF
APEX UTILITY EASEMENT
B.M. 2016, PGS. 1047-1049
B.M. 2016, PGS. 2108-2111

VARIABLE WIDTH TOWN OF
APEX UTILITY EASEMENT
B.M. 2015, PGS. 1637-1642

WAKE COUNTY BOARD
OF EDUCATION
D.B. 12589, PG. 2392
B.M. 2015, PG. 1638
P.I.N.: 0731-47-7630

VARIABLE WIDTH TOWN OF
APEX UTILITY EASEMENT
D.B. 14829, PG. 2198

CENTERLINE OF CREEK IS PROPERTY LINE
EVERY OTHER CALL IS DISPLAYED FOR
CLARITY

CURRENT TOWN OF APEX
CORPORATE LIMITS

POE ACRES FAMILY FARM, LLC
D.B. 15535, PG. 966
P.I.N.: 0731-76-1944
0 APEX BARBECUE RD

AREA TO BE ANNEXED:
157.234 AC.
6,849,127 SQ.FT.

WILLIAM DOUGLAS POE AND
WIFE, JEAN S. POE
D.B. 9827, PG. 1855
B.M. 2002, PG. 2117
P.I.N.: 0731-76-6588
1216 S SALEM ST

NEW TOWN OF APEX
CORPORATE LIMITS

POE ACRES FAMILY FARM, LLC
D.B. 12121, PG. 472
P.I.N.: 0731-56-4395
0 APEX BARBECUE RD

POE ACRES FAMILY FARM, LLC
D.B. 15535, PG. 966
P.I.N.: 0731-75-0984
1300 S SALEM ST

CSX TRANSPORTATION, INC.
100' PUBLIC RIGHT OF WAY
D.B. 24, PG. 152 AND TRACK MAPS
RIGHT OF WAY STATION 8809+88-9121+08
STATION 9121+08-9332+28

POE ACRES FAMILY FARM, LLC
D.B. 12121, PG. 472
P.I.N.: 0731-56-4395
0 APEX BARBECUE RD

SOUTH SALEM STREET
OLD U.S. 1
S.R. 1011
60' PUBLIC RIGHT OF WAY
B.M. 2006, PG. 1810
B.M. 2002, PG. 2117
B.M. 2003, PG. 2073
(NO REFERENCES TO RIGHT OF WAY F

NEW TOWN OF APEX
CORPORATE LIMITS
N 88°58'59" W 428.33'
N 88°24'26" W 416.05'
S 89°59'35" W 879.26'

NC DEPARTMENT OF
TRANSPORTATION
D.B. 7837, PG. 740
P.I.N.: 0731-45-9383

NC DEPARTMENT OF
TRANSPORTATION
TURNPIKE AUTHORITY
D.B. 14075, PG. 2434
P.I.N.: 0731-45-7553

VARYA LLC
D.B. 17239, PG. 1495
P.I.N.: 0731-55-4102

CAREY B. HUNTER
D.B. 2368, PG. 564
B.M. 1990, PG. 95
P.I.N.: 0731-64-1147

NEW TOWN OF APEX
CORPORATE LIMITS
N 00°17'39" E 911.20'

POE ACRES FAMILY FARM, LLC
D.B. 15535, PG. 966
B.M. 2006, PG. 1810
P.I.N.: 0731-65-7166
1330 S SALEM ST

NEW TOWN OF APEX
CORPORATE LIMITS

NEW TOWN OF APEX
CORPORATE LIMITS

VARIABLE WIDTH PUBLIC RIGHT OF WAY
NC 540
D.B. 14509, PG. 1790

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DEPOT 499
ANNEXATION PLAT

WHITE OAK TOWNSHIP, WAKE COUNTY, NC

NORTH CAROLINA PROFESSIONAL SEAL L-4411 JAMES S. ARMSTRONG
4.7.21

REVISIONS

NO.	DATE

PLAN INFORMATION

PROJECT NO.	LEN-19090
FILENAME	LEN19090-F1
CHECKED BY	JSA
DRAWN BY	TAM
SCALE	1"=200'
DATE	11-19-2020

SHEET

SHEET TITLE

2-3

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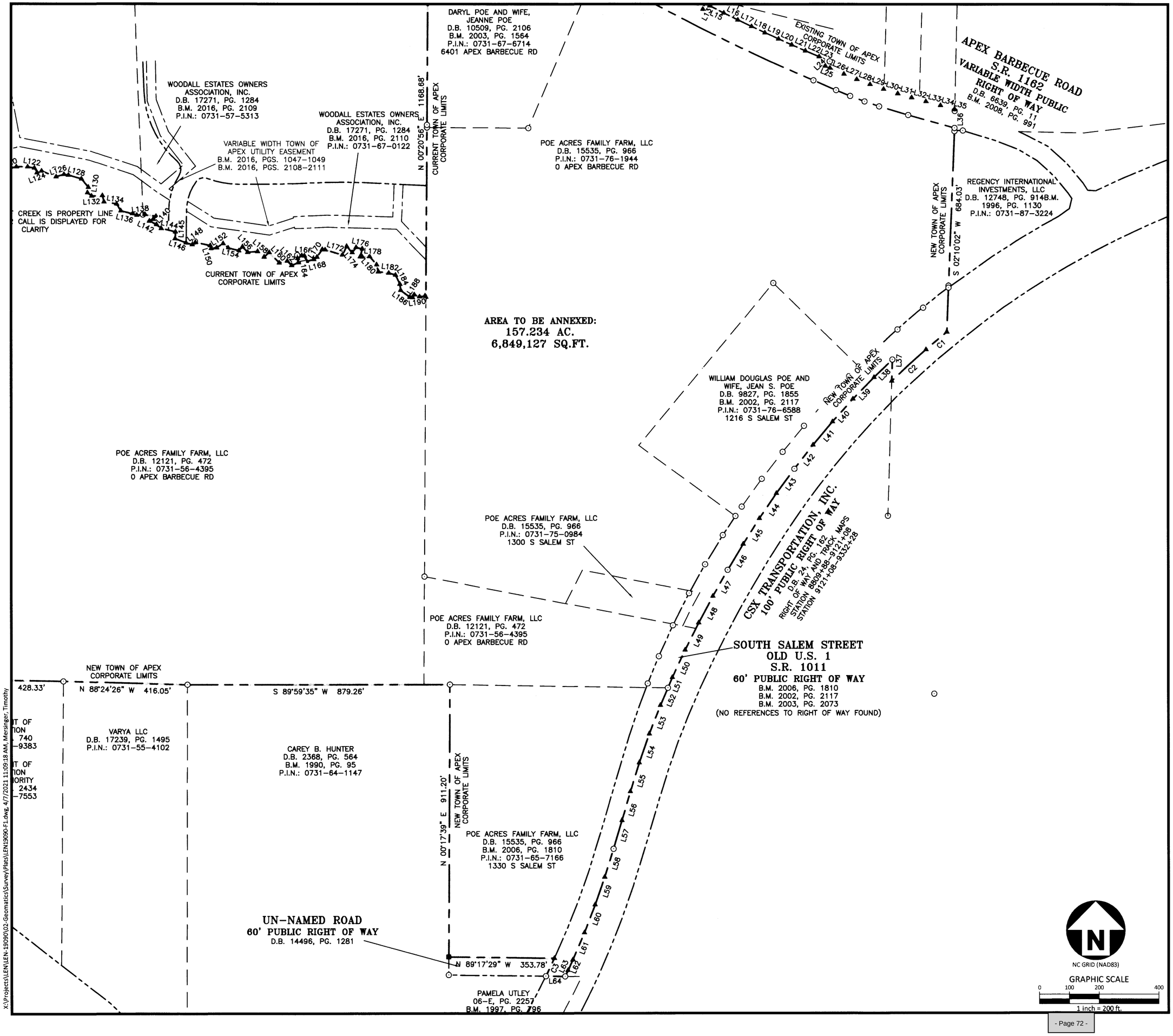

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ANNEXATION PLAT

WHITE OAK TOWNSHIP, WAKE COUNTY, NC

NORTH CAROLINA PROFESSIONAL SEAL L-4411 LAND SURVEYOR JAMES S. ARMSTRONG
4.7.21

REVISIONS

NO.	DATE

PLAN INFORMATION

PROJECT NO.	LEN-19090
FILENAME	LEN19090-F1
CHECKED BY	JSA
DRAWN BY	TAM
SCALE	1"=200'
DATE	11-19-2020

SHEET

SHEET TITLE

3-3

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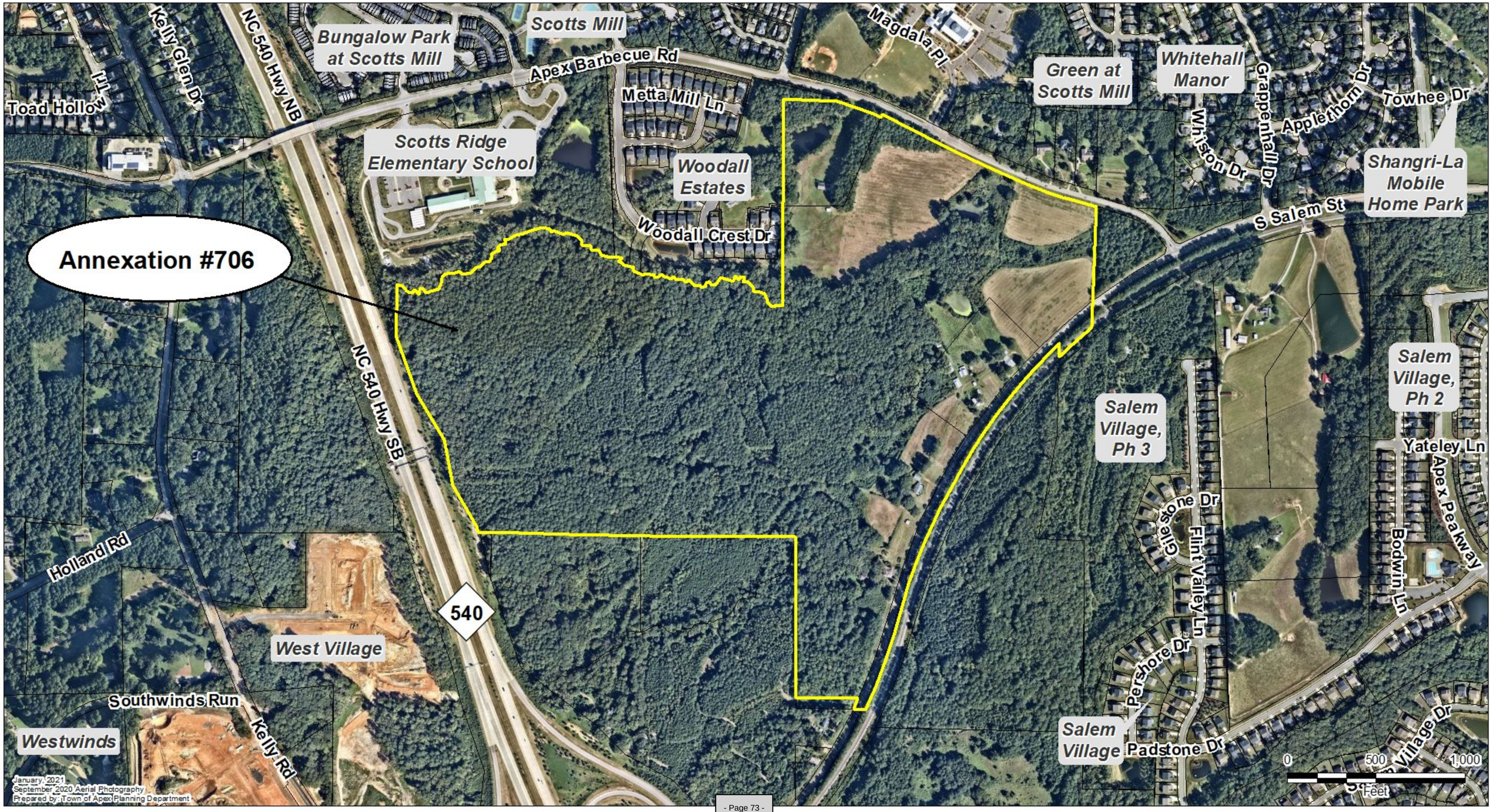
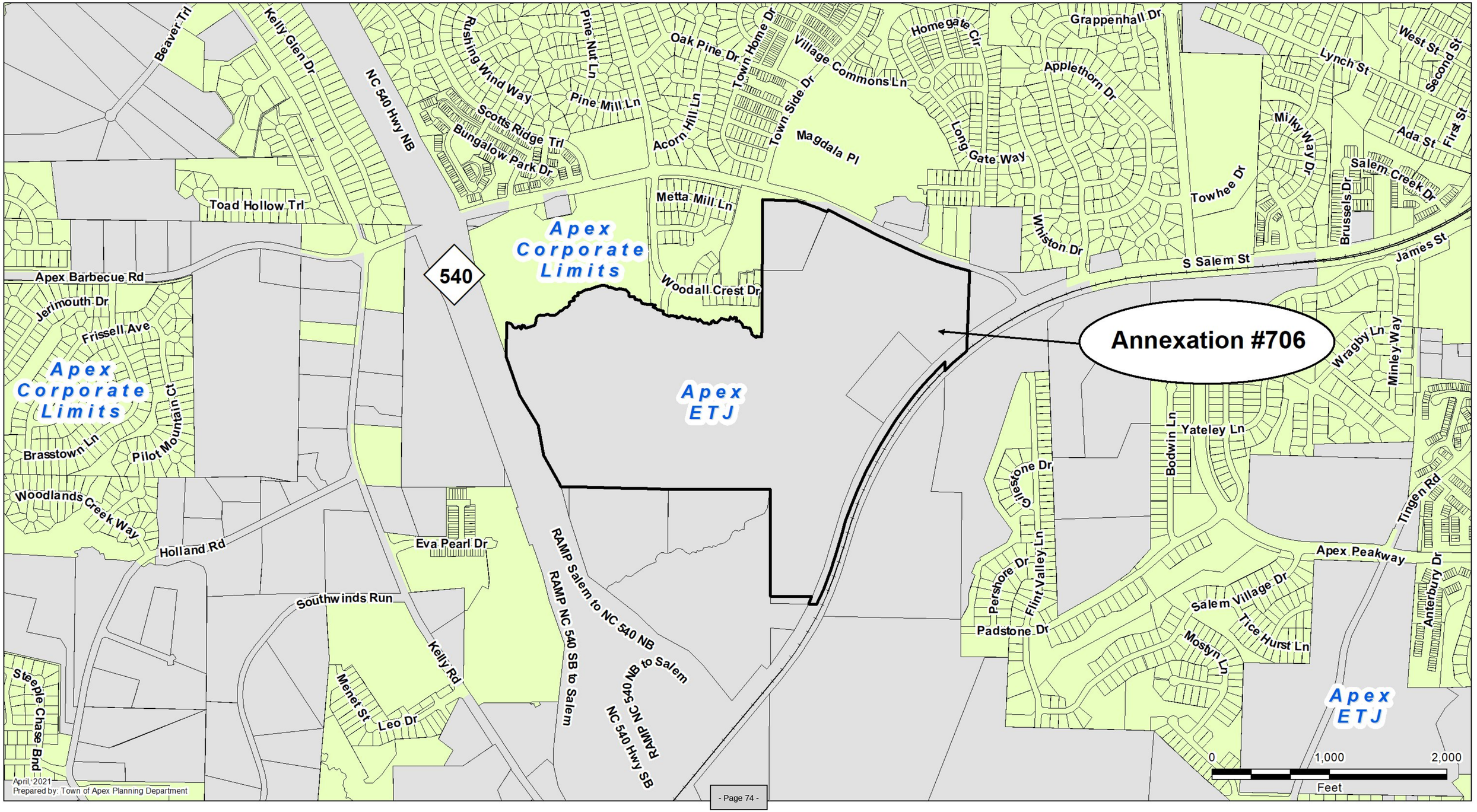
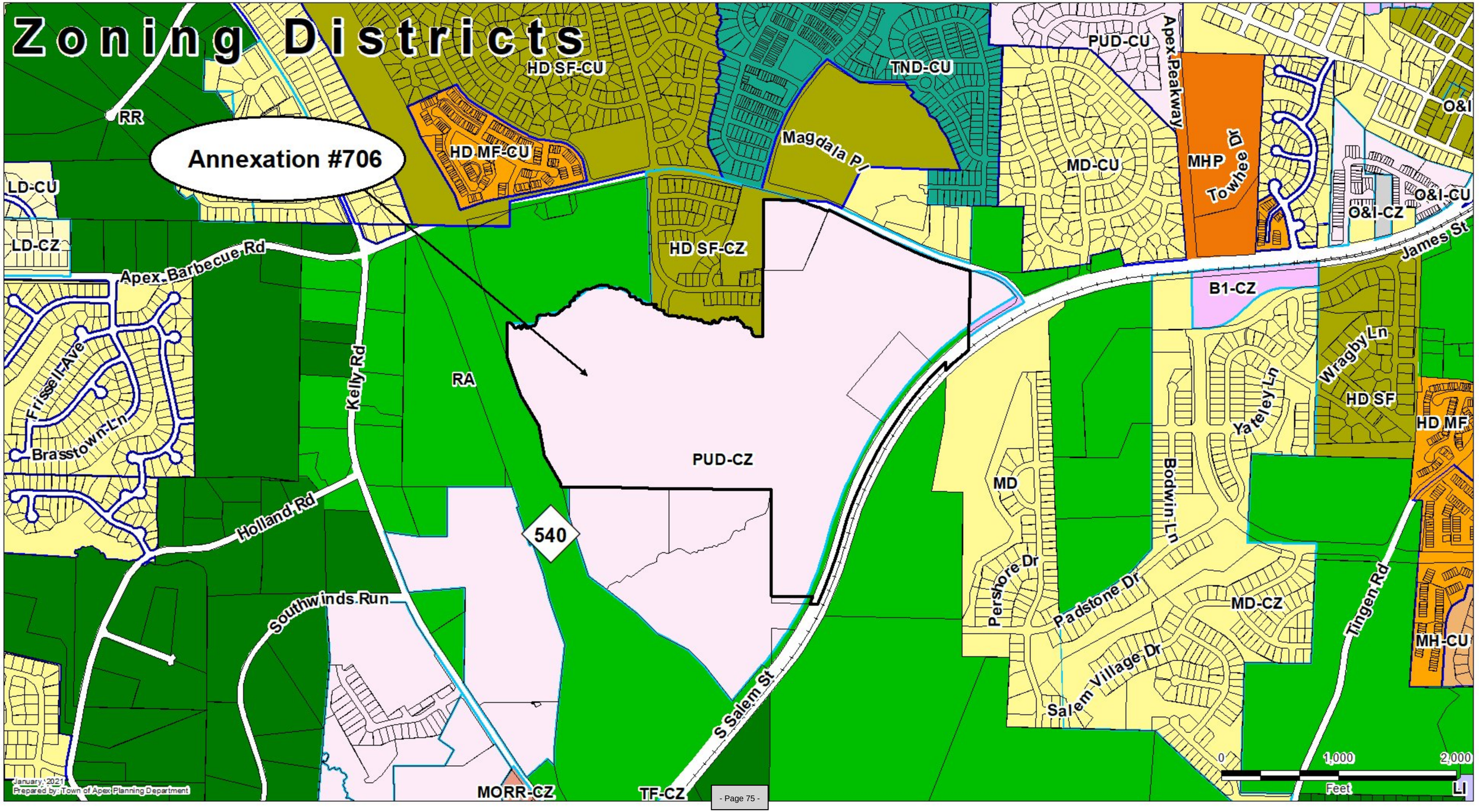

Annexation #706
Bungalow Park at Scotts Mill
Scotts Mill
Apex Barbecue Rd
Magdala Pl
Green at Scotts Mill
Whitehall Manor
Grappenhall Dr
Applethorn Dr
Towhee Dr
Whiston Dr
Shangri-La Mobile Home Park
S Salem St
Metta Mill Ln
Woodall Estates
Woodall Crest Dr
Scotts Ridge Elementary School
Toad Hollow Ln
Kelly Glen Dr
NC 540 Hwy NB
NC 540 Hwy SB
Salem Village, Ph 3
Salem Village, Ph 2
Yateley Ln
Apex Peakway
Bodwin Ln
Gilestone Dr
Flint Valley Ln
Pershore Dr
Padstone Dr
Village Dr
Salem Village
Holland Rd
540
West Village
Southwinds Run
Kelly Rd
Westwinds
January 2021
September 2020 Aerial Photography
Prepared by: Town of Apex Planning Department
0
500
1,000
Feet


Annexation #706
Apex Corporate Limits
Apex ETJ
Apex Corporate Limits
Apex ETJ
Apex ETJ
540
Beaver Trl
Kelly Glen Dr
NC 540 Hwy NB
Rushing Wind Way
Pine Nut Ln
Pine Mill Ln
Scotts Ridge Trl
Bungalow Park Dr
Oak Pine Dr
Town Home Dr
Town Side Dr
Acorn Hill Ln
Magdala Pl
Village Commons Ln
Homegate Cir
Long Gate Way
Grappenhall Dr
Applethorn Dr
Lynch St
West St
Second St
First St
Ada St
Milky Way Dr
Salem Creek Dr
Brussels Dr
Towhee Dr
Whiston Dr
S Salem St
James St
Toad Hollow Trl
Metta Mill Ln
Woodall Crest Dr
Apex Barbecue Rd
Jerimouth Dr
Frissell Ave
Brasstown Ln
Pilot Mountain Ct
Woodlands Creek Way
Holland Rd
Eva Pearl Dr
Southwinds Run
Kelly Rd
Steeple Chase Bnd
Menet St
Leo Dr
RAMP Salem to NC 540 NB
RAMP NC 540 SB to Salem
RAMP NC 540 NB to Salem
NC 540 Hwy SB
Wragby Ln
Minley Way
Yateley Ln
Bodwin Ln
Gilestone Dr
Pershore Dr
Flint Valley Ln
Padstone Dr
Apex Peakway
Tingen Rd
Anterbury Dr
Salem Village Dr
Tice Hurst Ln
Mostyn Ln
0
1,000
2,000
Feet
April 2021
Prepared by: Town of Apex Planning Department


Zoning Districts
Annexation #706
RR
HD SF-CU
HD MF-CU
TND-CU
Magdala Pl
PUD-CU
Apex Peakway
MD-CU
MHP
Towhee Dr
O&I
O&I-CU
O&I-CZ
LD-CU
LD-CZ
HD SF-CZ
James St
Apex Barbecue Rd
B1-CZ
Frissell Ave
Brasstown Ln
Kelly Rd
RA
Wragby Ln
HD SF
HD MF
Yateley Ln
PUD-CZ
MD
Bodwin Ln
Holland Rd
540
Pershore Dr
Padstone Dr
MD-CZ
Tingen Rd
Southwinds Run
MH-CU
S Salem St
Salem Village Dr
MORR-CZ
TF-CZ
0
1,000
2,000
Feet
January, 2021
Prepared by: Town of Apex Planning Department

BEGINNING AT AN IRON PIPE IN THE NORTHERN PROPERTY LINE OF THE DARYL POE AND JEANNE POE TRACT; THENCE SOUTH 88°15'40" EAST 294.44 FEET TO A POINT; THENCE SOUTH 88°15'40" EAST 73.53 FEET TO AN IRON PIPE IN THE SOUTHERN RIGHT OF WAY OF APEX BARBEQUE ROAD(VARIABLE WIDTH PUBLIC RIGHT OF WAY); THENCE SOUTH 88°17'21" EAST 166.15 FEET TO A POINT; THENCE SOUTH 66°51'11" EAST 52.41 FEET TO A POINT; THENCE SOUTH 66°15'45" EAST 53.82 FEET TO A POINT; THENCE SOUTH 65°14'19" EAST 41.62 FEET TO A POINT; THENCE NORTH 25°36'46" EAST 2.86 FEET TO A POINT; THENCE SOUTH 63°01'58" EAST 36.23 FEET TO A POINT; THENCE SOUTH 62°43'11" EAST 52.42 FEET TO A POINT; THENCE SOUTH 62°34'50" EAST 52.21 FEET TO A POINT; THENCE SOUTH 62°33'45" EAST 50.32 FEET TO A POINT; THENCE SOUTH 62°31'05" EAST 52.09 FEET TO A POINT; THENCE SOUTH 62°41'02" EAST 38.46 FEET TO A POINT; THENCE NORTH 27°30'20" EAST 20.00 FEET TO A POINT IN THE NORTHERN RIGHT OF WAY OF APEX BARBEQUE ROAD (VARIALBE WITH PUBLC RIGHT OF WAY); THENCE WITH SAID RIGHT OF WAY SOUTH 63°45'54" EAST 15.27 FEET TO A POINT; THENCE SOUTH 63°11'11" EAST 52.92 FEET TO A POINT; THENCE SOUTH 63°46'38" EAST 52.45 FEET TO A POINT; THENCE SOUTH 64°11'18" EAST 51.01 FEET TO A POINT; THENCE SOUTH 64°51'58" EAST 49.52 FEET TO A POINT; THENCE SOUTH 65°24'55" EAST 50.07 FEET TO A POINT; THENCE SOUTH 66°04'16" EAST 48.34 FEET TO A POINT; THENCE SOUTH 66°24'38" EAST 50.08 FEET TO A POINT; THENCE SOUTH 66°41'38" EAST 50.19 FEET TO A POINT; THENCE SOUTH 66°15'39" EAST 38.64 FEET TO AN IRON PIPE; THENCE LEAVING SAID RIGHT OF WAY SOUTH 45°09'49" WEST 21.52 FEET TO A POINT; THENCE SOUTH 66°29'41" EAST 17.50 FEET TO A POINT; THENCE SOUTH 66°51'15" EAST 51.02 FEET TO A POINT; THENCE SOUTH 67°29'37" EAST 46.49 FEET TO A POINT; THENCE SOUTH 69°10'44" EAST 47.69 FEET TO A POINT; THENCE SOUTH 70°48'55" EAST 47.97 FEET TO A POINT; THENCE SOUTH 72°26'29" EAST 49.98 FEET TO A POINT; THENCE SOUTH 73°56'45" EAST 48.27 FEET TO A POINT; THENCE SOUTH 74°36'34" EAST 49.46 FEET TO A POINT; THENCE SOUTH 74°35'50" EAST 50.79 FEET TO A POINT; THENCE SOUTH 74°07'44" EAST 48.03 FEET TO A POINT; THENCE SOUTH 73°53'30" EAST 1.43 FEET TO A POINT; THENCE SOUTH 00°46'03" WEST 62.04 FEET TO AN IRON PIPE; THENCE SOUTH 02°10'02" WEST 684.03 FEET TO A POINT; THENCE WITH A CURVE TO THE LEFT WITH AN ARC LENGTH OF 91.26 FEET, WITH A RADIUS OF 2927.20 FEET, WITH A CHORD BEARING OF SOUTH 49°51'06" WEST, WITH A CHORD LENGTH OF 91.25 FEET TO A POINT; THENCE WITH A COMPOUND CURVE TO THE LEFT WITH AN ARC LENGTH OF 156.33 FEET, WITH A RADIUS OF 2830.49 FEET, WITH A CHORD BEARING OF SOUTH 47°19'16" WEST, WITH A CHORD LENGTH OF 156.31 FEET TO A POINT; THENCE NORTH 01°41'10" EAST 71.72 FEET TO AN IRON PIPE; THENCE SOUTH 46°03'02" WEST 85.16 FEET TO A POINT; THENCE SOUTH 44°07'53" WEST 101.67 FEET TO A POINT; THENCE SOUTH 42°07'43" WEST 101.98 FEET TO A POINT; THENCE SOUTH 40°06'18" WEST 101.05 FEET TO A POINT; THENCE SOUTH 38°00'20" WEST 102.25 FEET TO AN IRON PIPE; THENCE SOUTH 36°10'22" WEST 101.61 FEET TO A POINT; THENCE SOUTH 34°13'40" WEST 101.88 FEET TO A POINT; THENCE SOUTH 32°20'31" WEST 101.40 FEET TO A POINT; THENCE SOUTH 30°52'45" WEST 101.44 FEET TO AN IRON PIPE; THENCE SOUTH 29°32'30" WEST 100.74 FEET TO A POINT; THENCE SOUTH 28°00'14" WEST 101.56 FEET TO A POINT; THENCE SOUTH 26°31'43" WEST 101.76 FEET TO A POINT; THENCE SOUTH 24°59'56" WEST 101.74 FEET TO A POINT; THENCE SOUTH 23°14'59" WEST 38.23 FEET TO AN IRON PIPE; THENCE SOUTH 23°13'26" WEST 63.12 FEET TO A POINT; THENCE SOUTH 21°18'46" WEST 102.56 FEET TO A POINT; THENCE SOUTH 19°14'15" WEST 102.34 FEET TO A POINT; THENCE SOUTH 17°17'15" WEST 101.06 FEET TO A POINT; THENCE SOUTH 16°16'37" WEST 100.94 FEET TO A POINT; THENCE SOUTH 16°30'48" WEST 99.68 FEET TO AN IRON PIPE; THENCE SOUTH 17°33'06" WEST 98.63 FEET TO A POINT; THENCE SOUTH 19°12'54" WEST 98.15 FEET TO A POINT; THENCE SOUTH 21°07'08" WEST 99.78 FEET TO A POINT; THENCE SOUTH 23°11'04" WEST 97.92 FEET TO A POINT; THENCE SOUTH 24°54'47" WEST 38.40 FEET TO A POINT; THENCE SOUTH 25°36'27" WEST 22.58 FEET TO AN IRON PIPE; THENCE NORTH 89°17'29" WEST 64.48 FEET TO AN IRON PIPE; THENCE WITH A CURVE TO THE LEFT WITH AN ARC LENGTH OF 66.11 FEET, WITH A RADIUS OF 2804.10 FEET, WITH A CHORD BEARING OF NORTH 25°32'13" EAST, WITH A CHORD LENGTH OF 66.11 FEET TO A

POINT; THENCE NORTH 89°17'29" WEST 353.78 FEET TO A CONCRETE MONUMENT; THENCE NORTH 00°17'39" EAST 911.20 FEET TO AN IRON PIPE; THENCE SOUTH 89°59'35" WEST 879.26 FEET TO AN IRON PIPE; THENCE NORTH 88°24'26" WEST 416.05 FEET TO AN IRON PIPE; THENCE NORTH 88°58'59" WEST 428.33 FEET TO AN IRON PIPE; THENCE NORTH 89°42'10" WEST 67.13 FEET TO AN IRON PIPE IN THE EASTERN RIGHT OF WAY OF N.C. HIGHWAY 540 (VARIABLE WIDTH PUBLIC RIGHT OF WAY); THENCE WITH SAID RIGHT OF WAY NORTH 14°10'11" WEST 25.98 FEET TO A CONCRETE MONUMENT; THENCE NORTH 29°27'03" WEST 279.28 FEET TO A CONCRETE MONUMENT; THENCE NORTH 10°30'20" WEST 258.11 FEET TO A CONCRETE MONUMENT; THENCE NORTH 31°49'46" WEST 302.09 FEET TO A CONCRETE MONUMENT; THENCE NORTH 19°25'27" WEST 348.05 FEET TO AN IRON PIPE; THENCE NORTH 01°06'22" EAST 289.07 FEET TO AN IRON PIPE IN THE CENTERLINE OF A CREEK; THENCE WITH SAID CENTERLINE SOUTH 62°05'16" EAST 8.68 FEET TO A POINT; THENCE SOUTH 75°58'33" EAST 23.59 FEET TO A POINT; THENCE SOUTH 54°32'13" EAST 16.14 FEET TO A POINT; THENCE SOUTH 28°27'52" EAST 21.06 FEET TO A POINT; THENCE SOUTH 52°11'00" EAST 19.37 FEET TO A POINT; THENCE NORTH 80°16'49" EAST 16.94 FEET TO A POINT; THENCE NORTH 27°19'34" EAST 14.43 FEET TO A POINT; THENCE NORTH 74°27'19" EAST 9.44 FEET TO A POINT; THENCE SOUTH 50°24'04" EAST 7.19 FEET TO A POINT; THENCE SOUTH 36°21'02" EAST 23.88 FEET TO A POINT; THENCE NORTH 39°19'42" EAST 12.17 FEET TO A POINT; THENCE NORTH 05°51'07" WEST 17.89 FEET TO A POINT; THENCE NORTH 50°03'59" EAST 8.76 FEET TO A POINT; THENCE SOUTH 73°12'41" EAST 16.32 FEET TO A POINT; THENCE SOUTH 21°18'53" EAST 18.47 FEET TO A POINT; THENCE SOUTH 72°13'16" EAST 13.54 FEET TO A POINT; THENCE NORTH 61°51'46" EAST 21.65 FEET TO A POINT; THENCE NORTH 74°00'24" EAST 50.54 FEET TO A POINT; THENCE NORTH 19°57'12" EAST 44.74 FEET TO A POINT; THENCE NORTH 06°03'59" WEST 20.11 FEET TO A POINT; THENCE NORTH 35°44'44" EAST 23.04 FEET TO A POINT; THENCE NORTH 69°35'37" EAST 22.30 FEET TO A POINT; THENCE SOUTH 84°36'00" EAST 31.56 FEET TO A POINT; THENCE NORTH 68°46'46" EAST 23.80 FEET TO A POINT; THENCE NORTH 88°42'18" EAST 17.10 FEET TO A POINT; THENCE SOUTH 54°50'03" EAST 18.40 FEET TO A POINT; THENCE NORTH 80°46'03" EAST 40.56 FEET TO A POINT; THENCE NORTH 58°20'09" EAST 25.29 FEET TO A POINT; THENCE NORTH 44°32'26" EAST 24.34 FEET TO A POINT; THENCE NORTH 71°02'31" EAST 19.10 FEET TO A POINT; THENCE NORTH 47°24'16" EAST 37.55 FEET TO A POINT; THENCE NORTH 81°51'36" EAST 25.80 FEET TO A POINT; THENCE NORTH 36°15'39" EAST 27.41 FEET TO A POINT; THENCE NORTH 20°21'02" WEST 17.38 FEET TO A POINT; THENCE NORTH 11°59'13" EAST 2.08 FEET TO A POINT; THENCE NORTH 58°12'58" EAST 29.12 FEET TO A POINT; THENCE NORTH 82°43'32" EAST 21.16 FEET TO A POINT; THENCE NORTH 05°01'51" WEST 12.48 FEET TO A POINT; THENCE NORTH 77°16'23" WEST 12.42 FEET TO A POINT; THENCE NORTH 37°17'58" EAST 22.50 FEET TO A POINT; THENCE NORTH 73°27'07" EAST 34.86 FEET TO A POINT; THENCE NORTH 03°15'44" EAST 13.46 FEET TO A POINT; THENCE NORTH 45°09'32" WEST 11.24 FEET TO A POINT; THENCE NORTH 53°48'21" EAST 6.23 FEET TO A POINT; THENCE SOUTH 68°53'55" EAST 13.88 FEET TO A POINT; THENCE NORTH 60°34'12" EAST 52.94 FEET TO A POINT; THENCE NORTH 78°46'01" EAST 46.77 FEET TO A POINT; THENCE NORTH 67°46'44" EAST 48.56 FEET TO A POINT; THENCE NORTH 74°58'45" EAST 43.00 FEET TO A POINT; THENCE SOUTH 89°36'23" EAST 38.18 FEET TO A POINT; THENCE SOUTH 79°42'51" EAST 22.68 FEET TO A POINT; THENCE SOUTH 29°26'17" EAST 17.84 FEET TO A POINT; THENCE NORTH 69°48'36" EAST 16.45 FEET TO A POINT; THENCE SOUTH 68°17'51" EAST 51.96 FEET TO A POINT; THENCE NORTH 73°12'05" EAST 27.64 FEET TO A POINT; THENCE SOUTH 79°24'02" EAST 15.42 FEET TO A POINT; THENCE SOUTH 74°12'31" EAST 45.28 FEET TO A POINT; THENCE SOUTH 39°16'28" EAST 36.13 FEET TO A POINT; THENCE SOUTH 08°43'30" WEST 18.30 FEET TO A POINT; THENCE SOUTH 50°53'39" EAST 18.00 FEET TO A POINT; THENCE NORTH 88°17'02" EAST 36.36 FEET TO A POINT; THENCE SOUTH 13°58'03" EAST 21.80 FEET TO A POINT; THENCE SOUTH 81°03'00" EAST 42.96 FEET TO A POINT; THENCE SOUTH 30°57'25" EAST 26.88 FEET TO A POINT; THENCE SOUTH 75°54'58" EAST 40.54 FEET TO A POINT; THENCE SOUTH 70°25'00" EAST 15.28 FEET TO A POINT; THENCE NORTH 84°19'40" EAST 27.52 FEET TO A POINT; THENCE SOUTH 80°36'18" EAST 37.25 FEET

TO A POINT; THENCE SOUTH 42°44'12" WEST 13.86 FEET TO A POINT; THENCE SOUTH 64°51'55" WEST 13.95 FEET TO A POINT; THENCE SOUTH 64°16'15" EAST 26.38 FEET TO A POINT; THENCE SOUTH 51°02'50" EAST 20.28 FEET TO A POINT; THENCE SOUTH 76°30'27" EAST 49.09 FEET TO A POINT; THENCE SOUTH 02°56'27" WEST 22.78 FEET TO A POINT; THENCE SOUTH 68°53'00" EAST 39.44 FEET TO A POINT; THENCE SOUTH 74°05'57" EAST 21.64 FEET TO A POINT; THENCE NORTH 54°46'33" EAST 12.67 FEET TO A POINT; THENCE SOUTH 78°44'03" EAST 50.69 FEET TO A POINT; THENCE SOUTH 17°24'42" EAST 10.77 FEET TO A POINT; THENCE NORTH 81°02'40" EAST 18.57 FEET TO A POINT; THENCE NORTH 57°30'16" EAST 25.96 FEET TO A POINT; THENCE SOUTH 49°12'49" EAST 22.49 FEET TO A POINT; THENCE SOUTH 75°13'50" EAST 36.68 FEET TO A POINT; THENCE NORTH 43°03'04" EAST 18.03 FEET TO A POINT; THENCE SOUTH 43°29'16" EAST 25.33 FEET TO A POINT; THENCE NORTH 84°54'55" EAST 33.14 FEET TO A POINT; THENCE SOUTH 49°52'36" EAST 29.02 FEET TO A POINT; THENCE NORTH 47°30'27" EAST 22.64 FEET TO A POINT; THENCE SOUTH 44°10'50" EAST 48.34 FEET TO A POINT; THENCE NORTH 77°35'58" EAST 27.83 FEET TO A POINT; THENCE SOUTH 44°55'44" EAST 20.62 FEET TO A POINT; THENCE NORTH 67°39'06" EAST 23.64 FEET TO A POINT; THENCE NORTH 09°17'48" WEST 14.71 FEET TO A POINT; THENCE NORTH 56°08'00" EAST 16.99 FEET TO A POINT; THENCE SOUTH 84°08'50" EAST 9.11 FEET TO A POINT; THENCE SOUTH 21°28'59" EAST 19.37 FEET TO A POINT; THENCE NORTH 77°01'03" EAST 25.20 FEET TO A POINT; THENCE NORTH 52°22'39" EAST 13.09 FEET TO A POINT; THENCE NORTH 34°19'37" EAST 31.41 FEET TO A POINT; THENCE SOUTH 83°30'24" EAST 9.86 FEET TO A POINT; THENCE SOUTH 73°18'34" EAST 60.44 FEET TO A POINT; THENCE NORTH 25°37'49" EAST 32.53 FEET TO A POINT; THENCE SOUTH 40°49'03" EAST 28.47 FEET TO A POINT; THENCE NORTH 36°58'17" EAST 21.69 FEET TO A POINT; THENCE SOUTH 76°44'46" EAST 21.44 FEET TO A POINT; THENCE SOUTH 14°26'49" WEST 27.21 FEET TO A POINT; THENCE SOUTH 86°41'52" EAST 6.78 FEET TO A POINT; THENCE NORTH 87°14'33" EAST 24.64 FEET TO A POINT; THENCE SOUTH 40°22'08" EAST 36.29 FEET TO A POINT; THENCE SOUTH 13°37'04" EAST 24.06 FEET TO A POINT; THENCE SOUTH 82°58'59" EAST 35.03 FEET TO A POINT; THENCE SOUTH 73°33'17" EAST 23.68 FEET TO A POINT; THENCE SOUTH 25°37'21" EAST 34.01 FEET TO A POINT; THENCE SOUTH 06°57'32" EAST 21.00 FEET TO A POINT; THENCE SOUTH 53°23'42" EAST 38.38 FEET TO A POINT; THENCE SOUTH 83°14'09" EAST 8.53 FEET TO A POINT; THENCE NORTH 33°23'35" EAST 11.26 FEET TO A POINT; THENCE SOUTH 68°50'30" EAST 18.96 FEET TO A POINT; THENCE NORTH 81°37'03" EAST 18.18 FEET TO A POINT; THENCE SOUTH 39°21'14" EAST 5.22 FEET TO A POINT; THENCE LEAVING THE CENTERLIN OF SAID CREEK NORTH 00°20'56" EAST 1168.68 FEET TO THE POINT AND PLACE OF BEGINNING CONTAINING 6,849,127 SQUARE FEET, 157.234 ACRES AND BEING THE SAME AREA AS SHOWN ON THE PLAT BY THE JOHN R MCADAMS COMPANY TITLED ANNEXATION MAP OF DEPOT 499 DATED NOVEMBER 19TH, 2020.

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: CONSENT AGENDA

Meeting Date: April 27,2021

Item Details

Presenter(s): Dianne Khin, Planning and Community Development Director

Department(s): Planning and Community Development

Requested Motion

Possible motion to approve update to the Historical Marker Program application to allow 1" letters.

Approval Recommended?

Yes

Item Details

The current specification calls for lettering that is no smaller than 1.5", but given the largest sign size, the sign vendor Sewah Studios has stated 1" lettering is necessary to include relevant information regarding the Rosenwald School.

Attachments

- Revised application

HISTORICAL MARKER PROGRAM APPLICATION

Town of Apex, North Carolina

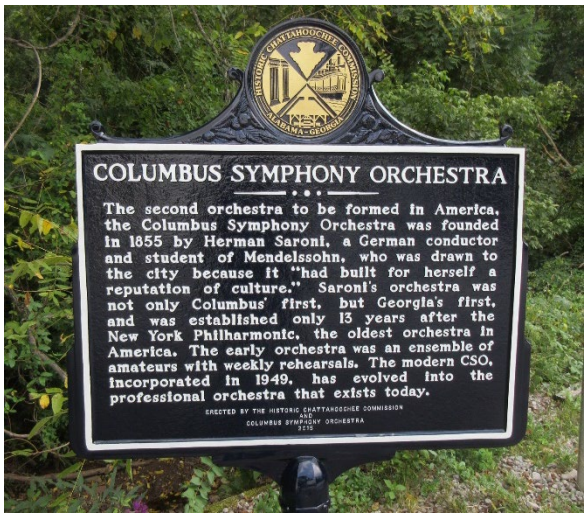
This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

For more information on the Historical Marker Program or for assistance in completing this application, please contact the Apex Planning Department at 919-249-3426.

The Historical Marker Program is designed to provide incentive funds to tenants/property owners to install Historical Markers at key locations adjacent to or on historic structures and sites within Apex's jurisdiction. The grant can provide up to 50% of the cost of the marker, up to a maximum of $2,000.00 per property.

1. Application requirements:
    a. Completed application form signed by the property owner.
    b. Photos of the historic structure or site, showing the current condition.
    c. Documentation of historic nature of structure or site.
    d. Detailed content for Historical Marker.
    e. 11" x 17" Site Plan showing location of Historical Marker on site or photograph of building with location noted for markers that will be hung on the structure.
    f. Drawings including colors/finishes of Historical Marker.
    g. Encroachment agreements and/or easements.
    h. Cost estimates from a qualified professional, such as but not limited to www.sewahstudios.com or www.signsunlimitedusa.com. Cost estimates must be detailed in a line by line format.
2. Applications must be approved before work begins or no funds will be disbursed.
3. The Planning Staff has been granted authority to administer the Historical Marker Program process by Town Council. Town Council allocates the funding for the grant through the yearly budgeting process.
4. Grant amount shall be paid only when construction is completed and receipts are submitted to the Planning Department. If the actual costs are less than the cost estimates, the maximum amount shall not exceed 50% of the actual costs or the $2,000 limit, whichever is less. In no case shall a grant be issued higher than the original approved grant amount.
5. Eligibility Criteria:
    a. If the tenant will be doing the proposed work, the tenant must obtain the property owner's signature on the application.
    b. Historical Marker Program applications will be reviewed for historical authenticity, relative merit, appropriateness of content, and aesthetics. No funds will be awarded for Historical Markers that are not in keeping with the appropriate content and aesthetic standards of the Town, as deemed by Planning Staff. Requirements include, but are not be limited to:
        i. Historical Markers can be located on private land with appropriate easements or on Town property with appropriate easements or encroachment agreements. Location of the Historical Markers in NCDOT rights-of-way will generally not be allowed due to maintenance issues with markers being hit by vehicles.
        ii. Historical Marker shall be the following style (identified by Sewah as "South Dakota") with the Town of Apex seal in the center.

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.



iii. Historical Marker must have a black background with white lettering (seal to be white as well).
iv. The post must be black if post mounted.
v. Lettering shall be appropriate to the location, but shall be no smaller than 1" and no larger than 3".

c. Historical Marker locations must be within Apex's corporate limits and/or extra-territorial jurisdiction and must comply with all state and local regulations, including obtaining required easements/encroachment agreements from the Town of Apex or easements on private property.

I have read the Historical Marker Program information:

Applicant Signature _____ Date _____

Application #: _____ Submittal Date: _____

HISTORICAL MARKER PROGRAM APPLICATION

Town of Apex, North Carolina

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Hard Copy Submittal Requirements: (Submit to Planning Department)

- One (1) copy of Historical Marker Program Application
- 11x 17 Site Plan/Marker Drawings and Colors

Applicant Information:

Applicant: _____ Tax ID: _____

Address: _____

City: _____ State: _____ ZIP: _____

Phone: _____ Email: _____

Owner Information:

Owner: _____ Tax ID: _____

Address: _____

City: _____ State: _____ ZIP: _____

Phone: _____ Email: _____

Location Information:

Address: _____

Property PIN: _____ Owner or Tenant Occupied? _____

Current Building or Site Use: _____

Cost of Overall Proposal: _____ Historical Marker Funds Requested: _____

Historical Marker Content:

1. Please provide the requested Historical Marker content in detail (exactly what it would say on the Marker). Attach a separate sheet if necessary.

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

2. On a separate sheet, provide a detailed cost estimate for the Historical Marker fabrication and installation. Once the work is completed, please provide the Planning Department with a copy of the receipt(s) for all labor and supplies. Historical Marker funds will not be released without receipt(s).

3. Please describe how this Historical Marker contributes to the historic character of Apex. Provide documentation of historical authenticity and relative merit as attachments to this application.

Owner/Applicant Signatures

I understand the limits and requirements of this program and if approved, agree to complete the project according to plan. In addition, I shall indemnify and hold harmless, the Town of Apex from and against any and all claims, actions, causes of action, demands, damages, losses, costs, expenses, and compensation of whatsoever kind and nature which may hereafter accrue on account of or in any way growing out of any and all known or unknown, foreseen and unforeseen bodily and personal injuries and property damage and consequences thereof, which might result from any occurrence in connection with this program.

Applicant Signature _____ Date _____

Owner Signature _____ Date _____

Staff Approval _____ Date _____

Conditions of Approval:

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for consideration by the Apex Town Council

Item Type: CONSENT AGENDA

Meeting Date: April 27,2021

Item Details

Presenter(s): Brian Meyer, Deputy Town Attorney; Mitchell McKinney, Deputy Police Chief

Department(s): Legal; Police

Requested Motion

Motion to approve a Resolution adopting an Involuntary Commitment Custody and Transportation Agreement.

Approval Recommended?

Yes

Item Details

One of the duties of the Apex Police Department is to provide transportation of Apex residents subject to involuntary commitment proceedings to a facility where an initial commitment examination may be conducted. This responsibility also applies to individuals who are located in Apex at the time of the issuance of the Order even if the individual is not a resident. Having an agreement or plan for this type of custody and transport has always been at the election of the local government and its police department but recent legislative changes now mandate that such a plan be adopted by the governing board. The attached Agreement is drafted to comply with new statutory requirements. While closely following current police procedures the Agreement now includes new requirements for Crisis Intervention Training as well as goals for medical professional involvement and specialized transport vehicles. The Local Management Entity/Managed Care Organization (Alliance Healthcare), Wake County, and the Wake County Sheriff's Department were consulted as part of the drafting of this Agreement, as required by statute.

Attachments

- Involuntary Commitment Custody and Transportation Agreement
- Resolution adopting Involuntary Commitment Custody and Transportation Agreement
- Alliance Health Community Crisis Services Plan for Wake County (Informational)

COMMUNITY CRISIS SERVICES PLAN

Wake County

Contents

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Involuntary Commitment Process 4
County Transportation Agreement 5
List of Facilities (first examination + health screening tool) 5
Approved and recommended training for IVC responders/transporters 6

Introduction

Why a county-specific community crisis services plan?

Session Law 2018-33 (SB630) represents a significant revisions to North Carolina's Involuntary Commitment (IVC) law. The most recent revised bill put into effect the requirement for every LME/MCO to develop local area crisis services plans. Alliance Health covers four single counties, each with unique strengths, challenges and needs. Each of the four counties in the Alliance Health catchment area has its own local area or community crisis services plan.

Wake has been at the forefront in North Carolina in regards to developing and organizing a community crisis system. Wake opened its 24/7/365 Crisis and Assessment center in 1993, providing a combination of 24/7 STR, phone and walk-in crisis assessment, involuntary commitment evaluations, 23 hour observation, and the centralized "drop-off site" for police CIT officers. Wake County expanded crisis services in 2010 with the construction of the WakeBrook campus, which included expansion of inpatient psychiatric services, facility-based crisis, and non-hospital detoxification as well as relocation of the Wake Crisis and Assessment unit. Wake was also one of the first communities to develop a local crisis collaborative, inclusive of community stakeholders, looking to improve behavioral health crisis services and reduce the unnecessary use of the local emergency departments. Over the years the landscape of crisis services in Wake has evolved and expanded, consisting of an array of services delivered within the community. Mobile Crisis Management services are delivered by a team of mental health professionals through Therapeutic Alternatives. For individuals experiencing non-emergent behavioral health issues, Monarch operates a Behavioral Health Urgent Care that accepts walk-ins. UNC Healthcare assumed operations of the WakeBrook crisis campus in 2012 and provides an array of crisis services on through its Crisis and Assessment Services, 28-bed inpatient psychiatric unit, Facility Based Crisis and Detox Services.

Brief summary of Involuntary Commitment (IVC) law revisions

IVC Laws provide for custody, transportation and evaluations for individuals identified as potentially having a mental illness or substance use disorder that may be a danger to themselves or others.

IVC also allows an individual found to be a danger to themselves or others to be remanded into the custody of a facility that provides treatment for mental illness or substance use when that individual does not voluntarily seek treatment.

Wake County Community Crisis Services Plan

According to revised Senate Bill 630, every LME/MCO shall adopt a community crisis services plan to facilitate first examinations in conjunction with a health screening at the same location. This plan shall be comprised of separate "local area crisis services plans," for each of the local areas or regions within the catchment area (local areas/regions defined by LME/MCOs). Alliance Health developed the local area crisis services plan in coordination with the county crisis collaborative groups that were already meeting regularly. Each county crisis collaborative is comprised of members from various agencies and organizations, including law enforcement and other first responders, connected to the crisis services continuum.

Crisis collaborative & stakeholders who developed the plan

The Wake County crisis collaborative group meets monthly to discuss strategies to reduce the number of mental health and substance use crises, reduce inappropriate utilization of the local emergency departments and to provide a space to share data and brainstorm opportunities to improve the quantity and quality of crisis services in Wake County. The stakeholder group is comprised of members who represent the following:

- Local Hospitals
    - Duke Raleigh Hospital
    - UNC Rex Hospital
    - WakeMed Health & Hospital
- Monarch
- NAMI of Wake County
- Therapeutic Alternatives
- UNC WakeBrook Crisis & Assessment, Facility Based Crisis
- Wake County Emergency Medical Services
- Wake County Manager's Office
- Wake County Magistrate's Office
- Local Law Enforcement
- Alliance Health

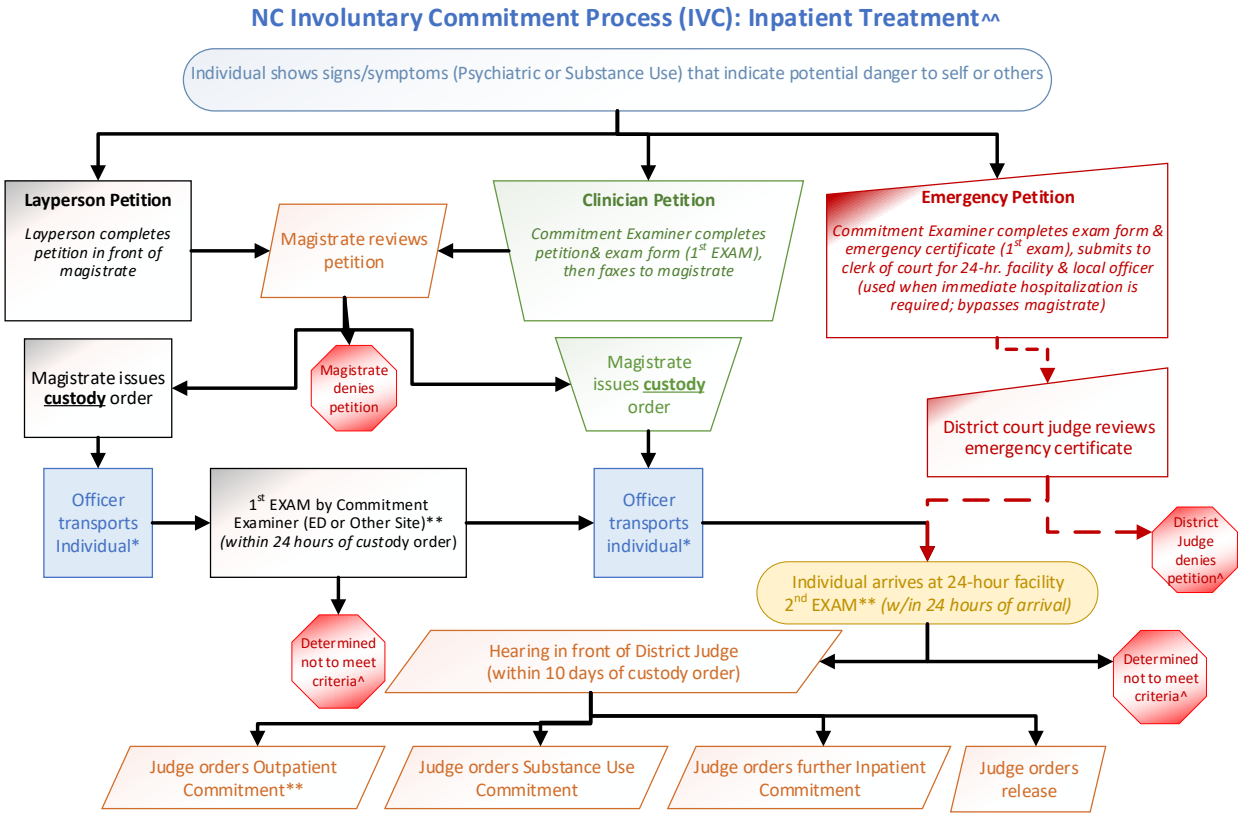
Representatives of the Standard Plans were also invited to provide input and will receive a final copy of this plan. The Wake Chief Magistrate provided the following statement regarding an effective communication process within the county. *"One system that has been working really well when it is a clinician initiated petition is having the Custody Order faxed directly to the facility where the respondent is located, which saves law enforcement time and also gets the commitment order over faster. "* This practice will be continued.

Wake County Crisis Services

The following serves as a list of the current crisis service providers in Wake County. The providers listed deliver specific services related to each category of the crisis continuum.

- 24-Hour crisis telephone line
  - Alliance Health Access Call Center
- Walk-in crisis services:
  - Monarch Behavioral Health Urgent Care
  - WakeBrook Crisis and Assessment
  - Holly Hill Respond
  - Triangle Springs Hospital
- Mobile crisis outreach
  - Therapeutic Alternatives MCM
  - Enhanced Mobile Crisis/Advanced Para-medicine team
  - Advanced Para-medicine ED diversion
- Crisis respite/residential services
  - Lutheran Family Services child respite
  - Methodist Home for Children and Access Family Services Rapid Response Beds
- Crisis stabilization units/facilities
  - 23-Hour beds: UNC WakeBrook
  - Facility Based Crisis UNC WakeBrook
  - Detox Services: UNC WakeBrook

Involuntary Commitment Process



*Based on Information from Criteria for Involuntary Commitment in NC (Mark Botts, 2009, UNC School of Government); Commitment Issues for Law Enforcement (NCAG, 2014); and SB630 IVC Revisions (2018). * Officer must take the individual into custody within 24 hours or new order needed.**If individual is found in need of Involuntary Outpatient Psychiatric or Substance Use Treatment, the provider will be identified and the individual will be released from custody; returned to residence after 1st Exam. ^If determined not to meet IVC criteria, individual is released and proceedings are terminated.); ^^Individual can, at any time, elect to have voluntary treatment. If voluntary, law enforcement will not transport.*

County Transportation Agreement

The Wake County involuntary commitment transportation agreement adopted pursuant to G.S. 122C-251(g) which identifies the law enforcement officers, designees under G.S. 122C-251(g), or individuals or entities otherwise required to provide custody and transportation of a respondent for a first examination in conjunction with a health screening at the same location required by G.S. 122C-263(a) and G.S. 122C-283 is incorporated herein by reference to it. The Transportation Agreement provided by Wake County is attached.

List of Facilities (first examination + health screening tool)

The following are facilities that are not emergency departments that are able to complete the first examination and health screening tool:

- Monarch Behavioral Health Urgent Care: *319 Chapanoke Road, Suite 120, Raleigh, NC 27603*
- UNC WakeBrook Crisis and Assessment: *107 Sunnybrook Road, Raleigh, NC 27610*
- Holly Hill Hospital: 3019 Falstaff Road, Raleigh, NC 27610
- Triangle Springs Hospital: *10901 World Trade Boulevard, Raleigh, NC 27617*

Approved and recommended training for IVC responders/transporters

The recommended training for law enforcement first responders responsible for responding to and transporting individuals experiencing a mental health crisis is:

Crisis Intervention Team (CIT) training

More than a training, CIT is a program that provides the foundation necessary to promote community and statewide solutions to assist individuals with a mental illness and/or addictions. The CIT model reduces both stigma and the need for further involvement with the criminal justice system. CIT provides a forum for effective problem solving regarding the interaction between the criminal justice and mental health care system and creates the context for sustainable change.

The recommended training for community and family members responding to individuals experiencing mental health crises is:

Mental Health First Aid

This training, offered upon request at various community locations, is designed to teach individuals how to identify, understand and respond to signs of mental illnesses and substance use disorders in their community.

RESOLUTION NO. 2021-0427-11

RESOLUTION ADOPTING INVOLUNTARY COMMITMENT CUSTODY AND TRANSPORTATION AGREEMENT PURSUANT TO N.C.G.S. 122C-251(g)

WHEREAS, Chapter 122C of the North Carolina General Statutes provides guidance and requirements regarding the involuntary commitment process and the responsibilities placed on local law enforcement agencies; and

WHEREAS, North Carolina General Statute § 122C-251(g) requires the governing body of a local government to adopt a written involuntary commitment transportation agreement; and

WHEREAS, the Apex Town Council wishes to make clear the policies and procedures of the Town and its police department with regard to the transportation of persons subject to the involuntary commitment process so as to ensure the safety and dignity of such persons while minimizing the physical and emotional stress and impact.

NOW THEREFORE, BE IT RESOLVED by the Apex Town Council that:

The Involuntary Commitment Custody and Transportation Agreement is hereby adopted.

Upon motion duly made by Council Member_____ , and duly seconded by Council Member _____, the above Resolution was duly adopted by the Apex Town Council at the meeting held on the 27th day of April, 2021, in the Town Hall.

Upon call for a vote the following Council Members voted in the affirmative:

_____

and the following Council Members voted in the negative:

_____

This the 27th day of April 2021.

_____
Jacques K. Gilbert
Mayor

ATTEST:

_____
Donna B. Hosch, MMC, NCCMC
Town Clerk

STATE OF NORTH CAROLINA
COUNTY OF WAKE

INVOLUNTARY COMMITMENT ("IVC") CUSTODY AND TRANSPORTION AGREEMENT

THIS INVOLUNTARY COMMITMENT ("IVC") CUSTODY AND TRANSPORTION AGREEMENT ("Agreement") is made and entered into this the 27th day of April, 2021 (the "Effective Date"), by the Town of Apex, a municipal corporation in the State of North Carolina ("Town"), which includes its police department, the Apex Police Department ("APD").

RECITALS:

WHEREAS, the Apex Town Council desires to make clear the policies of the Town and the APD regarding the custody and transportation of involuntarily commitment ("IVC") Respondents and the APD's role and responsibilities with respect to custody, commitment, supervision, and transportation of IVC Respondents in accordance with Chapter 122C, Article 5, Parts 6, 7, and 8 of the North Carolina General Statutes;

WHEREAS, specifically, pursuant to and in accordance with N.C.G.S. § 122C-251(g), the Town intends and desires that this Agreement shall serve as its "Involuntary Commitment Transportation Agreement" or "Transportation Agreement" for the custody and transportation of individuals in IVC proceedings under Chapter 122C, Article 5, Parts 6, 7, and 8 of the North Carolina General Statutes, applicable to all APD law enforcement officers ("LEOs"); and

WHEREAS, this Agreement shall be utilized to comply with N.C.G.S. § 122C-251(g) and assure adequate safety and protections for both the public and Respondents.

NOW, THEREFORE, the Apex Town Council ordains that the following is the Town's plan for the custody and transportation of persons subject to involuntary commitment proceedings.

AGREEMENT

ARTICLE I
DEFINED TERMS

1.0 Unless otherwise specified or defined herein, the following terms, wherever used herein, shall have the following meanings:

1.1 **IVC Order**. A custody order issued by a Magistrate or a Clerk of Court or an Involuntary Commitment Custody Order entered by a District Court Judge.

1.2 **LEO.** Law enforcement officer.

1.3 **Respondent.** The individual who is committed under an IVC Order and subject to IVC proceedings pursuant to Chapter 122C, Article 5 of the North Carolina General Statutes, including IVC custody and transport.

1.4 **Alliance Behavioral Health ("Alliance").** Alliance is the Local Management Entity/Managed Care Organization ("LME/MCO") for Wake County as defined by N.C.G.S. § 122C-3(1), N.C.G.S. § 122C-3(20b), and N.C.G.S. § 122C-3(20c). Alliance is responsible for managing, coordinating, facilitating and monitoring mental health, developmental disability, and substance abuse services in Wake County. Alliance's contact information is as follows:

Alliance Health
5200 W. Paramount Parkway, Suite 200
Morrisville, NC 27560
Telephone: 1-919-651-8500 (Offices)
Telephone: 1-800-510-9132 (Access and Information Center)
Website: https://www.alliancehealthplan.org/

1.5 **Crisis Service Providers.** The following is a list of current crisis service providers in Wake County:

- 24-Hour crisis telephone line
  - Alliance Health Access Call Center
- Walk-in crisis services:
  - Monarch Behavioral Health Urgent Care
  - WakeBrook Crisis and Assessment
  - Holly Hill Respond
  - Triangle Springs Hospital
- Mobile crisis outreach
  - Therapeutic Alternatives MCM
  - Enhanced Mobile Crisis/Advanced Para-medicine team
  - Advanced Para-medicine ED diversion
- Crisis respite/residential services
  - Lutheran Family Services child respite
  - Methodist Home for Children and Access Family Services Rapid Response Beds
- Crisis stabilization units/facilities
  - 23-Hour beds: UNC WakeBrook
  - Facility Based Crisis UNC WakeBrook
  - Detox Services: UNC WakeBrook

1.6 **24-Hour Facility.** A medical facility where a Respondent is taken if the first examination by a commitment examiner or other physician determines that the Respondent is mentally ill and requires inpatient commitment. A physician will conduct the second examination of a Respondent at a 24-Hour Facility.

ARTICLE II
APPLICABILITY

2.0 To the extent required to provide all or parts of the custody and transportation required by IVC proceedings, the Town shall follow the procedures in Chapter 122C, Article 5 of the North Carolina General Statutes. Moreover, the custody and transportation of individuals in IVC proceedings by APD LEOs shall be in accordance with Chapter 122C, Article 5, Parts 6, 7, and 8 of the North Carolina General Statutes and this Agreement. This Agreement does not in any way change any statutorily prescribed responsibility for IVC custody and transport.

2.1 To the extent this Agreement does not address or incorrectly addresses any statutory obligation or procedure, or if any inconsistency exists between the Agreement and a corresponding statutory provision, the Parties understand that the statute shall control.

ARTICLE III
DESIGNATED WAKE COUNTY COMMITMENT EXAMINER FACILITIES

3.0 Pursuant to the Alliance Community Crisis Services Plan for Wake County; Chapter 122C, Article 5, specifically including but not limited to N.C.G.S. § 122C-3(8a), N.C.G.S. § 122C-252, N.C.G.S. § 122C-261, N.C.G.S. § 122C-262, N.C.G.S. § 122C-263, and N.C.G.S. § 122C-283; the following non-emergency facilities may provide first examinations and health screenings:

- UNC WakeBrook Crisis and Assessment: 107 Sunnybrook Rd., Raleigh, NC 27610
- Monarch Behavioral Health Urgent Care: 319 Chapanoke Rd., Suite 120, Raleigh, NC 27603
- Holly Hill Hospital: 3019 Falstaff Rd., Raleigh, NC 27610
- Triangle Springs Hospital: 10901 World Trade Blvd., Raleigh, NC 27617

ARTICLE IV
TRANSPORTATION OBLIGATIONS FOR APD

4.0 Transportation of a Respondent within the Town of Apex corporate limits, under the IVC proceedings of Chapter 122C, Article 5, Parts 6, 7, and 8 of the North Carolina General Statutes shall be provided by the APD in accordance with the duties listed below. However, a Respondent being discharged from a facility may use Respondent's own transportation at Respondent's own expense.

A. Apex Police Duties

(1) IVC Orders:

(a) APD will provide the service of IVC Orders upon any Respondent physically located at an address inside the Town of Apex corporate limits, regardless of the Respondent's residential address.

(b) If the Respondent cannot be served at the call for service address inside the Apex corporate limits, but the Respondent has a home address inside the corporate limits, APD will continue to attempt to serve the Respondent at any other address inside the Town corporate limits until the IVC Order expires.

(c) If the Respondent cannot be served at the call for service address inside the Apex corporate limits, but the Respondent has a home address in Wake County but outside of the Town of Apex, APD will endeavor to pass the IVC Order to the Wake County Sheriff's department if the Respondent resides in the county limits and outside a municipal jurisdiction, or the police department in the municipality in Wake County in which the Respondent resides if inside municipal corporate limits.

(d) After serving the initial IVC Order APD will provide the initial transport of the Respondent to a Commitment Examiner Facility or 24 Hour Facility as required. APD will primarily transport individuals to UNC WakeBrook but may transport to any other qualified facility in Wake County.

(2) Out of County Transport:

APD will have no responsibility to transport a Respondent to any facility located outside Wake County.

(3) Subsequent Transport:

Following initial transport by APD, The Wake County Sheriff's Office, either through their personnel or through contract with a private agency, will handle all subsequent transports inside Wake County to another facility regardless of the facility location within Wake County or the residence of the Respondent.

ARTICLE V
TRANSPORTATION BETWEEN COUNTIES

5.0 Transportation between counties under the IVC proceedings of Chapter 122C, Article 5 of the North Carolina General Statutes for a first examination as described in N.C.G.S. § 122C-263(a) and N.C.G.S. § 122C-283(a) and for admission to a 24-hour facility shall be provided by the county where the Respondent is taken into custody.

5.1 Transportation between counties under the IVC proceedings of Chapter 122C, Article 5 of the North Carolina General Statutes for Respondents held in 24-hour facilities who have requested a change of venue for the district court hearing shall be provided by the county where the petition for involuntary commitment was initiated.

5.2 Transportation between counties under the IVC proceedings of Chapter 122C, Article 5 of the North Carolina General Statutes for discharge of a Respondent from a 24-hour facility shall be provided by the county of residence of the Respondent. However, a Respondent being discharged from a facility may use Respondent's own transportation at Respondent's own expense.

ARTICLE VI
TRANSPORTATION PROCEDURES

6.0 **LEO Vehicles and Manner of Dress.** Transportation of a Respondent by the APD shall be in a Town-owned vehicle. To the extent feasible, APD LEOs transporting Respondents shall dress in plain clothes and shall travel in unmarked vehicles.

6.1 **Advising Respondents.** To the extent possible, APD LEOs transporting Respondents shall advise Respondents when taking them into custody that they are not under arrest and have not committed a crime, but are being taken into custody and transported to receive treatment and for the Respondent's own safety and that of others.

6.2 **Driver or Attendant of Same Sex as Respondent.** To the extent feasible, in providing transportation of a Respondent, the APD shall provide a driver or attendant who is the same sex as the Respondent, unless the LEO allows a family member of the Respondent to accompany the Respondent in lieu of an attendant of the same sex as the Respondent.

6.3 **Use of Force to Restrain by LEO.** In taking custody and providing transportation as required by statute, APD LEOs may use reasonable force to restrain the Respondent if it appears necessary to protect the LEO, the Respondent, or others. Any use of restraints shall be as reasonably determined by the LEO to be necessary under the circumstances for the safety of the Respondent, the LEO, and other persons. Every effort to avoid restraint of a child under the age of 10 shall be made by the transporting LEO unless the child's behavior or other circumstances dictate that restraint is necessary.

6.4 **LEO Response to Facility Inquiries.** The LEO shall respond to all inquiries from the facility concerning the Respondent's behavior and the use of any restraints related to the custody and transportation of the Respondent, except in circumstances where providing that information is confidential or would otherwise compromise a law enforcement investigation.

ARTICLE VII
CRIMINAL OR CIVIL LIABILITY

7.0 No APD LEO or other person designated or required to provide custody or transport of a Respondent under N.C.G.S. § 122C-251 may be held criminally or civilly liable for assault, false imprisonment, or other torts or crimes on account of reasonable measures taken under the authority of Chapter 122C, Article 5 of the North Carolina General Statutes.

7.1 In accordance with N.C.G.S. § 122C-210.1, no facility, person, or entity, including an area facility, a facility licensed under Chapter 122C of the North Carolina General Statutes, an

acute care hospital, a general hospital, an area authority, a law enforcement officer, an LME, or an LME/MCO, or any of their officials, staff, or employees, or any other physician or individual who is responsible for the custody, transportation, examination, admission, management, supervision, treatment, or release of a Respondent or client and who is not grossly negligent, is civilly or criminally liable, personally or otherwise, for that person's or entity's actions or omissions arising from the responsibilities of Chapter 122C of the North Carolina General Statutes or for the actions or omissions of a Respondent or client. This immunity is in addition to any other legal immunity from liability to which these persons, entities, facilities, agencies, or individuals may be entitled and applies to actions performed in connection with, or arising out of, the custody, transportation, examination, commitment, admission, management, supervision, treatment, or release of any individual pursuant to or under the authority of Chapter 122C, Article 5 of the North Carolina General Statutes or otherwise.

ARTICLE VIII
OTHER AUTHORIZED TRANSPORT

8.0 It is understood by the APD that pursuant to N.C.G.S. § 122C-251(f), a clerk, a magistrate, or a district court judge, where applicable, may authorize the family or immediate friends of the Respondent, if they so request, to transport the Respondent in accordance with the procedures of Chapter 122C, Article 5 of the North Carolina General Statutes. This authorization shall only be granted in cases where the danger to the Respondent, the public, the family, or friends of the Respondent, is not substantial. The family or immediate friends of the Respondent shall bear the costs of providing this transportation.

ARTICLE IX
COST AND EXPENSES OF CUSTODY AND TRANSPORTATION

9.0 The cost and expenses of custody and transportation of a Respondent as required by the IVC procedures of Chapter 122C, Article 5, to the extent they are not reimbursed by a third-party insurer, are the responsibility of the county of residence of the Respondent. The State (when providing transportation under N.C.G.S. § 122C-408(b)), a municipality, or a county is entitled to recover the reasonable cost of transportation from the county of residence of the Respondent. The county of residence of the Respondent shall reimburse the State, another county, or a municipality the reasonable transportation costs incurred as authorized by N.C.G.S. § 122C-251(h). The county of residence of the Respondent is entitled to recover the reasonable cost of transportation it has paid to the State, a municipality, or a county. Provided that the county of residence provides the Respondent or other individual liable for the Respondent's support a reasonable notice and opportunity to object to the reimbursement, the county of residence of the Respondent may recover that cost from:

A. The Respondent, if the Respondent is not indigent;
B. Any person or entity that is legally liable for the resident's support and maintenance provided there is sufficient property to pay the cost;
C. Any person or entity that is contractually responsible for the cost; or
D. Any person or entity that otherwise is liable under federal, State, or local law for the cost.

ARTICLE X
TRAINING

10.0 Crisis Intervention Training (CIT) is a program designed to provide the foundation needed to assist individuals with mental illness and/or addiction by reducing both stigma and the need for further involvement with the criminal justice system. Alliance offers Mental Health First Aid training which is designed to teach individuals how to identify, understand, and respond to signs of mental illnesses and substance use disorders. APD LEOs shall participate in Crisis Intervention Training, or other related training, as offered by Alliance or any other approved provider, as set forth in N.C.G.S. § 122C-202.2(a)(3), to the greatest extent possible. To the extent feasible, CIT Officers, as defined by Apex Police Department General Order 904-20, as amended from time to time, shall serve Involuntary Commitment and Custody Orders. All sworn personnel who supervise APD LEOs, regardless of whether those LEOs are CIT Officers or not, shall complete the training described in this Section within a reasonable time after being placed in a supervisory role.

ARTICLE XI
OTHER

11.0 **Mental Health/Social Work Professionals**. The APD Police Chief or designee will take affirmative steps toward obtaining the budgeting and approval necessary for hiring mental health and/or social work professionals to assist APD LEOs in carrying out the duties described in this Agreement. The specifics regarding the use of these professionals will be developed and detailed in future APD General Orders, as amended from time to time.

11.1 **Specialized LEO Vehicles**. The transportation of Respondents pursuant to this Agreement is a service to the citizens and not a criminal process. APD is aware of the stigma that could be associated with law enforcement's involvement in the involuntary commitment process and recognizes the importance of demonstrating that mental illness is not being criminalized. In pursuit of that goal, the APD Police Chief or designee shall explore the possibility of funding and obtaining specialized unmarked vehicles that cater to the mission and purposes of this Agreement. In the event such vehicles are funded, the specifics regarding the use of said vehicles will be developed and detailed in future APD General Orders, as amended from time to time.

11.2 **Mutual Assistance.** Nothing herein shall change any APD agreement to provide mutual assistance to another agency when necessary and upon request for any matter involving crime control and public safety.

11.3 **Recitals Incorporated.** The recitals hereto are incorporated herein by reference and constitute an integral part hereof.

11.4 **Counterparts.** This Agreement may be executed in one or more counterparts, each of which shall be deemed to be an original, but all of which together shall constitute one and the same instrument.

11.5 **Amendment or Modification.** This Agreement may only be amended, modified, or supplemented by an agreement in writing adopted by the Apex Town Council. If the Town modifies this Agreement, the Town will submit the modified agreement to the Wake County Magistrate's Office, the Wake County Clerk of Superior Court's Office, Alliance, and the NCDHHS, Division of Mental Health, Developmental Disabilities, and Substance Abuse Services at least 10 days prior to the effective date of the new Agreement.

11.6 **Required Distribution of Agreement.** In accordance with N.C.G.S. § 122C-251(g)(3), this Agreement shall be submitted to the Wake County Magistrate's Office, the Wake County Clerk of Superior Court's Office, to Alliance, and to the North Carolina Department of Health and Human Services, Division of Mental Health, Developmental Disabilities, and Substance Abuse Services.

11.7 **Inclusion of Agreement in Alliance Community Crisis Services Plan.** Pursuant to N.C.G.S. §122C-202.2, the Alliance Community Crisis Services Plan shall incorporate this Agreement.

This Agreement is hereby approved and adopted by the Apex Town Council this the _____ day of April, 2021.

TOWN OF APEX

By: _____
Name: Jacques K. Gilbert
Title: Mayor

The foregoing is agreed to and will be adhered to by myself and my agency for the transports of persons subject to the involuntary commitment process.

This the _____ day of _____, 2021.

APEX POLICE DEPARTMENT

By: _____
Name: Anthony L. Godwin
Title: Interim Chief of Police

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: CONSENT AGENDA

Meeting Date: April 27, 2021

Item Details

Presenter(s): Colleen Merays, Downtown & Small Business Development Coordinator

Department(s): Economic Development

Requested Motion

Motion to amend the approved date of (Sunday, July 4, 2021) for the Annual 4th of July Celebration to (Saturday, July 3, 2021).

Approval Recommended?

Yes

Item Details

Event Date & Time: Saturday, July 3, 2021, 8:30 AM to 12:00 PM

Roads & Parking Closed Date & Time: Saturday, July 3, 2021 on N. Salem St. from (Center to Chatham) from 7:30 AM to 1:00 PM

Rain Date: NA

Event Organizer: Town of Apex

Attachments

- N/A

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: CONSENT AGENDA

Meeting Date: April 27, 2021

Item Details

Presenter(s): Shawn Purvis, Assistant Town Manager

Department(s): Administration

Requested Motion

Motion to approve Pipeline Accommodation Agreement with Colonial Pipeline Company and authorize the Town Manager to execute the same and to approve Budget Amendment #19 for the agreement

Approval Recommended?

Yes

Item Details

Before construction of the Burma Drive extension can begin, Colonial Pipeline requires inspection and recoating of impacted gas lines. The cost of the recoating is at the expense of the party crossing the pipeline. Colonial has provided a cost estimate of $496,000. The funds to cover the recoating will come from the sale of property at the Cash Corporate Center.

Attachments

- Colonial Pipeline Agreement
- Budget Amendment #19

Loc/Tract: 806 Tract 293

AFE: _____

Pipeline Accommodation Agreement

This Agreement, made this _____ day of _____, 2021, by and between **Colonial Pipeline Company**, a Delaware corporation, hereinafter called **"Colonial"**, and **The Town of Apex**, hereinafter called **"Town";**

W I T N E S S E T H:

WHEREAS, Colonial's facilities are in conflict with proposed plans of the **Town** for the proposed construction project of Burma Dr. Extension in Wake County, State of North Carolina, at which location Colonial has previously constructed two pipelines (8" and 8") under authority of the following instruments:

- Right of Way Easement Option signed by F.G. Cash and wife Mildred C. Cash dated May 29, 1963, and recorded on July 16, 1963 in Book 1560 Page 515 at the Register of Deeds Office, Wake County, North Carolina.

And

WHEREAS, to accommodate the **Town's** proposed plans, Colonial agrees to make certain adjustments to its facilities, as shown on drawings No. 0806038S by CPC, dated 03/29/21

And

WHEREAS, Colonial has furnished the **Town** with a detailed cost estimate describing the manner and cost of adjusting said facilities, said estimate dated April 19, 2021, prepared by Colonial Pipeline Company and being in the amount of Four Hundred Ninety Six Thousand Dollars and 00/100 ($496,000.00), of which the **Town** will bear 100% of the cost, said estimate being designated Exhibit "A", attached to and made a part hereof.

NOW THEREFORE, in consideration of the mutual covenants and premises, Colonial agrees to make adjustments to its facilities in accordance with Exhibits "A", subject to the following conditions and understandings:

(1) **Prior to any adjustments being made to Colonial facilities, a detailed estimate of the actual non-betterment costs of performing said adjustments, including construction costs, plus applicable overhead will be provided by Colonial and must be paid in full before Colonial will schedule or commence work.**

(2) The **Town** agrees that Colonial may at its option, solicit bids from two or more pipeline contractors, use one of Colonial's independent contractors under existing Work Order Contract, and/or use its own forces to effect the proposed adjustments.

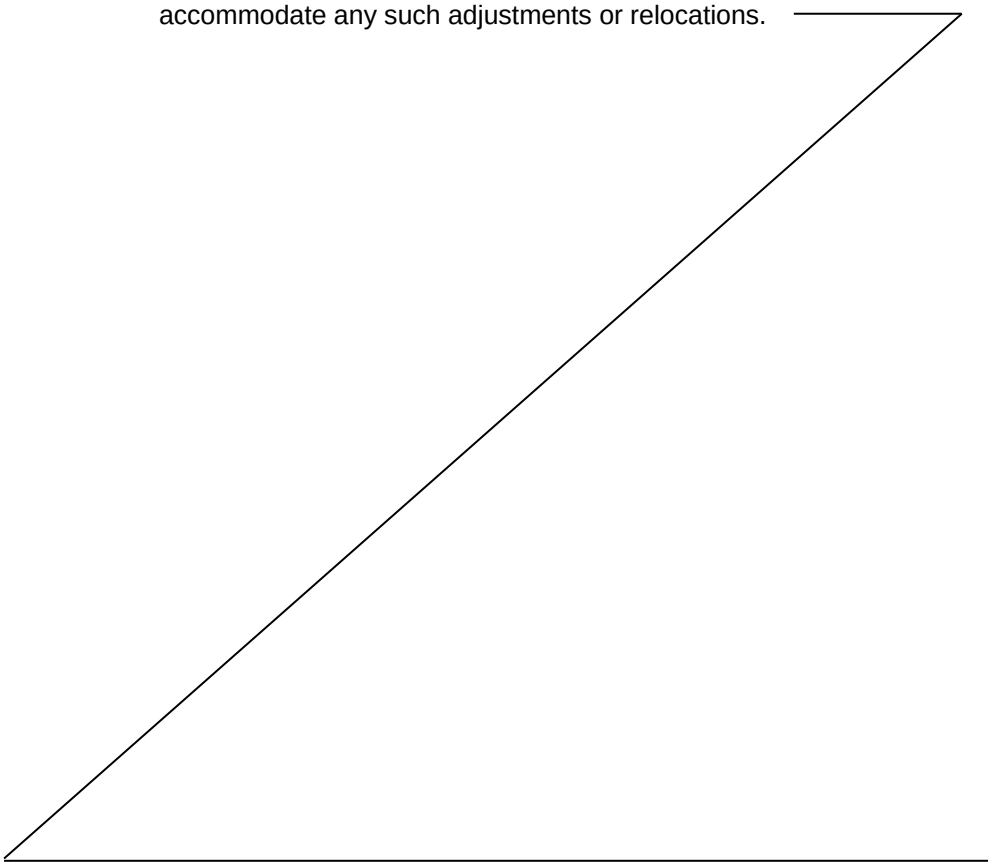
(3) The total estimated cost of the work to be performed by Colonial is $496,000.00 as set out in the attached estimate dated April 19, 2021 (Exhibit "A"); however, **said cost figure is an estimate only, and neither it nor any of the other estimated cost figures set out in the estimate shall in any way constitute a limit upon the amount for which the Town shall be liable to compensate Colonial hereunder, as final compensation for adjustment work will be based on the total actual cost.** Upon completion of the work, a settlement statement shall be provided detailing all costs. Should the final summarized cost differ from the amount paid by the **Town**, Colonial will invoice or refund the **Town** for the difference.

(4) Audit of adjustment costs may be made at Colonial's office located at 1185 Sanctuary Parkway, Suite 100, Alpharetta, Georgia 30004, between the hours of 9:00 AM and 4:00 PM, Monday through Friday.

(5) It is mutually agreed between the parties hereto that this document shall be deemed to have been executed in the State of North Carolina, and that all questions of interpretation and construction shall be governed by the laws of the State of North Carolina.

(6) The covenants herein contained shall, except as otherwise provided, accrue to the benefit of and be binding upon the successors and assigns of the parties hereto.

(7) Colonial Pipeline Company shall maintain its prior rights of occupancy. Colonial Pipeline Company shall remain eligible for reimbursement of all costs for any adjustments or relocation that may be required of/by the **Town** or other entity in the future, including costs necessary for acquiring any new rights-of-way to accommodate any such adjustments or relocations.



IN WITNESS WHEREOF the parties hereto have caused this agreement to be executed by their authorized representatives in two counterparts, each to be considered as an original, on the day and year hereinabove written.

COLONIAL PIPELINE COMPANY

WITNESS AS TO COMPANY

By: _____

Colonial Representative

_____

Attest: _____

Title:

_____

Town of Apex

WITNESS AS TO THE TOWN

By: _____

Title:

_____

Attest: _____

_____

Town of Apex

Budget Ordinance Amendment No. 19

BE IT ORDAINED, by the Council of the Town of Apex that the following Budget Amendment for the Fiscal Year 2020-2021 Budget Ordinance be adopted:

GENERAL FUND

Section 1. Revenues:

Sale of Capital Assets	$496,000
Total Revenues	**$496,000**

Section 2. Expenditures:

Transfer to Street Improvement Capital Projects Fund	$496,000
Total Expenditures	**$496,000**

STREET IMPROVEMENTS CAPITAL PROJECT FUND

Section 3.

Transfer from General Fund	$496,000
Total Revenues	**$496,000**

Section 4.

Capital Projects-Burma Drive	$496,000
Total Expenditures	**$496,000**

Section 5. Within five (5) days after adoption, copies of this Amendment shall be filed with the Finance Officer and Town Clerk.

Adopted this the 27th day of April, 2021

Attest:

Jacques K. Gilbert, Mayor

Donna B. Hosch, MMC, Town Clerk

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: CONSENT AGENDA

Meeting Date: April 27, 2021

Item Details

Presenter(s): Jose Martinez, Public Works Director; Shawn Purvis, Assistant Town Manager

Department(s): Public Works & Transportation

Requested Motion

Motion to approve closing of sidewalks as identified on the pedestrian safety plan for Highline Building and to temporarily mark three spaces on the west side of Salem St. as a loading zone of 8 am – 5 pm, Mon. – Fri. until the loading zone can reopen on Saunders St.

Approval Recommended?

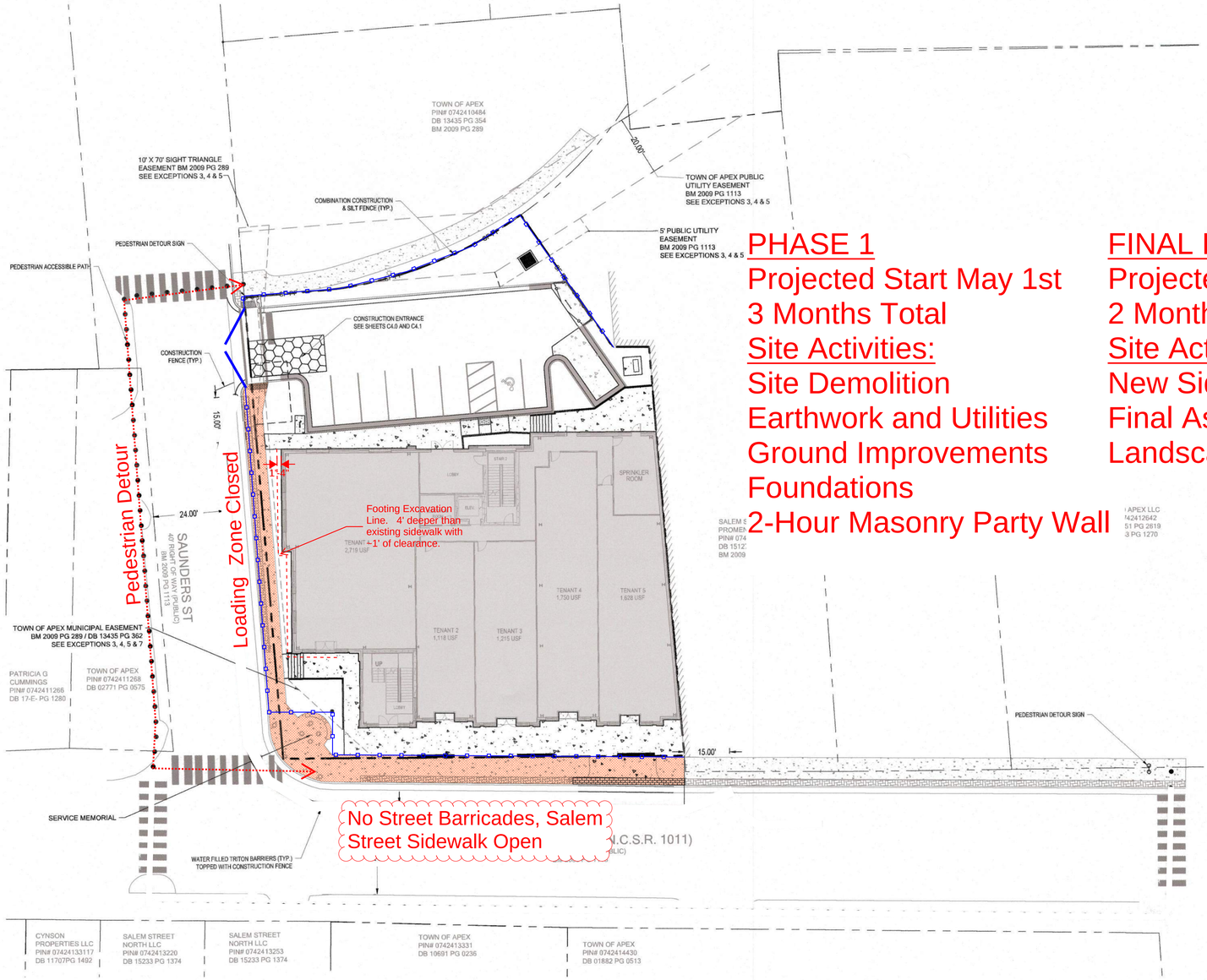
Yes

Item Details

Construction of a new 3-story building is set to begin soon at the corner of Salem St. and Saunders St. Staff has worked with the developer and contractor to develop a pedestrian plan that ensures safety and accessibility. Project construction is expected to take 11-12 months. The tight quarters for construction necessitate the closing of the sidewalk along Salem adjacent the site during portions of the construction (6 months) and along Saunders for the duration of the construction. Additionally, access for equipment and ensuring safety will require closure of the loading zone spaces along Saunders for the duration of the project. The proposed pedestrian routes are attached. To accommodate the necessary loading zones that support downtown businesses, staff is proposing converting three parking spaces in front of 123-127 Salem St. into a temporary loading zone. The spaces would be for loading 8 am – 5 pm, Monday – Friday, leaving regular parking for evenings and weekends. The 9/11 Memorial will be outside the construction fencing and the contractor is aware of planned events downtown and will schedule their work accordingly to prevent disturbance.

Attachments

- Pedestrian Safety Plan
- Parking-Loading Zone Site map



NOTES:

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8. SEE DETAIL 1101.01 ON SHEET C9.01 FOR SIGN LOCATION PRIOR TO CONSTRUCTION.

PHASE 1
Projected Start May 1st
3 Months Total

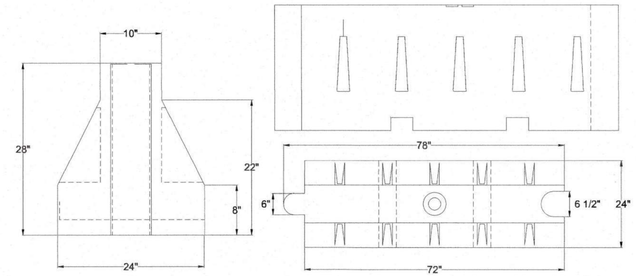
Site Activities:
Site Demolition
Earthwork and Utilities
Ground Improvements
Foundations
2-Hour Masonry Party Wall

FINAL PHASE
Projected Start February 1
2 Months Total

Site Activities:
New Sidewalks
Final Asphalt Paving
Landscaping Installation

TRAFFIC MANAGEMENT LEGEND

- WATER FILLED TRITON BARRIERS
- PEDESTRIAN ACCESSIBLE PATH



WATER FILLED TRITON BARRIER

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Approved rdalton 02/22/2021 3:53:23 PM — Public Works – Transportation	N / A jbolin 02/16/2021 12:39:36 PM — Water Resources – Stormwater
N / A sewens 02/22/2021 11:36:05 AM — Building Inspections	N / A ltaltin 02/01/2021 10:53:36 AM — Planning
N / A jdillon 02/22/2021 1:40:01 PM — Water Resources – Utility Engineering	N / A kvannoy 02/16/2021 4:45:32 PM — Planning – Transportation
N / A rsmith 02/16/2021 3:32:23 PM — Electric	N / A khuegerich 02/16/2021 1:57:15 PM — Fire
N / A jbolin 02/16/2021 12:39:39 PM — Water Resources – Soil & Erosion Control	N / A areincke 02/15/2021 12:10:40 PM — Parks, Recreation & Cultural Resources

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SCALE: 1" = 20'

REV	DATE	DESCRIPTION
1	01/29/2021	PER TOWN COMMENTS
2	01/06/2021	PER TOWN COMMENTS

DESIGNED BY: SP/TW
DRAWN BY: SP
REVIEWED BY: CT

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5440 WADE PARK BLVD, SUITE 102
RALEIGH, NC 27607
WWW.BGENC.COM
NC LICENSE #C-4397
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OPPIDAN INVESTMENT COMPANY
2000 REGENCY PARKWAY, SUITE 435
CARY, NC 27518

SALEM STREET MIXED USE
209 N. SALEM STREET
APEX, NC

TRAFFIC MANAGEMENT PLAN

NORTH CAROLINA PROFESSIONAL SEAL 048995 ENGINEER CHARLES D. TOWNSEND
2/1/21

FILE NUMBER: 7646-00
DATE: 11/30/2020
C2-2

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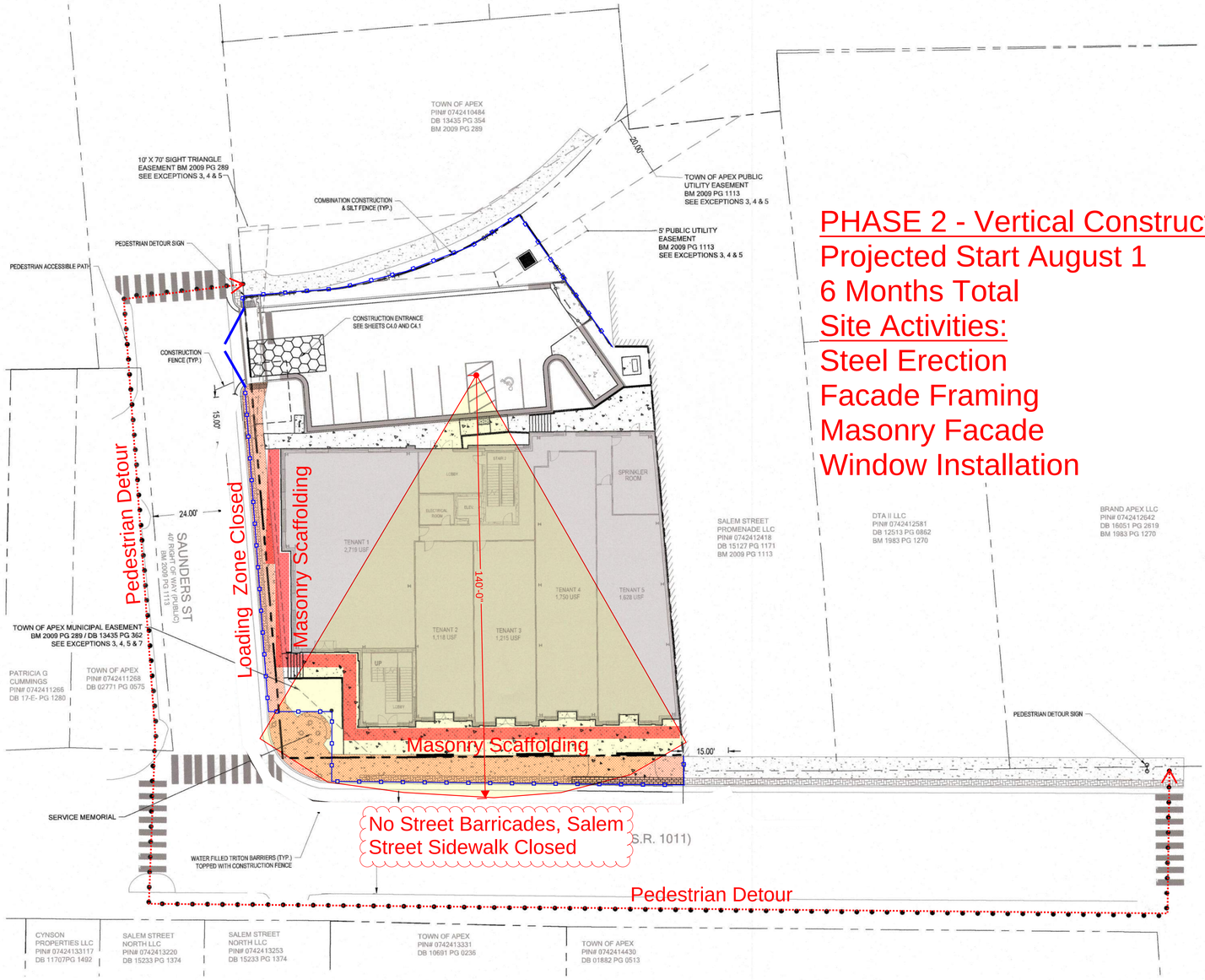

PHASE 2 - Vertical Construction
Projected Start August 1
6 Months Total
Site Activities:
Steel Erection
Facade Framing
Masonry Facade
Window Installation

NOTES:

1. ALL SIDEWALKS MUST BE ACCESSIBLE TO PERSONS WHO ARE BLIND, HAVE LOW VISION AND PEOPLE WITH MOBILITY DISABILITIES. PEDESTRIAN EXISTING ROUTES AND ALTERNATE PEDESTRIAN ROUTES DURING CONSTRUCTION WILL BE REQUIRED TO BE COMPLIANT WITH THE PUBLIC RIGHTS OF WAY ACCESSIBILITY GUIDELINES (PPOWAG), 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
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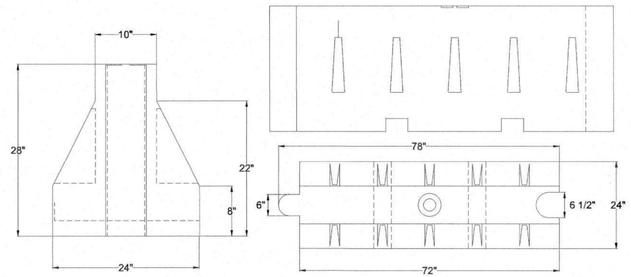
TRAFFIC MANAGEMENT LEGEND

WATER FILLED TRITON BARRIERS

PEDESTRIAN ACCESSIBLE PATH



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TRAFFIC MANAGEMENT PLAN

NORTH CAROLINA PROFESSIONAL SEAL 048995 ENGINEER CHARLES D. TOWNSEND
2/1/21

FILE NUMBER: 7646-00
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C2-2

g:\NCA\Projects\Oppidan\7646-00 - oppidan apex\03 - DWG\plansheets\C2-2 - PEDESTRIAN.dwg Layout: TRAFFIC MANAGEMENT PLAN Plotted: 1/29/2021 9:24:08 AM

TOWN OF APEX	PROJECT REFERENCE NO.	SHEET NO.
PUBLIC WORKS & TRANSPORTATION ENGINEERING DIVISION 73 HUNTER STREET APEX, NC 27502 919-249-3417		

PRELIMINARY
DO NOT USE
FOR
CONSTRUCTION

0 20 40 Feet

PROPOSED CONDITION

April 22, 2021

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: PUBLIC HEARING

Meeting Date: April 27, 2021

Item Details

Presenter(s): Allyson Coltrane, Long Range Transit Planner II

Department(s): Planning and Community Development

Requested Motion

Public hearing and possible motion regarding proposed amendments to the Transit Plan map related to GoApex Route 1.

Approval Recommended?

Planning staff recommends adoption of the proposed amendments to the Transit Plan map.

The Planning Board unanimously recommended approval of the proposed amendment during their April 12, 2021 meeting and the Transit Advisory Committee unanimously recommended approval of the proposed amendment during their April 14, 2021 meeting.

Item Details

The proposed amendment is related to the Beaver Creek Crossings section of GoApex Route 1. Staff is proposing that the outbound stop in the interior of Beaver Creek Crossings be removed, and therefore, this section of the route would be removed and the bus would instead travel inbound and outbound on Beaver Creek Commons Drive. Routing the bus through Beaver Creek Crossings to serve an internal stop requires permission from the property manager.

Attachments

- Staff report

The Transit Plan Map (last amended July 21, 2020) represents a network of current and future transit routes that provide guidance on what is likely to be suitable for long-term growth and mobility. The plan does not require a schedule for implementation nor does it set aside funding for improvements. The purpose of the public hearing is to consider a proposed amendment to the future route of GoApex Route 1 in order to make a decision.

The proposed amendment is related to the Beaver Creek Crossings section of GoApex Route 1. Staff is proposing that the outbound stop in the interior of Beaver Creek Crossings be removed, and therefore, this section of the route would be removed and the bus would instead travel inbound and outbound on Beaver Creek Commons Drive. Routing the bus through Beaver Creek Crossings to serve an internal stop requires permission from the property manager. The property manager has indicated that they are unable to enter into an agreement at this time; however, they may have interest in the future. Beaver Creek Crossings and Beaver Creek Commons will still be served by two exterior stops along Beaver Creek Commons Drive. The amendment would revise the Transit Plan map as shown in Figure 1.

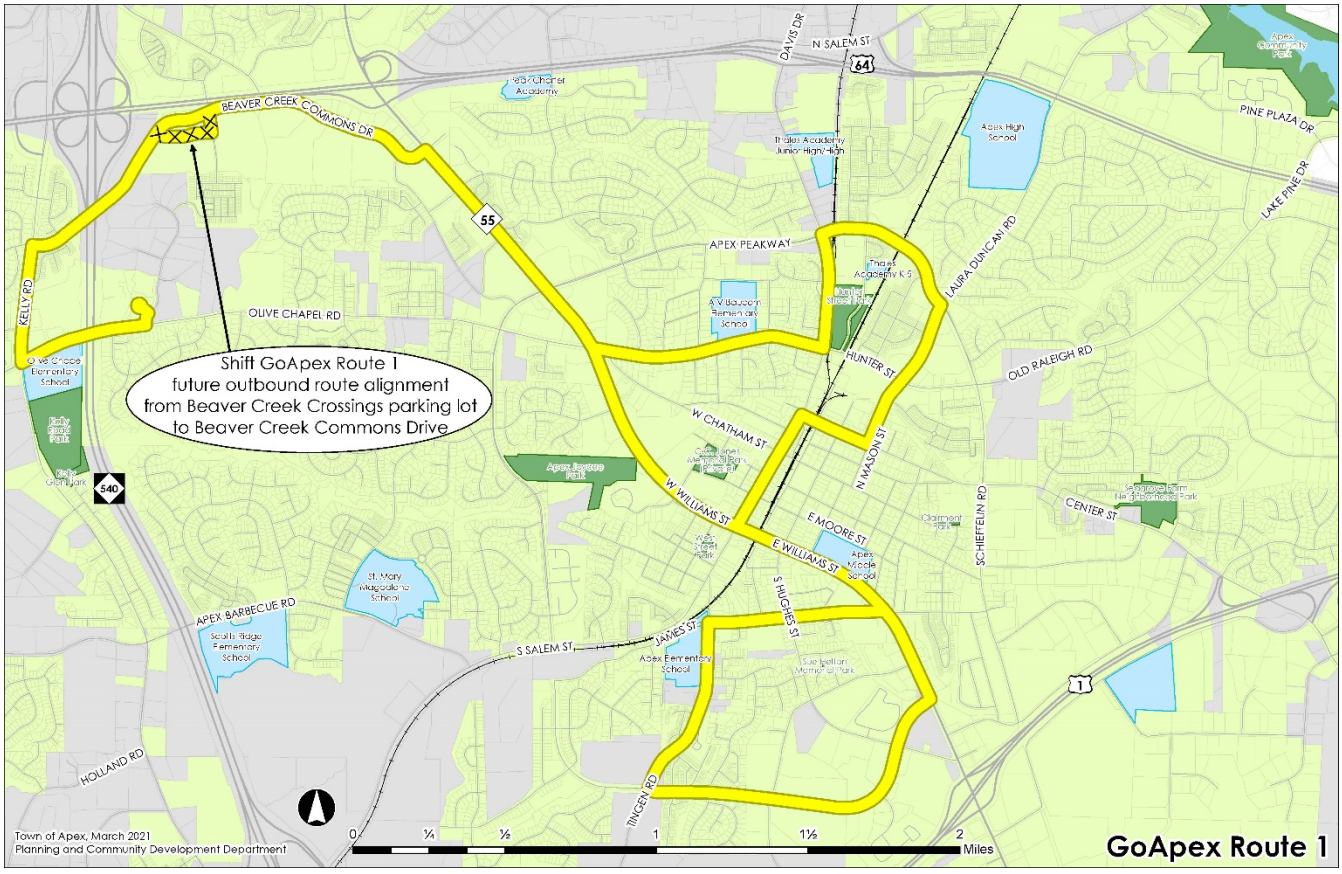


Figure 1. Proposed amendment to the Transit Plan map

Staff Recommendation:

Planning staff recommend supporting the proposed amendment to Transit Plan map. The proposed amendment was reviewed with staff from Public Works and Transportation and there were no concerns.

Transit Advisory Committee Recommendation:

The Transit Advisory Committee unanimously recommended approval of the proposed amendment during their April 14, 2021 meeting.

Planning Board Recommendation:

The Planning Board unanimously recommended approval of the proposed amendment during their April 12, 2021 meeting.

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: PUBLIC HEARING

Meeting Date: April 27, 2021

Item Details

Presenter(s): Shelly Mayo, Planner II

Department(s): Planning and Community Development

Requested Motion

Quasi-Judicial Public Hearing and possible motion regarding a Major Site Plan for Felton Grove High School located at 8550 Stephenson Road. This item was continued from the April 13, 2021 meeting.

Approval Recommended?

No recommendation is made by Planning staff on Quasi-Judicial Public Hearings.

Item Details

The subject property is identified as Wake County PIN 0750545646.

Attachments

- Vicinity Map
- Staff Report and Attachments

The purpose of the public hearing is to review, hear, consider and approve, approve with conditions, or disapprove the application for a Major Site Plan.

BACKGROUND INFORMATION:	
Location:	8550 Stephenson Road
Applicant/Owner:	Renee Pfeifer, CLH Design, PA/Wake Co. Board of Education
PROJECT DESCRIPTION:	
Acreage:	+/- 68.06 acres
PIN:	0750545646
Zoning:	Medium Density Residential-Conditional Zoning (MD-CZ #20CZ12)
2045 Land Use Map:	School
Town Limits:	Inside Corporate Limits

ADJACENT ZONING & LAND USES:		
	Zoning	**Land Use**
North:	Rural Residential (#07ETJ24)	Single-family Residential
South:	Light Industrial (#07ETJ24) & Rural Residential (#07ETJ24)	Triangle Forest Products, Inc. Landfill (formerly Currin Brothers) & Indian Hills Subdivision
East:	Mobile Home Park (#07ETJ24)	Briarwood Farms Mobile Home Park
West:	Rural Residential (#07ETJ24) & Light Industrial (#07ETJ24)	Triangle Forest Products, Inc. Landfill (formerly Currin Brothers) & Single-family Residential

EXISTING CONDITIONS:

The site consists of one (1) parcel totaling approximately 68.06 acres. It is completely wooded with several perennial and intermittent streams throughout the site. It is located west of Stephenson Rd, at the end of Derry Down Lane and Thriftwood Drive. It is west of the Briarwood Farms Mobile Home Park and north of the Indian Hills Subdivision and Triangle Forest Products, Inc. Landfill (formerly Currin Brothers).

The adjacent landfill is a "Land Clearing and Inert Debris Landfill." Section 4.3.3 of the UDO defines this use as:

> A disposal facility that consists of solid waste that is generated solely from land clearing activities such as stumps and trees; and inert debris such as brick, concrete and clean soil.

It was approved by Wake County in 2003 and has a 50-foot undisturbed buffer along the eastern and northern boundaries. UDO Sec. 4.4.3.I.1.3 requires the following of new landfills:

> No part of a land clearing and inert debris landfill, its accessory ramps, on-site circulation system or storage areas shall be sited within 250 feet of a school, child care center, park, church, library or residential lot;

There is an intermittent stream on the southern portion of the Felton Grove High School property, which limits development in that area. The UDO requires a 50-foot riparian buffer along each side of the stream, making the total width of the buffer 100-feet wide. Based on the location of the stream and the buffers on the landfill property, the high school will be a minimum of 250 feet from the active portion of the landfill.

The UDO does not require new schools to meet these dimensional requirements when locating near an existing landfill. However, the concern was mentioned during Planning Board and staff evaluated both properties to confirm that the standard would be met.

NEIGHBORHOOD MEETING:

The applicant conducted a virtual neighborhood meeting on November 18, 2020. The meeting report is attached. The applicant held a separate neighborhood meeting with the residents of the adjacent rental properties. This courtesy meeting was held on April 7, 2021 and was not required by the UDO. The applicant will present the results of the meeting.

ZONING

Approved Uses:

The Rezoned Lands may be used for, and only for, the uses listed immediately below. The permitted uses are subject to the limitations and regulations stated in the UDO and any additional limitations or regulations stated below. For convenience, some relevant sections of the UDO may be referenced; such references do not imply that other sections of the UDO do not apply.

1. School, public or private
2. Communication tower, camouflage stealth (S)
3. Communication tower, public safety (S)
4. Wireless communication facility
5. Wireless support structure
6. Church or place of worship

Conditions:

1. This project shall preserve trees measuring 18-inches in diameter at breast height or greater to the maximum extent reasonably possible.
2. In compliance with the UDO and to optimize survival of landscaping, an extension of up to 6 months' time may be provided for installation of landscaping after a Certificate of Occupancy would otherwise be issued.
3. To support re-establishment of forest, a reforestation seed mix shall be used in disturbed areas with slopes of 3:1 or less, and not located within RCAs or SCMs. To expedite growth and avoid erosion, a slope stabilizing mix with conservation seed mix shall be used to slopes greater than 3:1 but less than 2:1 and not located within RCAs or SCMs.
4. This project shall dedicate a 20-foot on-site public greenway easement and within it provide a 10-foot greenway path and/or 10-foot sidewalk connection from the driveway connection at Thriftwood Drive to the western property line.
5. This project shall also provide off-site a combined greenway and sanitary sewer easement to accommodate future greenway construction by others. To comply with Section 900 of the Town's Standard Specifications, the combined public utility and greenway easement shall be recorded providing no less than 30 feet in width, or 10 feet beyond the minimum required for the sanitary sewer, whichever is greater. The public greenway easement shall extend from the western boundary of the site, across the landfill site (Wake Co. PIN 0750-44-1182) to the landfill's western boundary.
6. The Vehicular Use Area Shading described in UDO Section 8.2.5.C is not required in the area between the parking deck and parking lot near the site's eastern boundary. Instead, the same number of trees required to meet this standard will be planted elsewhere on the site. The remainder of the site shall meet the requirements of UDO Section 8.2.5.C. to the maximum extent reasonably possible.
7. The 2045 Transportation Plan shows a future north-south Minor Collector along the eastern property line starting at Derry Downs Lane extending to the northern site boundary. This project shall provide half of the required 60-foot right-of-way as shown on the plan.
8. Improvements to the existing streets known as Thriftwood Drive and Derry Down Lane (identified as public streets having a 60' right of way on the Briarwood Farms-COSD subdivision map recorded in Book of Maps

1986-2149, Wake County Registry, and as accepted by Wake County for use by the general public by instrument recorded in Book 7714 at Page 404, Wake County Registry) shall be provided to satisfy such NCDOT requirements made upon review of the traffic study for the project which are minimally necessary to provide adequate public access as state-maintained roadways to Stephenson Road. Consequently, the existing streets known as Thriftwood Drive and Derry Down Lane are not proposed for upgrades to meet Town of Apex standards nor are they proposed for dedication to the Town of Apex.

9. The northern perimeter buffer shall be a 20-foot Type B buffer, except where segmental retaining wall tie-backs would encroach. In those areas, it shall be no less than a 15-foot Type A buffer.
10. Cast-in-place retaining walls shall be permitted within the western 20-foot Type B buffer, as long as sufficient landscaping is planted around and on top of the walls to meet the requirements of the 20-foot Type B buffer.

PROJECT DATA:

The proposed high school will provide space for 2,350 students and approximately 200 employees. The site plan consists of several buildings, parking lots, a parking deck, and sports fields.

Building:

The proposed educational building ranges from one (1) to three (3) stories tall and contains approximately 392,760 square feet and 110 classrooms. This building is primarily brick with EIFS and architectural metal accents. The parking deck is primarily precast concrete with decorative metal panels that coordinate with the accents on the main building. There are also several smaller athletic buildings totaling 7,794 sf on the northern portion of the site.

Resource Conservation Area:

The UDO requires that developments in this area provide 20% of the site as Resource Conservation Area (RCA). This site meets the requirement with the RCA being primarily located within the riparian buffers around the streams on site.

UDO Requirement	Provided
20% = 13.612 acres	20% = 13.612 acres

Buffers:

Per UDO Sec. 8.2.6, School, public or private is considered a Class 4 use which require the following buffers:

Adjacent Property Use:	UDO Requirement:	Proposed:
North - Large Lot SF (>/= 12,000 sf)	20-foot Type B buffer	15-foot Type A or 20-foot Type B buffer*
South - Large Lot SF (>/= 12,000 sf)	20-foot Type B buffer	20-foot Type B Buffer + 50-foot stream buffer
West - Large Lot SF (>/= 12,000 sf)	20-foot Type B buffer	20-foot Type B buffer
South & West - Landfill:	15-foot Type B buffer	20-foot Type B buffer
East - Mobile Home Park:	0-foot	0-foot buffer

*Zoning Condition #9 allows the northern property buffer to vary from the required 20-foot Type B buffer to a 15-foot Type A buffer where segmental retaining wall tiebacks would otherwise encroach into the regular buffer. There are two (2) areas within the northern buffer where this is shown and the landscaping plan shows a Type A buffer plants in those areas.

Landscaping:
The proposed Major Site Plan meets the requirements in the UDO, with the changes that were approved in rezoning case #20CZ12. Specifically, the conditions are being met in the following ways:

- Zoning Conditions #1 & #3: The applicant and engineer have worked with staff to preserve as much of the existing forested area as possible and a reforestation seed mix is shown in the areas specified in the zoning condition.
- Zoning Condition #6: Shading trees have not been planted between the parking deck and the parking lot to the east, but the same number of trees have been planted elsewhere on site.
- Zoning Condition #10: The landscaping plan shows trees and shrubs planted both above and below the cast-in-place retaining wall within a portion of the western 20' Type B Buffer. This vegetation meets the requirements of the Type B buffer standard.

Parking:
The vehicle parking provided for the proposed Major Site Plan meets the requirements of the UDO. The table below describes the minimum requirement and proposed number of spaces. The provided number includes 21 handicap spaces and 2 electric vehicle charging stations within the parking deck.

Minimum Required:	110 classrooms	x	10 per classroom	=	1,100 spaces
Provided:			Parking Deck		631 spaces
			Surface Spaces		469 spaces
			Total	=	1,100 spaces

In addition, the project provides 56 bicycle parking spaces, while the UDO only requires 26. The bicycle racks provided are decorative and will act as site amenities.

Apex Transportation Plan/Access and Circulation:
The proposed Felton Grove High School will access Stephenson Road via Thriftwood Drive and Derry Down Lane. The applicant is proposing to reconstruct both roads to meet NCDOT access road standards. The plans show this work primarily taking place within the 60-foot right-of-way shown on the original plat for Briarwood Farms. Some disturbance outside the right-of-way is shown to tie the grading related to the road improvements back to the existing grade. This grading will not impact any homes. The applicant will need to show temporary construction easements on the Construction Drawings for all work outside of the right-of-way and subject property.

A Traffic Impact Analysis (TIA) was submitted with this application and was reviewed by Transportation staff. The TIA studied access to the proposed H-12 (Felton Grove) High School at the following four intersections:

- Stephenson Road at Derry Down Lane / Cockle Burr Drive
- Stephenson Road at Thriftwood Drive / Tear Drop Circle
- Thriftwood Drive at Staff / Bus Driveway (internal)
- Thriftwood Drive / Reunion Creek Parkway Extension at Connector Road

The following four intersections were also studied in the TIA:

- E. Williams Street / N. Main Street at Sunset Lake Road / Old Smithfield Road
- Sunset Lake Road at Stephenson Road
- E. Williams Street at Reunion Creek Parkway
- Stephenson Road at Smith Road

The TIA noted that the proposed Felton Grove High School is expected to consist of 2,350 students and 217 staff members. The school is projected to generate approximately 1,107 new trips entering and 253 new trips exiting

the site during the school weekday A.M. peak hour and 139 new trips entering and 776 new trips exiting the site during the school weekday P.M. peak hour.

Staff has formulated recommendations based on the UDO standards, but NC General Statutes §160A-307.1 only gives the Town authority to require improvements to municipal streets, as follows:

> A city may only require street improvements related to schools that are required for safe ingress and egress to the municipal street system and that are physically connected to a driveway on the school site.

Since Thriftwood Drive, Derry Down Lane, and Stephenson Road are not municipal roads, Apex does not have the authority to require improvements on those roads. That said, the following improvements are recommended by staff based upon review of the TIA and UDO standards, and in some instances may agree with TIA recommendations and in some instances may differ, to accommodate the increase in traffic generated by the school. The TIA studied options with and without the Reunion Creek Parkway extension, but since the Transportation Plan was updated to remove Reunion Creek Parkway connectivity to the school site that option no longer applies.

- Stephenson Road and Derry Down Lane/Cockle Burr Drive:
  - Construct an exclusive northbound left-turn lane with 100 feet of full-width storage and appropriate taper.
  - Widen the eastbound approach to accommodate an exclusive right turn lane and a shared left-through lane with 100 feet of full-width storage and appropriate taper.
  - In the event that NCDOT does not recommend geometric improvements and/or improvements are not being provided by WCPSS, consider officer control for peak hour traffic. Currently the intersection is operating as two-way stop control with no turn lanes.
  - Note: NCDOT has not recommended any improvements at this intersection.
- Stephenson Road and Thriftwood Drive/Tear Drop Circle:
  - Install a traffic signal if warranted and permitted by NCDOT.
  - Construct dual northbound left turn lanes with 425 feet of storage in each lane, and two (2) receiving westbound lanes with the outside receiving lane providing a minimum of 300 feet of full width merge lane and a 35:1 merge taper.
  - Construct an exclusive southbound right-turn lane with 100 feet of full-width storage and appropriate taper along Stephenson Road.
  - Widen the eastbound approach to provide an exclusive right turn lane and a shared left-through lane with 250 feet of full-width storage and appropriate taper and a shared left-through lane.
  - In the event that NCDOT does not recommend geometric improvements/signalization and/or improvements are not being provided by WCPSS, consider officer control for peak hour traffic. Currently the intersection is operating as two-way stop control with no turn lanes.
  - Note: NCDOT has not recommended any improvements at this intersection.
- Thriftwood Drive at the Staff/Bus Driveway:
  - Construct an on-site unsignalized intersection with stop-control on the southbound approach. There are no applicable public road recommendations at this location following removal of Reunion Creek Parkway extension.
  - Consider school staff control as needed for peak hour traffic based on observation.
- Thriftwood Drive at Connector Road:
  - There are no applicable recommendations following removal of Reunion Creek Parkway extension. This location operates as free flow parking lot access on site.
- E. Williams Street / N. Main Street at Sunset Lake Road / Old Smithfield Road:

  - Widen the intersection to provide an additional through lane in the eastbound direction of travel (starting and ending 1,000 upstream and 1,200 downstream of the intersection with a lane drop at Commons Drive).
  - Construct a second (dual) southbound left turn lane and provide 225 feet of storage on each lane with appropriate tapers.
  - Construct a westbound right turn lane with 400 feet of full width and appropriate taper.
  - Construct a northbound right turn lane with 200 feet of full width and appropriate taper.
  - In the event that NCDOT does not recommend geometric improvements and/or improvements are not being provided by WCPSS, the intersection will operate over capacity with longer delays than if improvements were constructed.
  - Note: NCDOT has not recommended any improvements at this intersection.
- Sunset Lake Road at Stephenson Road:
  - Construct a restricted conflict intersection (RCI) to handle the heavy eastbound left turn traffic volume (over 1,000 vehicles in the AM peak hour) while at the same time minimizing delays caused by school development traffic. Description follows.
  - Construct a signalized U-turn bulb 500 feet east of the Stephenson Road intersection (lined up with the proposed right-in, right-out of the future apartment complex) with dual eastbound U-turn lanes and a single eastbound through lane.
  - Construct two westbound receiving lanes, with one of those lanes continuing as a westbound through lane and the other an exclusive westbound right turn lane that begins 150 feet east of the signalized U-turn bulb and continues as an add lane to the Stephenson Road intersection where it terminates as a channelized free-flow westbound right turn.
  - Stagger the dual eastbound U-turn lanes to provide adequate capacity, with the inside lane having minimum 250 feet of storage and appropriate taper, and the outside U-turn lane beginning 150 feet west of the Stephenson Road intersection and extending east to the signalized U-turn bulb.
  - Construct a second westbound right turn lane with 150 feet of full width storage and a northbound receiving lane on Stephenson Road with 600 feet of full width merge length and appropriate merge taper.
  - In the event that NCDOT does not recommend geometric improvements and/or improvements are not being provided by WCPSS, the intersection will operate over capacity with longer delays than if improvements were constructed, even if placed under signalized control. Currently the intersection is operating as southbound stop control with no turn lanes.
  - Note: NCDOT has recommended a traffic signal at this intersection, but has not recommended any geometric improvements as part of the school site plan.
  - Note: The TIA also assumed background improvements by others as part of an apartment complex proposed on the northeast corner. Those included a southbound left turn lane, eastbound left turn lane, westbound right turn lane, and signalization.
- E. Williams Street at Reunion Creek Parkway:
  - Staff recommends no geometric improvements at this intersection.
- Smith Road at Stephenson Road:
  - Staff recommends no geometric improvements at this intersection.
  - Note: NCDOT has recommended a traffic signal at this intersection.

The TIA estimated a need for 2,350 feet of internal stacking distance for student pick-up and drop-off. NCDOT's Municipal School Transportation Assistance (MSTA) calculator requires 1,804 feet of internal stacking. The TIA

referenced a site plan that appears to provide 2,700 feet of stacking for carpool internal to the site and the proposed site plan actually provides 3,100 feet stacking, which will adequately accommodate carpool traffic.

To promote safer pedestrian access, sidewalk will be extended from the driveway at each road connection and will run throughout the site. Sidewalk is not proposed along Derry Down Lane or Thriftwood Drive from the site boundary to Stephenson Road and sidewalk currently does not exist along either side of Stephenson Road north of Sunset Lake Road in the vicinity of Thriftwood Drive or Derry Down Lane. The nearest sidewalk on Stephenson Road is more than 2,000 feet north of Derry Down Lane.

The proposed site plan meets the requirements of zoning condition #4 by building a 10' greenway from Thriftwood Drive to the school's western property line. It also complies with zoning condition #5 by showing a shared public greenway/sewer easement from the school's western property line, across the landfill, and stopping at its western property line.

Public Works and Transportation staff noted deficiencies in the TIA recommendations for intersection on State maintained roadways. The proposed site plan has not incorporated TIA recommendations or staff recommendations for geometric improvements to address traffic capacity on state-maintained roadways, with the exception of Smith Road at Stephenson Road where staff concur with no recommended improvements.

Public Utilities:
The proposed Major Site Plan complies with the standards in the UDO. Sanitary sewer will be extended from the Middle Creek pump station on Sunset Lake Road, under NC-540 and across the Triangle Forest Products landfill property to the school site. It will then be extended up each of two (2) the natural draws to the property to the east. Water will be extended from Colvin Park along Smith Road and across to the site. It will then be extended to the east at Thriftwood Drive and Derry Down Lane.

Storm Drainage:
The proposed Major Site Plan complies with the requirements of the UDO. The site proposes five (5) Stormwater Control Measures.

Grading:
The proposed Major Site Plan meets the grading requirements of the Unified Development Ordinance. Generally, the site sits lower than the eastern and northern properties, except where streams cross the property lines. The main buildings, parking, and closest sports fields are between 10 and 20 feet lower than the adjacent property to the east.

Lighting:
The proposed lighting plan complies with the requirements of the UDO.

Supplemental Standards:
There are no supplemental standards required for the use School, public or private.

UNIFIED DEVELOPMENT ORDINANCE:

The proposed Major Site Plan complies with the standards provided in the UDO, except the traffic conditions of the connecting roads.

Public Works and Transportation staff noted deficiencies in the TIA recommendations for intersection on State maintained roadways. The proposed Major Site Plan has not incorporated TIA recommendations or staff recommendations for geometric improvements to address traffic capacity on state-maintained roadways, with the exception of Smith Road at Stephenson Road where staff concur with no recommended improvements.

MAJOR SITE PLAN STANDARDS:

In order to approve an application for a Major Site Plan, the Town Council shall find the following standards are met by the proposed Major Site Plan:

a) Compatibility. The development proposed in the site plan and its general location is compatible with the character of surrounding land uses.

b) Zoning district supplemental standards. The development and uses in the site plan comply with Sec. 4.4 *Supplemental Standards*.

c) Site development standards. The development proposed in the site plan and its general layout and design comply with all appropriate standards in Article 8: *General Development Standards*.

d) Mitigation of development on steep slopes. If appropriate, the site plan complies with the requirements of Sec. 8.1.4 *Slope Protection Standards*.

e) Dedication of ROW for Thoroughfare Plan. The development proposed in the site plan conforms to the requirements of Sec. 7.4 *Dedication of ROW for Thoroughfare Streets and Highways*.

f) Required improvements. The development proposed in the site plan conforms to the requirements of Sec. 7.5 *Required Improvements*.

g) Other relevant standards of this Ordinance. The development proposed in the site plan and its general layout and design comply with all other relevant standards of this Ordinance, except that a site plan is not required to comply with a setback standard if there is a permanent improvement on the site that existed prior to August 1, 2000 that makes compliance impossible and the exception to the setback standard is the minimum necessary to accommodate the pre-existing permanent improvement.

h) Applicable Standards of Article 7: *Subdivision* and Article 14: *Parks, Recreation, Greenways, and Open Space*. The development proposed in the site plan shall comply with the applicable standards of Article 7: *Subdivision* and Article 14: *Parks, Recreation, Greenways, and Open Space*, including, but not limited to, street and utility improvements and park, recreation, and open space dedication or fee-in-lieu.

i) Impact on public facilities. The proposed development shall not have a significant adverse impact on public facilities and services, including roads, potable water and wastewater facilities, parks, police, fire, and EMS facilities.

January 15, 2021

Matthew D. Peach, P.E.
Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606

Subject: **Staff summary and comments for the H-12 (Felton Grove) High School TIA, 11/30/2020**

Mr. Peach:

Please review the following summary of my comments and recommendations. You may schedule a meeting with me and your client to discuss at your convenience.

Study Area

The TIA studied access to the proposed H-12 (Felton Grove) High School at the following four intersections:

- Stephenson Road at Derry Down Lane / Cockle Burr Drive
- Stephenson Road at Thriftwood Drive / Tear Drop Circle
- Thriftwood Drive at Staff / Bus Driveway (internal)
- Thriftwood Drive / Reunion Creek Parkway Extension at Connector Road

The following four intersections were also studied in the TIA:

- E. Williams Street / N. Main Street at Sunset Lake Road / Old Smithfield Road
- Sunset Lake Road at Stephenson Road
- E. Williams Street at Reunion Creek Parkway
- Stephenson Road at Smith Road

Trip Generation

The proposed H-12 (Felton Grove) High School is expected to consist of 2,350 students and 217 staff members. It's projected to generate approximately 1107 new trips entering and 253 new trips exiting the site during the school weekday A.M. peak hour and 139 new trips entering and 776 new trips exiting the site during the school weekday P.M. peak hour. It should be noted

that the school A.M. peak hour is expected to overlap with the A.M. peak hours for the adjacent roadway network. The school P.M. peak hour is expected to occur between 2 P.M. and 4 P.M.

Background traffic

Background traffic consists of 1% annual background traffic growth compounded to build out year 2026, except for the through movements on Sunset Lake Road and Old Smithfield Road which were projected to have a 4% annual growth rate compounded to build out year 2026. Background traffic from the following approved developments was also included in the analysis:

- Horton Park
- Sunset Lake Apartments

Trip Distribution and Assignment

The trip distributions to and from the school site are as follows:

- 35 percent to/from the north on East Williams Street;
- 35 percent to/from the west on Old Smithfield Road;
- 15 percent to/from the south on East Williams Street;
- 10 percent to/from the east on Sunset Lake Road; and
- 5 percent to/from the north on Smith Road.

An alternate scenario was also analyzed that assumes an extension of Reunion Creek Parkway to Thriftwood Drive. That scenario reassigns 60% of the school trips onto the extension and the intersection of E. Williams Street at Reunion Creek Parkway. However the alternate scenario does not change the overall assumptions for the trip distribution. Trips from the north and south on East Williams Street, and from the west on Old Smithfield Road are reassigned to the intersection of E Williams Street and Reunion Creek Parkway. It should be noted that the extension of Reunion Creek Parkway is on the Town of Apex's transportation plan, however it is not a funded project.

Traffic Capacity Analysis and Recommendations

Level of Service (LOS) is a grade of A through F assigned to an intersection, approach, or movement to describe how well or how poorly it operates. LOS A through D is considered acceptable for peak hour operation. LOS E or F describes potentially unacceptable operation and developers may be required to mitigate their anticipated traffic impact to improve LOS based on the Apex Unified Development Ordinance (UDO).

Tables 1 through 8 describe the levels of service (LOS) for the scenarios analyzed in the TIA. "*NA"* is shown when the scenario does not apply. The scenarios are as follows:

- **Existing 2020** - Existing year 2020 traffic.
- **No Build 2026** – Projected year (2026) with background growth, approved development traffic from others, and committed transportation improvements by others where applicable.

- **Build 2026 –** Projected year (2026) with background traffic, background improvements, and site build-out including recommended improvements where applicable.
- **Build 2026 Alternate -** Projected year (2026) with Reunion Creek Parkway extended to E Williams Street, background traffic, background improvements, and site build-out including recommended improvements where applicable.

Stephenson Road at Derry Down Lane / Cockle Burr Drive (unsignalized)

Table 1. A.M. / P.M. Unsignalized Peak Hour Levels of Service Stephenson Road at Derry Down Lane / Cockle Burr Drive

	Existing 2020	No Build 2026	Build 2026	Build 2026 Alt
Overall	NA	NA	NA	NA
Eastbound (Derry Down Lane)	*B / B*[1]	*C / B*[1]	*E / C*[1]	*F / C*[1]
Westbound (Cockle Burr Drive)	*B / B*[1]	*C / B*[1]	*F / D*[1]	*F / D*[1]
Northbound (Stephenson Road)	*A / A*[2]	*A / A*[2]	*A / A*[2]	*A / A*[2]
Southbound (Stephenson Road)	*A / A*[2]	*A / A*[2]	*A / A*[2]	*A / A*[2]

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends construction of an exclusive northbound left-turn lane with 100 feet of full-width storage and appropriate taper, and widening of the eastbound approach to accommodate an exclusive right turn lane and a shared left-through lane with 100 feet of full-width storage and appropriate taper. These recommendations are consistent for both the Build 2026 and the Build 2026 Alternate scenarios analyzed in the TIA.

Apex staff recommendations:

- Apex staff concur with both recommendations. In both scenarios the minor street approaches are projected to operate at LOS E or F in the AM peak hour. Average vehicle delays are projected to be over three minutes per vehicle for the eastbound shared left-through lane in both the Build and the Build Alternate scenarios, however 95th percentile queues are not projected to exceed 100 feet due to low through and turn movement volumes. A traffic signal would improve operations on the minor street approaches if warranted and permitted. However, based on the traffic volume projections, a traffic signal will most likely not be warranted.

Stephenson Road at Thriftwood Drive / Tear Drop Circle (unsignalized)

Table 2. A.M. / P.M. Unsignalized Peak Hour Levels of Service Stephenson Road at Thriftwood Drive / Tear Drop Circle				
	Existing 2020	**No Build 2026**	**Build 2026**	**Build 2026 Alt**
Overall	NA	NA	NA	NA
Eastbound (Thriftwood Drive)	*B / B*[1]	*C / C*[1]	*F / F*[1]	*F / E*[1]
Westbound (Tear Drop Circle)	*B / B*[1]	*C / B*[1]	*F / F*[1]	*F / F*[1]
Northbound (Stephenson Road)	*A / A*[2]	*A / A*[2]	*F / A*[2]	*C / A*[2]
Southbound (Stephenson Road)	*A / A*[2]	*A / A*[2]	*A / A*[2]	*A / A*[2]

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends construction of an exclusive northbound left-turn lane with 500 feet of full-width storage and appropriate taper and an exclusive southbound right-turn lane with 100 feet of full-width storage and appropriate taper along Stephenson Road. On the eastbound approach the TIA recommends widening to provide an exclusive right turn lane and a shared left-through lane with 250 feet of full-width storage and appropriate taper. With these improvements the projected northbound 95th percentile queues were calculated to be 2,570 feet in the A.M. peak hour. When modeled in SimTraffic the AM maximum left turn queue was shown to exceed 600 feet, however the TIA did not report the spillover queue in the northbound through lane (which is in access of 1,500 feet). Based on both Synchro traffic analysis and SimTraffic micro-simulation the projected queue lengths are shown to exceed the recommended left lane storage capacity of 500 feet, which will cause queue spillback and blockage of the northbound through lane, leading to operational failure at the intersection.

- In the Build 2026 Alternate scenario (with the Reunion Creek Parkway Extension), the TIA recommends construction of an exclusive northbound left-turn lane with 425 feet of full-width storage and appropriate taper on Stephenson Road, and widening the eastbound approach to provide an exclusive right turn lane and a shared left-through lane with 125 feet of full-width storage and appropriate taper. With these improvements, the free flow northbound and southbound approaches are projected to operate without interruptions to traffic flow from the school generated traffic, and the northbound left turn storage bay is projected to provide enough capacity to store the left turn queue. However, both minor street approaches are projected to experience delays of over 2 minutes per vehicle in the AM peak hour when modeled in SimTraffic. In the PM peak hour, the eastbound approach that serves the heavy outbound school traffic is projected

to operate at LOS E with average vehicle delays of 37 seconds per vehicle, while the westbound approach is projected to operate at LOS F with delays of 113 seconds per vehicle.

Apex staff recommendations:

- Apex staff recommends the installation of a traffic signal if warranted and permitted by NCDOT. The intersection will most likely not meet traffic volume warrants outside of the AM peak hour, however, due to the projected high volume of vehicles entering and leaving the school site (over 800 vehicles in the AM Peak Hour and over 640 vehicles in the PM Peak Hour), a traffic signal would be justified based on the Peak Hour Warrant. In addition to the traffic signal Apex staff recommends dual northbound left turn lanes with 425 feet of storage on each lane, and two receiving westbound lanes with the outside receiving lane providing minimum of 300 feet of full width acceleration distance and a 35:1 merge taper. Staff agrees with the recommendation for the southbound right turn lane and the widening of the eastbound approach for an exclusive right turn lane and a shared left-through lane. The eastbound right turn should operate to allow right turns on red in order to accommodate the heavy right turn outbound traffic flow in the PM peak hour. The installation of a traffic signal along with the other stated improvements, would provide enough intersection capacity to serve the heavy inbound traffic flow in the AM peak hour, with overall intersection LOS D and average intersection delays of 39 seconds per vehicle (meeting requirements of the UDO). In the PM peak hour, with staff recommendations the signalized intersection is projected to operate at LOS D or better on all approaches except the eastbound approach. Due to the heavy right turn school traffic, the eastbound approach is projected to operate at LOS F with 95th percentile queues less than 500 feet.

- In the event that the Reunion Creek Parkway Extension is constructed per the Build 2026 Alternate scenario, Apex staff concurs with the recommendations of the TIA. With a significant portion of school traffic being diverted west on Reunion Creek Parkway, it is unlikely this intersection will meet traffic volume warrants for a traffic signal. The TIA recommendations provide for adequate queue storage internally on the minor street eastbound approach and on the northbound left turn.

Thriftwood Drive at Staff / Bus Driveway (unsignalized)

Table 3. A.M. / P.M. Unsignalized Peak Hour Levels of Service Thriftwood Drive at Staff/Bus Driveway		
	Build 2026	**Build 2026 Alt**
Overall	NA	NA
Eastbound (Thriftwood Drive)	*NA*	*F / A*[2]
Westbound (Thriftwood Drive)	*NA*	*NA*
Southbound (Staff/Bus Driveway)	*C / F*[1]	*A / B*[1]

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends construction of an unsignalized intersection with stop-control on the southbound approach. The TIA recommends Thriftwood Drive to be constructed as a two-lane, two-way road in the east-west direction, and the southbound approach to be constructed as a two-lane, two-way road with no addition turn lanes. In the Build 2026 Alternate scenario with the Reunion Creek Parkway Extension, significant traffic volume is projected to leave and enter the site to and from the west. Therefore the TIA recommends additional construction of an exclusive eastbound left-turn lane with 500 feet of full-width storage and appropriate taper, an exclusive westbound right-turn lane with 275 feet of full-width storage and appropriate taper, and an exclusive southbound left-turn lane with maximum available full-width storage and appropriate taper.

  With these improvements the stop controlled southbound approach is projected to operate at LOS A and F in the AM and PM peak hours in the Build 2026 scenario with average vehicle delays of over 3 minutes per vehicle and 95th percentile queues of over 1,000 feet during the PM peak hour. In the Build 2026 Alternate scenario the southbound approach is projected to operate at LOS A and B, however the eastbound left turn movement is projected to operate at LOS F and A in the AM and PM peak hours. Average vehicle delays for the left turn movement are projected to be over 90 seconds per vehicle with 95th percentile queues of over 550 feet during the AM peak hour.

Apex staff recommendations:

- Apex staff recommends consideration of officer control in addition to the recommendations in the TIA. Alternative intersection design such as a roundabout may also improve operations.

Thriftwood Drive / Reunion Creek Parkway Extension at Connector Road (unsignalized)

Table 4. A.M. / P.M. Unsignalized Peak Hour Levels of Service Thriftwood Drive / Reunion Creek Parkway Extension at Connector Road	
	Build 2026 Alt
Overall	NA
Eastbound (Reunion Creek Parkway)	*A / A*[2]
Westbound (Thriftwood Drive)	*NA*
Southbound (Connector Road)	*A / C*[1]

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends construction of an unsignalized intersection in the Build 2026 Alternate scenario with free flow movements in the eastbound and westbound directions of travel and stop control on the southbound approach. The TIA recommends Thrifwood Drive and Reunion Creek Parkway to be constructed as two-lane two-way roadways in the east-west directions of travel and the Connector Road be constructed as a two-lane two-way road in the north-south directions of travel.

Apex staff recommendations:

- Apex staff concurs with the recommendation. The stop-controlled southbound approach is projected to operate at LOS A and C in the AM and PM peak hours with minimal delays.

E. Williams Street / N. Main Street at Sunset Lake Road / Old Smithfield Road (signalized)

Table 5. A.M. / P.M. Signalized Peak Hour Levels of Service E. Williams Street / N. Main Street at Sunset Lake Road / Old Smithfield Road				
	Existing 2020	**No Build 2026**	**Build 2026**	**Build 2026 Alt**
Overall	D / C	F / D	F / E	F / E
Eastbound (Old Smithfield Road)	*C / D*	*C / E*	*F / F*	*F / F*
Westbound (Sunset Lake Road)	*E / C*	*F / C*	*D / C*	*D / D*
Northbound (E. Williams Street/ N. Main Street)	*D / C*	*E / D*	*F / E*	*F / E*
Southbound (E. Williams Street)	*D / C*	*F / C*	*F / E*	*F / E*

TIA recommendations:

- In the Build 2026 scenario, the TIA recommends considering construction of an exclusive northbound right-turn lane with 500 feet of full-width storage and appropriate taper, and an exclusive westbound right-turn lane with 450 feet of full-width storage and appropriate taper. Additionally, the TIA recommends traffic signal modifications to accommodate new phasing. Despite these improvements the intersection is still projected to operate over capacity resulting in multiple approaches with LOS F and queue spillback during both AM and PM hours of operation. Average intersection delays are projected to be 187 seconds per vehicle in the AM peak hour and 61 seconds per vehicle in the PM peak hour.

- In the Build 2026 Alternate scenario, with the Reunion Creek Parkway extension, the TIA recommends considering construction of an exclusive northbound right-turn lane with 225 feet of full-width storage and appropriate taper, an exclusive westbound right-turn lane with 350 feet of full-width storage and appropriate taper, as well as traffic signal modifications to accommodate new phasing. Despite these improvements the intersection is still projected to operate over capacity resulting in multiple approaches with LOS F and queue spillback during both AM and PM hours of operation. Average intersection delays are projected to be 123 seconds per vehicle in the AM peak hour and 66 seconds per vehicle in the PM peak hour.

Apex staff recommendations:

- Apex staff recommends for consideration intersection widening to provide an additional through lane in the eastbound direction of travel (starting and ending 1,000 upstream and 1,200 downstream of the intersection with a lane drop at Commons Drive), and a dual southbound left turn lane with minimum 225 feet of storage on each lane and appropriate taper. The westbound right turn storage lane can be reduced to provide 400 feet of full width and appropriate taper, and the northbound right turn storage lane can be reduced to provide 200 feet of full width and appropriate taper. With these capacity improvements the intersection is projected to operate at LOS E in the AM peak hour with intersection delays of 74 seconds per vehicle, and LOS D in the PM peak hour with intersection delays of 41 seconds per vehicle. The proposed school development is projected to increase traffic volumes by 36% in the AM peak hour and 28% in the PM peak hour at this intersection. The improvements recommended for consideration by Town staff will minimize delays associated with development traffic per the UDO.

- In the case of the Reunion Creek Parkway extension, Apex staff recommends for consideration intersection widening to provide an additional through lane in the eastbound direction of travel (starting and ending 1,000 upstream and 1,200 downstream of the intersection with a lane drop at Commons Drive), a dual southbound left turn lane with minimum 225 feet of storage on each lane and appropriate taper, as well as the westbound and northbound right turn lanes recommended for consideration in the TIA. With these capacity improvements the intersection is projected to operate at LOS E in the AM peak hour with intersection delays of 66 seconds per vehicle, and LOS D in the PM peak hour with intersection delays of 42 seconds per vehicle. The proposed school development is projected to increase traffic volumes by 29% in the AM peak hour and 20% in the PM peak hour at this intersection. The improvements recommended for consideration by Town staff will minimize delays associated with development traffic per the UDO.

Sunset Lake Road at Stephenson Road

Table 6. A.M. / P.M. Peak Hour Levels of Service Sunset Lake Road at Stephenson Road				
	Unsignalized	**Signalized**		
	Existing 2020	**No Build 2026**	**Build 2026**	**Build 2026 Alt**
Overall	NA	B / B	F / F	D / C
Eastbound (Sunset Lake Road)	*A / A*[2]	*A / A*	*F / A*	*D / C*
Westbound (Sunset Lake Road)	*NA*	*B / B*	*F / E*	*E / C*
Southbound (Stephenson Road)	*E / E*[1]	*D / D*	*E / F*	*E / D*

1. Level of service for stop-controlled approaches.
2. Level of service for left turn movement on free-flowing approaches.

TIA recommendations:

- The TIA assumes a traffic signal will be installed by background development, as well as an eastbound left turn lane with 150 feet of storage and taper, a westbound right turn lane with 100 feet of storage and taper, and a southbound left turn lane with 250 feet of storage and taper. In addition to these improvements done by others, the TIA recommends considering construction of a second eastbound left-turn with maximum available length of full-width storage and appropriate taper to store a left turn vehicle queue 1,150 feet, a second northbound receiving lane on Stephenson Road with minimum 600 feet of full with storage and appropriate merge taper, extension of the westbound right-turn lane to 625 feet of full-width storage and appropriate taper, extension of the southbound left-turn lane to 525 feet of full-width storage and appropriate taper, as well as modifications to the traffic signal. Despite these improvements the intersection is still projected to operate at LOS F in both peak hours in the Build 2026 scenario with average intersection delays of 115 and 87 seconds per vehicle in the AM and PM peak hours.

- In the Build 2026 Alternate scenario, with the Reunion Creek Parkway extension, the TIA recommends considering construction of dual eastbound left-turn lanes with 475 feet of full-width storage and appropriate taper, a second northbound receiving lane with a minimum of 600 feet of full with storage and appropriate merge taper, extension of the westbound right-turn lane to 525 feet of full-width storage and appropriate taper, as well as modifications to the traffic signal. With these improvements the intersection is projected to operate at LOS D and C in the AM and PM peak hours with average intersection delays of 48 and 32 seconds per vehicle in the AM and PM peak hours.

Apex staff recommendations:

- Apex staff recommends for consideration the construction of a restricted conflict intersection (RCI) to handle the heavy eastbound left turn traffic volume (over 1,000 vehicles in the AM peak hour) while at the same time minimizing delays caused by school development traffic per the UDO. Utilizing the widened pavement section committed by others in the No Build scenario, the RCI would require construction of a signalized U-turn bulb 500 feet east of the Stephenson Road intersection (lined up with the proposed right-in, right-out of the future apartment complex) with dual eastbound U-turn lanes and a single eastbound through lane, as well as two westbound receiving lanes, with one of those lanes being a westbound through lane and the other one an exclusive westbound right turn lane that begins 150 feet east of the signalized U-turn bulb and continues as an add lane to the Stephenson Road intersection where it terminates as a channelized free-flow westbound right turn. The dual eastbound U-turn lanes need to be staggered to provide adequate capacity, with the inside lane having minimum 250 feet of storage and appropriate taper, and the outside U-turn lane beginning 150 feet west of the Stephenson Road intersection and extending east to the signalized U-turn bulb. In addition a second westbound right turn lane with 150 feet of full with storage and a northbound receiving lane with 600 feet of full with storage and appropriate merge taper is recommended. With these improvements the signalized U-turn bulb is projected to operate at LOS B and A with average vehicle delays of 20 and 6 seconds per vehicle, and the intersection of Stephenson Road and Sunset Lake Road is projected to operate at LOS B with average vehicle delays of 19 and 14 seconds per vehicle. Both intersections are projected to provide enough capacity to meet all of the traffic demand. The proposed school development is projected to increase traffic volumes by 45% in the AM peak hour and 37% in the PM peak hour at this intersection. The improvements recommended for consideration by Town staff will minimize delays associated with development traffic per the UDO.

- In the Build 2026 Alternate scenario, with the Reunion Creek Parkway extension, Apex Staff concurs with the recommendations in the TIA, provided that widening of the eastbound approach is feasible given the existing corridor constraints due to adjacent development.

E. Williams Street at Reunion Creek Parkway

Table 7. A.M. / P.M. Peak Hour Levels of Service E. Williams Street at Reunion Creek Parkway				
	Unsignalized			**Signalized**
	Existing 2020	**No Build 2026**	**Build 2026**	**Build 2026 Alt**
Overall	NA	NA	NA	D / C
Eastbound (Hope Community Church Driveway)	*E / D*[1]	*F / E*[1]	*F / F*[1]	*F / D*
Westbound (Reunion Creek Parkway)	*E / D*[1]	*F / E*[1]	*F / F*[1]	*F / D*
Northbound (E. Williams Street)	*A / A*[2]	*A / A*[2]	*A / A*[2]	*C / C*
Southbound (E. Williams Street)	*A / A*[2]	*A / A*[2]	*A / A*[2]	*D / B*

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

In the Build 2026 scenario, the TIA recommends no improvements at this intersection. In the Build 2026 Alternate scenario, with the Reunion Creek Parkway extension, traffic from the school site is projected to reroute to this intersection. The TIA recommends construction of an exclusive northbound right-turn lane with 225 feet of full-width storage and appropriate taper, and widening and marking of the westbound approach to accommodate a left-turn lane with 325 feet of full-width storage and appropriate taper, a right-turn lane with 450 feet of full-width storage and appropriate taper, and a through lane. Additionally the TIA recommends remarking of the southbound two-way left turn lane as far back as Straywhite Avenue to provide additional queue storage, and installation of a traffic signal. With these improvements the intersection is projected to operate at LOS D and C with overall intersection delays of 40 and 29 seconds per vehicle in the AM and PM peak hours.

Apex staff recommendations:

- Apex staff concur with the recommendations in the TIA for both Build 2026 and Build 2026 Alternate scenarios. In the Build 2026 scenario, school traffic will add more than 15% of overall traffic to the intersection in both peak hours on E. Williams Street, causing the minor street stop-controlled approaches to operate at LOS F in both peak hours, with delays on both eastbound and westbound approaches in excess of 300 seconds per vehicle in the AM peak hour. However, due to low traffic volumes on the minor street eastbound and westbound approaches, a traffic signal will most likely not be warranted.

- In the Build 2026 Alternate scenario, with Reunion Creek Parkway extension bringing school traffic to the westbound approach, a traffic signal will most likely be warranted, and is recommended for installation contingent on NCDOT approval. The southbound left turn queue is projected to stack beyond the intersection of Straywhite Avenue in the AM peak hour, however the two-way left turn lane on E. Williams Street provides enough storage capacity for the long left turn queue. It is anticipated that some of the Miramonte neighborhood traffic will reroute to the signalized intersection of Reunion Creek Parkway in the AM peak hour due to excessive left turn delays on Straywhite Avenue and potential intersection blockage from the left turn queue. The recommendation for the left turn and right turn storage lanes on Reunion Creek Parkway will provide adequate queue storage capacity even though both eastbound and westbound approaches are projected to operate at LOS F in the AM peak hour.

Smith Road at Stephenson Road

Table 8. A.M. / P.M. Unsignalized Peak Hour Levels of Service Smith Road at Stephenson Road				
	Existing 2020	**No Build 2026**	**Build 2026**	**Build 2026 Alt**
Overall	NA	NA	NA	NA
Eastbound (Stephenson Road)	*A / A[2]*	*A / A[2]*	*A / A[2]*	*A / A[2]*
Westbound (Stephenson Road)	*NA*	*NA*	*NA*	*NA*
Southbound (Smith Road)	*B / B[1]*	*C / C[1]*	*D / C[1]*	*D / C[1]*

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

The TIA does not recommend improvements at this intersection for both the Build 2026 and the Build 2026 Alternate scenarios.

Apex staff recommendations:

- Apex staff concur with the recommendations in the TIA for both Build 2026 and Build 2026 Alternate scenarios. The stop controlled southbound approach is projected to operate at LOS D or better in both the AM and PM peak hours under both scenarios, with southbound 95th percentile queues not exceeding 150 feet.

Carpool Queue Accommodations

The TIA estimated a need for 2,350 feet of internal stacking distance for student pick-up and drop-off. The TIA references a site plan that appears to provide 2,700 feet of stacking for carpool internal to the site. Therefore it appears the site plan adequately accommodates carpool traffic.

Please coordinate with the NCDOT District Engineer's Office concerning recommended improvements. Town staff will be available for meetings with NCDOT staff to discuss improvements on state maintained roadways as needed. All recommendations are subject to review by Town Council prior to approval.

Sincerely,

Serge Grebenschikov
Traffic Engineer
919-372-7448

ATTACHMENTS:

Figure 32: Recommended Improvements without Reunion Creek Parkway Extension (Modified to include Town of Apex Staff recommendations)

Figure 33: Recommended Improvements with Reunion Creek Parkway Extension (Modified to include Town of Apex Staff recommendations)

Figure 32: Recommended Improvements without Reunion Creek Parkway Extension

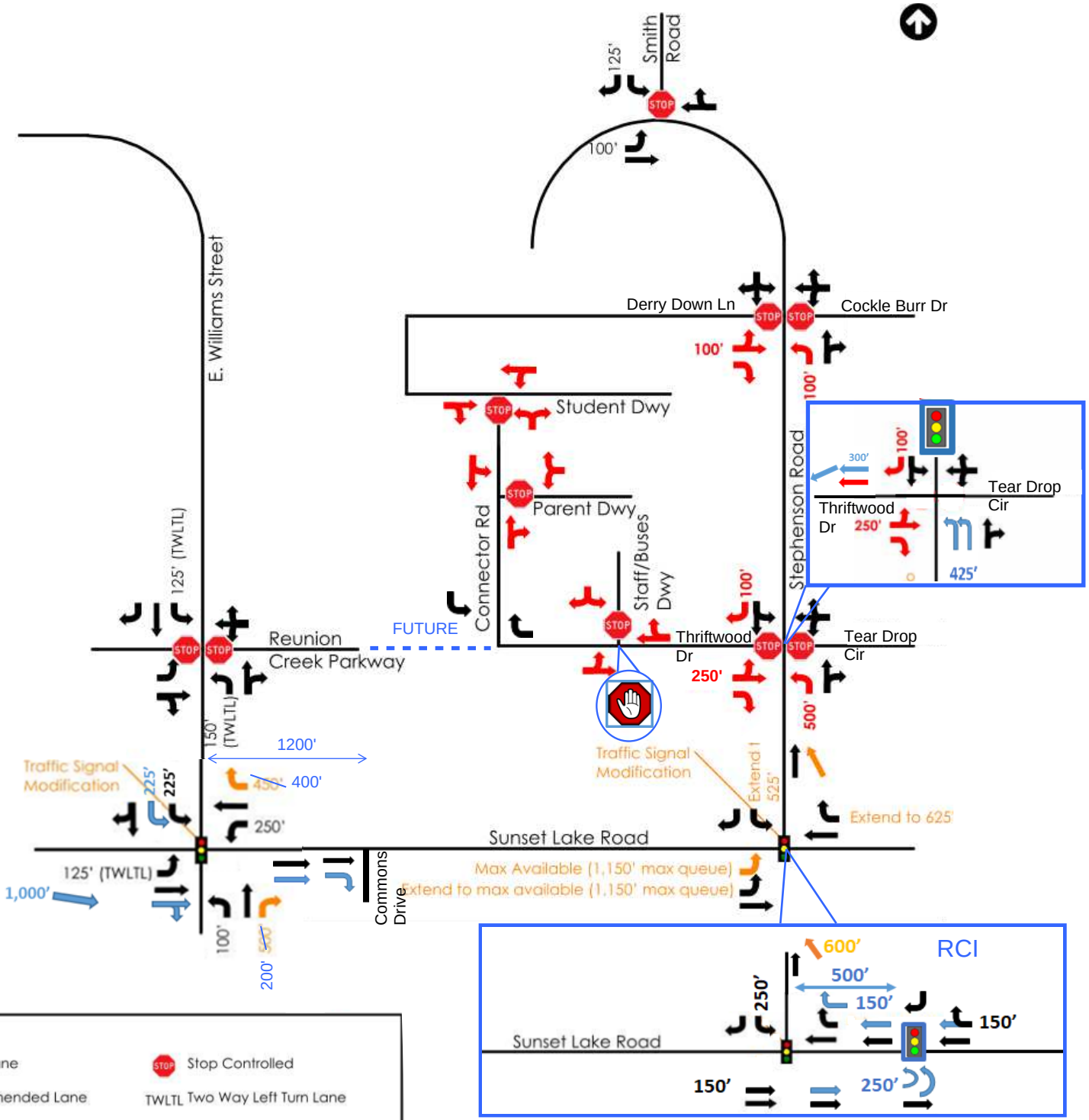
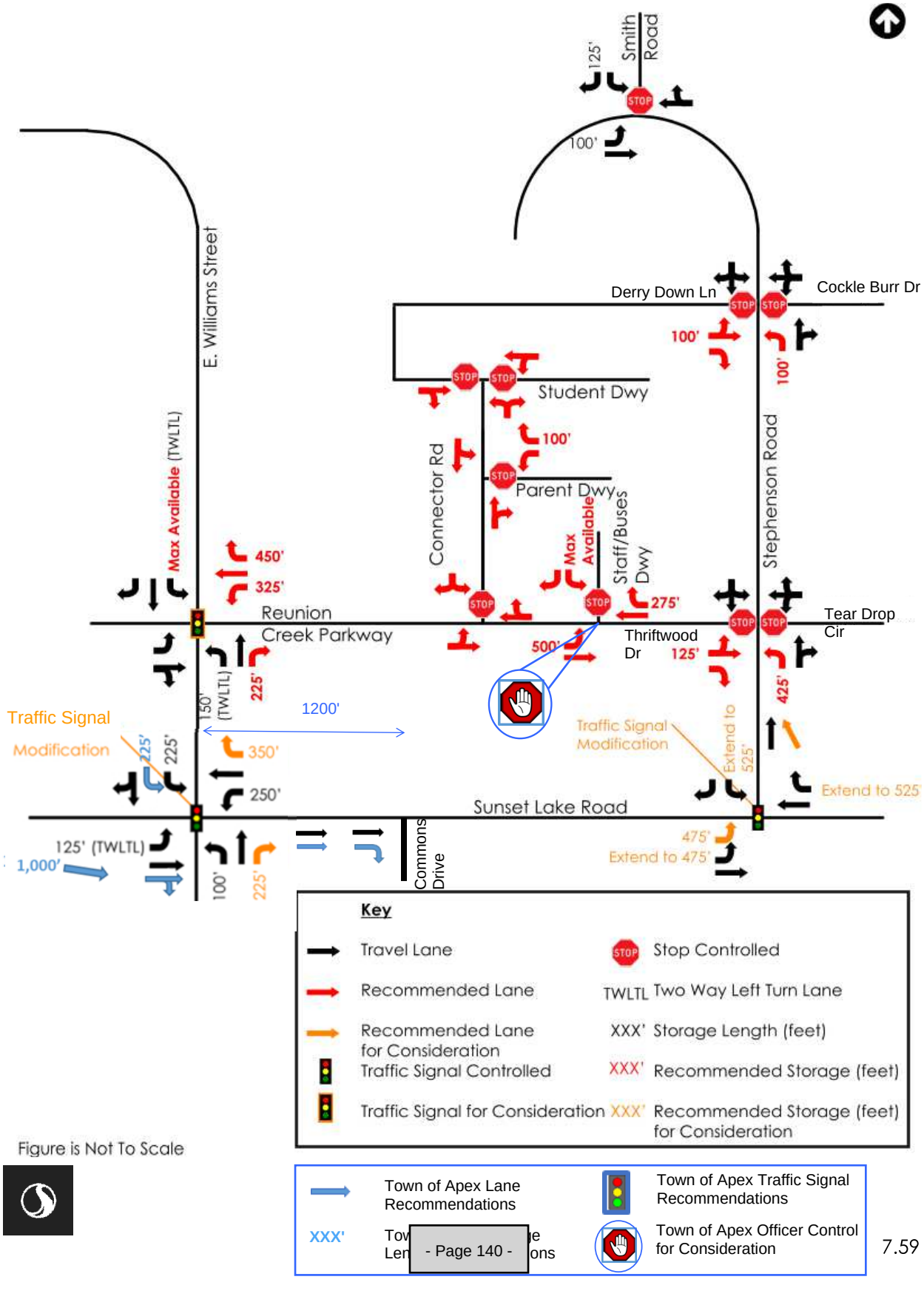


Figure 33: Recommended Improvements with Reunion Creek Parkway Extension



Colby Crossing
Miramonte
Merion Station Dr
Lianfair Ln
Merion
Smith Rd
Felton Grove High School
Harmony Glen
Summer Ridge Ct
Derry Down Ln
Briarwood Farms COSD
Westford Way
Stephenson Rd
Brook Cross Dr
Cherrystone Ln
Lynnford Dr
Briarwood Farms
Thriftwood Dr
Coralberry Cir
Holly Brook Dr
Indian Hills
Saponi Hills
Arrowhead Dr
Banview Ln
Fair Oaks
0
500
1,000
Feet
March, 2021
January 2021 Aerial Photography
Prepared by: Town of Apex Planning Department

MAJOR SITE PLAN APPLICATION INFORMATION

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Application #: _____ Submittal Date: 11/30/20

Fee Paid $ N/A Check # _____

Project Information

Project Name: Felton Grove High School (H-12)

Address: 8550 Stephenson Road, Apex, NC 27539

Property PIN: 0750545646

Acreage: 68.06 Zoning MD-CZ

Town Limits: ☐ Inside corporate limits ☑ In ETJ ☐ *Outside corporate limits and ETJ

For Non-residential Developments

Total number of buildings: 6 total buildings Number of floors: HS- 3 floor, remaining buildings 1 floor

Total square footage of all buildings: 399,671 SF

For Residential Developments

Number of multi-family units: N/A Number of floors: N/A

Applicant Information

Name: Renee Pfeifer

Address: 400 Regency Forest Drive, Suite 120

City: Cary State: NC Zip: 27518

Phone: 919-319-6716 Email: rpfeifer@clhdesignpa.com

Owner Information

Name: Wake County board of Education (ATTN: AnnaMaria Taylor, Senior Facility Planner)

Address: 5625 Dillard Drive, Crossroad Building 1

City: Cary State: NC Zip: 27518

Phone: 919-588-3602 Email: amtaylor@wcpss.net

Attorney Information

Name: Kenneth C. Haywood- Howard, Stalling, From, Atkins, Angell & Davis, P.A.

Address: 5410 Trinity Road, Suite 210

City: Raleigh State: NC Zip: 27605

Phone: 919-821-7700 Email: khaywood@hsfh.com

Engineer Information

Name: CLH Design, P.A.

Address: 400 Regency Forest Drive, Suite 120

City: Cary State: NC Zip: 27518

Phone: 919-319-6716 Email: rpfeifer@clhdesignpa.com

CERTIFIED LIST OF NEIGHBORING PROPERTY OWNERS

Application #: _____ Submittal Date: _____

Provide a certified list of property owners subject to this application and all property owners within 300' of the subject property and HOA Contacts.

	Owner's Name	PIN
1.	See attached list of property owners and HOA contacts	
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		

I, AnnaMaria Taylor, certify that this is an accurate listing of all property owners and property owners within 300' of the subject property.

Date: 11·20·2020 By: _____

COUNTY OF WAKE STATE OF NORTH CAROLINA

Sworn and subscribed before me, SCOTT D LOWDER, a Notary Public for the above State and County, on this the 20th day of November, 20 20.

SCOTT D. LOWDER SEAL Notary Public Rowan County NORTH CAROLINA

_____
Notary Public

SCOTT D. LOWDER
Print Name

My Commission Expires: 4-24-21

# of Property Owners	PIN	Real Estate ID	Owner	Mail Address 1	Mail Address 2	Site Address
1	0750441182	069355	CURRIN BROS INC	PO BOX 547	FUQUAY VARINA NC 27526-0547	4237 SUNSET LAKE RD
2	0750456175	109150	REVOCABLE LIVING TRUST OF DENNIS MCCOY & RANDY GARREN	8537 SMITH RD	APEX NC 27539-8169	8549 SMITH RD
3	0750456507	109149	CHAMBLEE, DAVIS B. CHAMBLEE, LEANNE M.	8509 SMITH RD	APEX NC 27539-8169	8509 SMITH RD
4	0750466110	107588	SCOTT, RONALD D. SCOTT, MELODY S.	8429 SMITH RD	APEX NC 27539-8181	8429 SMITH RD
5	0750466564	109146	EMERY, JASON G. EMERY, JOANNA L.	8409 SMITH RD	APEX NC 27539-8181	8409 SMITH RD
6	0750538989	130746	DEW, JOHNNIE M. DEW, BESSIE W.	4712 JOSEPH MICHAEL CT	RALEIGH NC 27606-9646	4636 ARROWHEAD DR
8	0750549090	130747	DEW, BESSIE W.	4712 JOSEPH MICHAEL CT	RALEIGH NC 27606-9646	4632 ARROWHEAD DR
9	0750576147	107587	DEAN, JOSEPH W. DEAN, CHRISTINE W.	8317 SMITH RD	APEX NC 27539-8179	8317 SMITH RD
10	0750631918	130748	DEW, BESSIE W.	4712 JOSEPH MICHAEL CT	RALEIGH NC 27606-9646	4628 ARROWHEAD DR
11	0750632916	130749	DEW, BESSIE W.	4712 JOSEPH MICHAEL CT	RALEIGH NC 27606-9646	4624 ARROWHEAD DR
12	0750633913	130750	DEW, BESSIE W.	4712 JOSEPH MICHAEL CT	RALEIGH NC 27606-9646	4620 ARROWHEAD DR
13	0750634925	130751	DEW, BESSIE W.	4712 JOSEPH MICHAEL CT	RALEIGH NC 27606-9646	4616 ARROWHEAD DR
14	0750642452	175263	BRIARTAC FAMILY LLC Attn: TONYA C. CUMALANDER, TRUSTEE	PO BOX 1055	FUQUAY VARINA NC 27526-1055	3012 THRIFTWOOD DR
15	0750643379	159768	AQUA NORTH CAROLINA, INC.	202 MACKENAN DR	CARY NC 27511-6447	3008 THRIFTWOOD DR
16	0750644717	159766	AQUA NORTH CAROLINA, INC.	202 MACKENAN DR	CARY NC 27511-6447	3016 THRIFTWOOD DR
17	0750646366	159769	BRIARTAC FAMILY LLC Attn: TONYA C. CUMALANDER, TRUSTEE	PO BOX 1055	FUQUAY VARINA NC 27526-1055	3004 THRIFTWOOD DR
18	0750652582	159767	BRIARTAC FAMILY LLC Attn: TONYA C. CUMALANDER, TRUSTEE	PO BOX 1055	FUQUAY VARINA NC 27526-1055	0 THRIFTWOOD DR
19	0750657552	067494	BRIARTAC FAMILY LLC Attn: TONYA C. CUMALANDER, TRUSTEE	PO BOX 1055	FUQUAY VARINA NC 27526-1055	3468 CHERRYSTONE LN
20	0750663067	159765	AQUA NORTH CAROLINA, INC.	202 MACKENAN DR	CARY NC 27511-6447	5049 DERRY DOWN LN
21	0750664237	159756	BRIARTAC FAMILY LLC Attn: TONYA C. CUMALANDER, TRUSTEE	PO BOX 1055	FUQUAY VARINA NC 27526-1055	5052 DERRY DOWN LN
22	0750665132	159763	BRIARTAC FAMILY LLC Attn: TONYA C. CUMALANDER, TRUSTEE	PO BOX 1055	FUQUAY VARINA NC 27526-1055	5045 DERRY DOWN LN
23	0750665218	159755	BRIARTAC FAMILY LLC Attn: TONYA C. CUMALANDER, TRUSTEE	PO BOX 1055	FUQUAY VARINA NC 27526-1055	5048 DERRY DOWN LN
24	0750665398	159753	BRIARTAC FAMILY LLC Attn: TONYA C. CUMALANDER, TRUSTEE	PO BOX 1055	FUQUAY VARINA NC 27526-1055	5040 LORRY LN
25	0750665475	159752	BRIARTAC FAMILY LLC Attn: TONYA C. CUMALANDER, TRUSTEE	PO BOX 1055	FUQUAY VARINA NC 27526-1055	5036 LORRY LN
26	0750665745	284548	HARMONY GLEN HOMEOWNERS ASSOC INC	3921 SUNSET RIDGE RD., STE. 201	RALEIGH NC 27607-6679	0 RHYTHM DR
27	0750666104	159762	BRIARTAC FAMILY LLC Attn: TONYA C. CUMALANDER, TRUSTEE	PO BOX 1055	FUQUAY VARINA NC 27526-1055	5041 DERRY DOWN LN
28	0750666219	159754	BRIARTAC FAMILY LLC Attn: TONYA C. CUMALANDER, TRUSTEE	PO BOX 1055	FUQUAY VARINA NC 27526-1055	5044 DERRY DOWN LN

AGENT AUTHORIZATION FORM

Application #: _____ Submittal Date: _____

Wake County Board of Education is the owner* of the property for which the attached application is being submitted:

- ☐ Land Use Amendment
- ☐ Rezoning: For Conditional Zoning and Planned Development rezoning applications, this authorization includes express consent to zoning conditions that are agreed to by the Agent which will apply if the application is approved.
- ☑ Site Plan
- ☐ Subdivision
- ☐ Variance
- ☐ Other: _____

The property address is: 8550 Stephenson Road, Apex, NC 27539

The agent for this project is: CLH Design, P.A.

☐ I am the owner of the property and will be acting as my own agent

Agent Name: Renee Pfeifer, CLH Design, P.A.

Address: 400 Regency Forest Drive, Suite 120, Cary, NC 27518

Telephone Number: 919-319-6716

E-Mail Address: rpfeifer@clhdesignpa.com

Signature(s) of Owner(s)*

David Neter / Chief Business Officer 11/23/2020

Type or print name Date

Type or print name Date

Attach additional sheets if there are additional owners.

*Owner of record as shown on the latest equalized assessment rolls of Wake County. An option to purchase does not constitute ownership. If ownership has been recently transferred, a copy of the deed must accompany this authorization.

Pursuant to Article 40 of Chapter 66 of the North Carolina General Statutes (the Uniform Electronic Transactions Act) this application and all documents related hereto containing an electronic or digitized signature are legally binding in the same manner as are hard copy documents executed by hand signature. The parties hereby consent to use electronic or digitized signatures in accordance with the Town's Electronic Signature Policy and intend to be bound by the application and any related documents. If electronic signatures are used the application shall be delivered in an electronic record capable of retention by the recipient at the time of receipt.

AFFIDAVIT OF OWNERSHIP

Application #: _____ Submittal Date: _____

The undersigned, David Neter (the "Affiant") first being duly sworn, hereby swears or affirms as follows:

1. Affiant is over eighteen (18) years of age and authorized to make this Affidavit. The Affiant is the sole owner, or is the authorized agent of all owners, of the property located at 8550 Stephenson Road, Apex, NC 27539 and legally described in **Exhibit "A"** attached hereto and incorporated herein (the "Property").

2. This Affidavit of Ownership is made for the purpose of filing an application for development approval with the Town of Apex.

3. If Affiant is the owner of the Property, Affiant acquired ownership by deed, dated September 15, 2016, and recorded in the Wake County Register of Deeds Office on September 16, 2016, in Book 016534 Page 00550-0054.

4. If Affiant is the authorized agent of the owner(s) of the Property, Affiant possesses documentation indicating the agency relationship granting the Affiant the authority to apply for development approval on behalf of the owner(s).

5. If Affiant is the owner of the Property, from the time Affiant was deeded the Property on September 16, 2016, Affiant has claimed sole ownership of the Property. Affiant or Affiant's predecessors in interest have been in sole and undisturbed possession and use of the property during the period of ownership. Since taking possession of the Property on September 16, 20216, no one has questioned Affiant's ownership or right to possession nor demanded any rents or profits. To Affiant's knowledge, no claim or action has been brought against Affiant (if Affiant is the owner), or against owner(s) (if Affiant is acting as an authorized agent for owner(s)), which questions title or right to possession of the property, nor is any claim or action pending against Affiant or owner(s) in court regarding possession of the Property.

This the 23 day of November, 2020.

_____ (seal)
David Neter
Type or print name

STATE OF NORTH CAROLINA
COUNTY OF _____

I, the undersigned, a Notary Public in and for the County of Wake, hereby certify that David Neter, Affiant, personally known to me or known to me by said Affiant's presentation of said Affiant's _____, personally appeared before me this day and acknowledged the due and voluntary execution of the foregoing Affidavit.

SHARON M. FERGUSON
Notary Public, North Carolina
Wake County
My Commission Expires
7-31-24

[NOTARY SEAL]

Sharon M. Ferguson
Notary Public
State of North Carolina
My Commission Expires: July 31, 2024

Last Updated: August 30, 2019

AFFIDAVIT OF OWNERSHIP: EXHIBIT A – LEGAL DESCRIPTION

Application #: _____ Submittal Date: _____

Insert legal description below.

See attached documents.

WAKE COUNTY, NC 101
LAURA M RIDDICK
REGISTER OF DEEDS
PRESENTED & RECORDED ON
09/16/2016 13:00:28

BOOK:016534 PAGE:00550 - 00554

NORTH CAROLINA NON-WARRANTY DEED

Excise Tax: $0.00

Parcel Identifier No. 0018131

Mail/Box to: BBGH Box #27

This instrument was prepared by: Barringer Sasser, LLP (Grantee's legal counsel)

Brief description for the Index: 68.07 acres, White Oak Twp., Wake County, NC

THIS DEED made this 15th day of September, 2016, by and between

GRANTOR	GRANTEE
MERION INVESTMENT PROPERTIES, LLC, a North Carolina limited liability company	**WAKE COUNTY BOARD OF EDUCATION**
114 Birklands Drive Cary, North Carolina 27518	Facilities Building 1551 Rock Quarry Road Raleigh, North Carolina 27610 Attn: Betty L. Parker, Real Estate Services Senior Director

Enter in appropriate block for each Grantor and Grantee: name, mailing address, and, if appropriate, character of entity, e.g. corporation or partnership.

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto

the Grantee in fee simple, all that certain lot or parcel of land (the "Subject Property") situated in Wake County, North Carolina and more particularly described as follows:

See Exhibit A attached hereto and hereby incorporated by reference.

The Subject Property described herein was acquired by Grantor by instruments recorded in Book 11544, Page 1153, and Book 11544, Page 1156, both of the Wake County Registry.

Grantor states that no portion of the property herein conveyed includes the primary residence of any Grantor.

TO HAVE AND TO HOLD the aforesaid lot or parcel of land and all privileges and appurtenances thereto belonging to the Grantee in fee simple.

The Grantor makes no warranty, express or implied, as to title to the property hereinabove described.

IN WITNESS WHEREOF, the Grantor has caused this instrument to be executed by its duly authorized Manager as of the day and year first above written.

Grantor:

Merion Investment Properties, LLC, a North Carolina limited liability company

By: MFW Investments, LLC, a North Carolina limited liability company,
Duly Authorized Manager of Merion Investment Properties, LLC

By: _____
Michael F. Whitehead, duly authorized Manager of MFW Investments, LLC

Notary acknowledgements on following page.

STATE OF NORTH CAROLINA
COUNTY OF WAKE

I, Ann L. Harper, a Notary Public of the County of Wake, State of North Carolina, certify that Michael F. Whitehead, personally known to me, personally appeared before me this day and acknowledged that he is the duly authorized Manager of MFW Investments, LLC, a North Carolina limited liability company, which is a Manager and Member of Merion Investment Properties, LLC, a North Carolina limited liability company, and further acknowledged the due and voluntary execution of the foregoing instrument for and on behalf of Merion Investment Properties, LLC.

Witness my hand and official stamp or seal, this 15th day of September, 2016.

Ann L. Harper
Notary Public, Signature
My Commission Expires: 8/8/21

ANN L. HARPER NOTARY PUBLIC WAKE COUNTY, N.C.

EXHIBIT A

BEING all of that certain tract or parcel of land containing 68.07 acres, lying and being in Wake County, North Carolina and being bounded on the North by the property of Dean (Book 2600, Page 666, Wake County Registry); on the East by the properties (now or formerly) of Briartac Family, LLC (Book 13812, Page 334, Wake County Registry), Derry Down Lane (Book of Maps 1986, Page 2149, Wake County Registry), Aqua North Carolina, Inc. (Book 13347, Page 76, Wake County Registry), and Thriftwood Drive (Book of Maps 1986, Page 2149, Wake County Registry); on the South by Lots 18-21, Indian Hills Subdivision (Book of Maps 1983, Page 1064, Wake County Registry), and the property of Currin Bros., Inc. (Book 6000, Page 178, Wake County Registry); and on the West by the properties of Currin Bros., Inc. (Book 6000, Page 178, Wake County Registry), Revocable Living Trust of Denis McCoy and Randy Garren (Book 13020, Page 135, Wake County Registry), Chamblee (Book 14545, Page 1437, Wake County Registry), Scott (Book 2689, Page 470, Wake County Registry), and Emery (Book 10299, Page 2534, Wake County Registry) and being more particularly described as follows:

BEGINNING in the northeasternmost corner of the Subject Property at an existing iron shank located at NC Grid Coordinates N 706,561.29, E 2,0562.69.25 and thence proceeding South 00 degrees 52 minutes 35 seconds West 2337.35 feet to an iron pipe found; thence proceeding South 86 degrees 51 minutes 55 seconds West 1224.69 feet to an iron pipe found; thence proceeding North 02 degrees 02 minutes 41 seconds West 632.90 feet to a stump found; thence proceeding North 01 degrees 20 minutes 47 seconds East1795.04 feet to an iron pipe found; thence proceeding South 88 degrees 56 minutes 13 seconds East 1239.22 feet to the POINT AND PLACE OF BEGINNING, All as shown on that certain Boundary and Wetlands Map prepared by WithersRavenel dated July 22, 2016.

WAKE COUNTY PUBLIC SCHOOL SYSTEM

Facilities Design and Construction Department

October 30, 2020

Dear Property Owner-

The Wake County Public School System is planning a new High School located at 8550 Stephenson Road near Sunset Lake Road in Apex as part of the Continuous Capital Improvement Program. The purpose of this letter is to invite you to a neighborhood meeting to discuss a major site plan being proposed for the New Felton Grove High School project. Included is a Vicinity Map, a Site Plan, a Project Contact Information document and a list of Common Construction Issues and Who to Call for your reference.

Please note, this is not a public hearing. Notice for the public hearing will be sent at a later date by the Town of Apex.

.

Meeting Scheduled

A public meeting has been scheduled in order for us to share our plans and for neighbors to offer comments and ask questions. This meeting has been scheduled for Wednesday, November 18th, 2020 from 5:00 – 7:00 PM. Due to Covid19 circumstances and recommended precautions, we will be holding a virtual meeting ONLY. The link to the meeting is as follows:

Microsoft Teams meeting

Join on your computer or mobile app
Click here to join the meeting
Or call in (audio only)
+1 773-917-5169,,760742360# United States, Chicago
Phone Conference ID: 760 742 360#
Find a local number | Reset PIN
Learn More | Meeting options

Please let me know if you have any questions or concerns. Thank you.

AnnaMaria Taylor AIA + NCARB
Senior Facility Planner
amtaylor@wcpss.net

NEIGHBORHOOD MEETING SIGN-IN SHEET

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Meeting Address: Virtual- TEAMS Meeting

Date of meeting: Wednesday, November 18, 2020 Time of meeting: 5:00 pm to 7:00 pm

Property Owner(s) name(s): Wake County Board of Education

Applicant(s): Renee C. Pfeifer, PLA, CLH Design, P.A.

Please print your name below, state your address and/or affiliation with a neighborhood group, and provide your phone number and email address. Providing your name below does not represent support or opposition to the project; it is for documentation purposes only.

	NAME/ORGANIZATION	ADDRESS	PHONE #	EMAIL	SEND PLANS & UPDATES
1.	VIRTUAL ATTENDEES				
2.	Jason Emery	8409 Smith Road, Apex, nc			
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					

Use additional sheets, if necessary.

SUMMARY OF DISCUSSION FROM THE NEIGHBORHOOD MEETING

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Property Owner(s) name(s): Wake County Board of Education

Applicant(s): Renee C. Pfeifer, PLA, CLH Design.P.A.

Contact information (email/phone): rpfeifer@clhdesignpa.com / 919-319-6716

Meeting Address: Virtual TEAMS Meeting

Date of meeting: Wednesday, November 18. 2020 Time of meeting: 5:00 pm to 7:00 pm

Please summarize the questions/comments and your response from the Neighborhood Meeting in the spaces below (attach additional sheets, if necessary). Please state if/how the project has been modified in response to any concerns. The response should not be "Noted" or "No Response". There has to be documentation of what consideration the neighbor's concern was given and justification for why no change was deemed warranted.

Question/Concern #1:
See Attached.

Applicant's Response:

Question/Concern #2:
See Attached.

Applicant's Response:

Question/Concern #3:
See Attached.

Applicant's Response:

Question/Concern #4:
See Attached.

Applicant's Response:

SUMMARY DISCUSSION FROM THE FELTON GROVE HIGH SCHOOL NEIGHBORHOOD MEETING:

Question/Concern #1:

Will there be any sort of fencing around the property?

Applicant's Response:

- The entire property will not be fenced. There will be fencing around specific areas of the school. There will also be fencing on top of the retaining walls.
- The areas that will be fenced will be the stadium area and the baseball area. The entire perimeter of the site will not be fenced.
- There will be retaining walls on this site and all the retaining walls will have safety rail fencing on top of them.
- We also have a tree buffer on this site and those trees will remain or be planted back. They will provide a buffer between this site and the adjacent residential properties

Question/Concern #2:

Mr. Emery is worried about children using the woods in an inappropriate way between the athletic fields and his property.

Applicant's Response:

- We do have a retaining wall between the athletic fields and Mr. Emery's property. That wall will have a fence on top of it. The entire stadium area will be fenced, and there is a significant slope as well as a 100' buffer on both sides of the stream between the high school property and the Emery property.

Question/Concern #3:

Currently Mr. Emery's property is zoned within the county. Will this site and adjacent properties have their zoning affected?

Applicant's Response:

- The high school property is located within Apex's ETJ and this project site will be annexed into the Town and rezoned, but no adjacent properties will be rezoned.

Question/Concern #4:

Stephenson Road is already congested. What does the school system plan to do to alleviate this?

Applicant's Response:

- The apex/holly springs boundary is south of the site on Stephenson and there is a future project planned to install a stoplight at the intersection of Stephenson road and Sunset Lake road.
- We've collected data that was available and tried to collect as much data as possible prior to COVID to finalize our TIA.
- We are currently putting the final touches on our Traffic analysis and this will be submitted to NCDOT and the Town. Then the Town and NCDOT will look at that report and decide what

improvements are necessary. Our anticipation is to provide enough stacking so that traffic does not back up on to Stephenson road from our site.

Question/Concern #5:

The intersection of Smith Road and Ten Ten is very congested. Would suggest we look at this intersection as well.

Applicant's Response:

- This intersection has been included in the traffic analysis.

Question/Concern #6:

What is the project schedule?

Applicant's Response:

- Construction will begin spring of 2022 and completed in August of 2024.
- This school will not be used as swing space for another school.
- For the first year the high school will be at ½ capacity. There will be no student drivers and the school will not be at full capacity until the third year.

Question/Concern #7:

Mr. Emery's biggest concern is people coming onto his property from the athletic facility.

Applicant's Response:

- WCPSS will provide the principals name and contact information to the adjacent neighbors in case issues arise when school is in session.

Question/Concern #8:

Where will utilities be coming from?

Applicant's Response:

- The waterline will come down Smith road and Sanitary sewer will be routed through the stump dump and to the South along Middle Creek and tie into an existing pump station along Sunset Lake road.

Question/Concern #9:

Where will construction traffic access the site?

Applicant's Response:

- Most of the construction traffic will access via Thriftwood. But both Derry Downs and Thriftwood are available to the contractor to use.

Question/Concern #10:

Would Mr. Emery be able to get municipal water from the town if he chooses?

Applicant's Response:

- Yes, this would be available for the adjacent residents. He would need to contact the Town of Apex to coordinate this.

Question/Concern #11:

If there's no sewer available would Mr. Emery still be able to get municipal water?

Applicant's Response:

- We believe so, but he would need to coordinate with the Town to verify.

AFFIDAVIT OF CONDUCTING A NEIGHBORHOOD MEETING, SIGN-IN SHEET AND ISSUES/RESPONSES SUBMITTAL

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

I, AnnaMaria Taylor, do hereby declare as follows:
Print Name

1. I have conducted a Neighborhood Meeting for the proposed Rezoning, Major Site Plan, Master Subdivision Plan, or Special Use Permit in accordance with UDO Sec. 2.2.7 *Neighborhood Meeting*.

2. The meeting invitations were mailed to the Apex Planning Department, all property owners within 300 feet of the subject property and any neighborhood association that represents citizens in the area via first class mail a minimum of 10 days in advance of the Neighborhood Meeting.

3. The meeting was conducted at Virtual- TEAMS Meeting (location/address) on Wednesday, November 18, 2020 (date) from 5:00 pm (start time) to 7:00 pm (end time).

4. I have included the mailing list, meeting invitation, sign-in sheet, issue/response summary, and zoning map/reduced plans with the application.

5. I have prepared these materials in good faith and to the best of my ability.

11·20·2020
Date

By: AnnaMaria Taylor

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, SCOTT D LOWDER a Notary Public for the above State and County, on this the 20th day of NOVEMBER, 20 20.

SCOTT D LOWDER
Notary Public
Rowan County
NORTH CAROLINA

Notary Public
SCOTT D LOWDER
Print Name

My Commission Expires: 4-24-21

H-12- Felton Grove High School Property

N

0 320 640 1,280 ft

1 inch = 600 feet

Disclaimer

*iMaps makes every effort to produce and publish the most current and accurate information possible. However, the maps are produced for information purposes, and are **NOT** surveys. No warranties, expressed or implied ,are provided for the data therein, its use,or its interpretation.*

LEGEND

1. NEW MAJOR COLLECTOR ROAD
2. PARENT DROP-OFF
3. ADMIN. ENTRY
4. BUS DROP-OFF
5. BUS STAGING
6. SERVICE AREA
7. PARKING DECK (STUDENT PARKING)
8. STAFF PARKING
9. STUDENT PARKING
10. MULTI-PURPOSE FIELD
11. TENNIS COURTS
12. VOLLEYBALL
13. SOFTBALL FIELD
14. BASEBALL FIELD
15. STADIUM
16. ATHLETICS PLAZA
17. PEDESTRIAN BRIDGE
18. STREAM CROSSING
19. COURTYARD
20. STORMWATER CONTROL MEASURE

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SITE PLAN | RATIO

PROJECT CONTACT INFORMATION

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Development Contacts:

Project Name: H-12 Felton Grove High School Zoning: MD-CZ

Location: 8550 Stephenson Road

Property PIN(s): 0750-54-5646 Acreage/Square Feet: 66.48 acres

Property Owner: Wake County Board of Education

Address: 111 Corning Road, Suite 100

City: Cary State: NC Zip: 27518

Phone: 919-588-3602 Email: amtaylor@wcpss.net

Developer: Wake County Board of Education

Address: 111 Corning Road, Suite 190

City: Cary State: NC Zip: 27518

Phone: 919-588-3602 Fax: N/A Email: amtaylor@wcpss.net

Engineer: CLH Design, P.A.

Address: 400 Regency Forest Drive, Suite 120

City: Cary State: NC Zip: 27518

Phone: 919-319-6716 Fax: N/A Email: rpfeifer@clhdesignpa.com

Builder (if known): Clancy & Theys Construction Company

Address: 516 W Cabarrus St.

City: Raleigh State: NC Zip: 27603

Phone: 919-834-3601 Fax: N/A Email: robertanweiler@clancytheys.com

Please note that Town staff will not have complete information about a proposed development until the application is submitted for review. If you have a question about Town development standards and how they relate to the proposed development, please contact the appropriate staff person listed below.

Town of Apex Department Contacts

Planning Department Main Number (Provide development name or location to be routed to correct planner)	(919) 249-3426
Parks, Recreation & Cultural Resources Department Angela Reincke, Parks Planner	(919) 249-7468
Public Works - Transportation Russell Dalton, Senior Transportation Engineer	(919) 249-3358
Water Resources Department Jessica Bolin, Senior Engineer (Stormwater, Sedimentation & Erosion Control) Stan Fortier, Senior Engineer (Stormwater, Sedimentation & Erosion Control) James Gregg, Utility Engineer (Water & Sewer)	 (919) 249-3537 (919) 249-1166 (919) 249-3324
Electric Utilities Division Rodney Smith, Electric Technical Services Manager	(919) 249-3342

Providing Input to Town Council:

Each Town Council meeting agenda includes a Public Forum time when anyone is permitted to speak for three (3) minutes on any topic with the exception of items listed as Public Hearings for that meeting. The Town Council meets on the 1st and 3rd Tuesdays of each month at 6:00 p.m. (except for holidays, see schedule of meetings at http://www.apexnc.org/838/Agendas-Minutes). You may also contact Town Council by e-mail at AllCouncil@apexnc.org.

Private Agreements and Easement Negotiation:

The Town of Apex cannot enforce private agreements between developers and neighbors and is not a party to the easement and right-of-way negotiation that occurs between developers and neighboring property owners for easements or rights-of-way that are necessary to build the project.

It is recommended that all private agreements be made in writing and that if a property owner feels it necessary, they should obtain private legal counsel in order to protect their interests in both private agreements and during easement negotiations. The only conditions that the Town of Apex can enforce are those conditions that are made a part of the conditional zoning of the property by agreement of the developer and the Town.

As an example, if a developer offers to build a fence for a neighbor to mitigate some impact, the Town can only enforce the construction of the fence if the fence becomes a condition of the rezoning. This would occur by the developer offering the condition as part of their conditional zoning application package or at the Town Council public hearing on the conditional zoning and the Town accepting it as a condition. Private agreements regarding a fence being constructed will not be enforced by the Town.

To request that any agreement with a developer is made a part of the conditional zoning at the time of approval, you may ask at the Town Council public hearing if the agreement is included in the conditions. If it is not, you may request that the Town Council not approve the rezoning without the agreement being included in the conditions (note that it is up to Town Council whether to approve or deny the rezoning but they cannot impose conditions that the applicant does not agree to add). The developer's proposed conditions can be viewed any time after a rezoning is submitted on the Interactive Development Map at: http://apexnc.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=fa9ba2017b784030b15ef4da27d9e795

Documentation:

Neighbors to a requested new development and/or rezoning are strongly encouraged to fully document (such as through dated photographs) the condition of their property before any work is initiated for the new development. Stormwater controls installed on developed property are not designed to and will likely not remove 100% of the soil particles transported by stormwater runoff. As a result, creeks and ponds could become cloudy for a period of time after rain events.

COMMON CONSTRUCTION ISSUES & WHO TO CALL

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Noise & Hours of Construction:	**Non-Emergency Police**	**919-362-8661**

Noise from tree removal, grading, excavating, paving, and building structures is a routine part of the construction process. The Town generally limits construction hours from 7:00 a.m. to 8:30 p.m. so that there are quiet times even during the construction process. Note that construction outside of these hours is allowed with special permission from the Town when it makes more sense to have the construction occur at night, often to avoid traffic issues. In addition, the Town limits hours of blasting rock to Monday through Friday from 8:00 a.m. to 5:00 p.m. Report violations of construction hours and other noise complaints to the Non-Emergency Police phone number at 919-362-8661.

Construction Traffic:	**James Misciagno**	**919-372-7470**

Construction truck traffic will be heavy throughout the development process, including but not limited to removal of trees from site, loads of dirt coming in and/or out of the site, construction materials such as brick and wood brought to the site, asphalt and concrete trucks come in to pave, etc. The Town requires a construction entrance that is graveled to try to prevent as much dirt from leaving the site as possible. If dirt does get into the road, the Town can require they clean the street (see "Dirt in the Road" below).

Road Damage & Traffic Control:	**Water Resources – Infrastructure Inspections**	**919-362-8166**

There can be issues with roadway damage, roadway improvements, and traffic control. Potholes, rutting, inadequate lanes/signing/striping, poor traffic control, blocked sidewalks/paths are all common issues that should be reported to Water Resources – Infrastructure Inspections at 919-249-3427. The Town will get NCDOT involved if needed.

Parking Violations:	**Non-Emergency Police**	**919-362-8661**

Unless a neighbor gives permission, there should be no construction parking in neighbors' driveways or on their property. Note that parking in the right-of-way is allowed, but Town regulations prohibit parking within 15 feet of driveways so as not to block sight triangles. Trespassing and parking complaints should be reported to the Non-Emergency Police phone number at 919-362-8661.

Dirt in the Road:	**James Misciagno**	**919-372-7470**

Sediment (dirt) and mud gets into the existing roads due to rain events and/or vehicle traffic. These incidents should be reported to James Misciagno. He will coordinate the cleaning of the roadways with the developer.

Dirt on Properties or in Streams:	**James Misciagno**	**919-372-7470**
	Danny Smith	**Danny.Smith@ncdenr.gov**

Sediment (dirt) can leave the site and get onto adjacent properties or into streams and stream buffers; it is typically transported off-site by rain events. These incidents should be reported to James Misciagno at 919-372-7470 so that he can coordinate the appropriate repairs with the developer. Impacts to the streams and stream buffers should also be reported to Danny Smith (danny.smith@ncdenr.gov) with the State.

Dust:	**James Misciagno**	**919-372-7470**

During dry weather dust often becomes a problem blowing into existing neighborhoods or roadways. These incidents should be reported to James Misciagno at 919-372-7470 so that he can coordinate the use of water trucks onsite with the grading contractor to help control the dust.

Trash:	**James Misciagno**	**919-372-7470**

Excessive garbage and construction debris can blow around on a site or even off of the site. These incidents should be reported to James Misciagno at 919-372-7470. He will coordinate the cleanup and trash collection with the developer/home builder.

Temporary Sediment Basins:	**James Misciagno**	**919-372-7470**

Temporary sediment basins during construction (prior to the conversion to the final stormwater pond) are often quite unattractive. Concerns should be reported to James Misciagno at 919-372-7470 so that he can coordinate the cleaning and/or mowing of the slopes and bottom of the pond with the developer.

Stormwater Control Measures:	**Mike Deaton**	**919-249-3413**

Post-construction concerns related to Stormwater Control Measures (typically a stormwater pond) such as conversion and long-term maintenance should be reported to Mike Deaton at 919-249-3413.

Electric Utility Installation:	**Rodney Smith**	**919-249-3342**

Concerns with electric utility installation can be addressed by the Apex Electric Utilities Department. Contact Rodney Smith at 919-249-3342.

FELTON GROVE HIGH SCHOOL

8550 STEPHENSON ROAD
APEX, NORTH CAROLINA 27539

WAKE COUNTY PUBLIC SCHOOL SYSTEM

60% CONSTRUCTION DOCUMENTS

SITE DATA

PROJECT:	FELTON GROVE HIGH SCHOOL
OWNER:	WAKE COUNTY BOARD OF EDUCATION
OWNER CONTACT:	ANNAMARIA TAYLOR 111 CORNING RD, SUITE 190 CARY, NC 27518 919-588-3602

SITE INFORMATION:

PLANNING JURISDICTION:	TOWN OF APEX
PARCEL PIN #:	0750-54-5646
SITE ADDRESS:	8550 STEPHENSON ROAD APEX, NC
ZONING:	MD-CZ
EXISTING USE:	VACANT
SITE ACREAGE:	68.06 ACRES
PROPOSED USE:	HIGH SCHOOL
STUDENT ENROLLMENT:	2350 STUDENTS
EMPLOYEES:	200 EMPLOYEES
REQUIRED SETBACKS:	25' SIDE/REAR/FRONT
ALLOWED BUILT UPON AREA:	2,027108.16 SF (70%)
PROPOSED BUILT UPON AREA:	21.86 AC (32.9%)
TWO COMMUNITY AMENITIES:	BIKE RACKS, BENCHES (FRONT PLAZA AREA OF THE SCHOOL BUILDING)
FEMA FLOODPLAIN:	N/A (FLOOD MAP NO. 3720075000J, PANEL 0750)

BUILDING INFORMATION:

PROPOSED BUILDING HEIGHT:	60'-0"	
EXISTING BUILDING FLOOR AREA:	0 SF	
PROPOSED GROSS FLOOR AREA:	363,072 SF	
AREA PER FLOOR:	FIRST FLOOR	94,079 SF
	SECOND FLOOR	197,390 SF
	GROUND FLOOR	71, 603 SF
	MECHANICAL PENTHOUSE	10,294 SF
	MECHANICAL MEZZANINE	20,582 SF
	AUX. ATHLETICS BLDGS	5,723 SF
AUTOMATIC FIRE SPRINKLER SYSTEM:	YES	
SITE HISTORIC STRUCTURES:	NONE	
TYPE OF CONSTRUCTION:	1B	
NUMBER OF CLASSROOMS:	110 CLASSROOMS	
PROPOSED SQUARE FOOTAGE BY USE:		
	EDUCATION: 147,346 SF	
	BUSINESS: 17,064 SF	
	ASSEMBLY: 53,671 SF	

TOWN OF APEX PARKING REQUIREMENT

REQUIRED:	10 PER CLASSROOM = 110 X 10 = 1,100 SPACES
PROPOSED:	631 PARKING SPACES WITHIN PARKING DECK 469 SURFACE SPACES (21 HANDICAP SPACES ARE PROVIDED, 5 OF WHICH ARE VAN ACCESSIBLE SPACES) 2 ELECTRIC VEHICLE CHARGING STATIONS WITHIN PARKING DECK
REQUIRED BIKE PARKING:	1 PER 40 STUDENTS & EMPLOYEES AT PLANNED CAPACITY OR NO MORE THAN 26 BICYCLE SPACES.
PROPOSED BIKE PARKING:	56 BICYCLE SPACES AND 28 BICYCLE RACKS (2 BIKE SPACES PER RACK) ARE PROVIDED THROUGHOUT THE SITE.
BENCHES PROVIDED:	14 BENCHES

CARPOOL STACKING:

REQUIRED PER MSTA SCHOOL CALCULATOR:	1,804 LF
PROVIDED:	3,100 LF

RESOURCE CONSERVATION AREA (RCA):

TOTAL GROSS SITE AREA: 2,964,693.6 SF (68.06 ACRES)

REQUIRED RCA (20% GROSS SITE AREA):	592,939 SF = 13.612 ACRES
PROVIDED RCA:	592,939 SF = 13.612 ACRES

SITE DATA CONTINUED

STORMWATER DATA

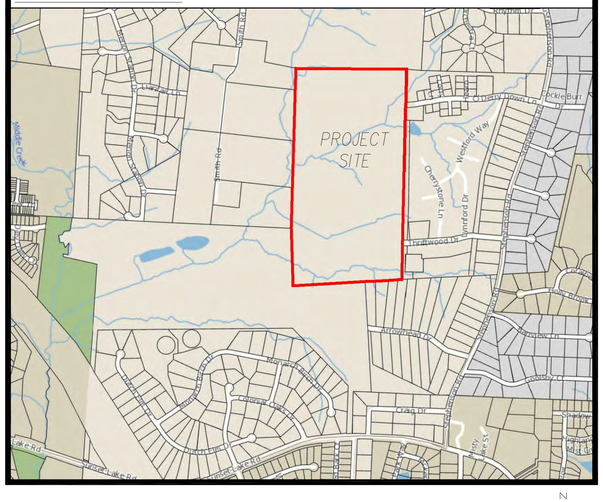
DISTURBED AREA:	2,613,600 SF (60 AC)
EXISTING IMPERVIOUS:	0 SF (0 AC)
PROPOSED IMPERVIOUS:	848,498 SF (19.48 AC)

*THIS SITE IS NOT LOCATED WITHIN THE DESIGNATED FEMA FLOODPLAIN AS SHOWN ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP NO. 3720075000J, PANEL 0750, EFFECTIVE DATE MAY 2, 2008.

PROJECT CONTACT:

OWNER:	WAKE COUNTY PUBLIC SCHOOL SYSTEM 111 CORNING ROAD, SUITE 190 CARY, NC 27518
OWNER CONTACT:	ANNAMARIA TAYLOR, SENIOR FACILITIES PLANNER PHONE 919-588-3602
DESIGNER:	CLH DESIGN, P.A. 400 REGENCY FOREST DRIVE, SUITE 120 CARY, NC 27518
DESIGNER CONTACT:	RENEE PFEIFER, PLA, ASLA PHONE 919-319-6716

VICINITY MAP



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SCALE: 1"= 800'

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C-00.00	COVER
C-00.01	SITE OVERALL PLAN
C-01.00	STAKING OVERALL PLAN
C-01.01 - C-01.09	STAKING PLANS
C-01.10	PAVEMENT MARKING & SIGNAGE OVERALL PLAN
C-01.11 - C-01.19	PAVEMENT MARKING & SIGNAGE PLANS
C-02.00	DEMOLITION & EXISTING CONDITIONS OVERALL PLAN
C-02.01 - C-02.09	DEMOLITION & EXISTING CONDITIONS PLANS
C-03.00	GRADING OVERALL PLAN
C-03.00B	STORM CHART
C-03.01 - C-03.09	GRADING PLANS
C-03.10	OVERALL DRAINAGE MAP
C-03.11	PRE- DEVELOPMENT DRAINAGE MAP
C-03.12	POST-DEVELOPMENT DRAINAGE MAP
C-05.00	UTILITY OVERALL PLAN
C-05.01 - C-05.09	UTILITY PLANS
C-05.10	OVERALL OFF-SITE UTILITY PLAN
C-05.11	OVERALL SEWER DRAINAGE MAP
C-05.12	
C-05.13 - C-05.26	SEWER PLAN & PROFILES
C-05.27 - C-05.41	WATER PLAN & PROFILES
C-07.00 - C-07.05	EROSION CONTROL DETAILS
C-08.00 - C-08.03	UTILITY & STORMWATER DETAILS
C-09.00 - C-09.08	PAVING & HARDSCAPE DETAILS
L-01.01 - L-01.07	RESOURCE CONSERVATION AREAS
L-02.01	COURTYARD PLAN ENLARGEMENT BASE BID
L-02.03	SOUTH ENTRY PLAN ENLARGEMENT
L-02.04	NORTH ENTRY PLAN ENLARGEMENT
L-04.01 - L-04.07	PLANTING PLANS
L-05.01 - L-05.06	SITE DETAILS
L-06.01	IRRIGATION PLAN DIAGRAM
	DUKE ENERGY PROGRESS LIGHTING PLAN 1
	DUKE ENERGY PROGRESS LIGHTING PLAN 2
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A-01.02 - A-01.11	BUILDING EXTERIOR ELEVATIONS
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A-01.13 - A-01.15	EXTERIOR ELEVATIONS
A-01.16	GARAGE FLOOR PLANS
A-01.17 - A01.18	EXTERIOR ELEVATIONS
E-05.01	ELECT SITE PLAN NORTH
E-05.02	ELECT SITE PLAN SOUTH
S-02.10	SITE WALL OVERALL PLAN
S-02.11 - S-02.20	SITE WALL PLANS
S-02.21	SITE WALL DETAILS AND SECTIONS
S-02.23	SITE WALL DETAILS AND SECTIONS
SX-01.01	SEGMENTAL WALL SPECIFICATIONS
SX-01.02	SEGMENTAL WALL DETAILS
SX-01.03	SEGMENTAL WALL PLAN
SX-01.04	SEGMENTAL WALL ELEVATION

Felton Grove High School
8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
11 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
RATIO
227 Fayetteville Street, Suite 301
Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
A Division of Bennett & Pless
5430 Wade Park Blvd #400
Ralelgh, North Carollna 27607
(919) 832-5587

Mechanical / Electrical / Plumbing Engineer
The Wooten Company
120 North Boylan Avenue
Ralelgh, North Carollna 27603
(919) 828-0531

Civil Engineer and Landscape Architect
CLH Design, PA
400 Regency Forest Drive, Suite 120
Cary, North Carollna 27518
(919) 319-6716

Envelope Consultant
Rick Nuhn Engineerlng
1913 Thayer Circle
Greensboro, North Carollna 27407
(336) 855-1182

Food Service
KRM
4230 Folkston Drive
Charlotte, North Carollna 28205
(704) 724-1045

Theatrical & Acoustic Consultant
Thorburn Associates
2500 Gateway Centre Blvd, Suite 800
Morrlsville, North Carollna 27560
(919) 463-9995

Parking Consultant
Walker Consultants
13860 Ballantyne Corporate Pl, Suite 140
Charlotte, North Carollna 28277
(704) 247-6230

SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

RATIO

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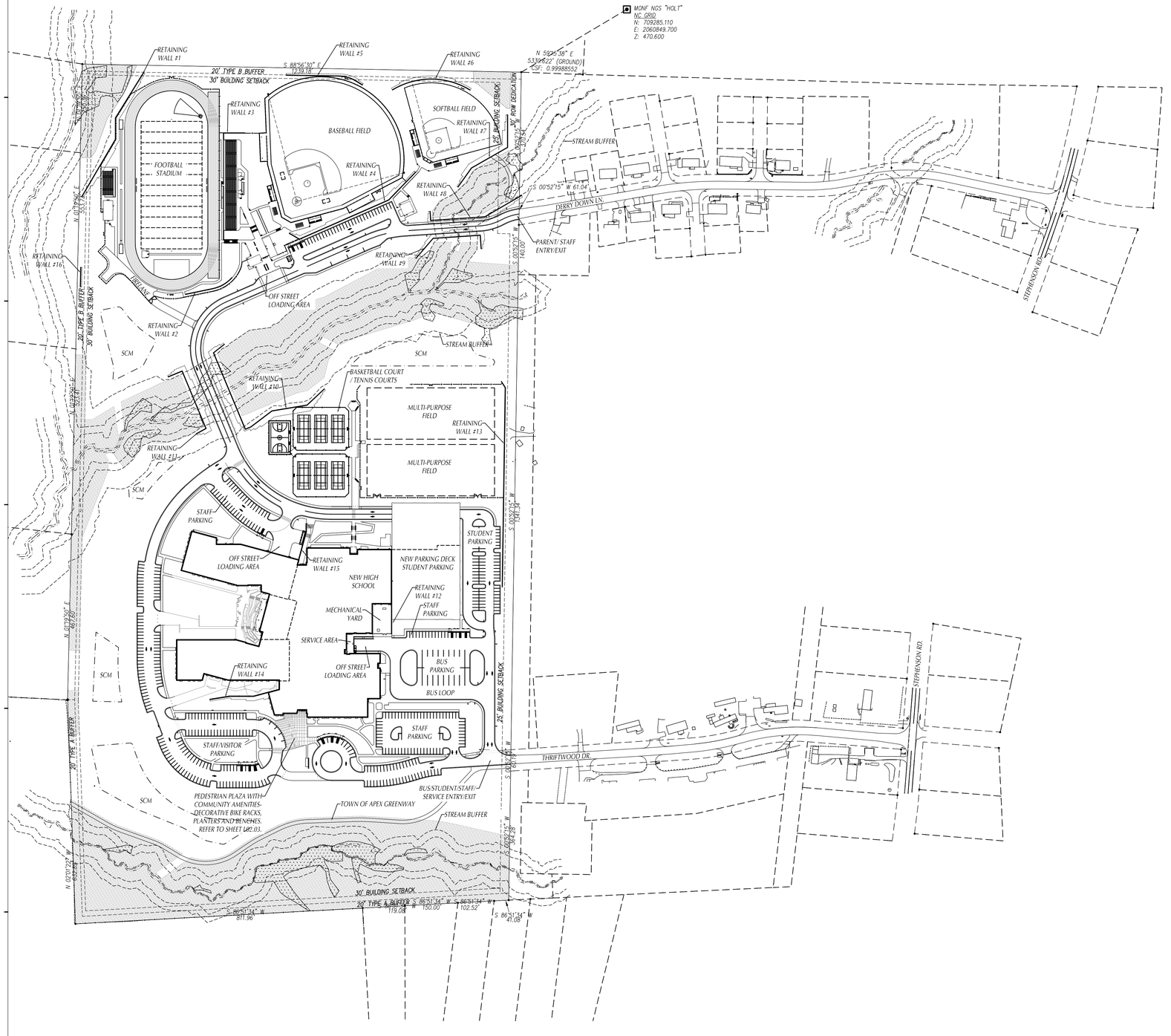
PROJECT NO. 02000.000

SHEET TITLE
COVER

SHEET NUMBER
C-00.00



TOWN OF APEX REQUIRED NOTES

1. IF BUILDINGS ARE TO BE DEMOLISHED, A COPY OF THE DEMOLITION NOTIFICATION FROM THE NC HEALTH HAZARD CONTROL UNIT AND AN ASBESTOS INSPECTION REPORT FROM A NC ACCREDITED ASBESTOS INSPECTOR MUST ACCOMPANY THE APPLICATION FOR THE DEMOLITION PERMIT WHICH MUST BE OBTAINED PRIOR TO START OF THE DEMOLITION.
2. ALL GRADING AND SUPPORT STRUCTURES ASSOCIATED WITH ANY RETAINING STRUCTURE SHALL NOT ENCROACH INTO ANY REQUIRED BUFFER OR PROTECTED AREA (E.G. RCA, THE CRITICAL ROOT ZONES OF TREES, PUBLIC UTILITY EASEMENTS AND RIGHT-OF-WAY), AND SHALL BE CONTAINED ENTIRELY ON SITE.
3. SITE ELEMENTS REQUIRED TO SATISFY RECREATIONAL REQUIREMENTS SUCH AS, BUT NOT LIMITED TO, PLAY FIELDS, GREENWAY TRAILS AND ITEMS TYPICALLY ASSOCIATED WITH THEM (BENCHES, TRASH CONTAINERS, SIGNS, ETC.) MUST MEET ANY APPLICABLE STANDARDS FOUND IN THE TOWN OF APEX STANDARD SPECIFICATIONS AND STANDARD DETAILS AND THE REQUIREMENTS OF THE TOWN OF APEX PARKS AND RECREATION DEPARTMENT.
4. THE SCREENING OF LOADING DOCKS, ROLL-OUT TRASH CONTAINERS, DUMPSTERS, OUTDOOR STORAGE, MECHANICAL AND HVAC EQUIPMENT, AND SIMILAR FACILITIES ON THE ROOF, GROUND, OR BUILDING SHALL MEET THE REQUIREMENTS OF UDO SEC. 8.2.8. SPECIFICALLY, SCREENING MUST BE DONE SO THAT:
   - 4.1. IT IS INCORPORATED INTO THE OVERALL DESIGN THEME OF THE BUILDING AND LANDSCAPE.
   - 4.2. SCREENING MATERIALS ARE NOT DIFFERENT FROM OR INFERIOR TO THE PRINCIPAL MATERIALS OF THE BUILDING OR LANDSCAPE, AND ARE SIMILAR IN MATERIAL AND COLOR.
   - 4.3. SCREENED ITEMS ARE OUT OF VIEW FROM ADJACENT PROPERTIES AND PUBLIC STREETS, AND A TOTALLY OPAQUE SCREEN IS ACHIEVED.
   - 4.4. ANY GROUND-MOUNTED HVAC OR OTHER MECHANICAL OR UTILITY EQUIPMENT SIX(6) FEET TALL OR HIGHER MUST BE FENCED AND LANDSCAPED.
   - 4.5. DUMPSTER ENCLOSURES MUST MEET THE ABOVE REQUIREMENTS PLUS BE EIGHT(8) FEET TALL OR THE HEIGHT OF THE DUMPSTER, WHICHEVER IS GREATER, AND BE BUILT OF MASONRY MATERIAL WITH OPAQUE GATES. WHERE PRACTICABLE, SHRUBS OR OTHER PLANTS MUST BE PLANTED OUTSIDE THE ENCLOSURE TO VISUALLY SOFTEN THE APPEARANCE.
5. ALL REQUIRED SITE ELEMENTS SHOWN WITHIN A PARTICULAR PHASE MUST BE INSTALLED BEFORE A FINAL CERTIFICATE OF OCCUPANCY MAY BE ISSUED FOR ANY BUILDING WITHIN THAT PHASE.
6. PRIOR TO SCHEDULING A FINAL SITE INSPECTION, ALL SITE ITEMS (E.G. LIGHTING, LANDSCAPING, MULCHING, SCREENING FOR DUMPSTERS, MECHANICAL EQUIPMENT, HVAC, ETC., SEEDING& SITE STABILIZATION, AND PARKING AND PAVEMENT MARKING) MUST BE COMPLETED.
7. INDIVIDUAL SIGNS ARE NOT APPROVED AS PART OF SITE PLAN APPROVAL PROCESS. A SEPARATE SIGN PERMIT MUST BE OBTAINED PRIOR TO INSTALLATION OF THE SIGN. MULTIPLE USE LOTS, NON-RESIDENTIAL SUBDIVISIONS, AND MULTIPLE TENANT LOTS MUST SUBMIT A MASTER SIGN PLAN FOR APPROVAL.
8. RETAINING SYSTEMS PROVIDING A CUMULATIVE VERTICAL RELIEF GREATER THAN FIVE FEET IN HEIGHT WITHIN A HORIZONTAL DISTANCE OF 50 FEET OR LESS, INCLUDING RETAINING WALLS OR MECHANICALLY STABILIZED EARTH WALLS, SHALL BE DESIGNED AND CONSTRUCTED UNDER THE RESPONSIBLE CHARGE OF A REGISTERED PROFESSIONAL ENGINEER AND COMPLY IN ALL ASPECTS WITH THE NC BUILDING CODE SEC. 1610. RETAINING SYSTEMS MEETING THESE CRITERIA WILL REQUIRE A SEPARATE BUILDING PERMIT PRIOR TO THE START OF WORK. ALL RETAINING WALLS AND OTHER RETENTION STRUCTURES MUST BE INTEGRALLY TINTED OR STAINED A MEDIUM OR DARK BROWN OR RUST COLOR OR BE COVERED WITH A MASONRY VENEER THAT IS A MEDIUM OR DARK BROWN OR RUST COLOR.
9. A GRADING PERMIT, WHEN APPLICABLE, MAY ONLY BE ISSUED BY THE BUILDING INSPECTIONS DIVISION AFTER THE INSTALLATION AND APPROVAL OF TREE PROTECTION FENCING AND S&E MEASURES AND A CERTIFICATE OF COMPLIANCE HAS BEEN ISSUED BY THE WATER RESOURCES DEPARTMENT.

LEGEND

RESOURCE CONSERVATION AREA

GRAPHIC SCALE

150 0 75 150 300 600

(IN FEET)
1 inch = 150 ft.

MAGNETIC

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
11 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
RATIO
227 Fayetteville Street, Suite 301
Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
A Division of Bennett & Pless
5430 Wade Park Blvd #400
Raleigh, North Carolina 27607
(919) 832-5587

Mechanical / Electrical / Plumbing Engineer
The Wooten Company
120 North Boylan Avenue
Raleigh, North Carolina 27603
(919) 828-0531

Civil Engineer and Landscape Architect
CLH Design, PA
400 Regency Forest Drive, Suite 120
Cary, North Carolina 27518
(919) 319-6716

Envelope Consultant
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SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

RATIO

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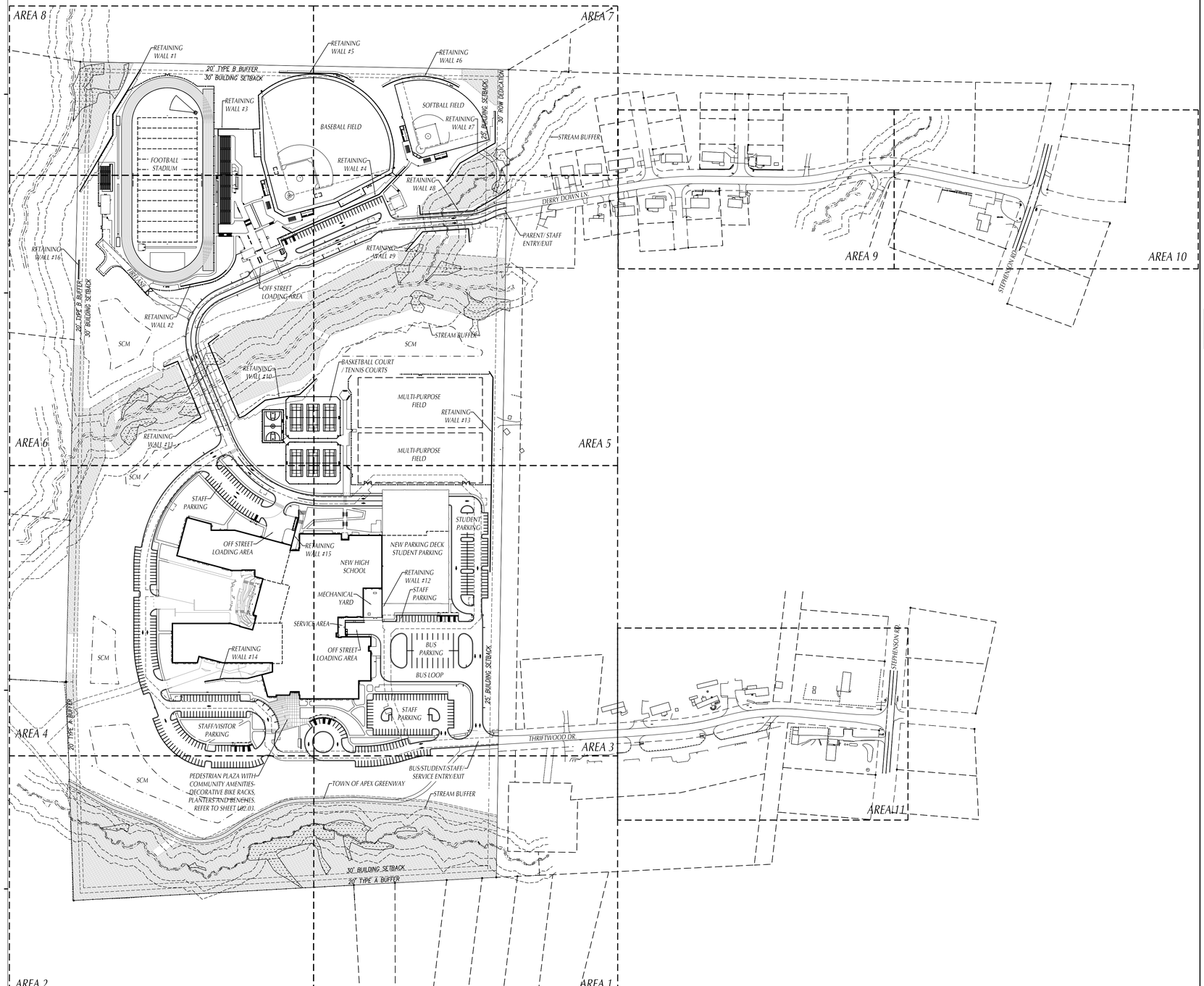
PROJECT NO. 02000.000

SHEET TITLE
SITE
OVERALL
PLAN

SHEET NUMBER
C-00.01



TOWN OF APEX REQUIRED NOTES

1. IF BUILDINGS ARE TO BE DEMOLISHED, A COPY OF THE DEMOLITION NOTIFICATION FROM THE NC HEALTH HAZARD CONTROL UNIT AND AN ASBESTOS INSPECTION REPORT FROM A NC ACCREDITED ASBESTOS INSPECTOR MUST ACCOMPANY THE APPLICATION FOR THE DEMOLITION PERMIT WHICH MUST BE OBTAINED PRIOR TO START OF THE DEMOLITION.
2. ALL GRADING AND SUPPORT STRUCTURES ASSOCIATED WITH ANY RETAINING STRUCTURE SHALL NOT ENCROACH INTO ANY REQUIRED BUFFER OR PROTECTED AREA (E.G. RCA, THE CRITICAL ROOT ZONES OF TREES, PUBLIC UTILITY EASEMENTS AND RIGHT-OF-WAY), AND SHALL BE CONTAINED ENTIRELY ON SITE.
3. SITE ELEMENTS REQUIRED TO SATISFY RECREATIONAL REQUIREMENTS SUCH AS, BUT NOT LIMITED TO, PLAY FIELDS, GREENWAY TRAILS AND ITEMS TYPICALLY ASSOCIATED WITH THEM (BENCHES, TRASH CONTAINERS, SIGNS, ETC.) MUST MEET ANY APPLICABLE STANDARDS FOUND IN THE TOWN OF APEX STANDARD SPECIFICATIONS AND STANDARD DETAILS AND THE REQUIREMENTS OF THE TOWN OF APEX PARKS AND RECREATION DEPARTMENT.
4. THE SCREENING OF LOADING DOCKS, ROLL-OUT TRASH CONTAINERS, DUMPSTERS, OUTDOOR STORAGE, MECHANICAL AND HVAC EQUIPMENT, AND SIMILAR FACILITIES ON THE ROOF, GROUND, OR BUILDING SHALL MEET THE REQUIREMENTS OF UDO SEC. 8.2.8. SPECIFICALLY, SCREENING MUST BE DONE SO THAT:
   - 4.1. IT IS INCORPORATED INTO THE OVERALL DESIGN THEME OF THE BUILDING AND LANDSCAPE.
   - 4.2. SCREENING MATERIALS ARE NOT DIFFERENT FROM OR INFERIOR TO THE PRINCIPAL MATERIALS OF THE BUILDING OR LANDSCAPE, AND ARE SIMILAR IN MATERIAL AND COLOR.
   - 4.3. SCREENED ITEMS ARE OUT OF VIEW FROM ADJACENT PROPERTIES AND PUBLIC STREETS, AND A TOTALLY OPAQUE SCREEN IS ACHIEVED.
   - 4.4. ANY GROUND-MOUNTED HVAC OR OTHER MECHANICAL OR UTILITY EQUIPMENT SIX(6) FEET TALL OR HIGHER MUST BE FENCED AND LANDSCAPED.
   - 4.5. DUMPSTER ENCLOSURES MUST MEET THE ABOVE REQUIREMENTS PLUS BE EIGHT(8) FEET TALL OR THE HEIGHT OF THE DUMPSTER, WHICHEVER IS GREATER, AND BE BUILT OF MASONRY MATERIAL WITH OPAQUE GATES. WHERE PRACTICABLE, SHRUBS OR OTHER PLANTS MUST BE PLANTED OUTSIDE THE ENCLOSURE TO VISUALLY SOFTEN THE APPEARANCE.
5. ALL REQUIRED SITE ELEMENTS SHOWN WITHIN A PARTICULAR PHASE MUST BE INSTALLED BEFORE A FINAL CERTIFICATE OF OCCUPANCY MAY BE ISSUED FOR ANY BUILDING WITHIN THAT PHASE.
6. PRIOR TO SCHEDULING A FINAL SITE INSPECTION, ALL SITE ITEMS (E.G. LIGHTING, LANDSCAPING, MULCHING, SCREENING FOR DUMPSTERS, MECHANICAL EQUIPMENT, HVAC, ETC., SEEDING& SITE STABILIZATION, AND PARKING AND PAVEMENT MARKING) MUST BE COMPLETED.
7. INDIVIDUAL SIGNS ARE NOT APPROVED AS PART OF SITE PLAN APPROVAL PROCESS. A SEPARATE SIGN PERMIT MUST BE OBTAINED PRIOR TO INSTALLATION OF THE SIGN. MULTIPLE USE LOTS, NON-RESIDENTIAL SUBDIVISIONS, AND MULTIPLE TENANT LOTS MUST SUBMIT A MASTER SIGN PLAN FOR APPROVAL.
8. RETAINING SYSTEMS PROVIDING A CUMULATIVE VERTICAL RELIEF GREATER THAN FIVE FEET IN HEIGHT WITHIN A HORIZONTAL DISTANCE OF 50 FEET OR LESS, INCLUDING RETAINING WALLS OR MECHANICALLY STABILIZED EARTH WALLS, SHALL BE DESIGNED AND CONSTRUCTED UNDER THE RESPONSIBLE CHARGE OF A REGISTERED PROFESSIONAL ENGINEER AND COMPLY IN ALL ASPECTS WITH THE NC BUILDING CODE SEC. 1610. RETAINING SYSTEMS MEETING THESE CRITERIA WILL REQUIRE A SEPARATE BUILDING PERMIT PRIOR TO THE START OF WORK. ALL RETAINING WALLS AND OTHER RETENTION STRUCTURES MUST BE INTEGRALLY TINTED OR STAINED A MEDIUM OR DARK BROWN OR RUST COLOR OR BE COVERED WITH A MASONRY VENEER THAT IS A MEDIUM OR DARK BROWN OR RUST COLOR.
9. A GRADING PERMIT, WHEN APPLICABLE, MAY ONLY BE ISSUED BY THE BUILDING INSPECTIONS DIVISION AFTER THE INSTALLATION AND APPROVAL OF TREE PROTECTION FENCING AND S&E MEASURES AND A CERTIFICATE OF COMPLIANCE HAS BEEN ISSUED BY THE WATER RESOURCES DEPARTMENT.

LEGEND

RESOURCE CONSERVATION AREA

GRAPHIC SCALE

150 0 75 150 300 600

(IN FEET)
1 inch = 150 ft.

MAGNETIC

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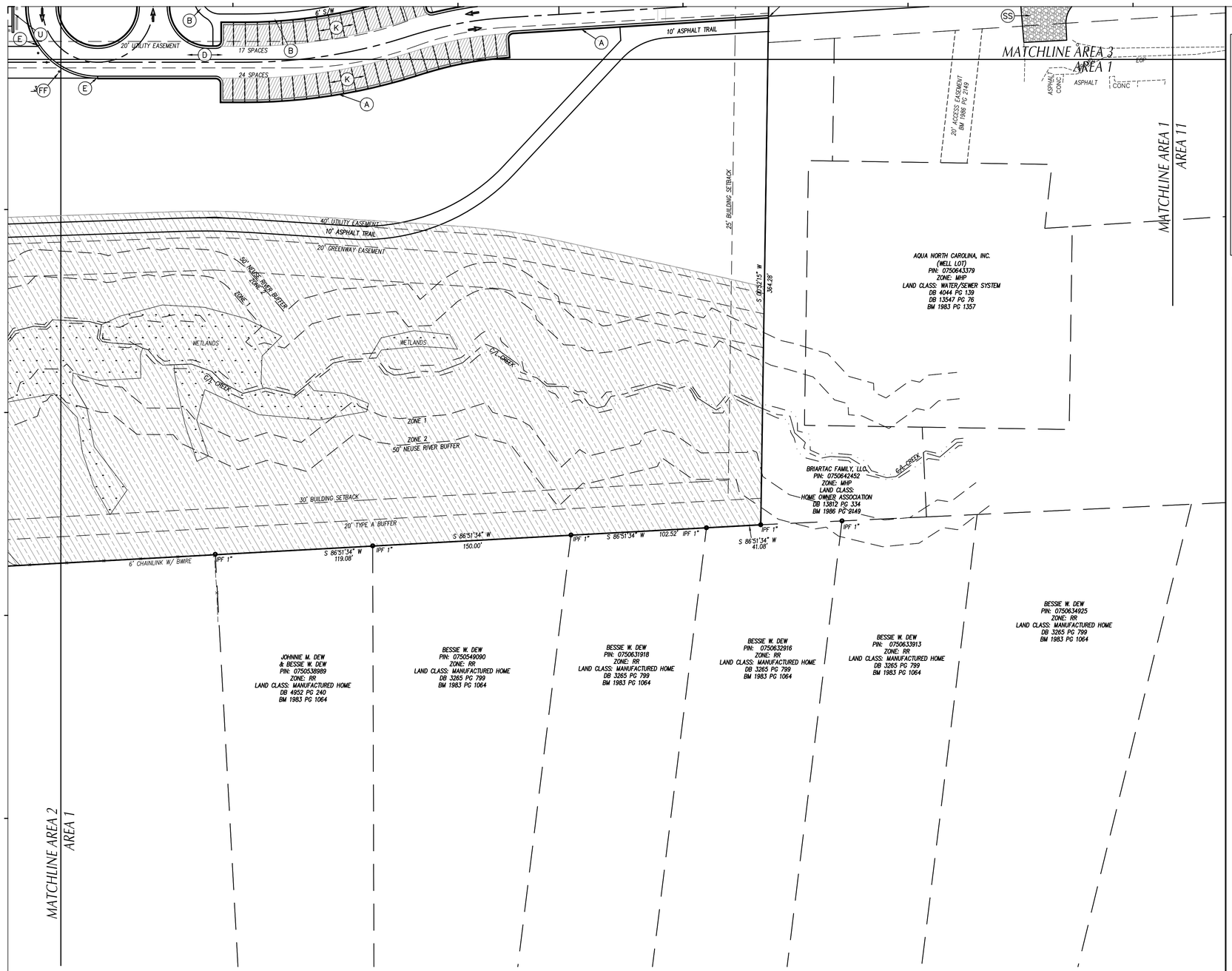
PROJECT NO. 02000.000

SHEET TITLE

STAKING PLAN OVERALL

SHEET NUMBER

C-01.00



GENERAL NOTES

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2. ALL DIMENSIONS SHOWN ARE TO FACE OF CURB AND FACE OF BUILDING WALL, UNLESS OTHERWISE SHOWN.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF ALL DIMENSIONS SHOWN AND CONTACT THE ARCHITECT IF ANY DISCREPANCIES OCCUR.
4. CONSTRUCTION STAKE OUT IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. SEE PAVEMENT MARKING AND SIGNAGE SHEETS C01.06 – C01.11 FOR SIGNAGE AND STRIPING PLANS.
6. ALL FACE OF RADIUS' ARE 4 FT UNLESS OTHERWISE SHOWN.
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8. (HC) DENOTES ACCESSIBLE PARKING SPACE.
9. (HC-VAN) DENOTES VAN ACCESSIBLE PARKING SPACE.
10. ANY AND ALL LANDSCAPING, EXISTING TREES OR SHRUBS TO REMAIN WHICH ARE DAMAGED DURING DEMOLITION OR CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR UTILIZING A LICENSED LANDSCAPE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
11. CONTRACTOR SHALL SUBMIT SCALED PLANS OF ALL SCORING/JOINTS FOR APPROVAL BY ARCHITECT 30 DAYS MINIMUM PRIOR TO INSTALLATION.
12. THE CROSS-SLOPE ON ALL SIDEWALKS SHALL BE A MAXIMUM OF 2.0%
13. NO WORK SHALL BE PERFORMED ON RIGHT-OF-WAYS OR ADJACENT PROPERTIES UNTIL THE OWNER NOTIFIES CONTRACTOR IN WRITING OF PROCUREMENT OF APPROPRIATE PERMITS, EASEMENTS, AGREEMENTS, OR RIGHTS-OF-WAY.

KEY NOTES

- (A) 24" CONCRETE CURB & GUTTER, SEE DETAIL SHEET C-09.00.
- (B) CONCRETE SIDEWALK, SEE DETAIL SHEET C-09.00.
- (C) CONCRETE WHEELSTOP, SEE DETAIL SHEET C-09.01.
- (D) 'HEAVY' DUTY ASPHALT PAVEMENT, SEE DETAIL SHEET C-09.01.
- (E) STANDARD CURB & GUTTER TERMINUS, SEE DETAIL SHEET C-09.00.
- (F) CONCRETE FLUSH WITH PAVEMENT, SEE DETAIL SHEET C-09.00.
- (G) ACCESSIBLE CURB RAMP, SEE DETAIL SHEET C-09.02.
- (H) ACCESSIBLE PARKING, SEE SIGNAGE AND STRIPING PLAN SHEET C-01.10-C-01.19.
- (I) TOWN OF APEX 30" CONCRETE CURB & GUTTER, SEE DETAIL SHEET C-09.02.
- (J) CONCRETE SERVICE COURT WITH MECHANICAL EQUIPMENT, SEE MECHANICAL PLANS FOR EQUIPMENT LAYOUT & RELATED INFORMATION.
- (K) LIGHT DUTY ASPHALT PAVEMENT. SEE DETAIL C-09.01.
- (L) PASSENGER/BUS LOADING ZONE, SEE DETAIL SHEET C-09.02.
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- (Q) CONCERTE DRIVEWAY APRON, SEE DETAIL C-09.01.
- (R) STAINLESS STEEL BOLLARD, SEE SPECIFICATIONS AND DETAIL SHEET L-05.01.
- (S) TRANSFORMER, SEE PLUMBING, MECHANICAL & ELECTRICAL PLANS.
- (T) DUMPSTERS (REFUSE & RECYCLING), PROVIDED BY OWNER.
- (U) MONUMENT SIGN AND EASEMENT, SEE ARCHITECTURAL PLANS.
- (V) BENCH, SEE SPECIFICATIONS AND DETAIL SHEET C-09.02.
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- (AA) BASKETBALL COURT, SEE DETAIL SHEET C-09.08.
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LEGEND

RESOURCE CONSERVATION AREA

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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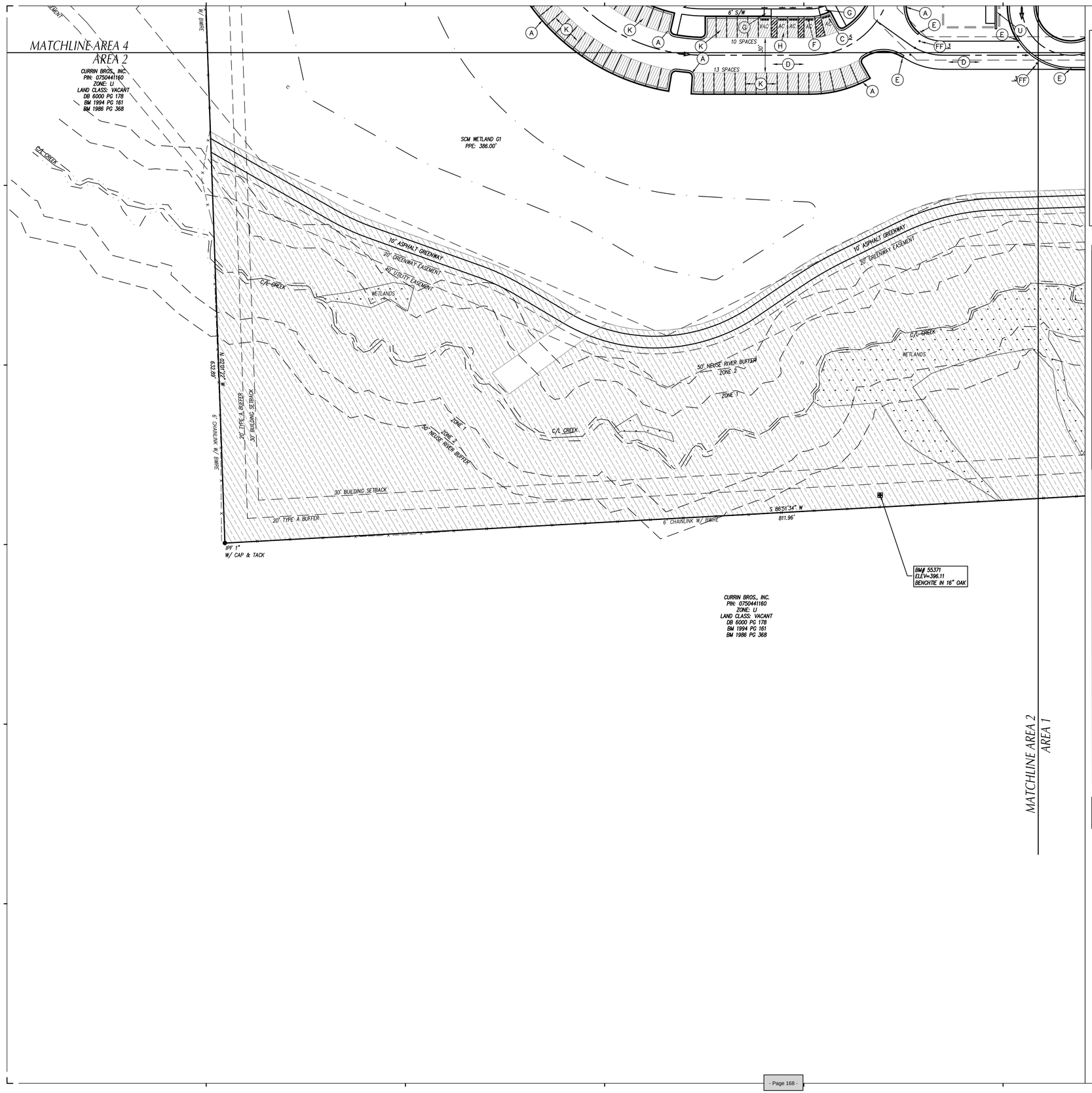
PROJECT NO. 02000.000

SHEET TITLE
STAKING
PLAN
AREA_1

SHEET NUMBER
C-01.01



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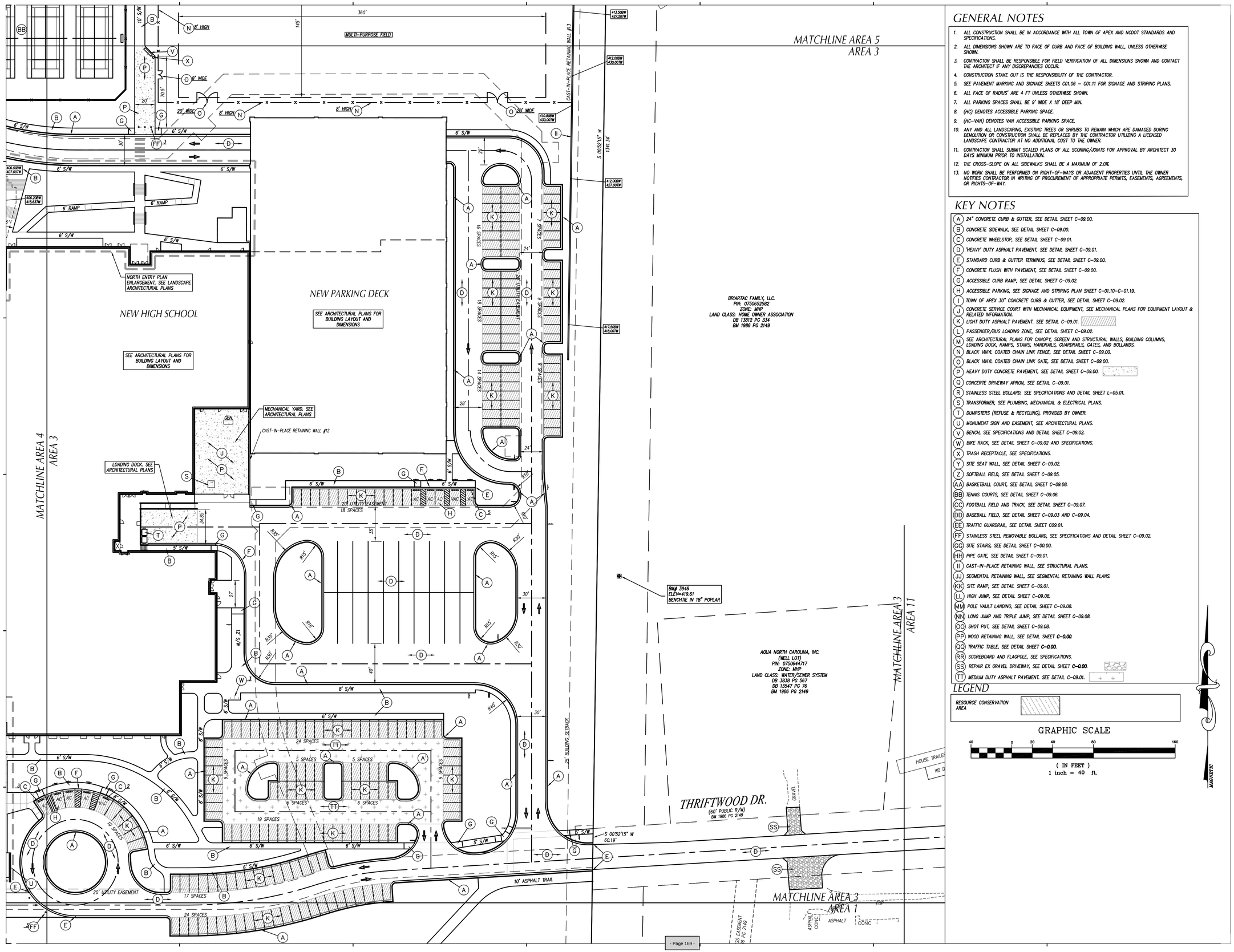
SHEET TITLE
STAKING
PLAN
AREA_2

SHEET NUMBER
C-01.02



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GRAPHIC SCALE

40 0 20 40 80 160

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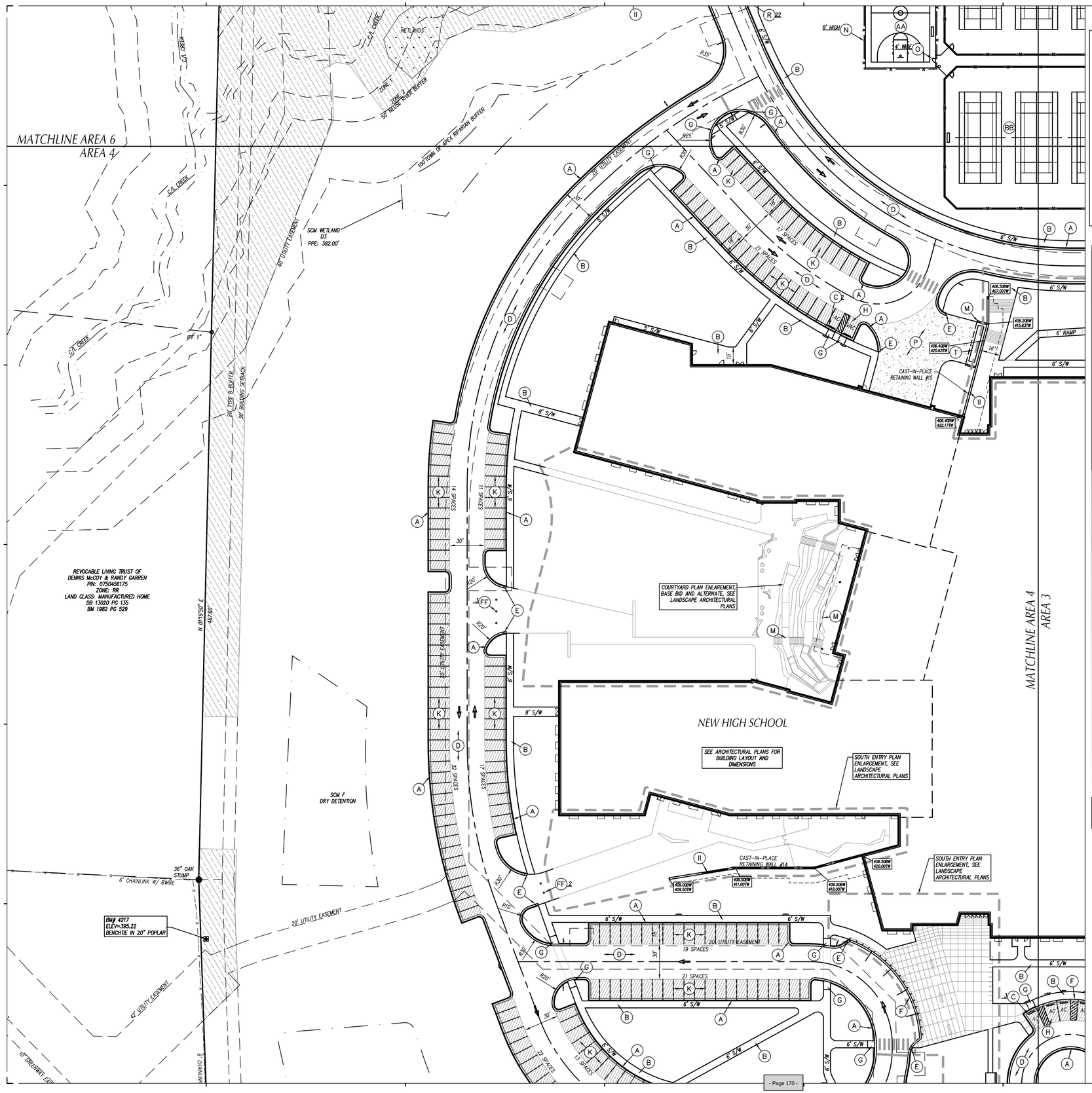
PROJECT NO. 02000.000

SHEET TITLE
STAKING PLAN AREA_3

SHEET NUMBER
C-01.03



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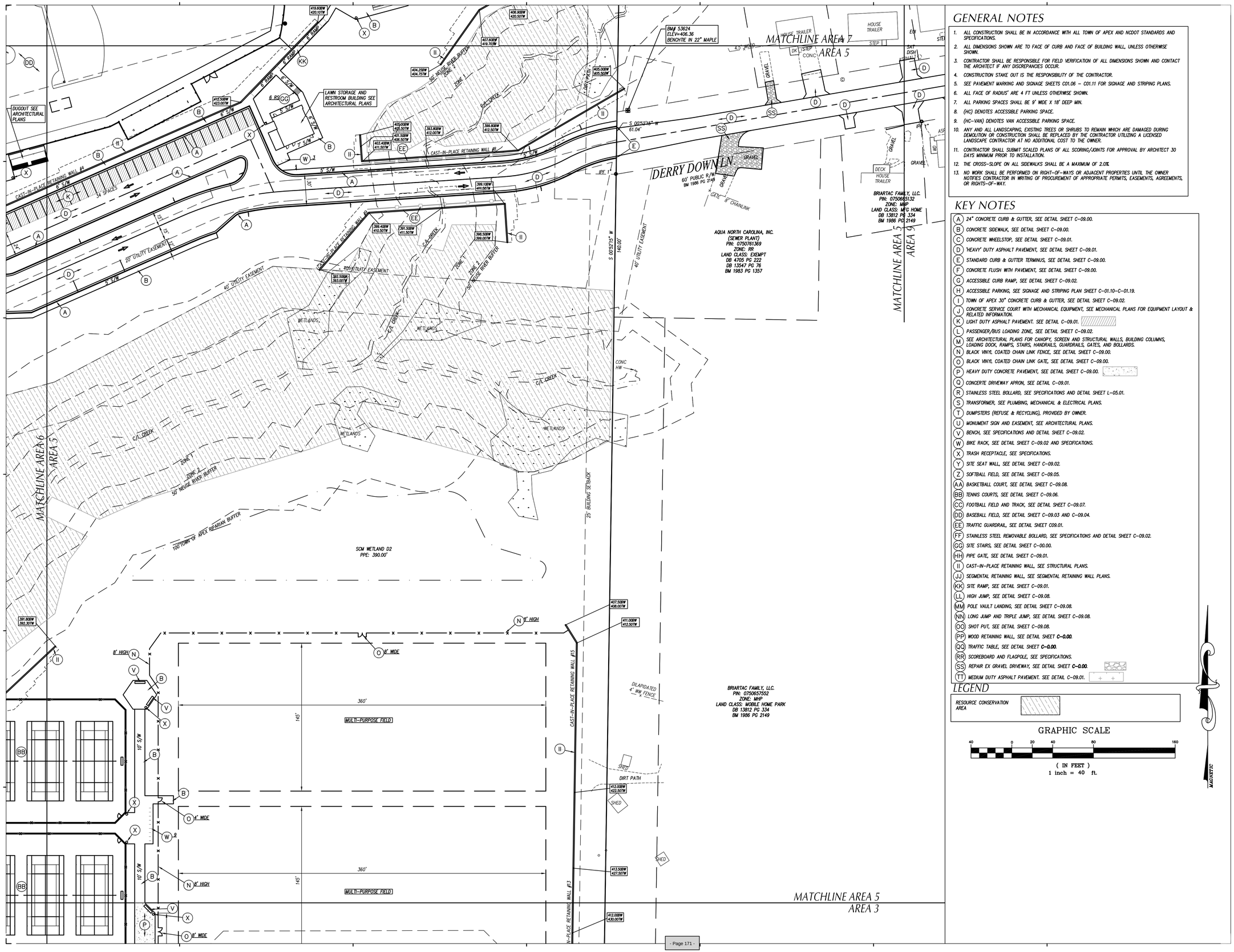
PROJECT NO. 02000.000

SHEET TITLE
STAKING
PLAN
AREA_4

SHEET NUMBER
C-01.04



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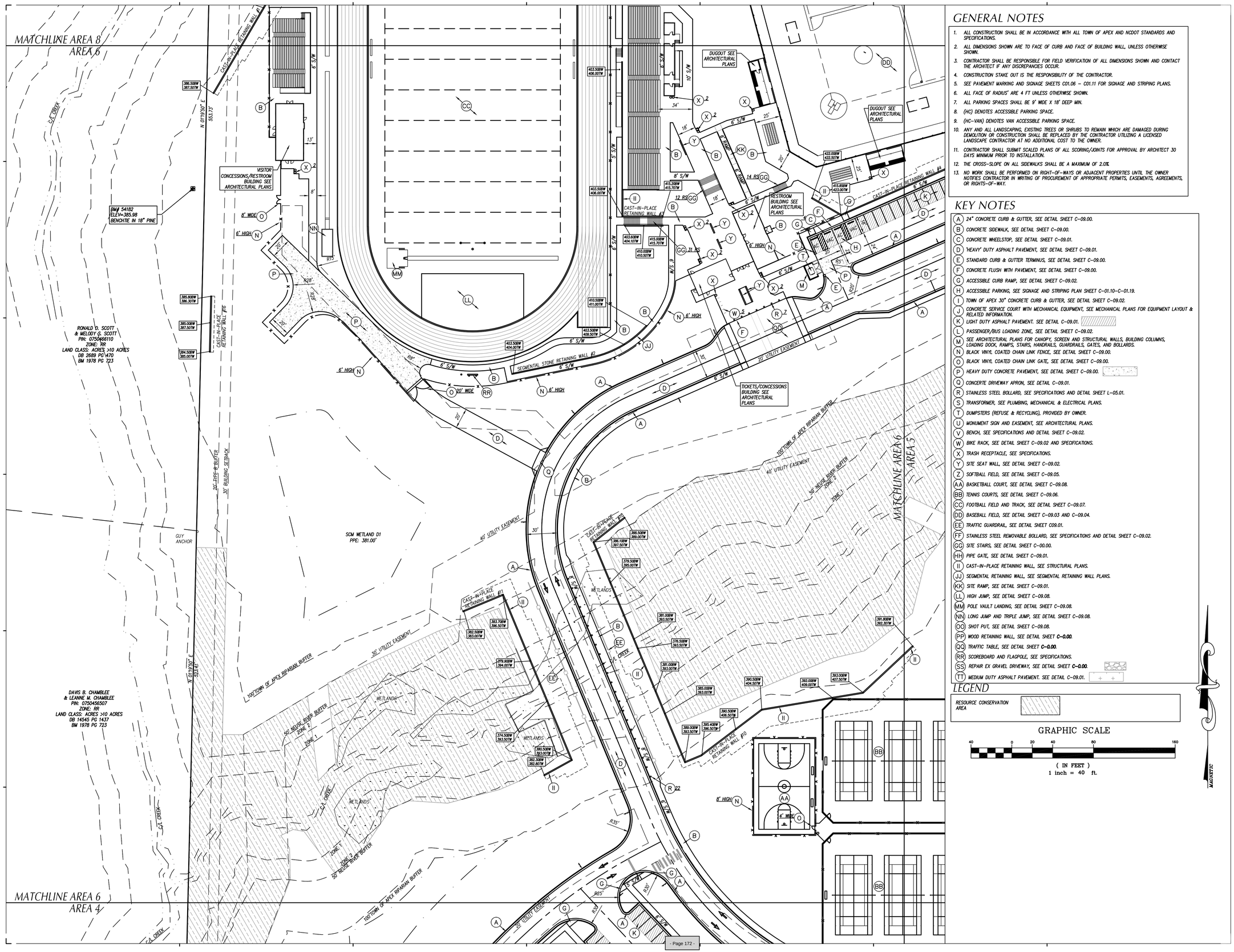

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- (G) ACCESSIBLE CURB RAMP, SEE DETAIL SHEET C-09.02.
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- (R) STAINLESS STEEL BOLLARD, SEE SPECIFICATIONS AND DETAIL SHEET L-05.01.
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- (X) TRASH RECEPTACLE, SEE SPECIFICATIONS.
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LEGEND

RESOURCE CONSERVATION AREA

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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SEAL | 03/26/2021

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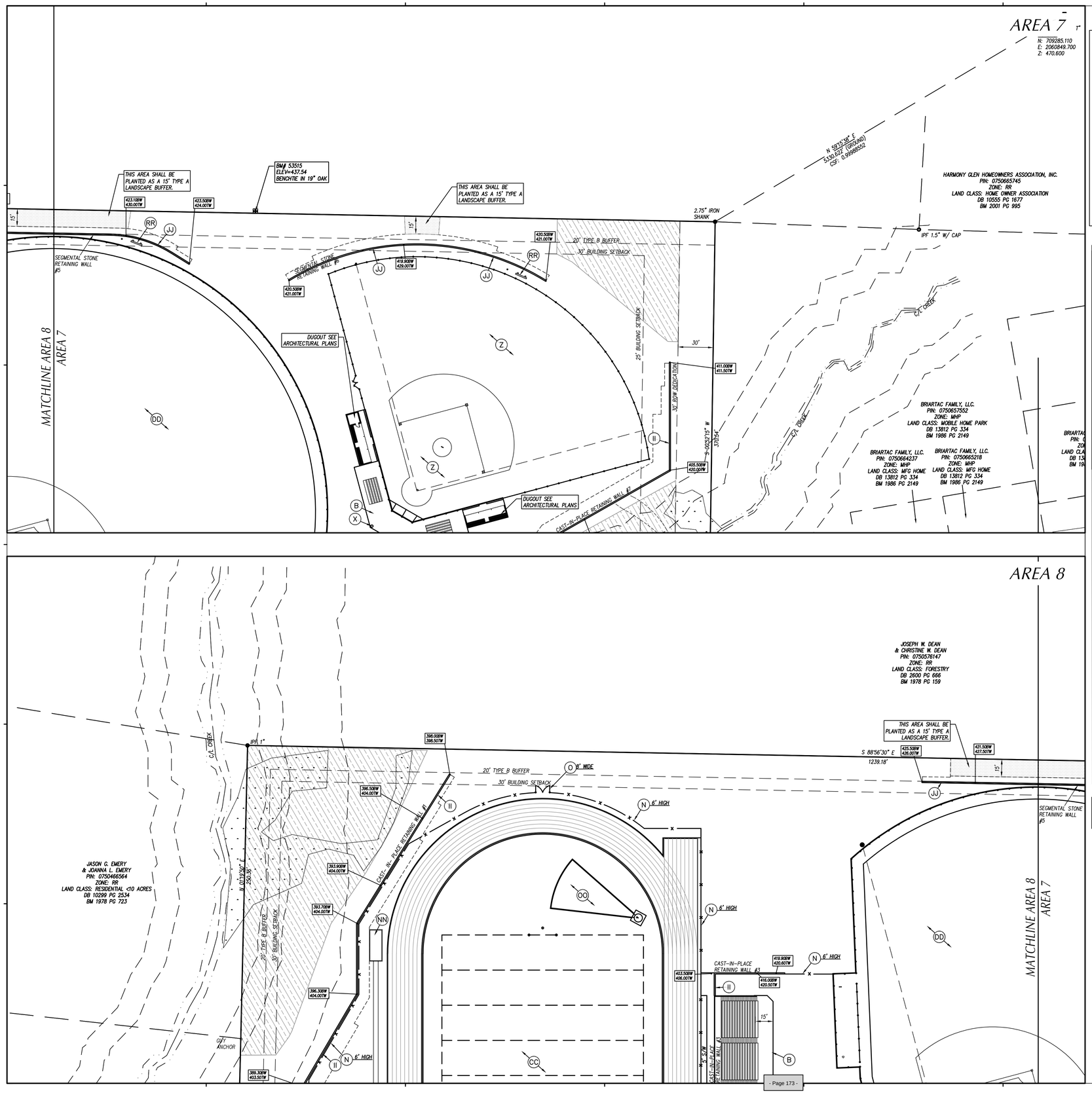
PROJECT NO. 02000.000

SHEET TITLE
STAKING
PLAN
AREA_6

SHEET NUMBER
C-01.06



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PROJECT NO. 02000.000

SHEET TITLE
STAKING
PLAN
AREA_7&8

SHEET NUMBER
C-01.07

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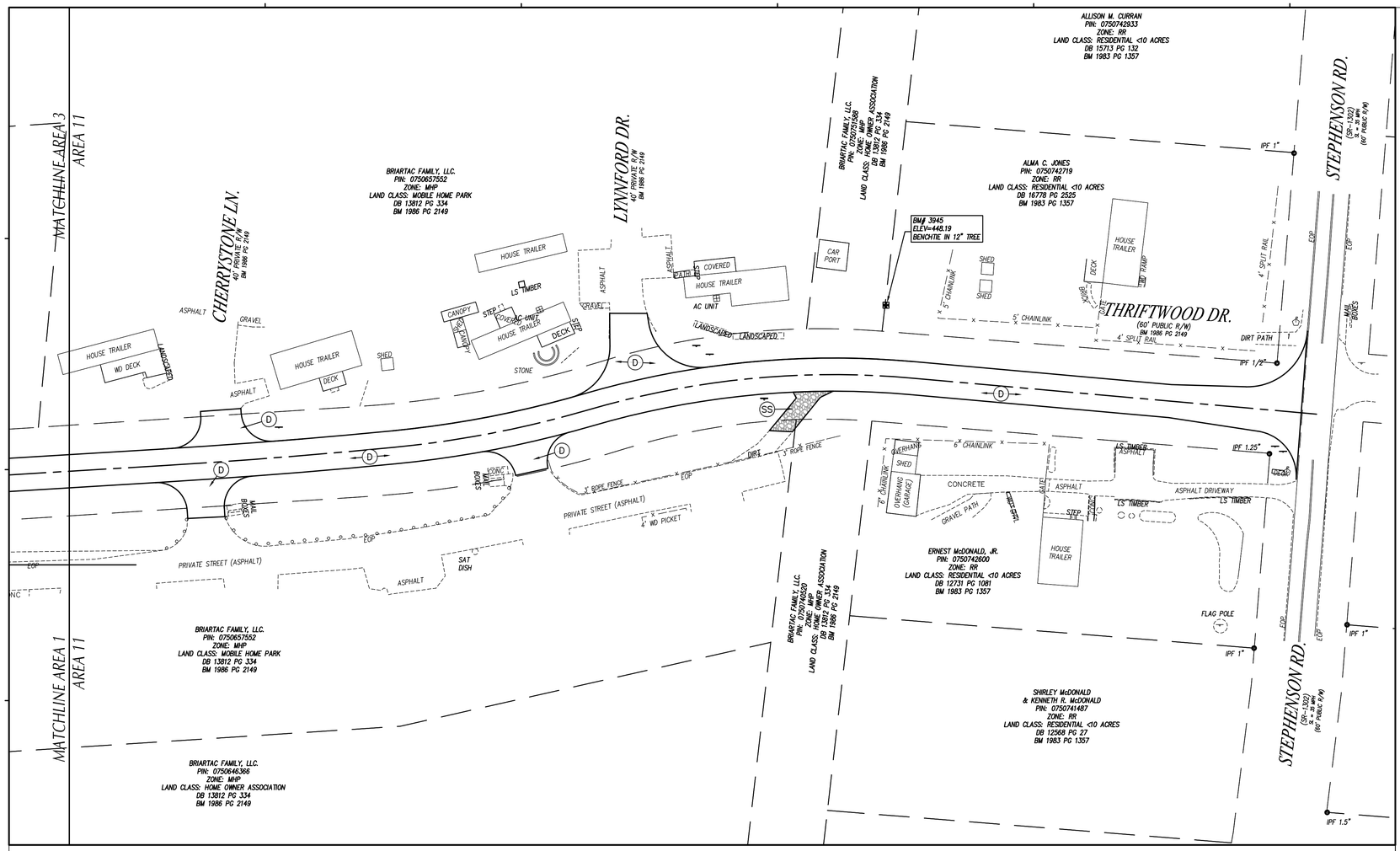
PROJECT NO. 02000.000

SHEET TITLE
STAKING PLAN AREA_9&10

SHEET NUMBER
C-01.08



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KEY NOTES

- (A) 24" CONCRETE CURB & GUTTER, SEE DETAIL SHEET C-09.00.
- (B) CONCRETE SIDEWALK, SEE DETAIL SHEET C-09.00.
- (C) CONCRETE WHEELSTOP, SEE DETAIL SHEET C-09.01.
- (D) 'HEAVY' DUTY ASPHALT PAVEMENT, SEE DETAIL SHEET C-09.01.
- (E) STANDARD CURB & GUTTER TERMINUS, SEE DETAIL SHEET C-09.00.
- (F) CONCRETE FLUSH WITH PAVEMENT, SEE DETAIL SHEET C-09.00.
- (G) ACCESSIBLE CURB RAMP, SEE DETAIL SHEET C-09.02.
- (H) ACCESSIBLE PARKING, SEE SIGNAGE AND STRIPING PLAN SHEET C-01.10-C-01.19.
- (I) TOWN OF APEX 30" CONCRETE CURB & GUTTER, SEE DETAIL SHEET C-09.02.
- (J) CONCRETE SERVICE COURT WITH MECHANICAL EQUIPMENT, SEE MECHANICAL PLANS FOR EQUIPMENT LAYOUT & RELATED INFORMATION.
- (K) LIGHT DUTY ASPHALT PAVEMENT. SEE DETAIL C-09.01.
- (L) PASSENGER/BUS LOADING ZONE, SEE DETAIL SHEET C-09.02.
- (M) SEE ARCHITECTURAL PLANS FOR CANOPY, SCREEN AND STRUCTURAL WALLS, BUILDING COLUMNS, LOADING DOCK, RAMPS, STAIRS, HANDRAILS, GUARDRAILS, GATES, AND BOLLARDS.
- (N) BLACK VINYL COATED CHAIN LINK FENCE, SEE DETAIL SHEET C-09.00.
- (O) BLACK VINYL COATED CHAIN LINK GATE, SEE DETAIL SHEET C-09.00.
- (P) HEAVY DUTY CONCRETE PAVEMENT, SEE DETAIL SHEET C-09.00.
- (Q) CONCERTE DRIVEWAY APRON, SEE DETAIL C-09.01.
- (R) STAINLESS STEEL BOLLARD, SEE SPECIFICATIONS AND DETAIL SHEET L-05.01.
- (S) TRANSFORMER, SEE PLUMBING, MECHANICAL & ELECTRICAL PLANS.
- (T) DUMPSTERS (REFUSE & RECYCLING), PROVIDED BY OWNER.
- (U) MONUMENT SIGN AND EASEMENT, SEE ARCHITECTURAL PLANS.
- (V) BENCH, SEE SPECIFICATIONS AND DETAIL SHEET C-09.02.
- (W) BIKE RACK, SEE DETAIL SHEET C-09.02 AND SPECIFICATIONS.
- (X) TRASH RECEPTACLE, SEE SPECIFICATIONS.
- (Y) SITE SEAT WALL, SEE DETAIL SHEET C-09.02.
- (Z) SOFTBALL FIELD, SEE DETAIL SHEET C-09.05.
- (AA) BASKETBALL COURT, SEE DETAIL SHEET C-09.08.
- (BB) TENNIS COURTS, SEE DETAIL SHEET C-09.06.
- (CC) FOOTBALL FIELD AND TRACK, SEE DETAIL SHEET C-09.07.
- (DD) BASEBALL FIELD, SEE DETAIL SHEET C-09.03 AND C-09.04.
- (EE) TRAFFIC GUARDRAIL, SEE DETAIL SHEET C09.01.
- (FF) STAINLESS STEEL REMOVABLE BOLLARD, SEE SPECIFICATIONS AND DETAIL SHEET C-09.02.
- (GG) SITE STAIRS, SEE DETAIL SHEET C-00.00.
- (HH) PIPE GATE, SEE DETAIL SHEET C-09.01.
- (II) CAST-IN-PLACE RETAINING WALL, SEE STRUCTURAL PLANS.
- (JJ) SEGMENTAL RETAINING WALL, SEE SEGMENTAL RETAINING WALL PLANS.
- (KK) SITE RAMP, SEE DETAIL SHEET C-09.01.
- (LL) HIGH JUMP, SEE DETAIL SHEET C-09.08.
- (MM) POLE VAULT LANDING, SEE DETAIL SHEET C-09.08.
- (NN) LONG JUMP AND TRIPLE JUMP, SEE DETAIL SHEET C-09.08.
- (OO) SHOT PUT, SEE DETAIL SHEET C-09.08.
- (PP) WOOD RETAINING WALL, SEE DETAIL SHEET **C-0.00**.
- (QQ) TRAFFIC TABLE, SEE DETAIL SHEET **C-0.00**.
- (RR) SCOREBOARD AND FLAGPOLE, SEE SPECIFICATIONS.
- (SS) REPAIR EX GRAVEL DRIVEWAY, SEE DETAIL SHEET **C-0.00**.
- (TT) MEDIUM DUTY ASPHALT PAVEMENT. SEE DETAIL C-09.01.

LEGEND

RESOURCE CONSERVATION AREA

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

MAGNETIC

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
11 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
RATIO
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Raleigh, North Carolina 27601
919-821-0805

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SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

RATIO

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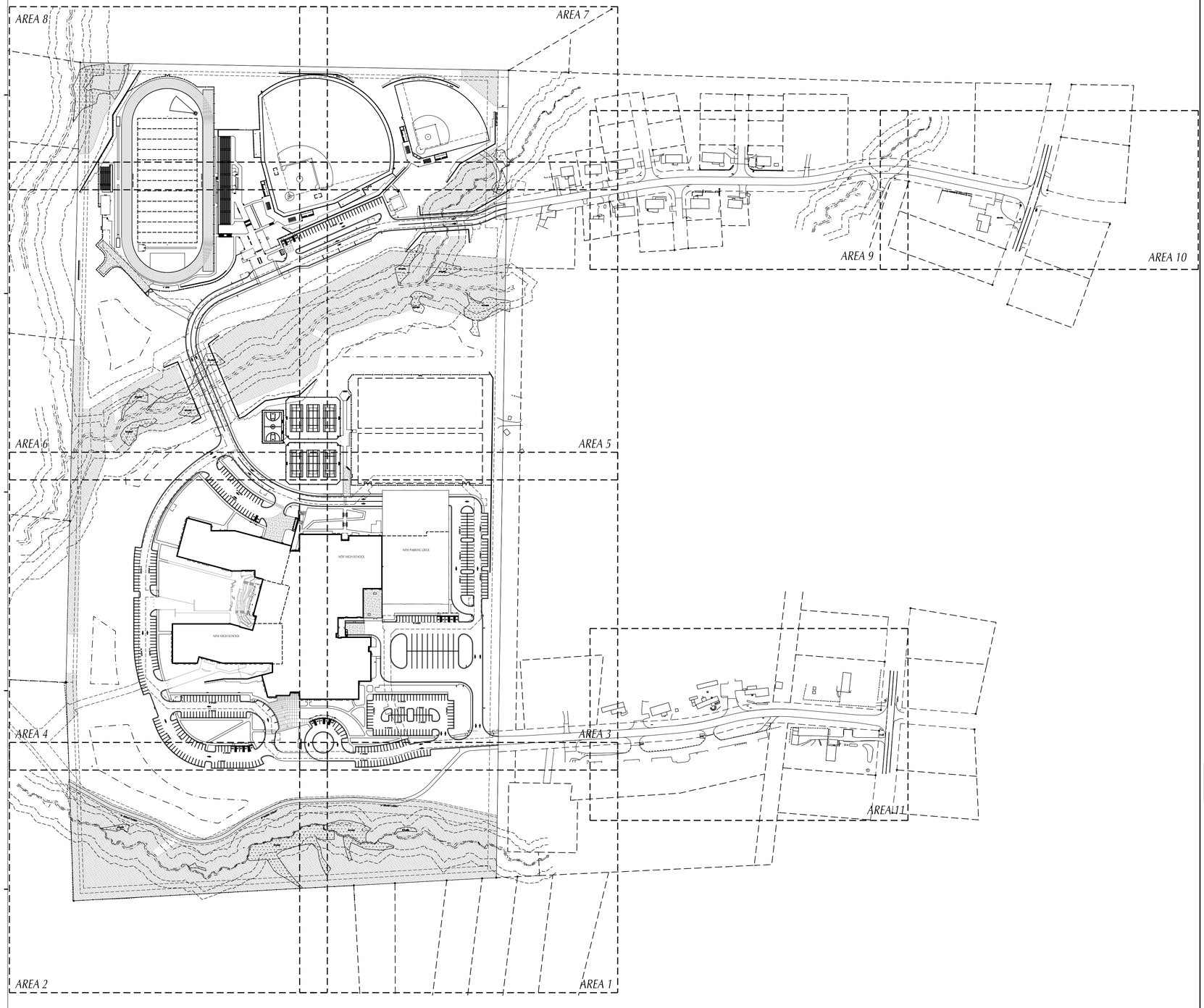
PROJECT NO. 02000.000

SHEET TITLE
STAKING PLAN AREA_11

SHEET NUMBER
C-01.09



LEGEND

RESOURCE CONSERVATION AREA

GRAPHIC SCALE

150 0 75 150 300 600

(IN FEET)
1 inch = 150 ft.

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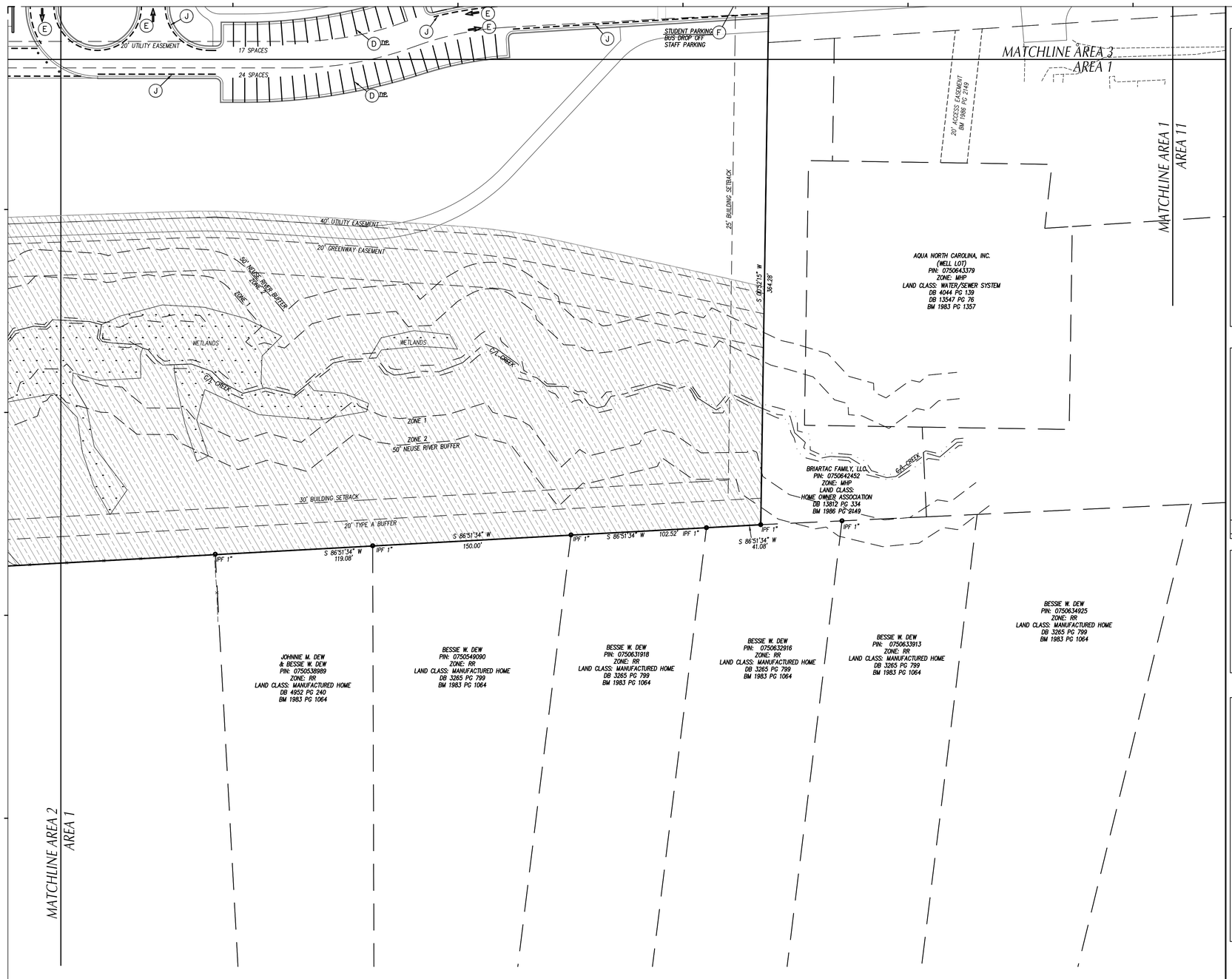
PROJECT NO. 02000.000

SHEET TITLE

PAVEMENT MARKING & SIGNAGE OVERALL PLAN

SHEET NUMBER

C-01.10



TRAFFIC CONTROL NOTES

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

SIGN	MUTCD STD.	SIZE
STOP	R1-1	30"x30"
ONE WAY	R6-2	18"x24"
DO NOT ENTER (DNE)	R5-1	30"x30"
NO PARKING ANY TIME FIRE LANE (NPFL)	--	12"x18"
BEGIN ONE WAY (BOW)	R6-6	24"x30"
EMERGENCY PARKING ONLY (EPO)	R8-4	30"x24"

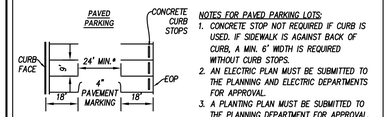
2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT DEEP x 12-IN DIA. CONCRETE FOOTING.
3. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MUTCD AND NCDOT STANDARDS AND THE PROJECT SPECIFICATIONS.

MARKING	NCDOT STD.	SIZE	COLOR
PARKING SPACES	--	4-IN	WHT.
CROSSWALK	1205.07(HI-VIS)	24-IN	WHT.
CROSSWALK	1205.07(STANDARD)	8-IN	WHT.
DIRECTIONAL ARROWS	1205.08	STD.	WHT.
NO PARKING - FIRE LANE *	--	4-IN	YEL.
SOLID	1205.01	4-IN	WHT./YEL.
DIAGONAL	1205.09	8-IN	YEL.
STOP BAR	--	24-IN	WHT.
MINI-SKIP (3'-9' TYPE)	1205.01	4-IN	WHT.

* NO PARKING - FIRE LANE MARKING SHALL BE THERMOPLASTIC AND CONSIST OF A 4" SOLID YELLOW STRIPE AND 8" HIGH YELLOW TEXT "NO PARKING - FIRE LANE" AT 40' INTERVALS.

4. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC TYPE EXCEPT FOR PARKING SPACE LINES WHICH SHALL BE ALKYD-RESIN TYPE PAINT.
5. ALL SIGNAGE SHALL BE FIELD STAKED AND THE LOCATIONS APPROVED BY CLH DESIGN PRIOR TO SIGN INSTALLATION.
6. CENTER ALL DIRECTIONAL ARROWS WITHIN TRAVEL LANE.
7. COORDINATE FIRE LANE MARKINGS WITH TOWN OF APEX FIRE MARSHAL.
8. ALL SIGNS SHALL USE PRISMATIC SHEETING THAT MEETS MINIMUM REFLECTIVITY STANDARDS FOUND IN THE LATEST EDITION OF THE MUTCD.

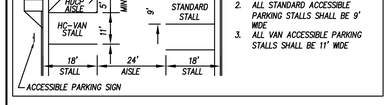
TYP. PARKING DIMENSIONS



PAVEMENT LOT STRUCTURE
2" ASPHALT SURFACE COARSE
6" AGGREGATE BASE COARSE
COMPACTED SUBGRADE

NOTES FOR PAVED PARKING LOTS:
1. CONCRETE STOP NOT REQUIRED IF CURB IS USED. IF SIDEWALK IS AGAINST BACK OF CURB, A MIN. 6' WIDTH IS REQUIRED WITHOUT CURB STOPS.
2. AN ELECTRIC PLAN MUST BE SUBMITTED TO THE PLANNING AND ELECTRIC DEPARTMENTS FOR APPROVAL.
3. A PLANTING PLAN MUST BE SUBMITTED TO THE PLANNING DEPARTMENT FOR APPROVAL.
4. NUMBER OF REQUIRED ADA SPACES FOR PAVED PARKING AREAS ARE LISTED IN THE CURRENT NC BUILDING CODE.
5. ALL ADA PARKING SPACES MUST DIRECTLY CONNECT TO PUBLIC ACCESS ROUTES THAT MEET ADA REQUIREMENTS.
6. ADA PARKING SPACES MUST MEET ADA DIMENSIONS.

TOWN OF APEX STANDARDS	PARKING	DETAIL NO. 200.04
EFFECTIVE OCTOBER 2018		SHEET 1 OF 1



NOTES:
1. ALL DIMENSIONS ARE FROM FACE OF CURB
2. ALL STANDARD ACCESSIBLE PARKING STALLS SHALL BE 9' WIDE
3. ALL VAN ACCESSIBLE PARKING STALLS SHALL BE 11' WIDE

ACCESSIBLE PARKING SIGN

KEY NOTES

- (A) ACCESSIBLE PARKING & SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (B) HI-VIS CROSS WALK, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (C) NO PARKING - FIRE LANE SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (D) SOLID WHITE MARKING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (E) DIRECTIONAL ARROW, SEE TRAFFIC CONTROL NOTES THIS SHEET.
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- (H) STOP BAR, SEE TRAFFIC CONTROL NOTES THIS SHEET.
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- (Q) SPECIAL PARKING SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (R) PARKING SPACE NUMBER, SEE TRAFFIC CONTROL NOTES THIS SHEET.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

MAGNETIC

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SEAL | 03/26/2021

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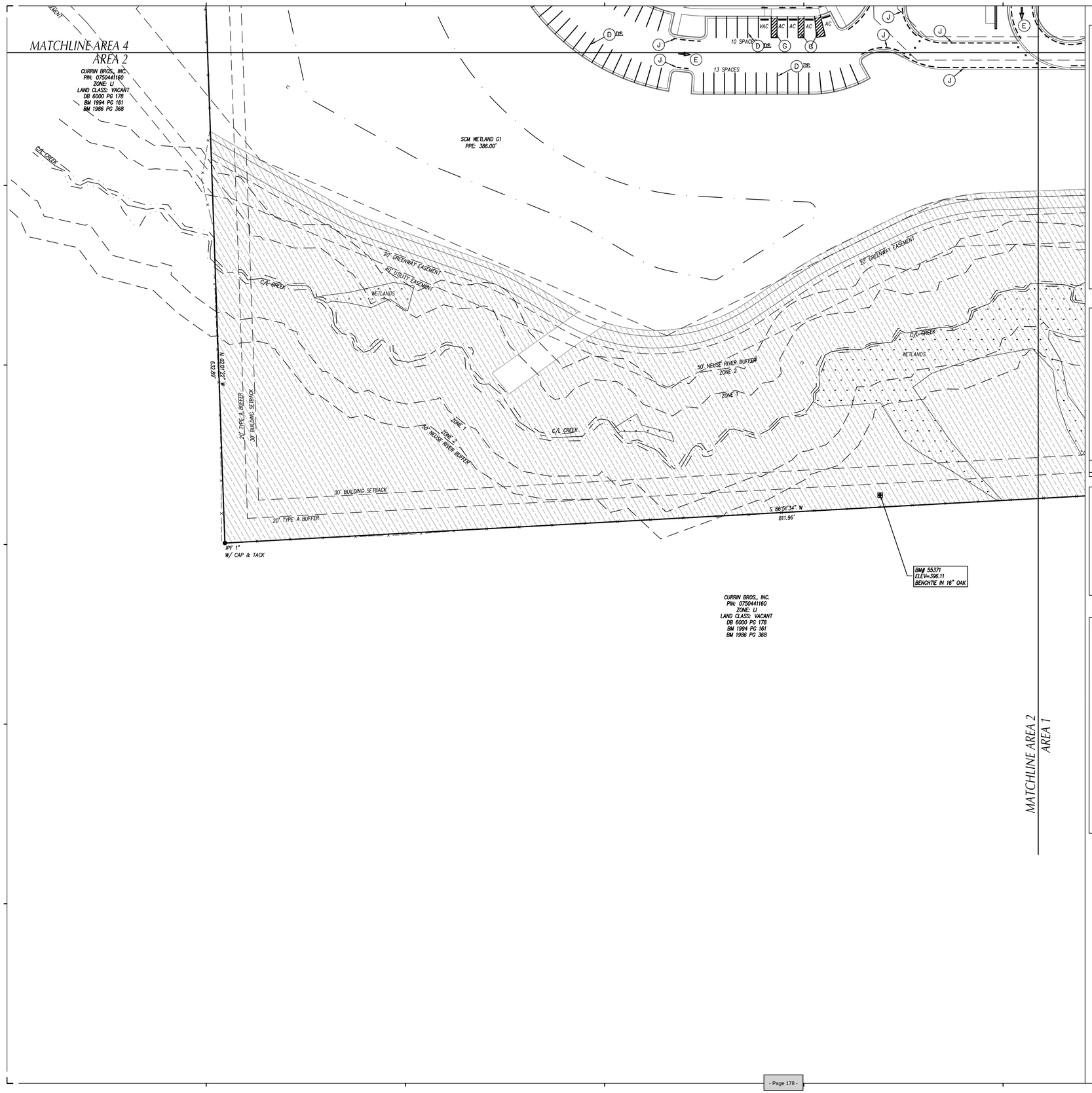
PROJECT NO. 02000.000

SHEET TITLE

PAVEMENT MARKING & SIGNAGE PLAN AREA_1

SHEET NUMBER

C-01.11



CURRIN BROS., INC.
PIN: 0750441160
ZONE: LI
LAND CLASS: VACANT
DB 6000 PG 178
BM 1994 PG 161
BM 1986 PG 368

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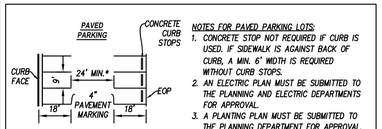

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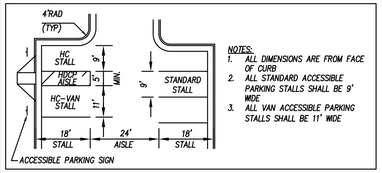
TOWN OF APEX STANDARDS	PARKING	SECTION 200.04 SHEET 1 OF 1
EFFECTIVE OCTOBER 2018		



ACCESSIBLE PARKING SIGN

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KEY NOTES

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SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

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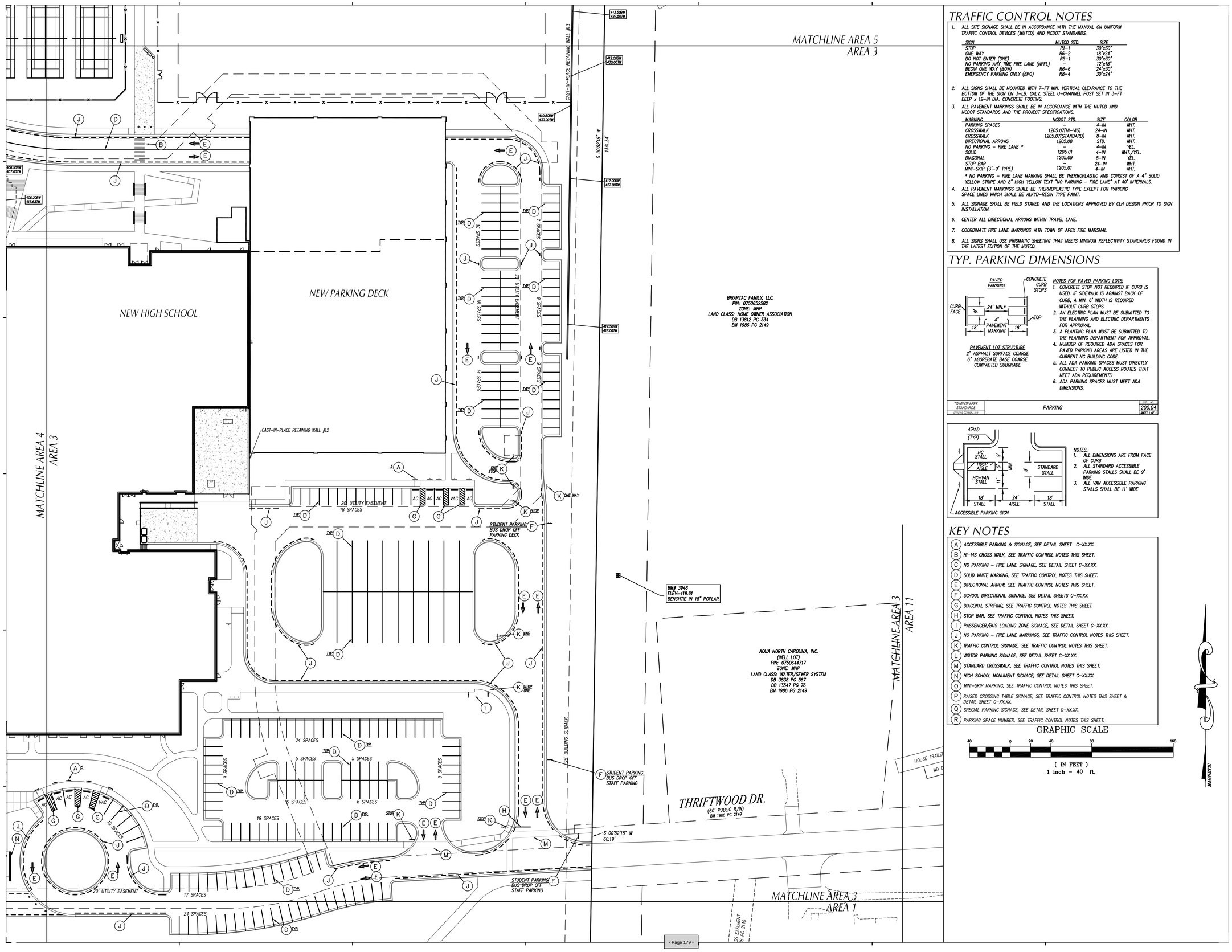
PROJECT NO. 02000.000

SHEET TITLE
PAVEMENT MARKING & SIGNAGE PLAN AREA_2

SHEET NUMBER
C-01.12



TRAFFIC CONTROL NOTES

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

SIGN	MUTCD STD.	SIZE
STOP	R1-1	30"x30"
ONE WAY	R6-2	18"x24"
DO NOT ENTER (DNE)	R5-1	30"x30"
NO PARKING ANY TIME FIRE LANE (NPFL)	--	12"x18"
BEGIN ONE WAY (BOW)	R6-6	24"x30"
EMERGENCY PARKING ONLY (EPO)	R8-4	30"x24"

2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT DEEP x 12-IN DIA. CONCRETE FOOTING.
3. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MUTCD AND NCDOT STANDARDS AND THE PROJECT SPECIFICATIONS.

MARKING	NCDOT STD.	SIZE	COLOR
PARKING SPACES	--	4-IN	WHT.
CROSSWALK	1205.07(HI-VIS)	24-IN	WHT.
CROSSWALK	1205.07(STANDARD)	8-IN	WHT.
DIRECTIONAL ARROWS	1205.08	STD.	WHT.
NO PARKING - FIRE LANE *	--	4-IN	YEL.
SOLID	1205.01	4-IN	WHT./YEL.
DIAGONAL	1205.09	8-IN	YEL.
STOP BAR	--	24-IN	WHT.
MINI-SKIP (3'-9' TYPE)	1205.01	4-IN	WHT.

* NO PARKING - FIRE LANE MARKING SHALL BE THERMOPLASTIC AND CONSIST OF A 4" SOLID YELLOW STRIPE AND 8" HIGH YELLOW TEXT "NO PARKING - FIRE LANE" AT 40' INTERVALS.

4. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC TYPE EXCEPT FOR PARKING SPACE LINES WHICH SHALL BE ALKYD-RESIN TYPE PAINT.
5. ALL SIGNAGE SHALL BE FIELD STAKED AND THE LOCATIONS APPROVED BY CLH DESIGN PRIOR TO SIGN INSTALLATION.
6. CENTER ALL DIRECTIONAL ARROWS WITHIN TRAVEL LANE.
7. COORDINATE FIRE LANE MARKINGS WITH TOWN OF APEX FIRE MARSHAL.
8. ALL SIGNS SHALL USE PRISMATIC SHEETING THAT MEETS MINIMUM REFLECTIVITY STANDARDS FOUND IN THE LATEST EDITION OF THE MUTCD.

TYP. PARKING DIMENSIONS

PAVEMENT LOT STRUCTURE
2" ASPHALT SURFACE COURSE
6" AGGREGATE BASE COURSE
COMPACTED SUBGRADE

NOTES FOR PAVED PARKING LOTS:
1. CONCRETE STOP NOT REQUIRED IF CURB IS USED. IF SIDEWALK IS AGAINST BACK OF CURB, A MIN. 6' WIDTH IS REQUIRED WITHOUT CURB STOPS.
2. AN ELECTRIC PLAN MUST BE SUBMITTED TO THE PLANNING AND ELECTRIC DEPARTMENTS FOR APPROVAL.
3. A PLANTING PLAN MUST BE SUBMITTED TO THE PLANNING DEPARTMENT FOR APPROVAL.
4. NUMBER OF REQUIRED ADA SPACES FOR PAVED PARKING AREAS ARE LISTED IN THE CURRENT NC BUILDING CODE.
5. ALL ADA PARKING SPACES MUST DIRECTLY CONNECT TO PUBLIC ACCESS ROUTES THAT MEET ADA REQUIREMENTS.
6. ADA PARKING SPACES MUST MEET ADA DIMENSIONS.

TOWN OF APEX STANDARDS (EFFECTIVE OCTOBER 2, 2012)	PARKING	DWG. NO. 200.04 SHT 1 OF 1

ACCESSIBLE PARKING SIGN

NOTES:
1. ALL DIMENSIONS ARE FROM FACE OF CURB
2. ALL STANDARD ACCESSIBLE PARKING STALLS SHALL BE 9' WIDE
3. ALL VAN ACCESSIBLE PARKING STALLS SHALL BE 11' WIDE

KEY NOTES

- (A) ACCESSIBLE PARKING & SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (B) HI-VIS CROSS WALK, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (C) NO PARKING - FIRE LANE SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (D) SOLID WHITE MARKING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (E) DIRECTIONAL ARROW, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (F) SCHOOL DIRECTIONAL SIGNAGE, SEE DETAIL SHEETS C-XX.XX.
- (G) DIAGONAL STRIPING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (H) STOP BAR, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (I) PASSENGER/BUS LOADING ZONE SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (J) NO PARKING - FIRE LANE MARKINGS, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (K) TRAFFIC CONTROL SIGNAGE, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (L) VISITOR PARKING SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (M) STANDARD CROSSWALK, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (N) HIGH SCHOOL MONUMENT SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (O) MINI-SKIP MARKING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (P) RAISED CROSSING TABLE SIGNAGE, SEE TRAFFIC CONTROL NOTES THIS SHEET & DETAIL SHEET C-XX.XX.
- (Q) SPECIAL PARKING SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (R) PARKING SPACE NUMBER, SEE TRAFFIC CONTROL NOTES THIS SHEET.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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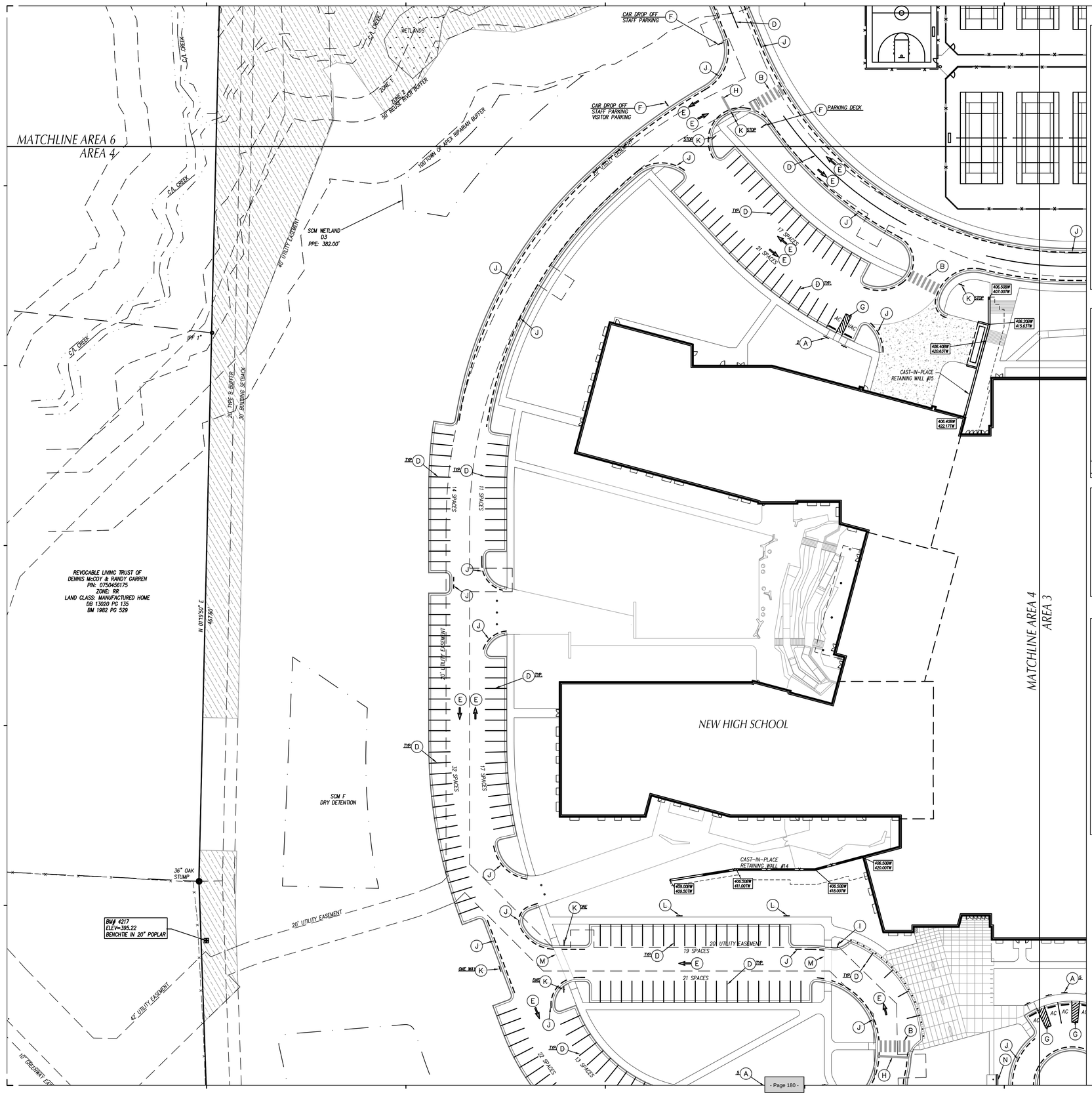
PROJECT NO. 02000.000

SHEET TITLE
PAVEMENT MARKING & SIGNAGE PLAN AREA_3

SHEET NUMBER
C-01.13



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MARKING	NCDOT STD.	SIZE	COLOR
PARKING SPACES	--	4-IN	WHT.
CROSSWALK	1205.07(HI-VIS)	24-IN	WHT.
CROSSWALK	1205.07(STANDARD)	8-IN	WHT.
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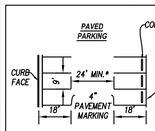
TYP. PARKING DIMENSIONS



PAVEMENT LOT STRUCTURE
2" ASPHALT SURFACE COARSE
6" AGGREGATE BASE COARSE
COMPACTED SUBGRADE

NOTES FOR PAVED PARKING LOTS:
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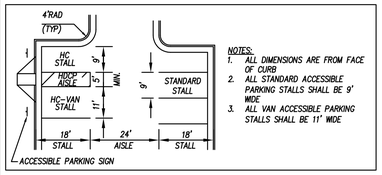
TOWN OF APEX STANDARDS (EFFECTIVE OCTOBER 2013)	PARKING	DETAIL NO. 200.04 SHEET 1 OF 1



NOTES:
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3. ALL VAN ACCESSIBLE PARKING STALLS SHALL BE 11' WIDE

KEY NOTES

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GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

MAGNETIC

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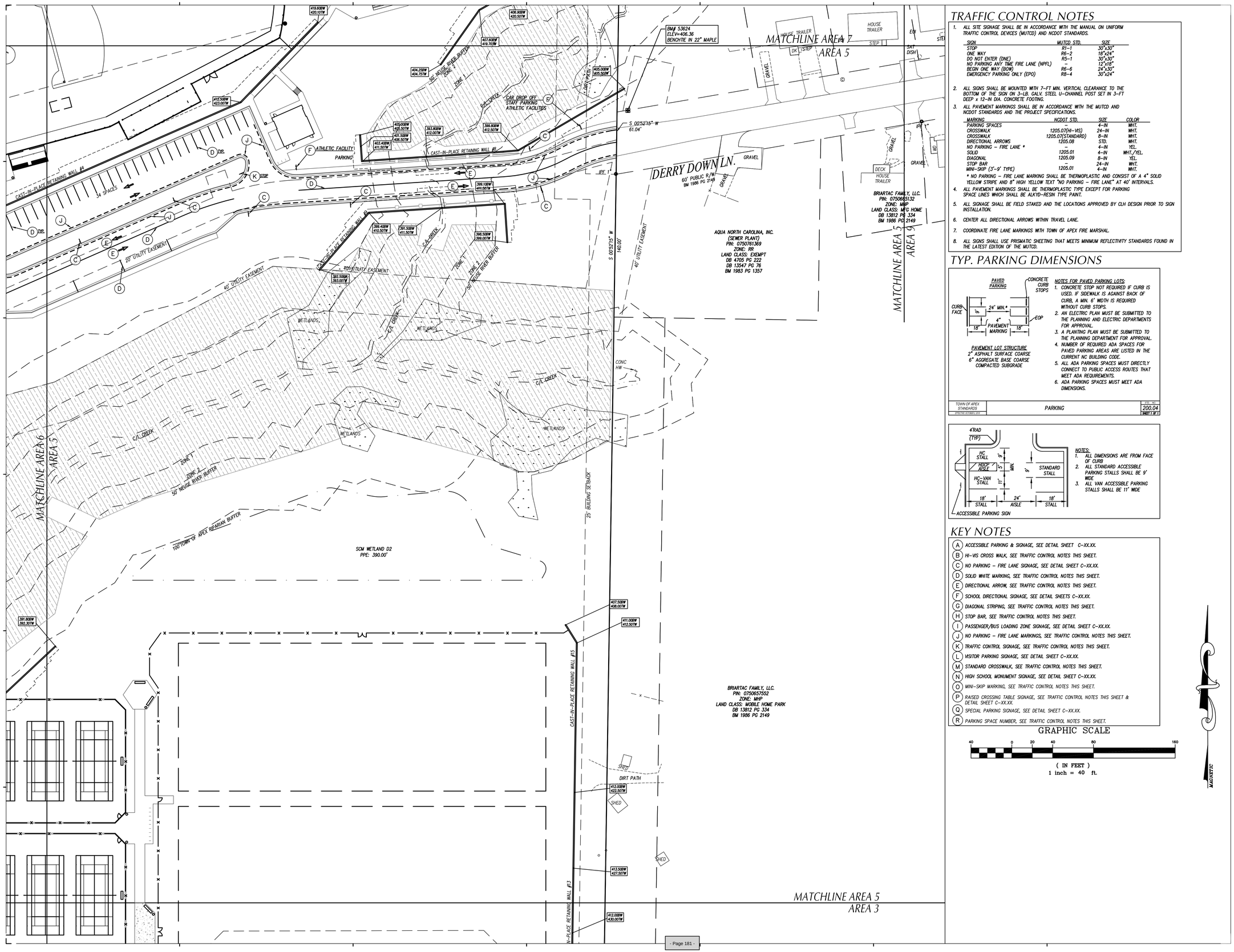
SHEET TITLE

PAVEMENT MARKING & SIGNAGE PLAN AREA_4

SHEET NUMBER

C-01.14



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PARKING SPACES	--	4-IN	WHT.
CROSSWALK	1205.07(TH-VIS)	24-IN	WHT.
CROSSWALK	1205.07(STANDARD)	8-IN	WHT.
DIRECTIONAL ARROWS	1205.08	STD.	WHT.
NO PARKING - FIRE LANE *	--	4-IN	YEL.
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TOWN OF APEX STANDARDS (EFFECTIVE OCTOBER 2013)	PARKING	DETAIL NO. 200.04 SHEET 1 OF 1

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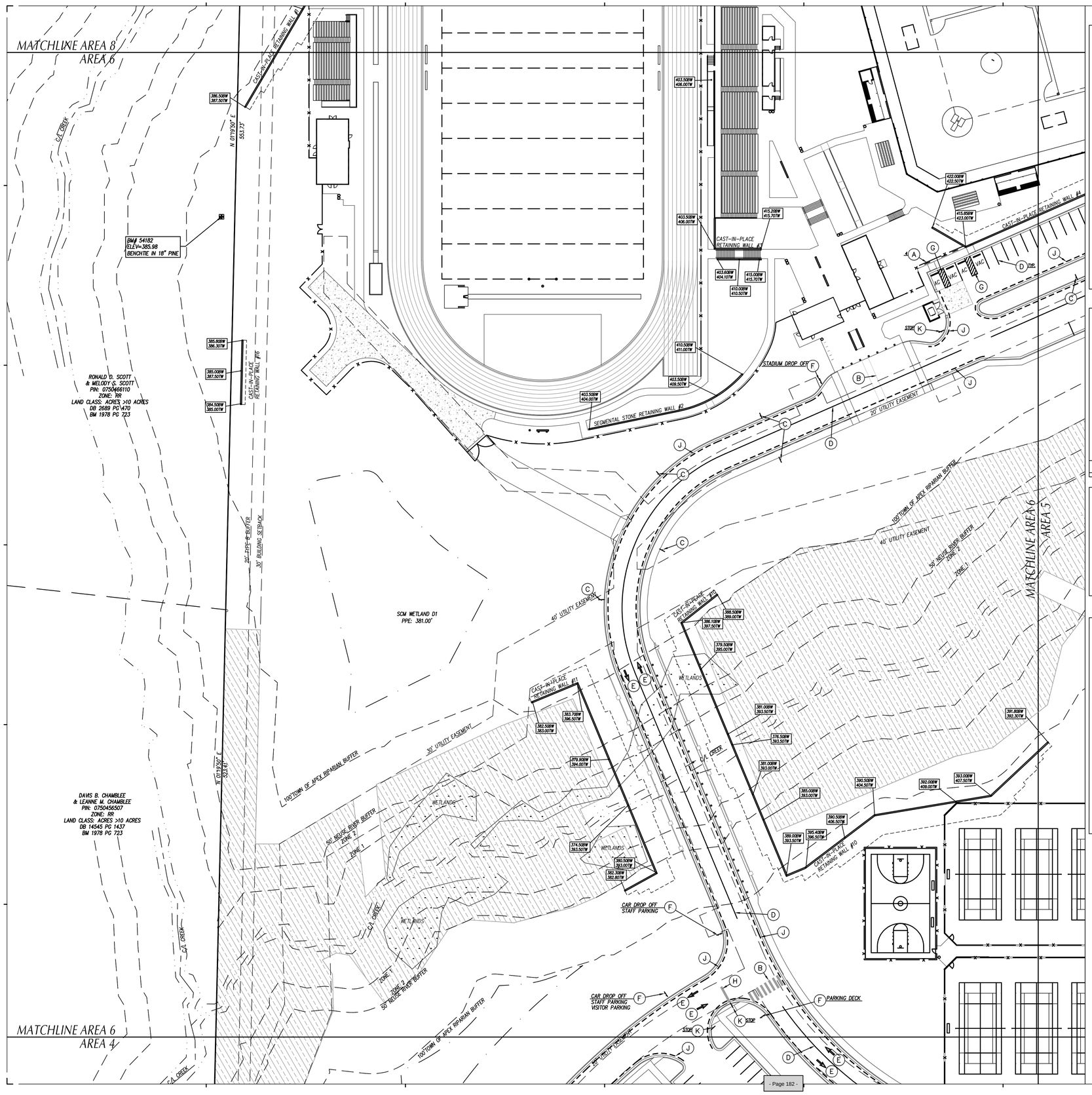
SHEET TITLE
PAVEMENT MARKING & SIGNAGE PLAN AREA_5

SHEET NUMBER
C-01.15



TRAFFIC CONTROL NOTES

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

SIGN	MUTCD STD.	SIZE
STOP	R1-1	30"x30"
ONE WAY	R6-2	18"x24"
DO NOT ENTER (DNE)	R5-1	30"x30"
NO PARKING ANY TIME FIRE LANE (NPFL)	--	12"x18"
BEGIN ONE WAY (BOW)	R6-6	24"x30"
EMERGENCY PARKING ONLY (EPO)	R8-4	30"x24"

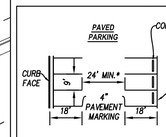
2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT DEEP x 12-IN DIA. CONCRETE FOOTING.
3. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MUTCD AND NCDOT STANDARDS AND THE PROJECT SPECIFICATIONS.

MARKING	NCDOT STD.	SIZE	COLOR
PARKING SPACES	--	4-IN	WHT.
CROSSWALK	1205.07(HI-VIS)	24-IN	WHT.
CROSSWALK	1205.07(STANDARD)	8-IN	WHT.
DIRECTIONAL ARROWS	1205.08	STD.	WHT.
NO PARKING - FIRE LANE *	--	4-IN	YEL.
SOLID	1205.01	4-IN	WHT./YEL.
DIAGONAL	1205.09	8-IN	YEL.
STOP BAR	--	24-IN	WHT.
MINI-SKIP (3'-9' TYPE)	1205.01	4-IN	WHT.

* NO PARKING - FIRE LANE MARKING SHALL BE THERMOPLASTIC AND CONSIST OF A 4" SOLID YELLOW STRIPE AND 8" HIGH YELLOW TEXT "NO PARKING - FIRE LANE" AT 40' INTERVALS.

4. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC TYPE EXCEPT FOR PARKING SPACE LINES WHICH SHALL BE ALKYD-RESIN TYPE PAINT.
5. ALL SIGNAGE SHALL BE FIELD STAKED AND THE LOCATIONS APPROVED BY CLH DESIGN PRIOR TO SIGN INSTALLATION.
6. CENTER ALL DIRECTIONAL ARROWS WITHIN TRAVEL LANE.
7. COORDINATE FIRE LANE MARKINGS WITH TOWN OF APEX FIRE MARSHAL.
8. ALL SIGNS SHALL USE PRISMATIC SHEETING THAT MEETS MINIMUM REFLECTIVITY STANDARDS FOUND IN THE LATEST EDITION OF THE MUTCD.

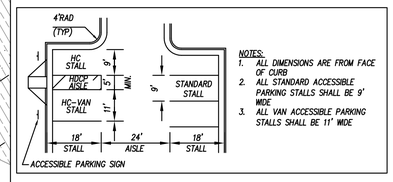
TYP. PARKING DIMENSIONS



PAVEMENT LOT STRUCTURE
2" ASPHALT SURFACE COARSE
6" AGGREGATE BASE COARSE
COMPACTED SUBGRADE

NOTES FOR PAVED PARKING LOTS:
1. CONCRETE STOP NOT REQUIRED IF CURB IS USED. IF SIDEWALK IS AGAINST BACK OF CURB, A MIN. 6' WIDTH IS REQUIRED WITHOUT CURB STOPS.
2. AN ELECTRIC PLAN MUST BE SUBMITTED TO THE PLANNING AND ELECTRIC DEPARTMENTS FOR APPROVAL.
3. A PLANTING PLAN MUST BE SUBMITTED TO THE PLANNING DEPARTMENT FOR APPROVAL.
4. NUMBER OF REQUIRED ADA SPACES FOR PAVED PARKING AREAS ARE LISTED IN THE CURRENT NC BUILDING CODE.
5. ALL ADA PARKING SPACES MUST DIRECTLY CONNECT TO PUBLIC ACCESS ROUTES THAT MEET ADA REQUIREMENTS.
6. ADA PARKING SPACES MUST MEET ADA DIMENSIONS.

TOWN OF APEX STANDARDS (EFFECTIVE OCTOBER 2013)	PARKING	APEX NO. 200.04 SHEET 1 OF 1



NOTES:
1. ALL DIMENSIONS ARE FROM FACE OF CURB
2. ALL STANDARD ACCESSIBLE PARKING STALLS SHALL BE 9' WIDE
3. ALL VAN ACCESSIBLE PARKING STALLS SHALL BE 11' WIDE

KEY NOTES

- (A) ACCESSIBLE PARKING & SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (B) HI-VIS CROSS WALK, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (C) NO PARKING - FIRE LANE SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (D) SOLID WHITE MARKING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (E) DIRECTIONAL ARROW, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (F) SCHOOL DIRECTIONAL SIGNAGE, SEE DETAIL SHEETS C-XX.XX.
- (G) DIAGONAL STRIPING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (H) STOP BAR, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (I) PASSENGER/BUS LOADING ZONE SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (J) NO PARKING - FIRE LANE MARKINGS, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (K) TRAFFIC CONTROL SIGNAGE, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (L) VISITOR PARKING SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (M) STANDARD CROSSWALK, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (N) HIGH SCHOOL MONUMENT SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (O) MINI-SKIP MARKING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (P) RAISED CROSSING TABLE SIGNAGE, SEE TRAFFIC CONTROL NOTES THIS SHEET & DETAIL SHEET C-XX.XX.
- (Q) SPECIAL PARKING SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (R) PARKING SPACE NUMBER, SEE TRAFFIC CONTROL NOTES THIS SHEET.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

MAGNETIC

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SEAL | 03/26/2021

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SHEET ISSUE

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3	TOA Major Site Plan Submittal #2	2/12/21
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5	60% Construction Documents	3/26/21

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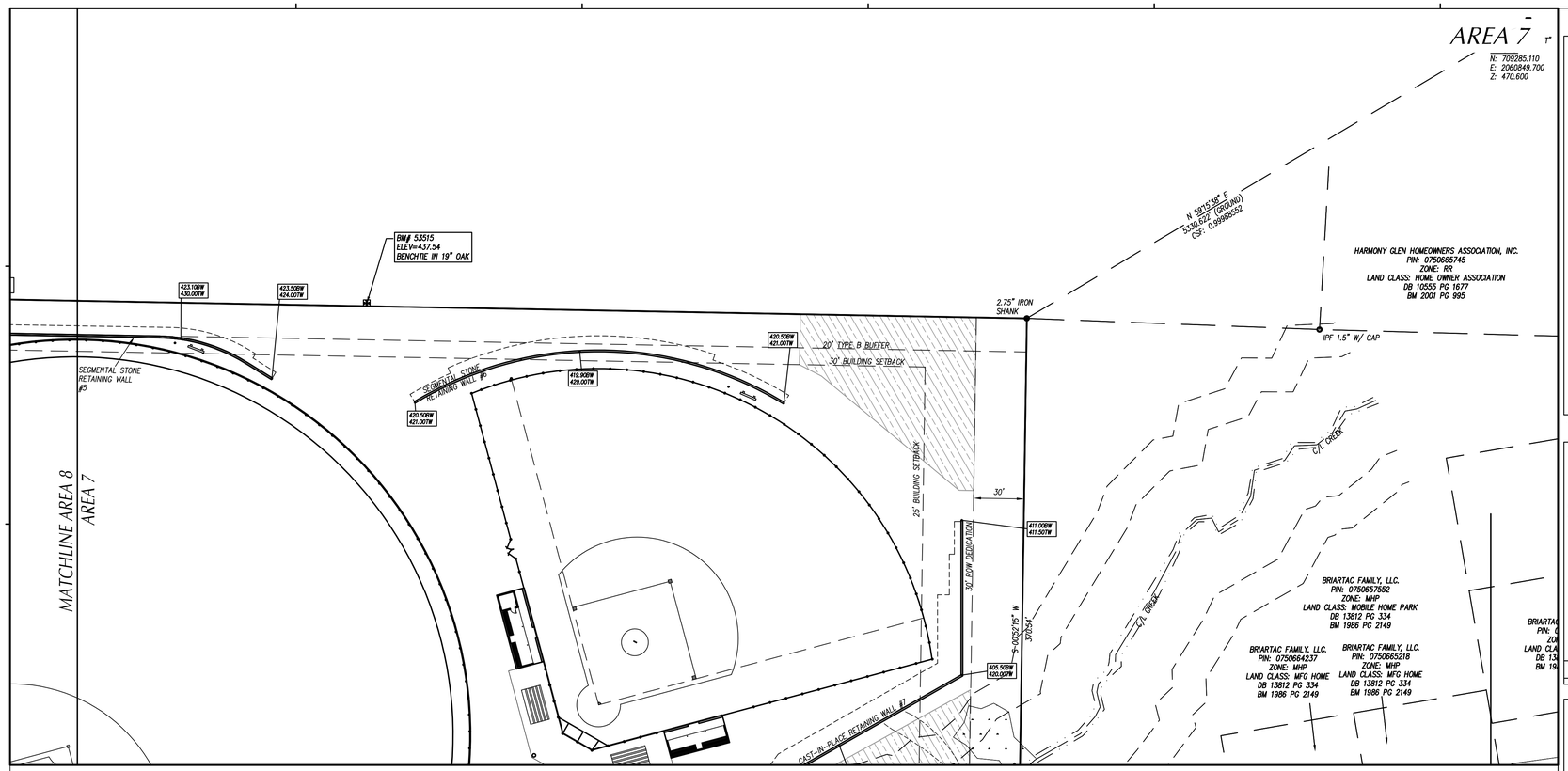
PROJECT NO. 02000.000

SHEET TITLE

PAVEMENT MARKING & SIGNAGE PLAN AREA_6

SHEET NUMBER

C-01.16



TRAFFIC CONTROL NOTES

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

SIGN	MUTCD STD.	SIZE
STOP	R1-1	30"x30"
ONE WAY	R6-2	18"x24"
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NO PARKING ANY TIME FIRE LANE (NPFL)	--	12"x18"
BEGIN ONE WAY (BOW)	R6-6	24"x30"
EMERGENCY PARKING ONLY (EPO)	R8-4	30"x24"

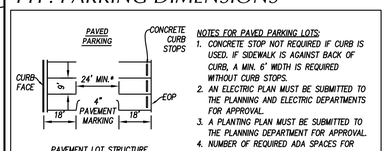
2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT DEEP x 12-IN DIA. CONCRETE FOOTING.
3. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MUTCD AND NCDOT STANDARDS AND THE PROJECT SPECIFICATIONS.

MARKING	NCDOT STD.	SIZE	COLOR
PARKING SPACES	--	4-IN	WHT.
CROSSWALK	1205.07(HI-VIS)	24-IN	WHT.
CROSSWALK	1205.07(STANDARD)	8-IN	WHT.
DIRECTIONAL ARROWS	1205.08	STD.	WHT.
NO PARKING - FIRE LANE *	--	4-IN	YEL.
SOLID	1205.01	4-IN	WHT./YEL.
DIAGONAL	1205.09	8-IN	YEL.
STOP BAR	--	24-IN	WHT.
MINI-SKIP (3'-9' TYPE)	1205.01	4-IN	WHT.

* NO PARKING - FIRE LANE MARKING SHALL BE THERMOPLASTIC AND CONSIST OF A 4" SOLID YELLOW STRIPE AND 8" HIGH YELLOW TEXT "NO PARKING - FIRE LANE" AT 40' INTERVALS.

4. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC TYPE EXCEPT FOR PARKING SPACE LINES WHICH SHALL BE ALKYD-RESIN TYPE PAINT.
5. ALL SIGNAGE SHALL BE FIELD STAKED AND THE LOCATIONS APPROVED BY CLH DESIGN PRIOR TO SIGN INSTALLATION.
6. CENTER ALL DIRECTIONAL ARROWS WITHIN TRAVEL LANE.
7. COORDINATE FIRE LANE MARKINGS WITH TOWN OF APEX FIRE MARSHAL.
8. ALL SIGNS SHALL USE PRISMATIC SHEETING THAT MEETS MINIMUM REFLECTIVITY STANDARDS FOUND IN THE LATEST EDITION OF THE MUTCD.

TYP. PARKING DIMENSIONS



PAVEMENT LOT STRUCTURE
2" ASPHALT SURFACE COARSE
6" AGGREGATE BASE COARSE
COMPACTED SUBGRADE

NOTES FOR PAVED PARKING LOTS:
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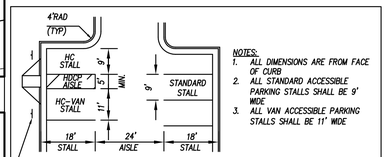
6. ADA PARKING SPACES MUST MEET ADA DIMENSIONS.

TOWN OF APEX STANDARDS (EFFECTIVE OCTOBER 2013)	PARKING	DETAIL NO. 200.04 SHEET 1 OF 1



ACCESSIBLE PARKING SIGN

NOTES:
1. ALL DIMENSIONS ARE FROM FACE OF CURB
2. ALL STANDARD ACCESSIBLE PARKING STALLS SHALL BE 9' WIDE
3. ALL VAN ACCESSIBLE PARKING STALLS SHALL BE 11' WIDE

KEY NOTES

- (A) ACCESSIBLE PARKING & SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (B) HI-VIS CROSS WALK, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (C) NO PARKING - FIRE LANE SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (D) SOLID WHITE MARKING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (E) DIRECTIONAL ARROW, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (F) SCHOOL DIRECTIONAL SIGNAGE, SEE DETAIL SHEETS C-XX.XX.
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- (H) STOP BAR, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (I) PASSENGER/BUS LOADING ZONE SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (J) NO PARKING - FIRE LANE MARKINGS, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (K) TRAFFIC CONTROL SIGNAGE, SEE TRAFFIC CONTROL NOTES THIS SHEET.
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- (M) STANDARD CROSSWALK, SEE TRAFFIC CONTROL NOTES THIS SHEET.
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- (O) MINI-SKIP MARKING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (P) RAISED CROSSING TABLE SIGNAGE, SEE TRAFFIC CONTROL NOTES THIS SHEET & DETAIL SHEET C-XX.XX.
- (Q) SPECIAL PARKING SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (R) PARKING SPACE NUMBER, SEE TRAFFIC CONTROL NOTES THIS SHEET.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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SEAL | 03/26/2021

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SHEET ISSUE

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PROJECT NO. 02000.000

SHEET TITLE
PAVEMENT MARKING & SIGNAGE PLAN AREA_7&8

SHEET NUMBER
C-01.17

TRAFFIC CONTROL NOTES

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

SIGN	MUTCD STD.	SIZE
STOP	R1-1	30"x30"
ONE WAY	R6-2	18"x24"
DO NOT ENTER (DNE)	R5-1	30"x30"
NO PARKING ANY TIME FIRE LANE (NPFL)	--	12"x18"
BEGIN ONE WAY (BOW)	R6-6	24"x30"
EMERGENCY PARKING ONLY (EPO)	R8-4	30"x24"

2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT DEEP x 12-IN DIA. CONCRETE FOOTING.
3. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MUTCD AND NCDOT STANDARDS AND THE PROJECT SPECIFICATIONS.

MARKING	NCDOT STD.	SIZE	COLOR
PARKING SPACES	--	4-IN	WHT.
CROSSWALK	1205.07(HI-VIS)	24-IN	WHT.
CROSSWALK	1205.07(STANDARD)	8-IN	WHT.
DIRECTIONAL ARROWS	1205.08	STD.	WHT.
NO PARKING - FIRE LANE *	--	4-IN	YEL.
SOLID	1205.01	4-IN	WHT./YEL.
DIAGONAL	1205.09	8-IN	YEL.
STOP BAR	--	24-IN	WHT.
MINI-SKIP (3'-9' TYPE)	1205.01	4-IN	WHT.

* NO PARKING - FIRE LANE MARKING SHALL BE THERMOPLASTIC AND CONSIST OF A 4" SOLID YELLOW STRIPE AND 8" HIGH YELLOW TEXT "NO PARKING - FIRE LANE" AT 40' INTERVALS.

4. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC TYPE EXCEPT FOR PARKING SPACE LINES WHICH SHALL BE ALKYD-RESIN TYPE PAINT.
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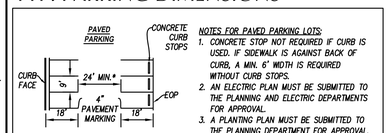
7. COORDINATE FIRE LANE MARKINGS WITH TOWN OF APEX FIRE MARSHAL.
8. ALL SIGNS SHALL USE PRISMATIC SHEETING THAT MEETS MINIMUM REFLECTIVITY STANDARDS FOUND IN THE LATEST EDITION OF THE MUTCD.

TYP. PARKING DIMENSIONS



NOTES FOR PAVED PARKING LOTS:
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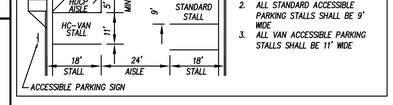
TOWN OF APEX STANDARDS	PARKING	ADA 10.04
EFFECTIVE OCTOBER 2019		SHEET 1 OF 1



NOTES:
1. ALL DIMENSIONS ARE FROM FACE OF CURB
2. ALL STANDARD ACCESSIBLE PARKING STALLS SHALL BE 9' WIDE
3. ALL VAN ACCESSIBLE PARKING STALLS SHALL BE 11' WIDE

KEY NOTES

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- (Q) SPECIAL PARKING SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (R) PARKING SPACE NUMBER, SEE TRAFFIC CONTROL NOTES THIS SHEET.

GRAPHIC SCALE

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(IN FEET)
1 inch = 40 ft.

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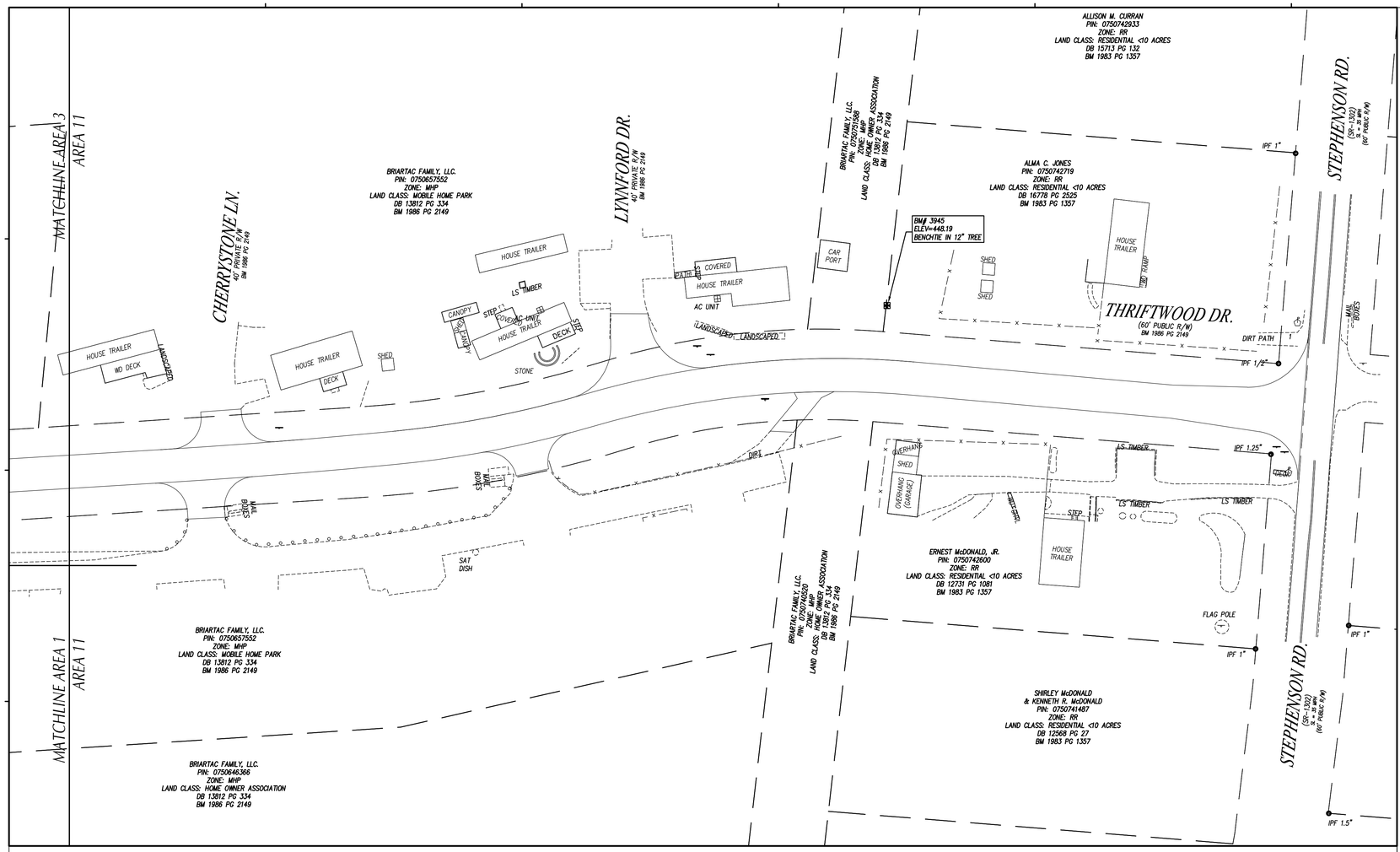
PROJECT NO. 02000.000

SHEET TITLE

PAVEMENT MARKING & SIGNAGE PLAN AREA_9&10

SHEET NUMBER

C-01.18



TRAFFIC CONTROL NOTES

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

SIGN	MUTCD STD.	SIZE
STOP	R1-1	30"x30"
ONE WAY	R6-2	18"x24"
DO NOT ENTER (DNE)	R5-1	30"x30"
NO PARKING ANY TIME FIRE LANE (NPFL)	--	12"x18"
BEGIN ONE WAY (BOW)	R6-6	24"x30"
EMERGENCY PARKING ONLY (EPO)	R8-4	30"x24"

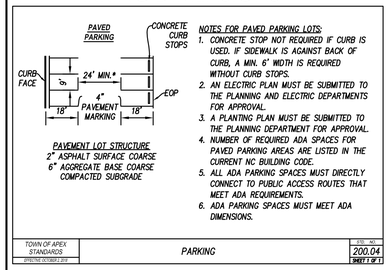
2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT DEEP x 12-IN DIA. CONCRETE FOOTING.
3. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE MUTCD AND NCDOT STANDARDS AND THE PROJECT SPECIFICATIONS.

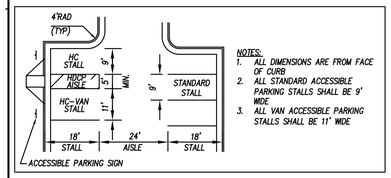
MARKING	NCDOT STD.	SIZE	COLOR
PARKING SPACES	--	4-IN	WHT.
CROSSWALK	1205.07(HI-VIS)	24-IN	WHT.
CROSSWALK	1205.07(STANDARD)	8-IN	WHT.
DIRECTIONAL ARROWS	1205.08	STD.	WHT.
NO PARKING - FIRE LANE *	--	4-IN	YEL.
SOLID	1205.01	4-IN	WHT./YEL.
DIAGONAL	1205.09	8-IN	YEL.
STOP BAR	--	24-IN	WHT.
MINI-SKIP (3'-9' TYPE)	1205.01	4-IN	WHT.

* NO PARKING - FIRE LANE MARKING SHALL BE THERMOPLASTIC AND CONSIST OF A 4" SOLID YELLOW STRIPE AND 8" HIGH YELLOW TEXT "NO PARKING - FIRE LANE" AT 40' INTERVALS.

4. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC TYPE EXCEPT FOR PARKING SPACE LINES WHICH SHALL BE ALKYD-RESIN TYPE PAINT.
5. ALL SIGNAGE SHALL BE FIELD STAKED AND THE LOCATIONS APPROVED BY CLH DESIGN PRIOR TO SIGN INSTALLATION.
6. CENTER ALL DIRECTIONAL ARROWS WITHIN TRAVEL LANE.
7. COORDINATE FIRE LANE MARKINGS WITH TOWN OF APEX FIRE MARSHAL.
8. ALL SIGNS SHALL USE PRISMATIC SHEETING THAT MEETS MINIMUM REFLECTIVITY STANDARDS FOUND IN THE LATEST EDITION OF THE MUTCD.

TYP. PARKING DIMENSIONS





KEY NOTES

- (A) ACCESSIBLE PARKING & SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (B) HI-VIS CROSS WALK, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (C) NO PARKING - FIRE LANE SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (D) SOLID WHITE MARKING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (E) DIRECTIONAL ARROW, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (F) SCHOOL DIRECTIONAL SIGNAGE, SEE DETAIL SHEETS C-XX.XX.
- (G) DIAGONAL STRIPING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (H) STOP BAR, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (I) PASSENGER/BUS LOADING ZONE SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (J) NO PARKING - FIRE LANE MARKINGS, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (K) TRAFFIC CONTROL SIGNAGE, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (L) VISITOR PARKING SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (M) STANDARD CROSSWALK, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (N) HIGH SCHOOL MONUMENT SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (O) MINI-SKIP MARKING, SEE TRAFFIC CONTROL NOTES THIS SHEET.
- (P) RAISED CROSSING TABLE SIGNAGE, SEE TRAFFIC CONTROL NOTES THIS SHEET & DETAIL SHEET C-XX.XX.
- (Q) SPECIAL PARKING SIGNAGE, SEE DETAIL SHEET C-XX.XX.
- (R) PARKING SPACE NUMBER, SEE TRAFFIC CONTROL NOTES THIS SHEET.

GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

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SEAL | 03/26/2021

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4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

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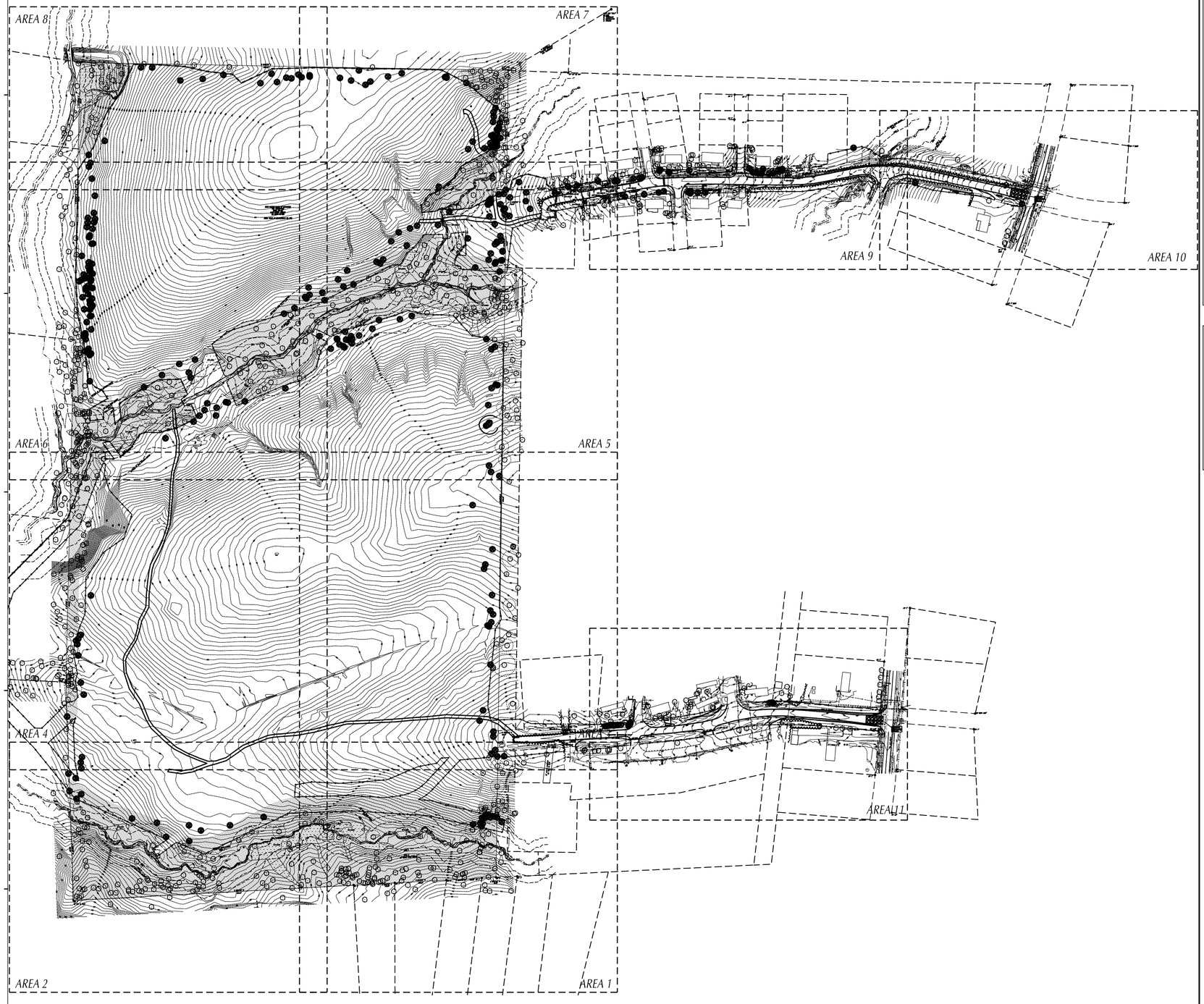
PROJECT NO. 02000.000

SHEET TITLE

PAVEMENT MARKING & SIGNAGE PLAN AREA_11

SHEET NUMBER

C-01.19



GENERAL NOTES

1. ALL EXISTING STRUCTURES AND UTILITIES SHALL BE REMOVED AS NEEDED TO ALLOW NEW CONSTRUCTION. IN GENERAL, FEATURES INDICATED IN BOLD ON THIS PLAN SHALL BE REMOVED.
2. ALL PAVEMENT OR CONCRETE TO BE REMOVED SHALL BE SAW CUT TO PROVIDE A STRAIGHT AND UNIFORM JOINT FOR NEW PAVEMENT, SIDEWALK, OR CURB AND GUTTER, ETC. ANY EXISTING PAVEMENT, SIDEWALK, CURB AND GUTTER, ETC. THAT MUST BE REMOVED TO ALLOW NEW CONSTRUCTION SHALL BE REMOVED AND REPAIRED PER THE SPECIFICATIONS AND DETAILS OR TO MATCH PRE-CONSTRUCTION CONDITIONS (WHETHER OR NOT SHOWN ON THE DRAWINGS TO BE REMOVED).
3. ALL UTILITIES OR STRUCTURES NOT INDICATED FOR REMOVAL OR MODIFICATION ARE TO REMAIN AND BE PROTECTED FROM DAMAGE.
4. ALL WASTE MATERIAL GENERATED FROM DEMOLITION ACTIVITIES SHALL BE DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL APPLICABLE RULES AND REGULATIONS.
5. EXISTING SITE BOUNDARY AND TOPOGRAPHIC SURVEY INFORMATION WAS TAKEN FROM SURVEY BY SEPI ENGINEERING & CONSTRUCTION, PERFORMED 07/03/2019. THESE PLANS DO NOT ASSUME ANY LIABILITY FOR ANY EXISTING INFORMATION BOTH SHOWN AND NOT SHOWN ON THE SURVEY AND ANY CHANGES TO THE EXISTING CONDITIONS THAT MAY HAVE OCCURRED AFTER THE SURVEY WAS ISSUED. CONTRACTOR SHALL VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION.
6. INSTALL TREE PROTECTION FENCING PRIOR TO BEGINNING CLEARING OPERATIONS. CLEAR AND GRUB ALL AREAS AS SHOWN AND REQUIRED TO PERMIT INSTALLATION OF NEW CONSTRUCTION PER SPECIFICATIONS AND DRAWINGS. EXISTING TREES, SHRUBS OR OTHER LANDSCAPE MATERIAL WHICH WILL CONFLICT WITH NEW CONSTRUCTION SHALL BE REMOVED (WHETHER OR NOT SHOWN ON THE DRAWINGS). ALL CONTRACTORS SHALL VISIT THE SITE AND OBSERVE EXISTING CONDITIONS PRIOR TO BIDDING.
7. TO MINIMIZE DAMAGE TO EXISTING TREES NEAR THE INTERIOR EDGE OF CLEARING LIMITS, THE CONTRACTOR SHALL CUT 2-FT DEEP TRENCHES ALONG THE LIMITS OF DISTURBANCE, SO AS TO CUT, RATHER THAN TEAR ROOTS.
8. PRIOR TO DEMOLISHING EXISTING STRUCTURES, MAKE AN INSPECTION FOR ANY HAZARDOUS MATERIALS. CONTACT ARCHITECT IMMEDIATELY IF ANY HAZARDOUS MATERIALS ARE DISCOVERED. CAP AND REMOVE UTILITY SERVICES, FUEL TANKS AND SEPTIC SYSTEMS. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
9. VERIFY ALL ILLUSTRATED UNDERGROUND ELEMENTS/UTILITIES. EXERCISE REASONABLE EFFORTS TO PROTECT ANY UNKNOWN UNDERGROUND ELEMENTS/UTILITIES. NOTIFY THE ARCHITECT IMMEDIATELY IF UNKNOWN ELEMENTS/UTILITIES ARE DISCOVERED THAT WOULD NECESSITATE MODIFICATION TO THE PROPOSED DESIGN.
10. CONTACT UTILITY LOCATING SERVICE AT LEAST 48-HRS PRIOR TO EXCAVATION.
11. PROTECT ALL ADJACENT PROPERTIES, THE GENERAL PUBLIC AND ALL OF THE OWNER'S FACILITIES. SHOULD DAMAGES OCCUR, REPAIR IMMEDIATELY AS DIRECTED BY THE ARCHITECT.
12. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF APEX AND/OR NCDOT STANDARDS AND SPECIFICATIONS.
13. ALL EXISTING VAULTS, MANHOLES, STORM DRAIN STRUCTURES, CLEANOUTS, ETC. SHALL BE ADJUSTED AS NEEDED TO MATCH FINISH GRADE.
14. DEMOLITION AND PATCHING OF PAVEMENT, SIDEWALK, CURB AND GUTTER AND OTHER EXISTING PAVED SURFACES IN ADDITION TO THAT INDICATED ON THIS PLAN SHALL BE PERFORMED AS REQUIRED TO CONSTRUCT AND INSTALL NEW UTILITIES. ALL SUCH DEMOLITION AND PATCHING SHALL BE INCLUDED IN THE BASE BID SCOPE OF WORK. SEE SHEET ___ FOR PAVEMENT REPAIR DETAILS.
15. THIS SITE IS NOT LOCATED WITHIN SPECIAL FLOOD HAZARD AREAS AS DETERMINED BY FEMA AND DEPICTED ON F.I.R.M. MAP 3720072100J DATED 05/02/2006 AND MAP 3720072000J DATED 05/02/2006 AS BEING WITHIN ZONE "X-OTHER AREA".
16. NO WORK SHALL BE PERFORMED ON RIGHT-OF-WAYS OR ADJACENT PROPERTIES UNTIL THE OWNER NOTIFIES CONTRACTOR IN WRITING OF PROCUREMENT OF APPROPRIATE PERMITS, EASEMENTS, AGREEMENTS, OR RIGHTS-OF-WAY.
17. THIS SITE IS LOCATED WITHIN THE PRIMARY WATERSHED PROTECTION OVERLAY DISTRICT.

TOWN OF APEX REQUIRED NOTES

1. NO SITE DEVELOPMENT ACTIVITY INCLUDING, BUT NOT LIMITED TO, TESTING, CLEARING, INSTALLATION OF S&E MEASURES, OR GRADING, SHALL OCCUR UNTIL REQUIRED TREE PROTECTION FENCING HAS BEEN INSTALLED AND INSPECTED. A PROTECTION FENCING INSTALLATION PERMIT MAY BE OBTAINED AT THE PLANNING DEPARTMENT OR ONLINE AT http://www.apexnc.org/215/Applications-Schedules.
2. TREE PROTECTION FENCING MUST BE PLACED:
   - 2.1. ONE FOOT AWAY FROM ANY SAVED TREE FOR EACH INCH OF DIAMETER AT BREAST HEIGHT,
   - 2.2. ALONG THE OUTSIDE LINE OF THE 100-YEAR FLOODPLAIN AND THE OUTSIDE EDGE OF ANY RIPARIAN BUFFER, AND,
   - 2.3. AT LEAST 10 FEET AWAY FROM ANY OTHER DESIGNATED RCA SUCH AS, BUT NOT LIMITED TO, HISTORIC BUILDINGS AND STRUCTURES, WETLANDS, AND PONDS.
3. ADDITIONAL TREE PROTECTION FENCING MAY BE REQUIRED IN OTHER LOCATIONS CLOSE TO CONSTRUCTION ACTIVITY WHERE IT IS DEEMED NECESSARY BY THE ZONING ENFORCEMENT OFFICER; SUCH AREAS MAY INCLUDE, BUT ARE NOT LIMITED TO, COMMON PROPERTY LINES OR NEAR PUBLIC AREAS (SIDEWALKS, ETC.).
4. IF BUILDINGS ARE TO BE DEMOLISHED, A COPY OF THE DEMOLITION NOTIFICATION FROM THE NC HEALTH HAZARD CONTROL UNIT AND AN ASBESTOS INSPECTION REPORT FROM A NC ACCREDITED ASBESTOS INSPECTOR MUST ACCOMPANY THE APPLICATION FOR THE DEMOLITION PERMIT WHICH MUST BE OBTAINED PRIOR TO START OF THE DEMOLITION.

GRAPHIC SCALE

150 0 75 150 300 600

(IN FEET)
1 inch = 150 ft.

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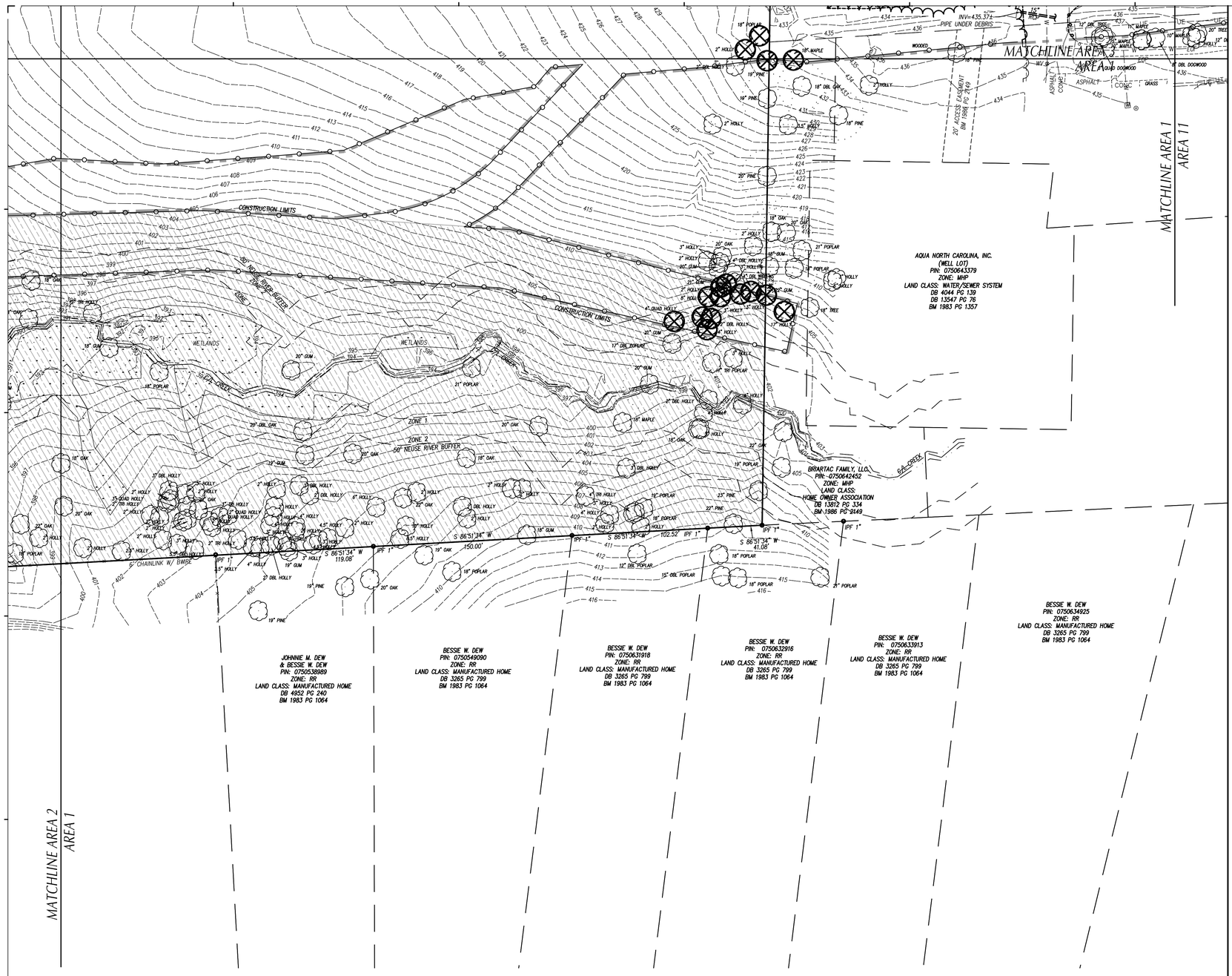
PROJECT NO. 02000.000

SHEET TITLE

DEMOLITION &
EXISTING CONDITIONS
OVERALL PLAN

SHEET NUMBER

C-02.00



LEGEND

STRUCTURES/UTILITIES TO BE REMOVED		STRUCTURES/UTILITIES TO REMAIN	
OVERHEAD ELECTRICAL	E	OVERHEAD ELECTRICAL	E
UNDERGROUND ELECTRICAL	UE	UNDERGROUND ELECTRICAL	UE
FIRE PROTECTION	FP	FIRE PROTECTION	FP
GAS	G	GAS	G
SANITARY SEWER	SS	SANITARY SEWER	SS
TELEPHONE	T	TELEPHONE	T
UNDERGROUND TELEPHONE	UT	UNDERGROUND TELEPHONE	UT
FIBER OPTIC	FO	FIBER OPTIC	FO
WATER	W	WATER	W
FORCE MAIN	FM	FORCE MAIN	FM
STORM DRAIN		STORM DRAIN	
INDIVIDUAL TREE TO BE REMOVED	>18" <18"	INDIVIDUAL TREE TO REMAIN.	
LIGHT POLE	LP	LIGHT POLE	LP
UTILITY POLE	PP	UTILITY POLE	PP
MANHOLE	MH	MANHOLE	MH
CLEAN OUT	CO	CLEAN OUT	CO
DROP INLET,CATCH BASIN	DI, CB	DROP INLET,CATCH BASIN	DI, CB
FIRE HYDRANT	FH	FIRE HYDRANT	FH
WATER VALVE	WV	WATER VALVE	WV
		CRITICAL ROOT ZONES	
CONSTR./CLEARING LIMITS		PAVEMENT, S/W, C&G TO BE REMOVED.	
TREE PROTECTION FENCE		BUILDING/STRUCTURE TO BE REMOVED. SEE ARCHITECTURAL PLANS.	
RESOURCE CONSERVATION AREA			

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
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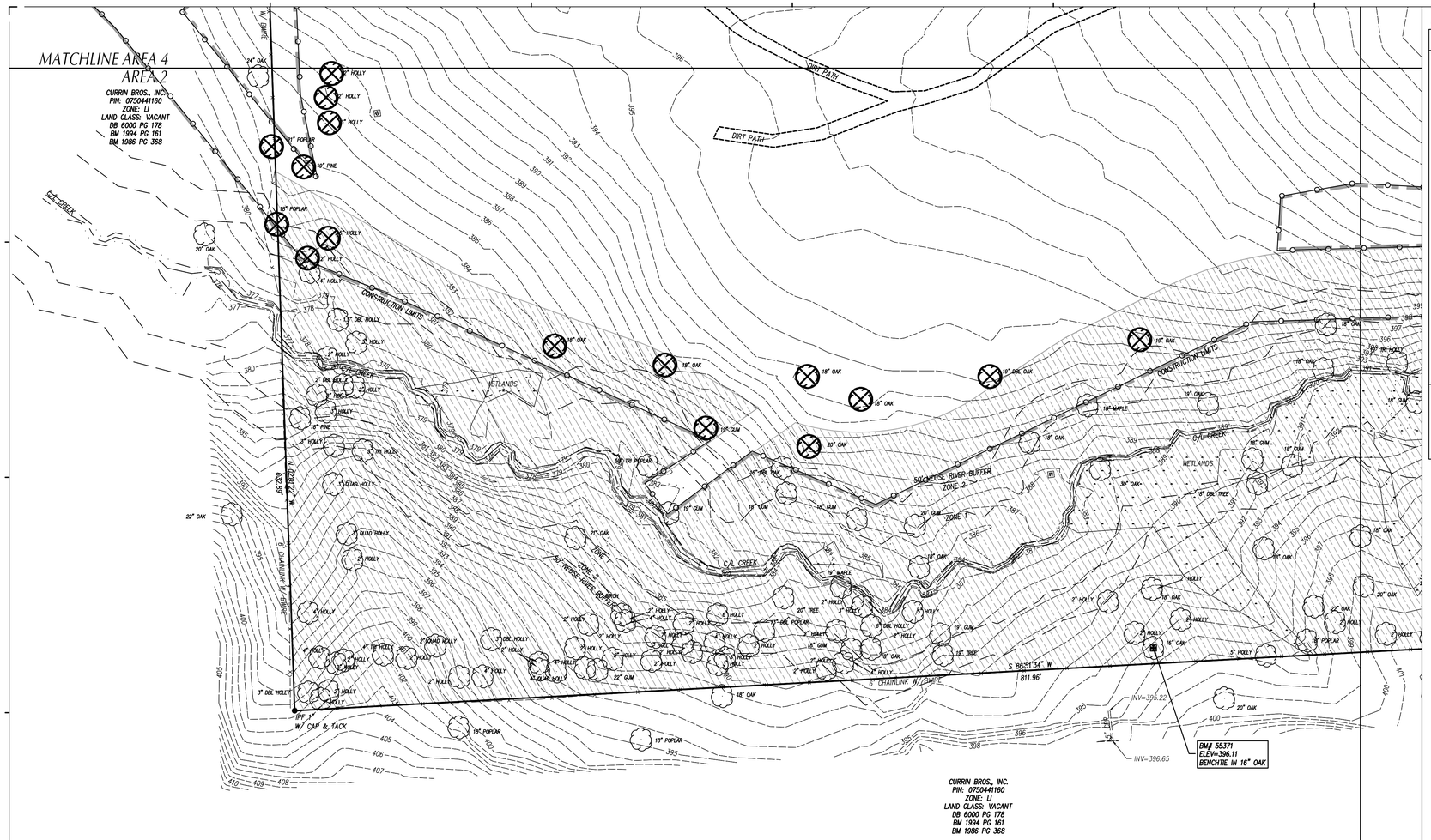
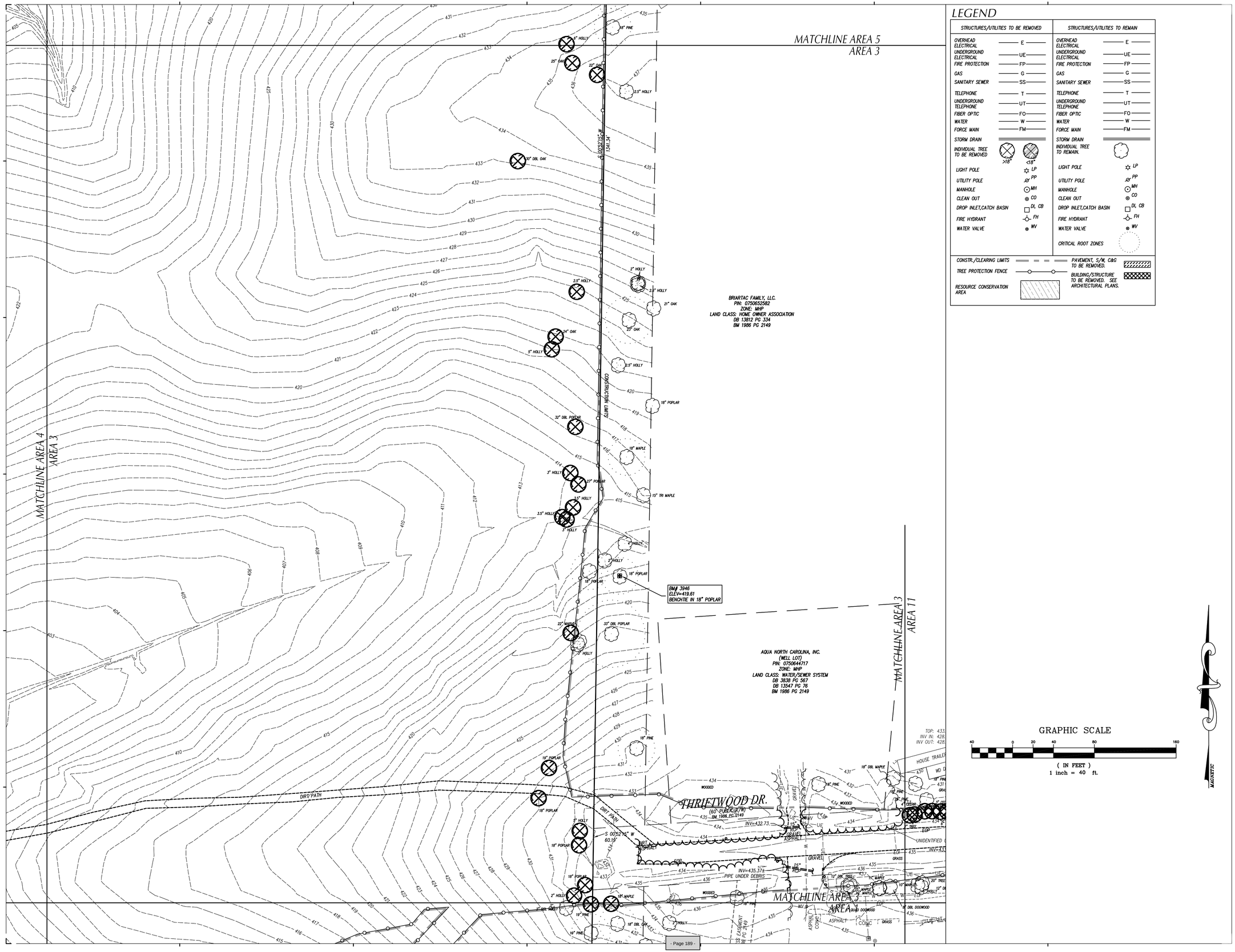
SHEET TITLE

DEMOLITION & EXISTING CONDITIONS PLAN AREA_1

SHEET NUMBER

C-02.01


MATCHLINE AREA 4
AREA 2
CURRIN BROS., INC.
PIN: 0750441160
ZONE: LI
LAND CLASS: VACANT
DB 6000 PG 178
BM 1994 PG 161
BM 1986 PG 368
DIRT PATH
DIRT PATH
CONSTRUCTION LIMITS
CONSTRUCTION LIMITS
WETLANDS
WETLANDS
SUGAR CREEK
SUGAR CREEK
SUGAR CREEK



LEGEND

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SANITARY SEWER	SS	SANITARY SEWER	SS
TELEPHONE	T	TELEPHONE	T
UNDERGROUND TELEPHONE	UT	UNDERGROUND TELEPHONE	UT
FIBER OPTIC	FO	FIBER OPTIC	FO
WATER	W	WATER	W
FORCE MAIN	FM	FORCE MAIN	FM
STORM DRAIN		STORM DRAIN	
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RESOURCE CONSERVATION AREA			

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40 0 20 40 80 160

(IN FEET)
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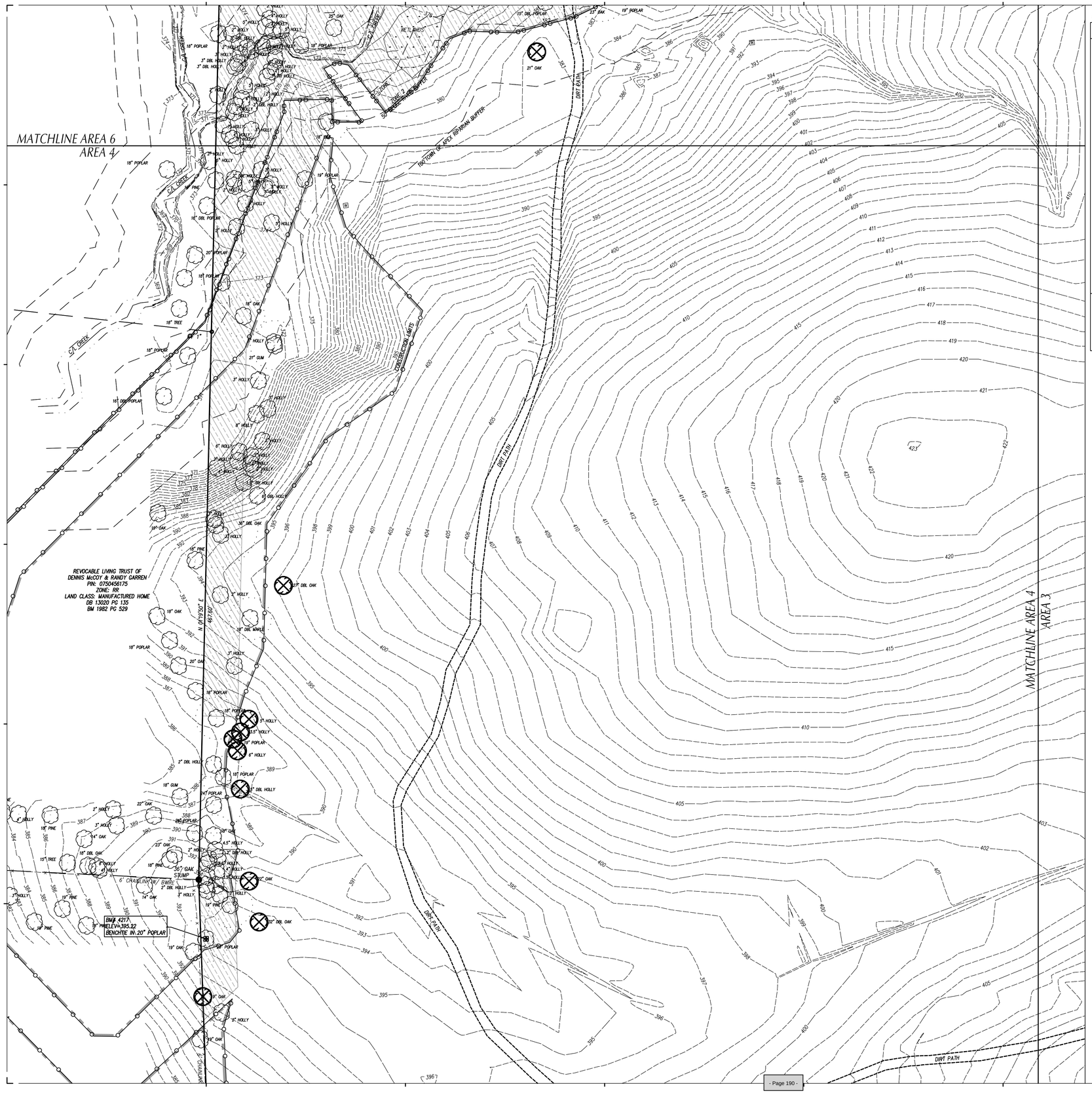
SHEET TITLE

DEMOLITION & EXISTING CONDITIONS PLAN AREA_3

SHEET NUMBER

C-02.03



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GAS	G	GAS	G
SANITARY SEWER	SS	SANITARY SEWER	SS
TELEPHONE	T	TELEPHONE	T
UNDERGROUND TELEPHONE	UT	UNDERGROUND TELEPHONE	UT
FIBER OPTIC	FO	FIBER OPTIC	FO
WATER	W	WATER	W
FORCE MAIN	FM	FORCE MAIN	FM
STORM DRAIN		STORM DRAIN	
INDIVIDUAL TREE TO BE REMOVED	>18" <18"	INDIVIDUAL TREE TO REMAIN.	
LIGHT POLE	LP	LIGHT POLE	LP
UTILITY POLE	PP	UTILITY POLE	PP
MANHOLE	MH	MANHOLE	MH
CLEAN OUT	CO	CLEAN OUT	CO
DROP INLET,CATCH BASIN	DI, CB	DROP INLET,CATCH BASIN	DI, CB
FIRE HYDRANT	FH	FIRE HYDRANT	FH
WATER VALVE	WV	WATER VALVE	WV
		CRITICAL ROOT ZONES	

CONSTR./CLEARING LIMITS	PAVEMENT, S/W, C&G TO BE REMOVED.
TREE PROTECTION FENCE	BUILDING/STRUCTURE TO BE REMOVED. SEE ARCHITECTURAL PLANS.
RESOURCE CONSERVATION AREA	

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SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
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4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

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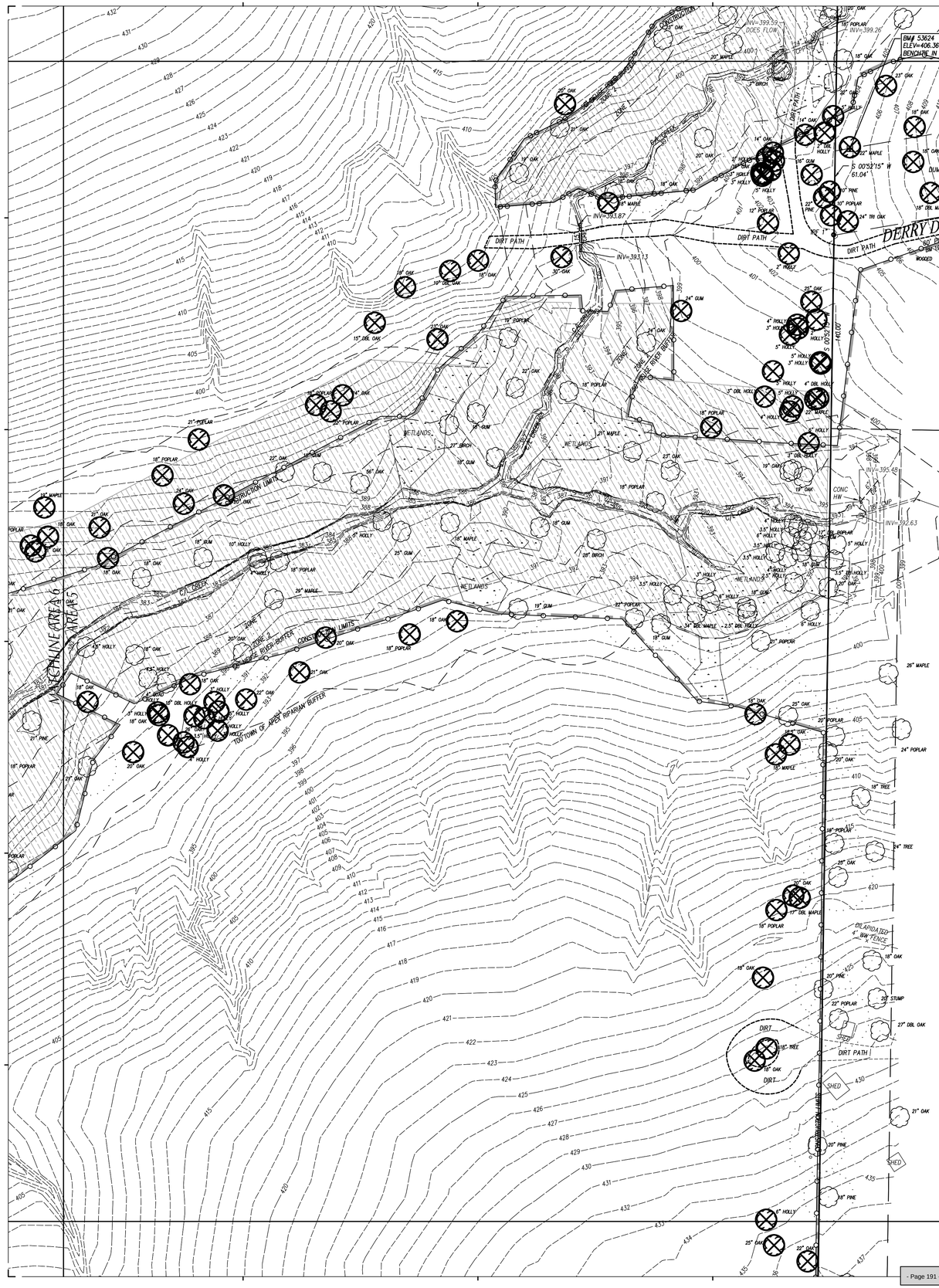
SHEET TITLE

DEMOLITION & EXISTING CONDITIONS PLAN AREA_4

SHEET NUMBER

C-02.04



LEGEND

STRUCTURES/UTILITIES TO BE REMOVED		STRUCTURES/UTILITIES TO REMAIN	
OVERHEAD ELECTRICAL	E	OVERHEAD ELECTRICAL	E
UNDERGROUND ELECTRICAL	UE	UNDERGROUND ELECTRICAL	UE
FIRE PROTECTION	FP	FIRE PROTECTION	FP
GAS	G	GAS	G
SANITARY SEWER	SS	SANITARY SEWER	SS
TELEPHONE	T	TELEPHONE	T
UNDERGROUND TELEPHONE	UT	UNDERGROUND TELEPHONE	UT
FIBER OPTIC	FO	FIBER OPTIC	FO
WATER	W	WATER	W
FORCE MAIN	FM	FORCE MAIN	FM
STORM DRAIN		STORM DRAIN	
INDIVIDUAL TREE TO BE REMOVED	>18" <18"	INDIVIDUAL TREE TO REMAIN.	
LIGHT POLE	LP	LIGHT POLE	LP
UTILITY POLE	PP	UTILITY POLE	PP
MANHOLE	MH	MANHOLE	MH
CLEAN OUT	CO	CLEAN OUT	CO
DROP INLET,CATCH BASIN	DI, CB	DROP INLET,CATCH BASIN	DI, CB
FIRE HYDRANT	FH	FIRE HYDRANT	FH
WATER VALVE	WV	WATER VALVE	WV
		CRITICAL ROOT ZONES	
CONSTR./CLEARING LIMITS		PAVEMENT, S/W, C&G TO BE REMOVED.	
TREE PROTECTION FENCE		BUILDING/STRUCTURE TO BE REMOVED. SEE ARCHITECTURAL PLANS.	
RESOURCE CONSERVATION AREA			

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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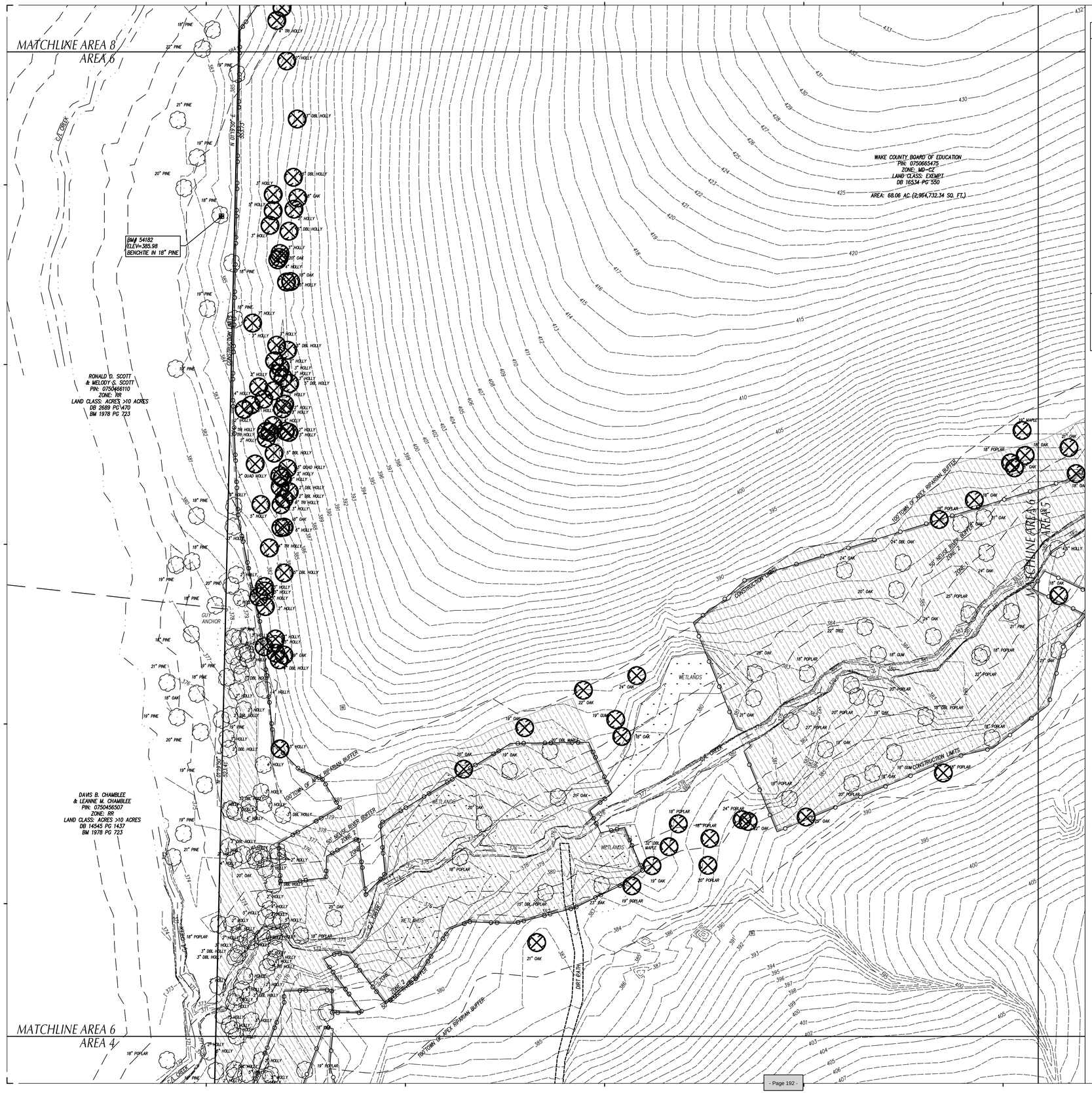
SHEET TITLE

DEMOLITION & EXISTING CONDITIONS PLAN AREA_5

SHEET NUMBER

C-02.05



LEGEND

STRUCTURES/UTILITIES TO BE REMOVED		STRUCTURES/UTILITIES TO REMAIN	
OVERHEAD ELECTRICAL	E	OVERHEAD ELECTRICAL	E
UNDERGROUND ELECTRICAL	UE	UNDERGROUND ELECTRICAL	UE
FIRE PROTECTION	FP	FIRE PROTECTION	FP
GAS	G	GAS	G
SANITARY SEWER	SS	SANITARY SEWER	SS
TELEPHONE	T	TELEPHONE	T
UNDERGROUND TELEPHONE	UT	UNDERGROUND TELEPHONE	UT
FIBER OPTIC	FO	FIBER OPTIC	FO
WATER	W	WATER	W
FORCE MAIN	FM	FORCE MAIN	FM
STORM DRAIN		STORM DRAIN	
INDIVIDUAL TREE TO BE REMOVED	>18" <18"	INDIVIDUAL TREE TO REMAIN.	
LIGHT POLE	LP	LIGHT POLE	LP
UTILITY POLE	PP	UTILITY POLE	PP
MANHOLE	MH	MANHOLE	MH
CLEAN OUT	CO	CLEAN OUT	CO
DROP INLET,CATCH BASIN	DI, CB	DROP INLET,CATCH BASIN	DI, CB
FIRE HYDRANT	FH	FIRE HYDRANT	FH
WATER VALVE	WV	WATER VALVE	WV
		CRITICAL ROOT ZONES	

CONSTR./CLEARING LIMITS	PAVEMENT, S/W, C&G TO BE REMOVED.
TREE PROTECTION FENCE	BUILDING/STRUCTURE TO BE REMOVED. SEE ARCHITECTURAL PLANS.
RESOURCE CONSERVATION AREA	

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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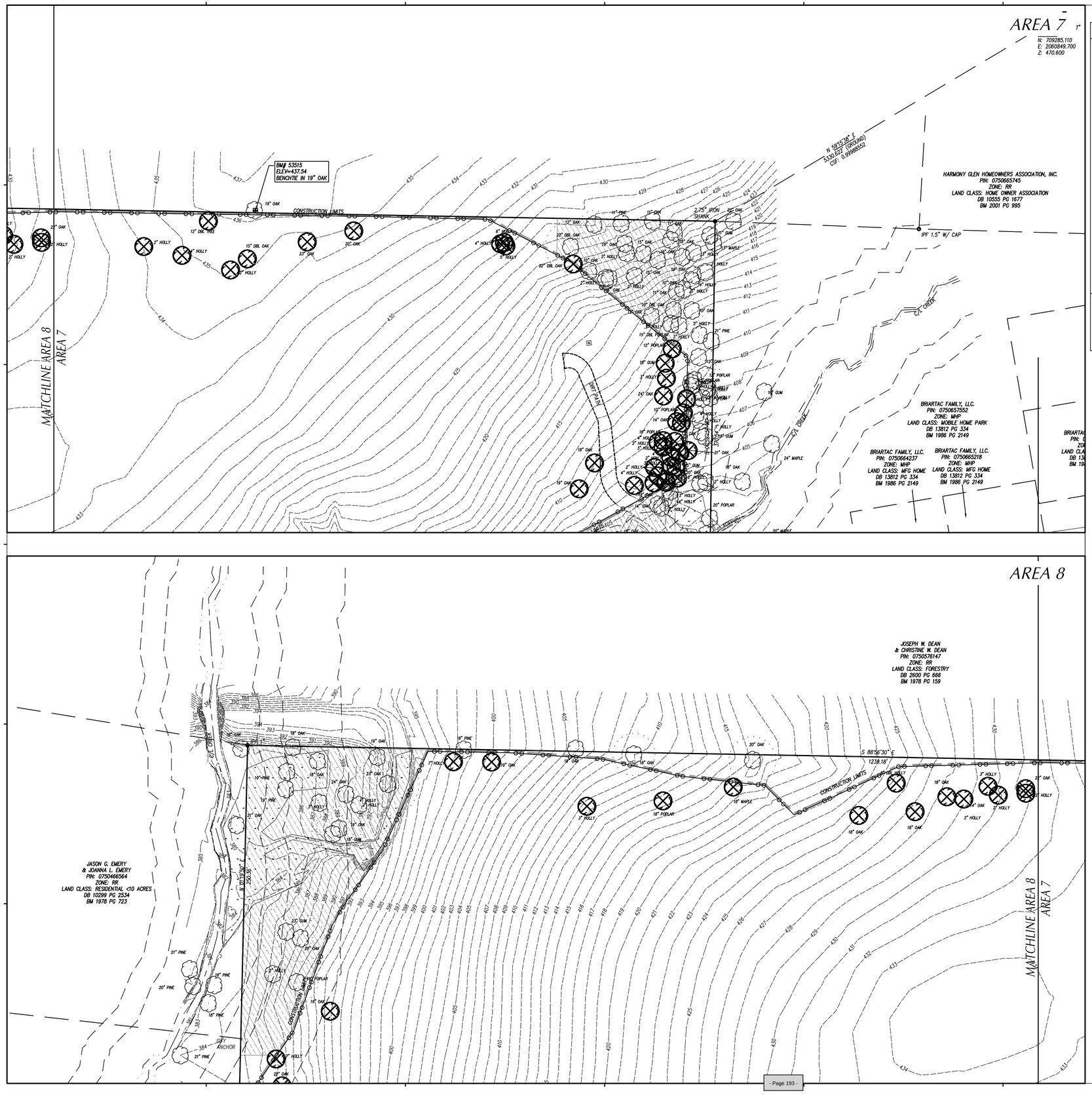
SHEET TITLE

DEMOLITION & EXISTING CONDITIONS PLAN AREA_6

SHEET NUMBER

C-02.06



LEGEND

STRUCTURES/UTILITIES TO BE REMOVED		STRUCTURES/UTILITIES TO REMAIN	
OVERHEAD ELECTRICAL	E	OVERHEAD ELECTRICAL	E
UNDERGROUND ELECTRICAL	UE	UNDERGROUND ELECTRICAL	UE
FIRE PROTECTION	FP	FIRE PROTECTION	FP
GAS	G	GAS	G
SANITARY SEWER	SS	SANITARY SEWER	SS
TELEPHONE	T	TELEPHONE	T
UNDERGROUND TELEPHONE	UT	UNDERGROUND TELEPHONE	UT
FIBER OPTIC	FO	FIBER OPTIC	FO
WATER	W	WATER	W
FORCE MAIN	FM	FORCE MAIN	FM
STORM DRAIN		STORM DRAIN	
INDIVIDUAL TREE TO BE REMOVED	>18" <18"	INDIVIDUAL TREE TO REMAIN.	
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UTILITY POLE	PP	UTILITY POLE	PP
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CLEAN OUT	CO	CLEAN OUT	CO
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FIRE HYDRANT	FH	FIRE HYDRANT	FH
WATER VALVE	WV	WATER VALVE	WV
		CRITICAL ROOT ZONES	
CONSTR./CLEARING LIMITS		PAVEMENT, S/W, C&G TO BE REMOVED.	
TREE PROTECTION FENCE		BUILDING/STRUCTURE TO BE REMOVED. SEE ARCHITECTURAL PLANS.	
RESOURCE CONSERVATION AREA			

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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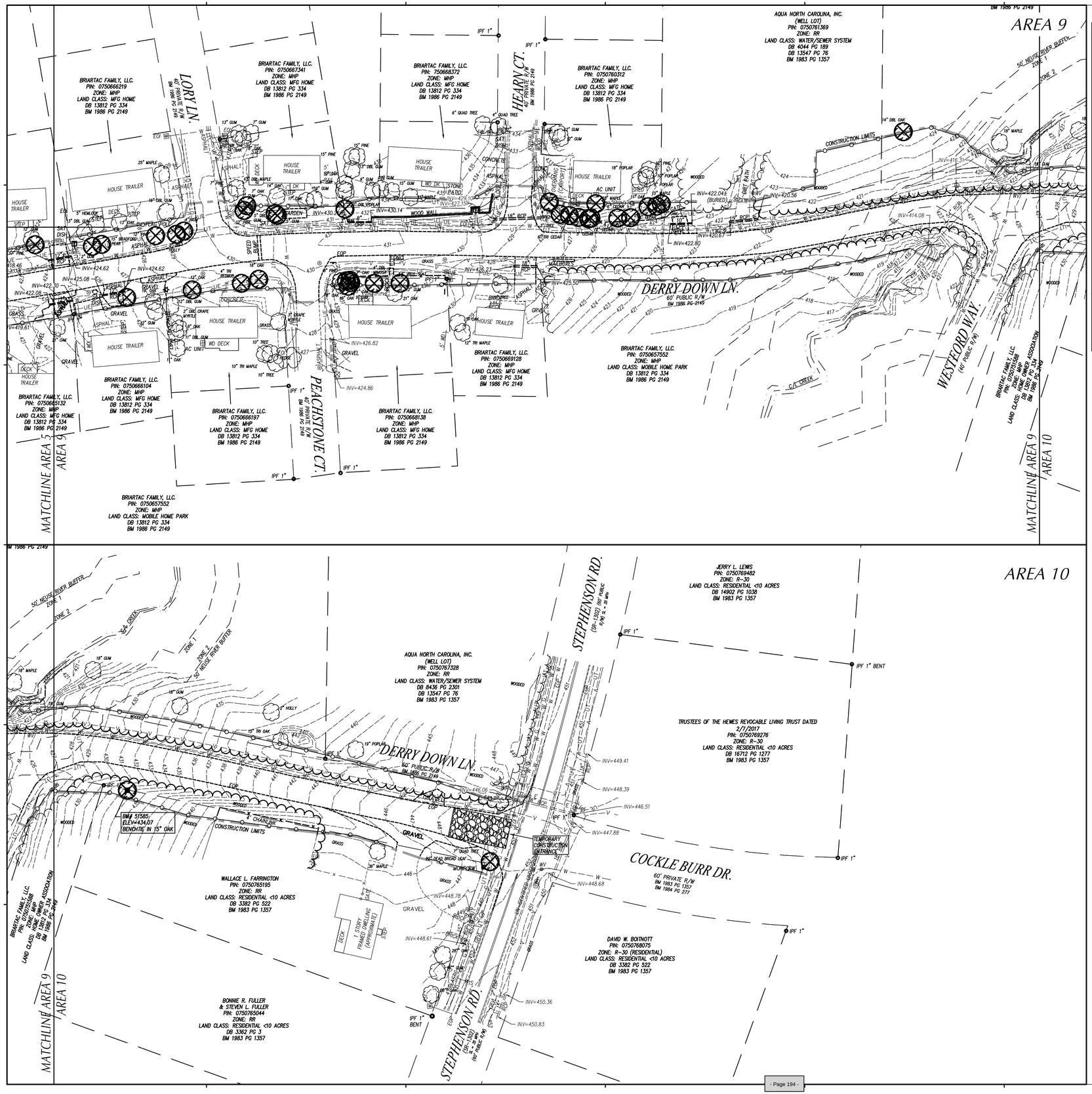
PROJECT NO. 02000.000

SHEET TITLE
DEMOLITION & EXISTING CONDITIONS PLAN AREA_7&8

SHEET NUMBER
C-02.07



LEGEND

STRUCTURES/UTILITIES TO BE REMOVED		STRUCTURES/UTILITIES TO REMAIN	
OVERHEAD ELECTRICAL	E	OVERHEAD ELECTRICAL	E
UNDERGROUND ELECTRICAL	UE	UNDERGROUND ELECTRICAL	UE
FIRE PROTECTION	FP	FIRE PROTECTION	FP
GAS	G	GAS	G
SANITARY SEWER	SS	SANITARY SEWER	SS
TELEPHONE	T	TELEPHONE	T
UNDERGROUND TELEPHONE	UT	UNDERGROUND TELEPHONE	UT
FIBER OPTIC	FO	FIBER OPTIC	FO
WATER	W	WATER	W
FORCE MAIN	FM	FORCE MAIN	FM
STORM DRAIN		STORM DRAIN	
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FIRE HYDRANT	FH	FIRE HYDRANT	FH
WATER VALVE	WV	WATER VALVE	WV
		CRITICAL ROOT ZONES	
CONSTR./CLEARING LIMITS		PAVEMENT, S/W, C&G TO BE REMOVED.	
TREE PROTECTION FENCE		BUILDING/STRUCTURE TO BE REMOVED. SEE ARCHITECTURAL PLANS.	
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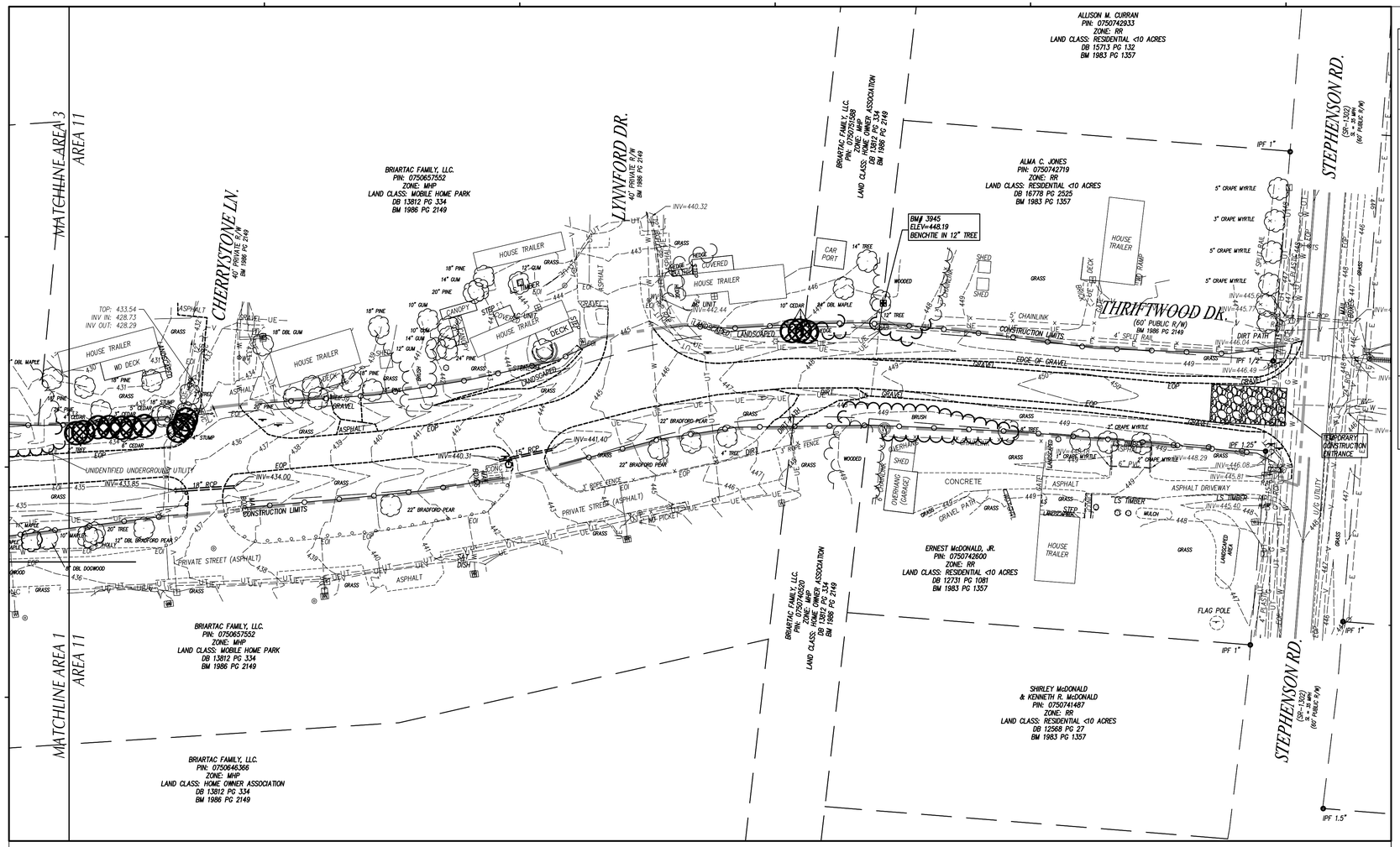
SHEET TITLE

DEMOLITION & EXISTING CONDITIONS PLAN AREA_9&10

SHEET NUMBER

C-02.08



LEGEND

STRUCTURES/UTILITIES TO BE REMOVED		STRUCTURES/UTILITIES TO REMAIN	
OVERHEAD ELECTRICAL	E	OVERHEAD ELECTRICAL	E
UNDERGROUND ELECTRICAL	UE	UNDERGROUND ELECTRICAL	UE
FIRE PROTECTION	FP	FIRE PROTECTION	FP
GAS	G	GAS	G
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FIBER OPTIC	FO	FIBER OPTIC	FO
WATER	W	WATER	W
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STORM DRAIN		STORM DRAIN	
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CONSTR./CLEARING LIMITS		PAVEMENT, S/W, C&G TO BE REMOVED.	
TREE PROTECTION FENCE		BUILDING/STRUCTURE TO BE REMOVED. SEE ARCHITECTURAL PLANS.	
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GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
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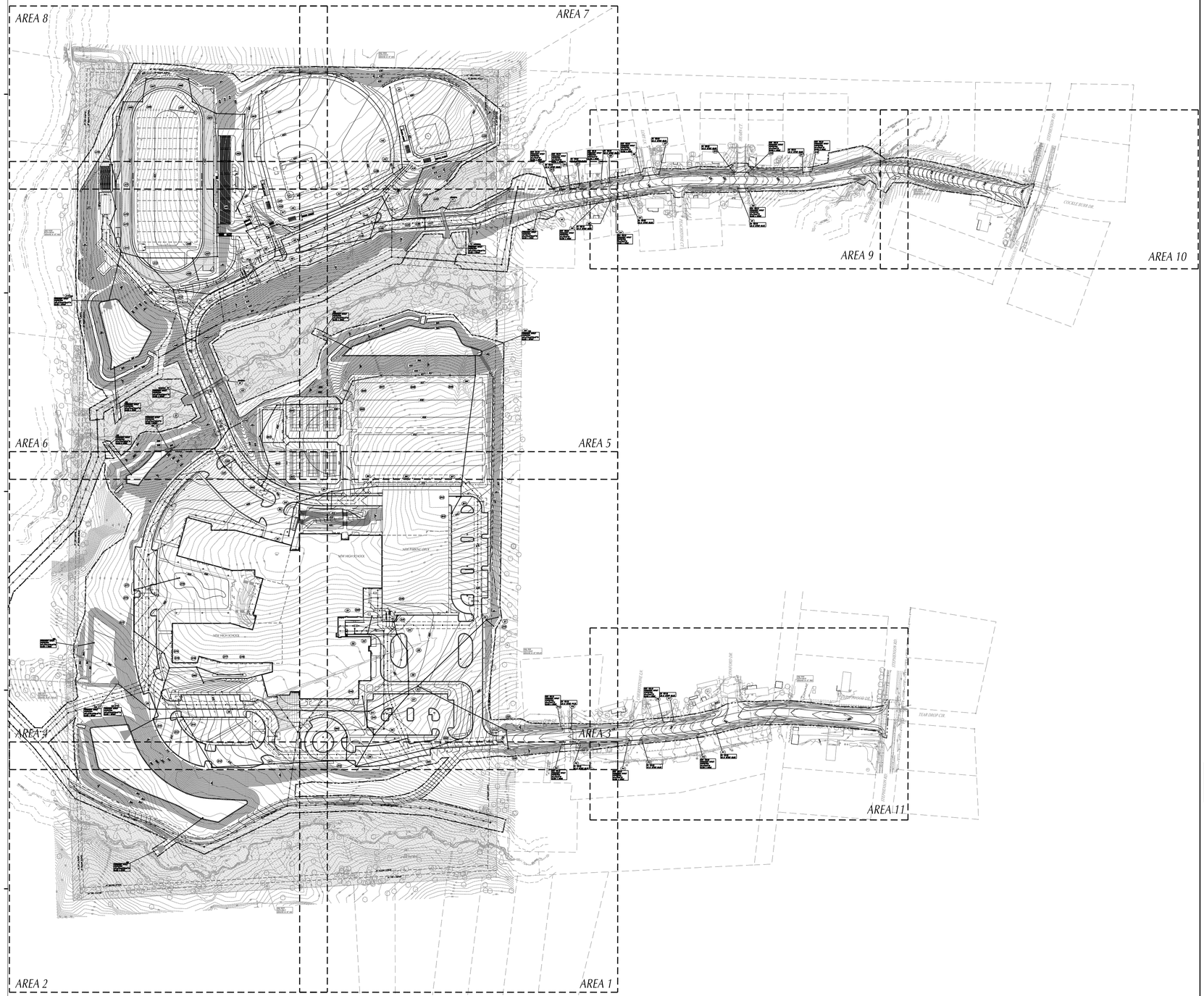
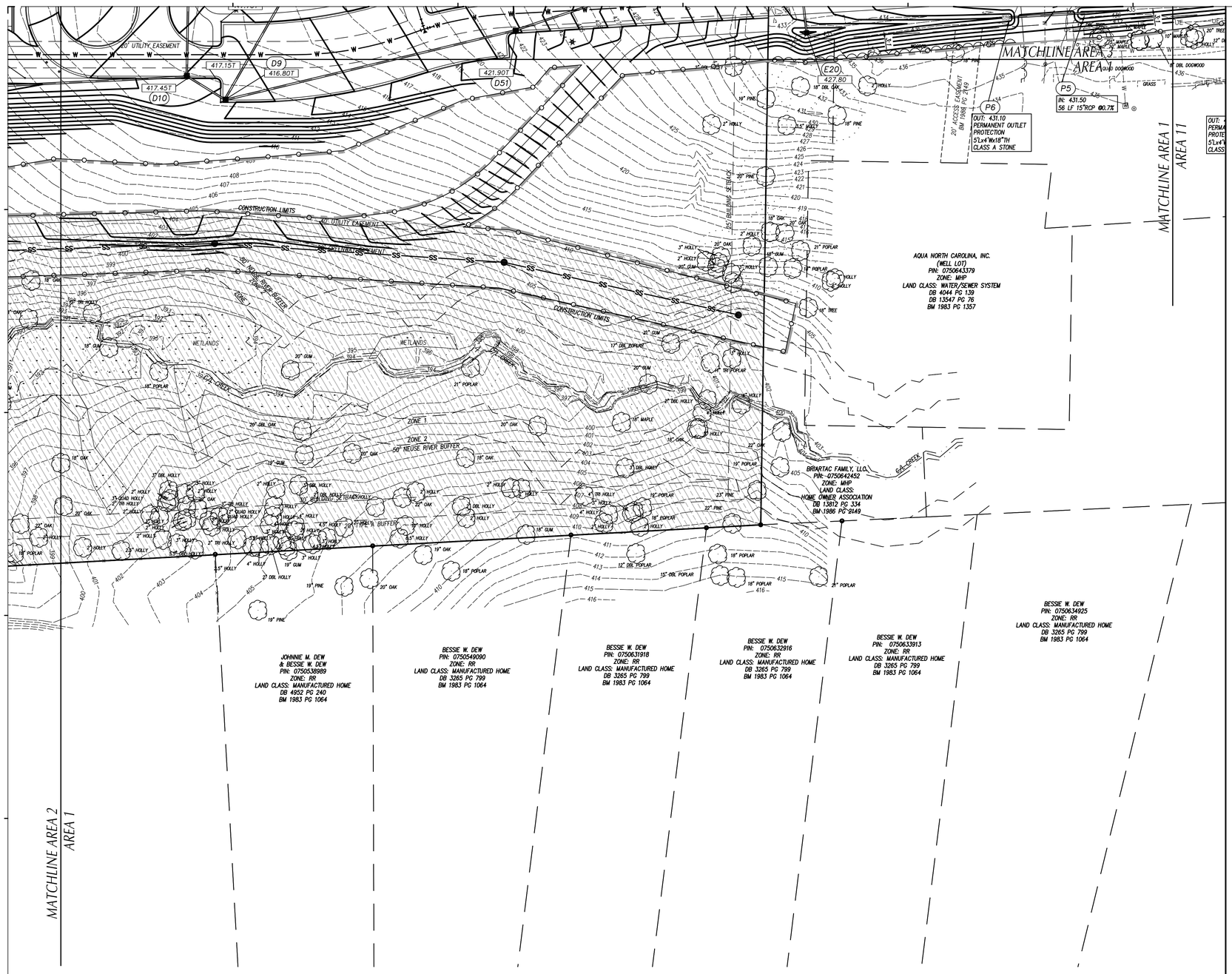
SHEET TITLE

DEMOLITION & EXISTING CONDITIONS PLAN AREA_11

SHEET NUMBER

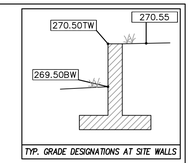
C-02.09


AREA 8
AREA 7
AREA 9
AREA 10
AREA 6
AREA 5
AREA 4
AREA 3
AREA 11
AREA 2
AREA 1
NEW HIGH SCHOOL
NEW PARKING AREA
NEW ACCESS ROAD
NEW ENTRANCE ROAD
EXISTING ENTRANCE ROAD
TEAR-DROP CDE.
CUL-DE-SAC
EXISTING ROAD
EXISTING DRIVE
EXISTING BUILDING
EXISTING TREE LINE
EXISTING POWER POLE
EXISTING UTILITY POLE
EXISTING GUY WIRE
EXISTING FIRE HYDRANT
EXISTING WATER VALVE
EXISTING SANITARY SEWER MANHOLE
EXISTING STORM DRAIN MANHOLE
EXISTING STORM DRAIN INLET
EXISTING STORM DRAIN PIPE
EXISTING SANITARY SEWER LINE
EXISTING WATER LINE
EXISTING GAS LINE
EXISTING OVERHEAD UTILITY LINE
EXISTING UNDERGROUND UTILITY LINE
EXISTING CONTOUR
EXISTING SPOT ELEVATION
EXISTING TREE
EXISTING SHRUB
EXISTING FENCE
EXISTING GUARDRAIL
EXISTING SIGN
EXISTING MAILBOX
EXISTING LIGHT POLE
EXISTING TRAFFIC SIGNAL
EXISTING CROSSWALK
EXISTING STOP BAR
EXISTING PAVEMENT MARKING
EXISTING CURB AND GUTTER
EXISTING SIDEWALK
EXISTING RETAINING WALL
EXISTING BOUNDARY LINE
EXISTING RIGHT-OF-WAY LINE
EXISTING EASEMENT LINE
EXISTING PROPERTY LINE
EXISTING ADJACENT PROPERTY LINE
EXISTING ADJACENT BUILDING
EXISTING ADJACENT DRIVE
EXISTING ADJACENT PARKING AREA
EXISTING ADJACENT SIDEWALK
EXISTING ADJACENT RETAINING WALL
EXISTING ADJACENT FENCE
EXISTING ADJACENT TREE LINE
EXISTING ADJACENT CONTOUR
EXISTING ADJACENT SPOT ELEVATION
EXISTING ADJACENT TREE
EXISTING ADJACENT SHRUB
EXISTING ADJACENT GUARDRAIL
EXISTING ADJACENT SIGN
EXISTING ADJACENT MAILBOX
EXISTING ADJACENT LIGHT POLE
EXISTING ADJACENT TRAFFIC SIGNAL
EXISTING ADJACENT CROSSWALK
EXISTING ADJACENT STOP BAR
EXISTING ADJACENT PAVEMENT MARKING
EXISTING ADJACENT CURB AND GUTTER



GRADING LEGEND

- EXISTING CONTOURS
- FINAL CONTOURS
- 270.4+ — EXISTING SURVEY SPOT ELEVATION
- 270.50T — PROPOSED TOP OF CURB SPOT ELEVATION
- 270.50 — PROPOSED GROUND/PAVEMENT ELEVATION
- 270.50TW — PROPOSED FINISHED GRADE AT TOP OF WALL ELEVATION
- 270.50BW — PROPOSED FINISHED GRADE AT BOTTOM OF WALL ELEVATION
- A4 — STORM STRUCTURE NUMBER
- EXISTING STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE
- FD — PROPOSED FOUNDATION DRAIN DISCHARGE LINE. SEE ARCH. PLANS FOR DRAIN PIPE LOCATIONS ALONG BUILDING WALLS.
- RD — PROPOSED ROOF DRAIN
- TREE PROTECTION FENCE
- CRITICAL ROOT ZONE
- RESOURCE CONSERVATION AREA



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CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

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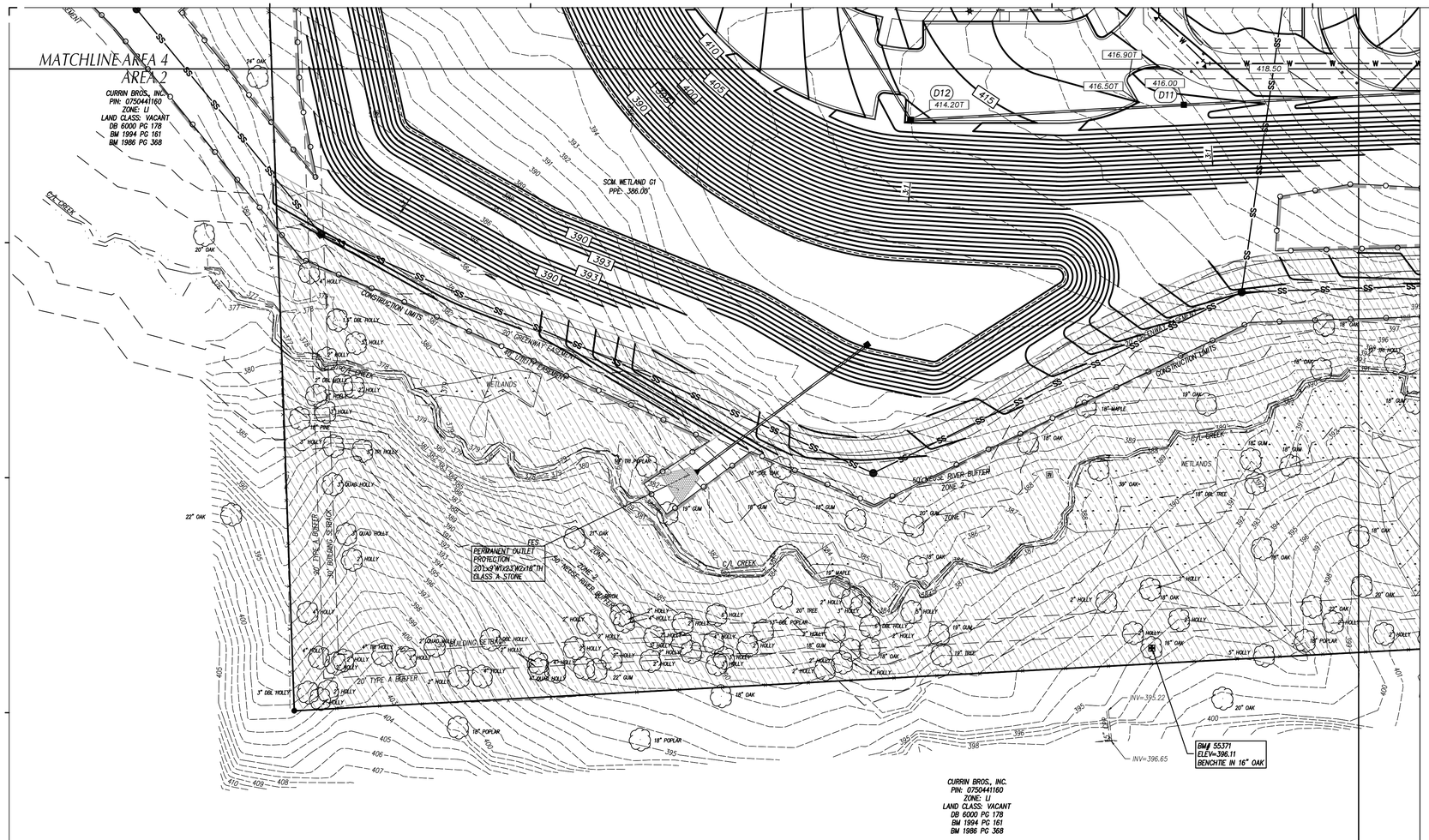
SHEET TITLE
GRADING
PLAN
AREA_1

SHEET NUMBER
C-03.01



GRADING LEGEND

- EXISTING CONTOURS
- FINAL CONTOURS
- 270.4+ EXISTING SURVEY SPOT ELEVATION
- 270.50T PROPOSED TOP OF CURB SPOT ELEVATION
- 270.50 PROPOSED GROUND/PAVEMENT ELEVATION
- 270.50TW PROPOSED FINISHED GRADE AT TOP OF WALL ELEVATION
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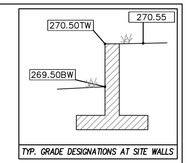

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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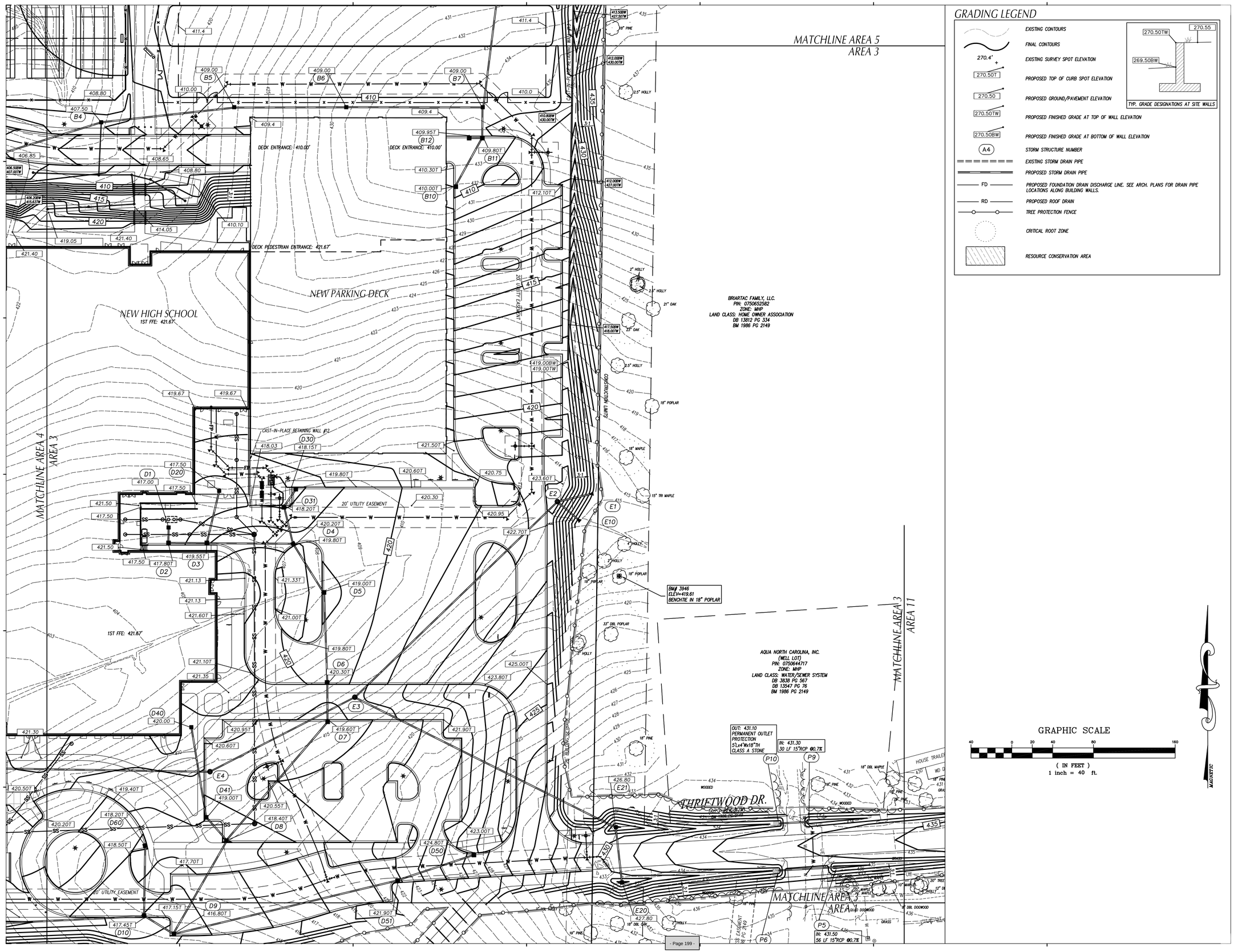
SHEET TITLE

GRADING PLAN AREA_2

SHEET NUMBER

C-03.02



GRADING LEGEND

- EXISTING CONTOURS
- FINAL CONTOURS
- 270.4+ — EXISTING SURVEY SPOT ELEVATION
- 270.50T — PROPOSED TOP OF CURB SPOT ELEVATION
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- RESOURCE CONSERVATION AREA

TYP. GRADE DESIGNATIONS AT SITE WALLS

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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SHEET TITLE
GRADING
PLAN
AREA_3

SHEET NUMBER
C-03.03

GRADING LEGEND

- EXISTING CONTOURS
- FINAL CONTOURS
- 270.4' + — EXISTING SURVEY SPOT ELEVATION
- 270.50T — PROPOSED TOP OF CURB SPOT ELEVATION
- 270.50 — PROPOSED GROUND/PAVEMENT ELEVATION
- 270.50TW — PROPOSED FINISHED GRADE AT TOP OF WALL ELEVATION
- 270.50BW — PROPOSED FINISHED GRADE AT BOTTOM OF WALL ELEVATION
- A4 — STORM STRUCTURE NUMBER
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- RD — PROPOSED ROOF DRAIN
- TREE PROTECTION FENCE
- CRITICAL ROOT ZONE
- RESOURCE CONSERVATION AREA

270.55 / 270.50TW / 269.50BW

TYP. GRADE DESIGNATIONS AT SITE WALLS

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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5	60% Construction Documents	3/26/21

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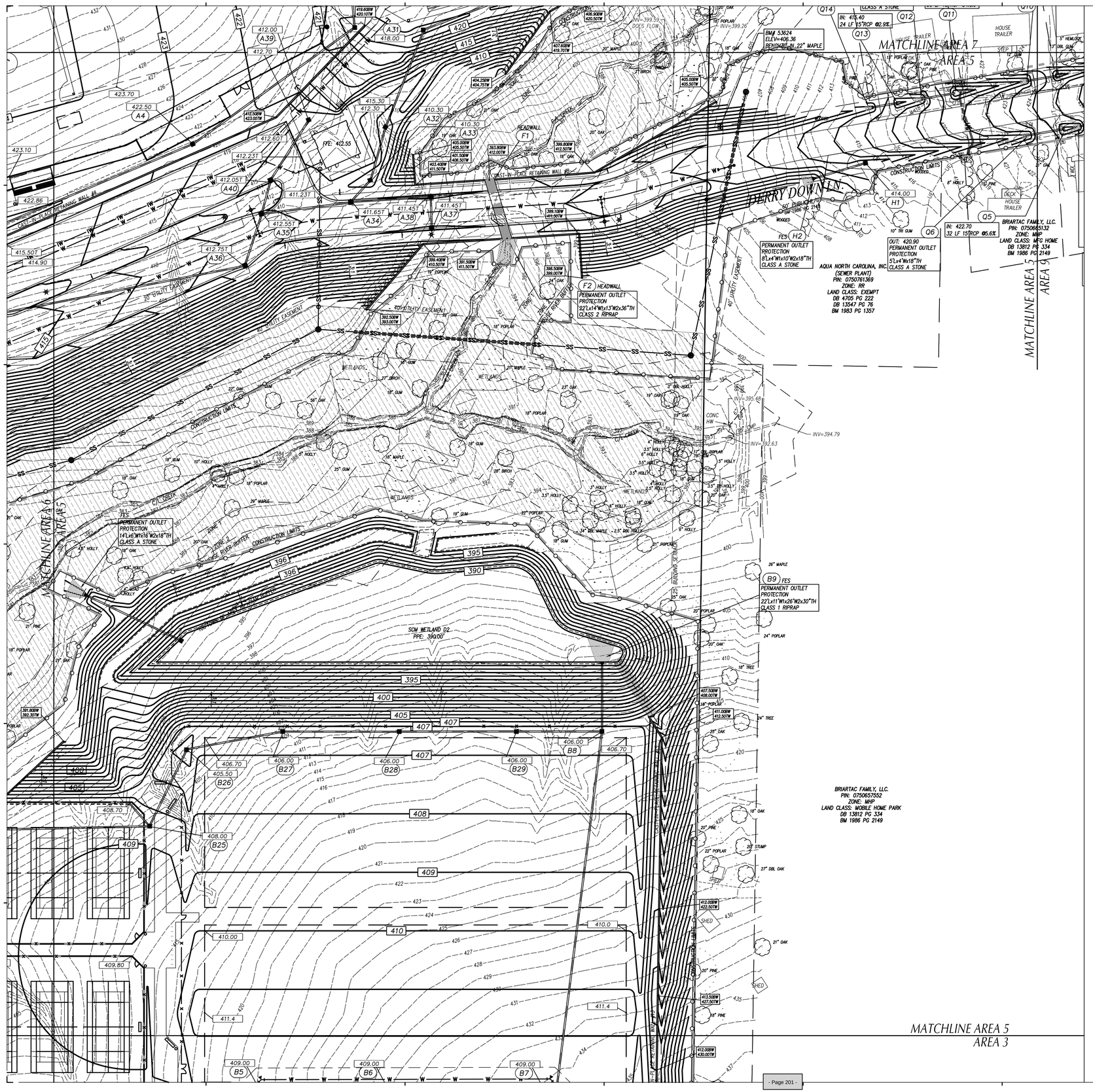
PROJECT NO. 02000.000

SHEET TITLE

GRADING PLAN AREA_4

SHEET NUMBER

C-03.04



- Page 201 -

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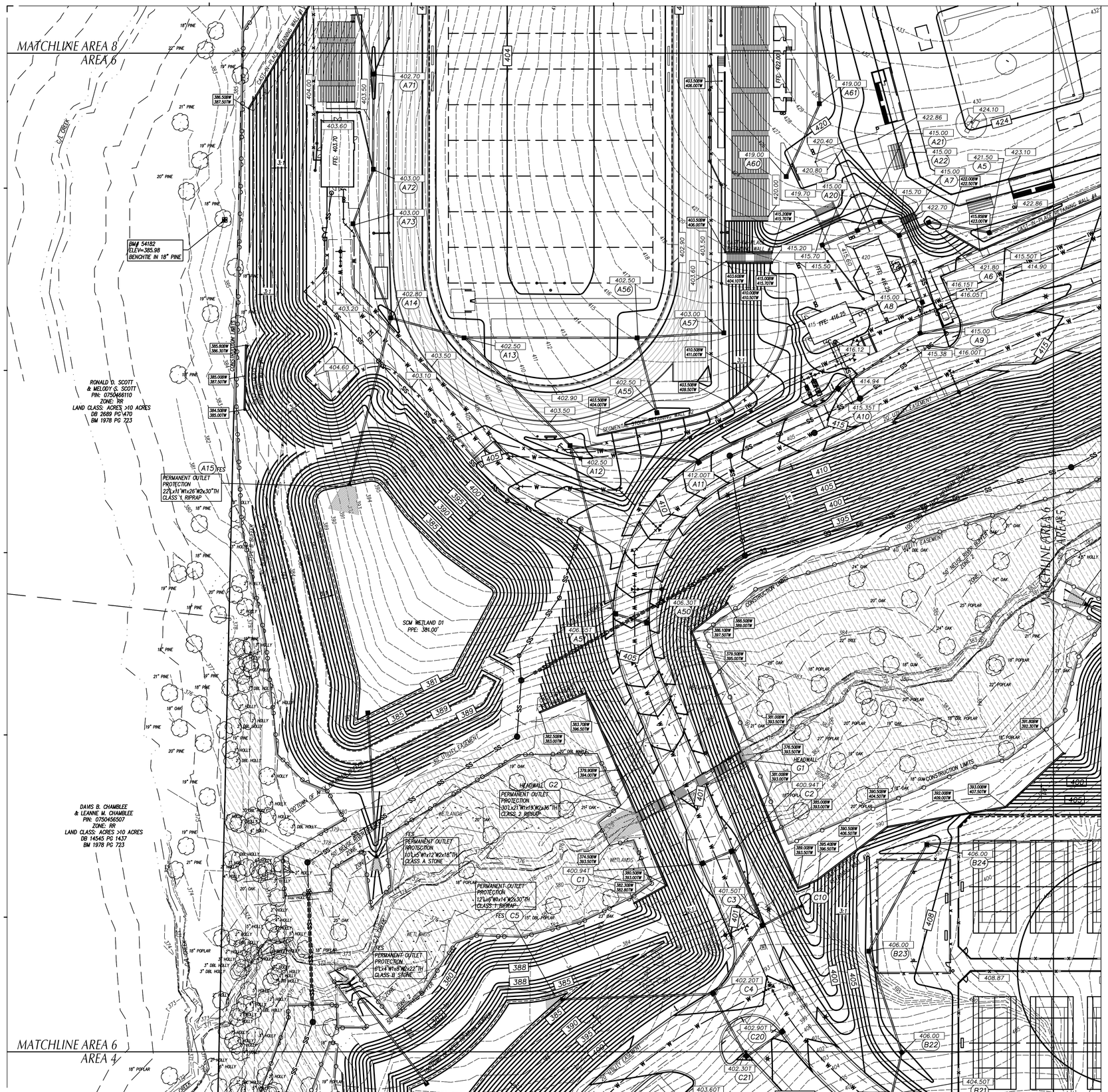
SHEET TITLE
GRADING PLAN AREA_5

SHEET NUMBER
C-03.05



GRADING LEGEND

- EXISTING CONTOURS
- FINAL CONTOURS
- 270.4+ — EXISTING SURVEY SPOT ELEVATION
- 270.50T — PROPOSED TOP OF CURB SPOT ELEVATION
- 270.50 — PROPOSED GROUND/PAVEMENT ELEVATION
- 270.50TW — PROPOSED FINISHED GRADE AT TOP OF WALL ELEVATION
- 270.50BW — PROPOSED FINISHED GRADE AT BOTTOM OF WALL ELEVATION
- A4 — STORM STRUCTURE NUMBER
- EXISTING STORM DRAIN PIPE
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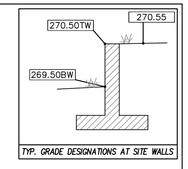

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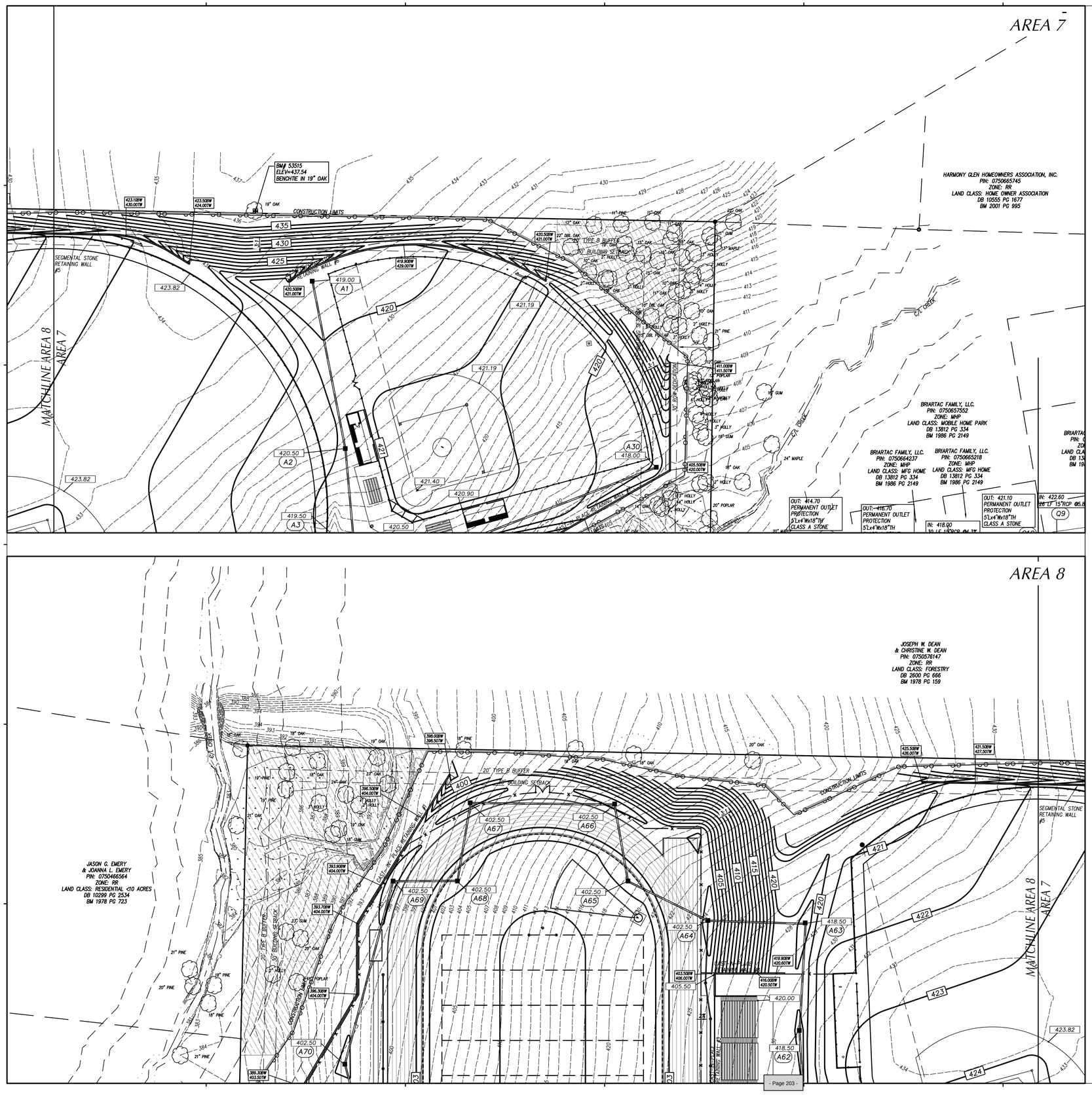
SHEET TITLE

GRADING PLAN AREA_6

SHEET NUMBER

C-03.06



GRADING LEGEND

- EXISTING CONTOURS
- FINAL CONTOURS
- 270.4+ EXISTING SURVEY SPOT ELEVATION
- 270.50T PROPOSED TOP OF CURB SPOT ELEVATION
- 270.50 PROPOSED GROUND/PAVEMENT ELEVATION
- 270.50TW PROPOSED FINISHED GRADE AT TOP OF WALL ELEVATION
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- RESOURCE CONSERVATION AREA

270.50TW / 270.55 / 269.50BW

TYP. GRADE DESIGNATIONS AT SITE WALLS

GRAPHIC SCALE

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(IN FEET)
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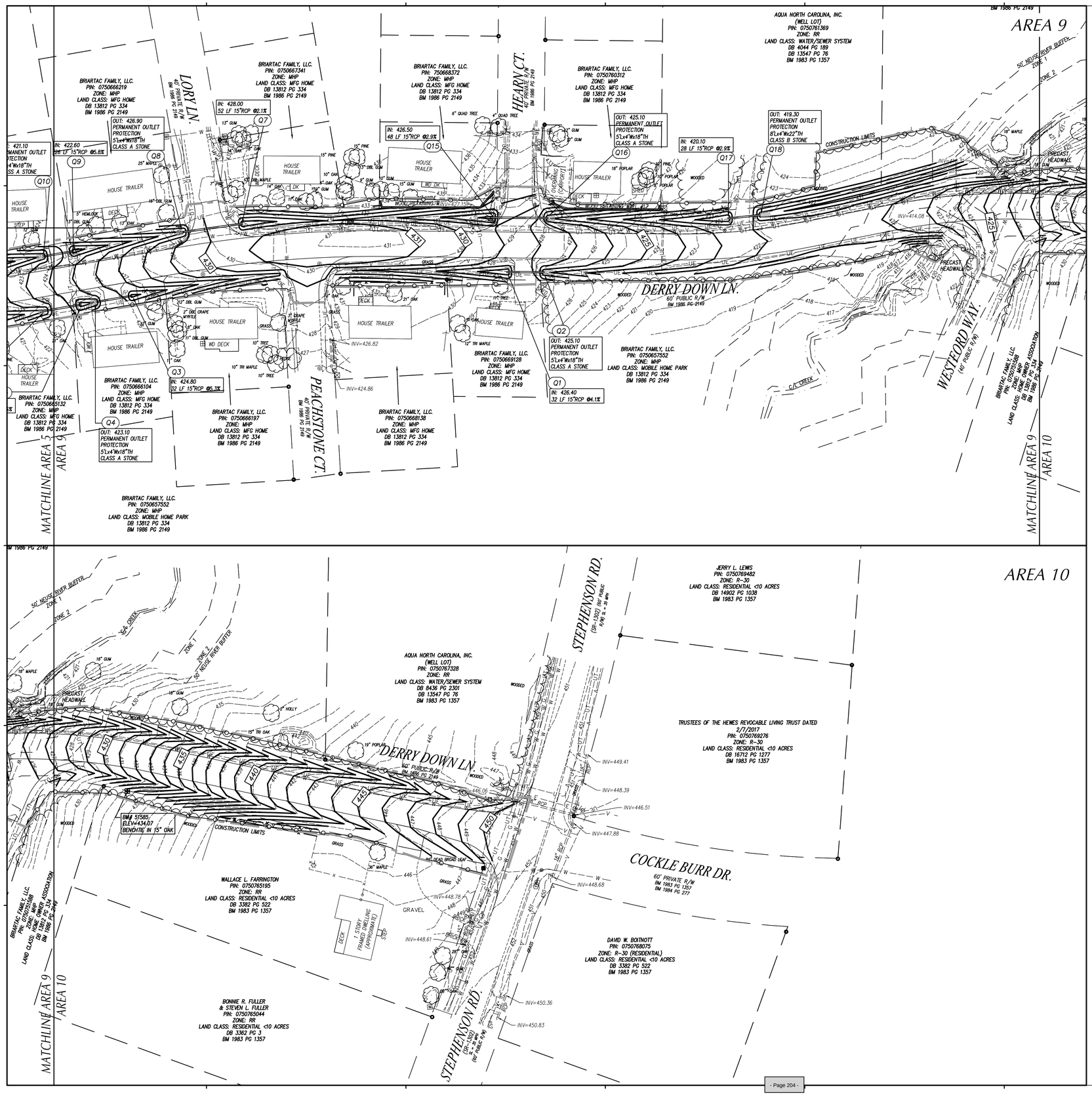
PROJECT NO. 02000.000

SHEET TITLE

GRADING
PLAN
AREA_7&8

SHEET NUMBER

C-03.07



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- 270.50T PROPOSED TOP OF CURB SPOT ELEVATION
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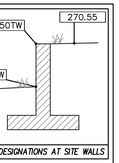
- A4 STORM STRUCTURE NUMBER
- EXISTING STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE
- FD PROPOSED FOUNDATION DRAIN DISCHARGE LINE. SEE ARCH. PLANS FOR DRAIN PIPE LOCATIONS ALONG BUILDING WALLS.
- RD PROPOSED ROOF DRAIN
- TREE PROTECTION FENCE
- CRITICAL ROOT ZONE
- RESOURCE CONSERVATION AREA



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Felton Grove High School

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Apex, NC 27539

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SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

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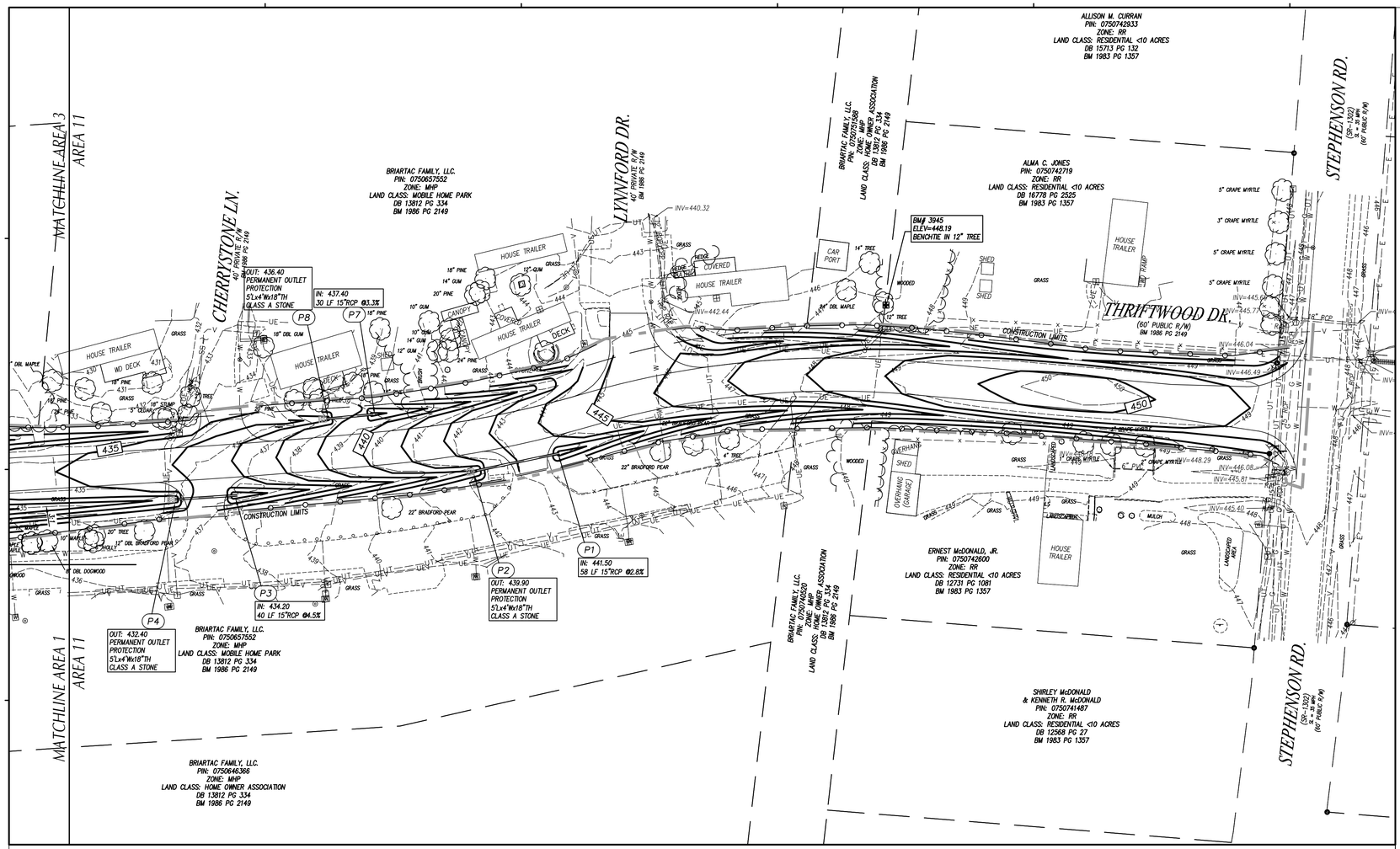
PROJECT NO. 02000.000

SHEET TITLE
GRADING PLAN AREA_9&10

SHEET NUMBER
C-03.08



GRADING LEGEND

- EXISTING CONTOURS
- FINAL CONTOURS
- 270.4+ EXISTING SURVEY SPOT ELEVATION
- 270.50T PROPOSED TOP OF CURB SPOT ELEVATION
- 270.50 PROPOSED GROUND/PAVEMENT ELEVATION
- 270.50TW PROPOSED FINISHED GRADE AT TOP OF WALL ELEVATION
- 270.50BW PROPOSED FINISHED GRADE AT BOTTOM OF WALL ELEVATION
- A4 STORM STRUCTURE NUMBER
- EXISTING STORM DRAIN PIPE
- PROPOSED STORM DRAIN PIPE
- FD PROPOSED FOUNDATION DRAIN DISCHARGE LINE. SEE ARCH. PLANS FOR DRAIN PIPE LOCATIONS ALONG BUILDING WALLS.
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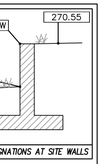

TYP. GRADE DESIGNATIONS AT SITE WALLS

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

MAGNETIC

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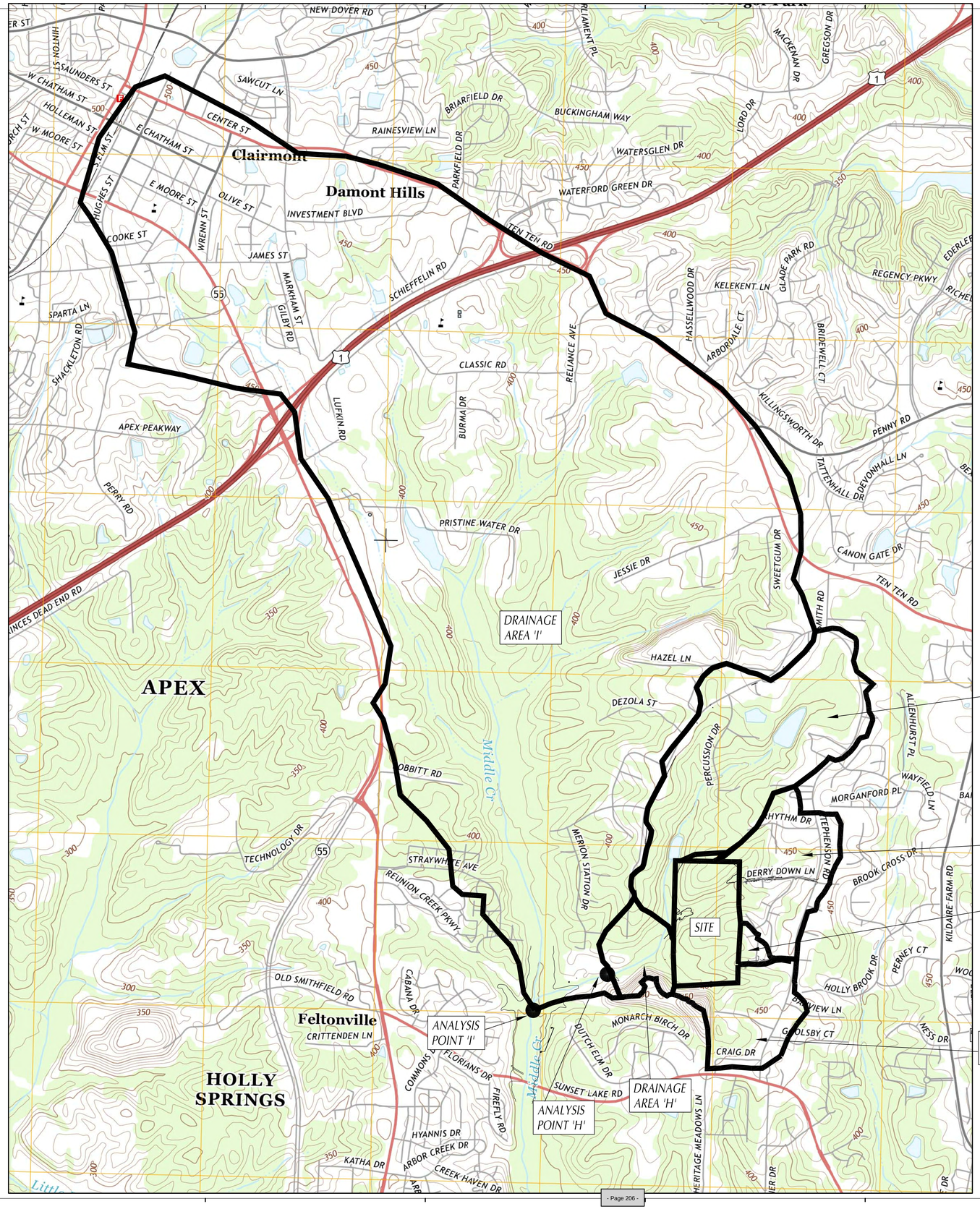
PROJECT NO. 02000.000

SHEET TITLE
GRADING
PLAN
AREA_11

SHEET NUMBER
C-03.09



SEE SHEET C-03.11 FOR PRE-DEVELOPMENT AREAS WITHIN THE SITE PROPERTY LIMITS. SEE SHEET C-03.12 FOR POST DEVELOPMENT AREAS WITHIN THE SITE PROPERTY LIMITS AND STORMWATER STUDY SUMMARY

UPSTREAM DRAINAGE AREA FOR ON-SITE AREAS 'C' & 'D'

OFF-SITE DRAINAGE FOR AREA 'D'

OFF-SITE DRAINAGE FOR AREA 'F'

OFF-SITE DRAINAGE FOR AREA 'G'

GRAPHIC SCALE

1000 0 500 1000 2000 4000

(IN FEET)
1 inch = 1000 ft.

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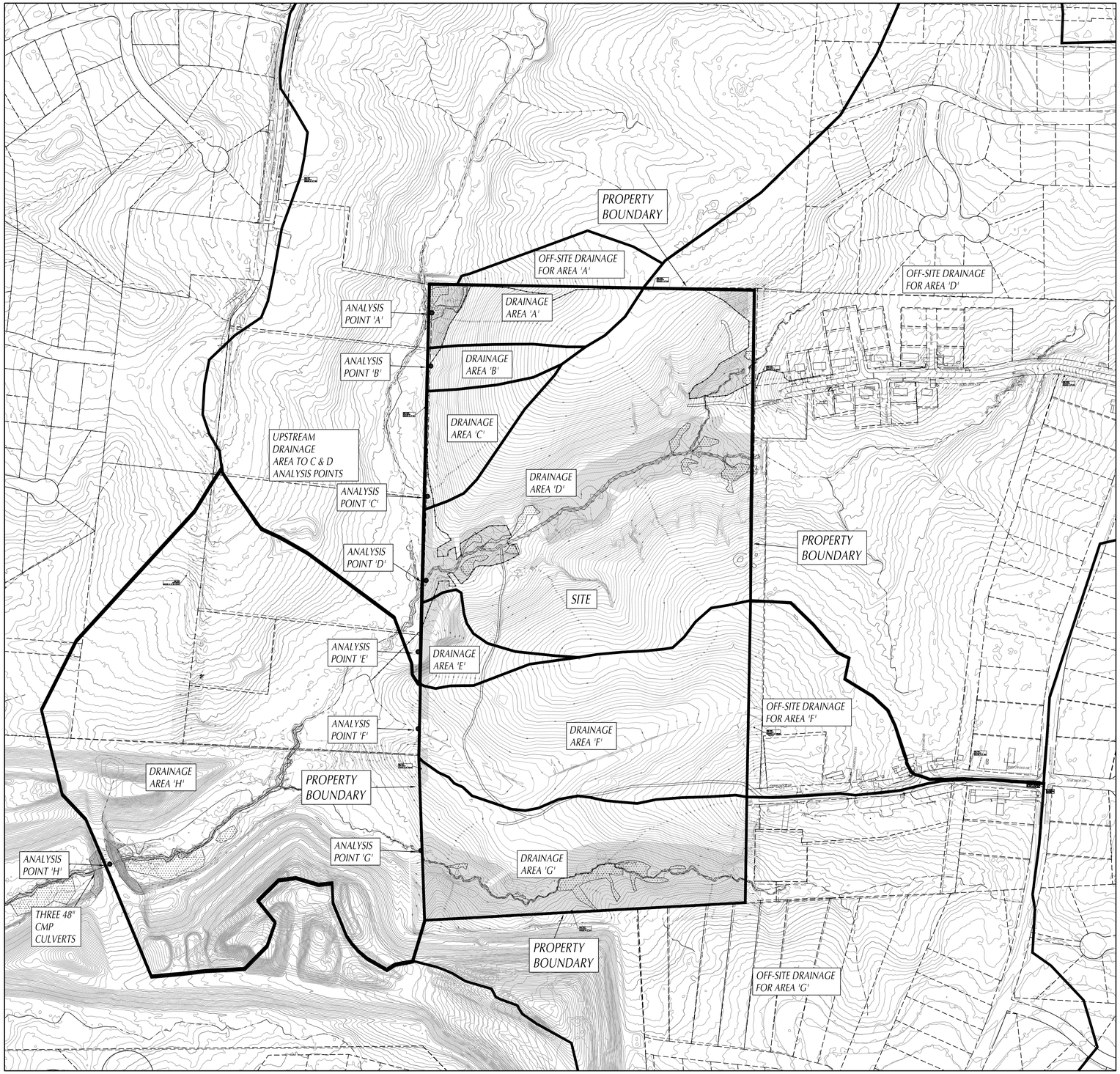
PROJECT NO. 02000.000

SHEET TITLE

OVERALL
DRAINAGE
AREA MAP

SHEET NUMBER

C-03.10



GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
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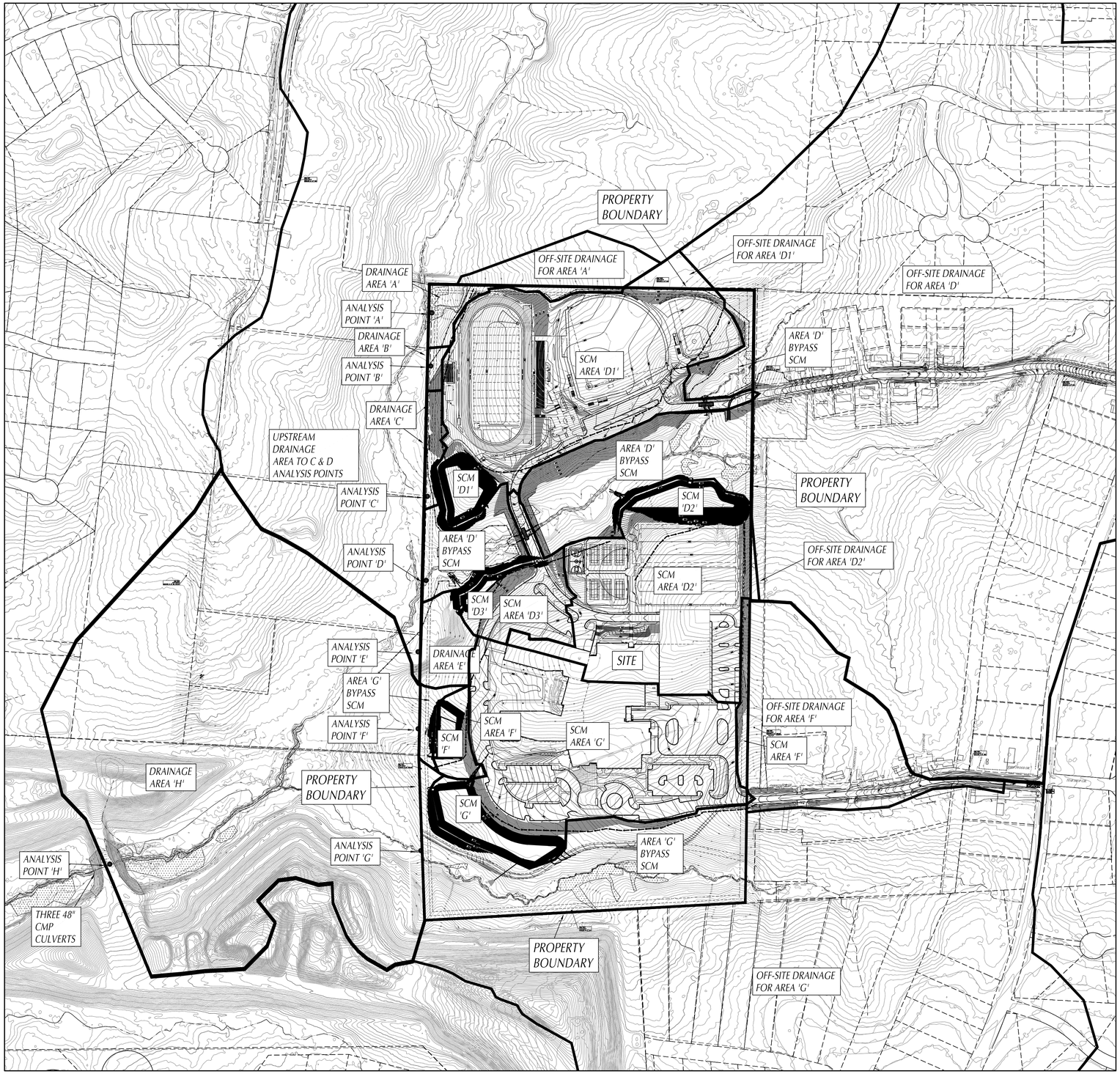
PROJECT NO. 02000.000

SHEET TITLE

PRE- DEVELOPMENT CONDITIONS DRAINAGE MAP

SHEET NUMBER

C-03.11



STORMWATER IMPACT STATEMENT

STORMWATER IMPACT STATEMENT:

A DOWNSTREAM IMPACT ANALYSIS WAS PERFORMED FOR THE H12/FELDON GROVE HIGH SCHOOL TO A LOCATION WHERE THE PROJECT PROPERTY AREA IS AT LEAST 10 PERCENT OF THE TOTAL DRAINAGE ARE. THE SITE IS 68 ACRES, WHICH REQUIRES THE STUDY TO INCLUDE A DRAINAGE AREA OF 680 ACRES. THE TRIBUTARY THAT EXTENDS FROM THE WESTERN EDGE OF THE PROPERTY DOWN TO MIDDLE CREEK IS ABOUT 580 ACRES WHERE THE SITE IS ABOUT 12 PERCENT OF THE DRAINAGE AREA. THE ANALYSIS POINT (DESIGNATED 'I', SEE SHEET C-03.10) DRAINAGE AREA IS APPROXIMATELY 3,195 ACRES WHICH BRINGS THE PROPERTY TO 2.1% OF THE DRAINAGE AREA.

THE ONLY PHYSICAL STRUCTURE DOWNSTREAM OF THE SITE TO THE ANALYSIS POINT 'I', IS A TRIPLE 48-IN CULVERT AT THE LANDFILL SITE THAT CROSSES THE TRIBUTARY. THIS LOCATION IS DESIGNATED AS ANALYSIS POINT 'H'.

POST DEVELOPMENT STORMWATER DISCHARGE RATE IS AT OR BELOW THE PRE-DEVELOPMENT RATE FOR THE 1-YEAR 24 HOUR DESIGN STORM, THE 10-YEAR 24 HOUR DESIGN STORM AND THE 100 YEAR 24 HOUR DESIGN STORM AT BOTH ANALYSIS POINT 'H' AND POINT 'I'.

ANALYSIS POINT	PHASE	Q1 (CFS)	Q10 (CFS)	Q100 (CFS)	NOTES
A*	PRE-DEV	0.35	8.01	22.12	
	POST-DEV	0.33	4.87	12.81	
	MANAGED				
B	PRE-DEV	0.09	1.92	5.35	
	POST-DEV	0.03	0.40	1.02	
	MANAGED				
C	PRE-DEV	0.17	3.86	10.65	
	POST-DEV	0.16	1.31	3.08	
	MANAGED				
D*	PRE-DEV	69.74	257.45	518.37	
	POST-DEV	106.04	330.05	624.41	
	MANAGED	68.22	237.42	509.98	3 STORMWATER WETLANDS
E	PRE-DEV	0.21	2.76	7.10	
	POST-DEV	0.18	2.41	6.09	
	MANAGED				
F*	PRE-DEV	6.35	34.93	81.66	
	POST-DEV	9.00	34.83	67.52	
	MANAGED	3.97	13.14	45.62	1 DRY DETENTION POND
G*	PRE-DEV	50.75	182.70	364.47	
	POST-DEV	76.26	240.56	455.56	
	MANAGED	49.00	175.02	357.45	1 STORMWATER WETLAND
H	PRE-DEV	265.14	1007.95	2033.27	EXISTING TRIPLE 48"CMP
	POST-DEV				CULVERTS AT LANDFILL SITE
	MANAGED	260.10	958.19	1981.70	
I	PRE-DEV	966.04	4127.88	8713.51	STORMWATER STUDY
	POST-DEV				ANALYSIS POINT AT MIDDLE
	MANAGED	966.04	4127.88	8713.51	CREEK.

* STORM DISCHARGE INCLUDES UPSTREAM DRAINAGE AREA.

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

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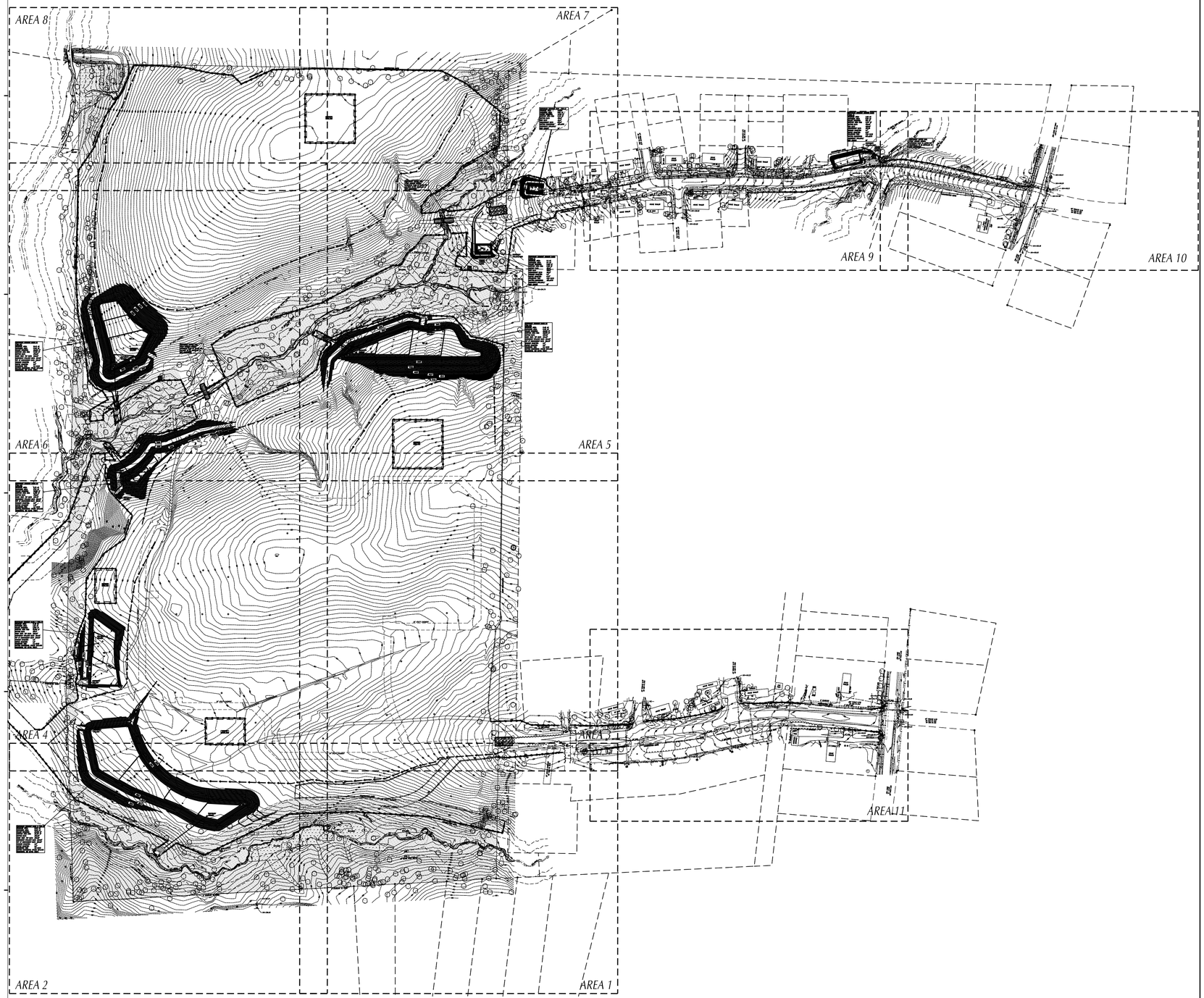
PROJECT NO. 02000.000

SHEET TITLE

POST DEVELOPMENT
CONDITIONS
DRAINAGE MAP

SHEET NUMBER

C-03.12



TOWN OF APEX CONSTRUCTION SEQUENCE

THE FOLLOWING BEGINS ONLY AFTER CONSTRUCTION PLANS ARE APPROVED, SIGNED BY TOWN STAFF AND COPIES ARE RECEIVED.

1. THROUGH THE INFRASTRUCTURE INSPECTIONS MANAGER AT 919-249-3386, SCHEDULE A PRE-CONSTRUCTION MEETING WITH INSPECTORS AND OTHER TOWN STAFF.
2. FILL OUT TREE/PROTECTION FENCING INSTALLATION PERMIT APPLICATION (OBTAIN FROM PLANNING DEPARTMENT).
3. HAVE A SURVEYOR FLAG PROPERTY LINES, EASEMENTS, BUFFERS, TREE PROTECTION AREAS, AND FLAG THE PROTECTION LIMITS.
4. CONTACT AN APEX PLANNING DEPARTMENT ZONING COMPLIANCE OFFICER AT 919-249-3426 TO REQUEST APPROVAL FOR TREE PROTECTION FENCING LOCATIONS.
5. INSTALL APPROVED TREE PROTECTION FENCING, SIGNS, AND/OR ANY OTHER PROTECTION MEASURES THAT MAY BE REQUIRED. CALL PLANNING AT 249-3426 FRO A FINAL INSPECTION OF PROTECTION MEASURES. PLANNING WILL FORWARD APPROVAL TO WATER RESOURCES, EROSION CONTROL FIELD STAFF.
6. PROVIDE STATE ISSUED EROSION CONTROL APPROVAL LETTER AND CERTIFICATE OF COMPLIANCE.
7. INSTALL GRAVEL CONSTRUCTION ENTRANCE, TEMPORARY DIVERSIONS, SILT FENCING, SEDIMENT BASINS, BYPASS CHANNELS, AND/OR OTHER MEASURES AS SHOWN ON THE APPROVED PLANS. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES.
8. WHEN COMPLETED, CALL WATER RESOURCES STAFF AT 919-362-8166 FOR AN ON-SITE INSPECTION AND TO REQUEST A CERTIFICATE OF COMPLIANCE.
9. COMPLETE A GRADING PERMIT APPLICATION, IF REQUIRED, FROM THE BUILDING INSPECTIONS & PERMITTING DEPARTMENT.
10. ONCE A GRADING PERMIT IS REVIEWED AND ISSUED BY THE BUILDING INSPECTIONS & PERMITTING DEPARTMENT, ARRANGE A PRE-CONSTRUCTION MEETING WITH TIM SAWYER AT 919-904-8744 OR BRANDON BECK AT 919-208-0362 PRIOR TO ANY GRADING ACTIVITIES. THIS MEETING IS SEPARATE FROM ANY OTHER PRE-CONSTRUCTION MEETINGS REQUIRED IN THE CONSTRUCTION SEQUENCE.
11. POST GRADING PERMIT PROMINENTLY ON SITE AT ALL TIMES.
12. BEGIN CLEARING, GRUBBING, AND ROUGH GRADE OF THE SITE IN ACCORDANCE WITH THE APPROVED GRADING PLAN.
13. STOCKPILE A SUFFICIENT AMOUNT OF TOPSOIL TO COVER 3 INCHES OVER LANDSCAPED AREAS AT THE END OF THE PROJECT.
14. INSTALL STORM SEWER, IF APPLICABLE, AND PROTECT INLETS WITH INLET PROTECTION DEVICES, SEDIMENT DEVICES, AND/OR OTHER APPROVED MEASURES AS SHOWN ON PLANS. MAINTAIN S&E MEASURES AS NEEDED.
15. AFTER COMPLETION OF ANY PHASE OF GRADING OR WHEN LAND-DISTURBING ACTIVITIES HAVE TEMPORARILY CEASED, ESTABLISH GROUND COVER ON SWALES AND DITCHES AND GRADED SLOPES STEEPER THAN 3:1 WITHIN 7 CALENDAR DAYS.
16. STABILIZE SITE AS AREAS ARE BROUGHT UP TO FINISHED GRADE WITH VEGETATION OR PAVING.
17. PRIOR TO PLAT APPROVAL, ALL DISTURBED AREAS BOTH PUBLIC AND PRIVATE, MUST BE PROPERLY STABILIZED. ALL TEMPORARY EROSION CONTROL MEASURES MUST BE INSTALLED, BE FUNCTIONING PROPERLY AND BE MAINTAINED FOR THE ENTIRE AREA CONTAINED WITHIN THE PLAT.
18. FLUSH AND CLEAN ALL STORMWATER SYSTEM PIPES. CLEAN AND REMOVE SEDIMENT FROM TEMPORARY SEDIMENT HOLDING DEVICES. FOLLOW THE SCM CONSTRUCTION SEQUENCE FOUND ON THE GRADING AND/OR SCM DETAIL SHEET ON THE CONSTRUCTION PLAN SET.
19. REMOVE ALL TEMPORARY DIVERSIONS, SILT FENCING, SEDIMENT BASINS, ETC. AND PROVIDE ADEQUATE COVER OR PAVE ANY RESULTING BARE AREAS. ALL PERMANENT EROSION CONTROL DEVICES SHOULD BE INSTALLED AT THIS POINT.
20. WHEN VEGETATION HAS BEEN ESTABLISHED, CALL WATER RESOURCES STAFF AT 919-362-8166 FOR A FINAL SITE INSPECTION AND TO REQUEST A CERTIFICATE OF COMPLETION. THE S&E PERFORMANCE GUARANTEE WILL BE RELEASED WITH THE ISSUANCE OF THE CERTIFICATE OF COMPLETION. VISIT THE STATE WEBSITE LISTED ABOVE AND SUBMIT ELECTRONIC NOTICE OF TERMINATION (e-NOT) TO END COVERAGE UNDER THE NCG01 PERMIT.
21. THE PROPERTY OWNER/HOME OWNERS ASSOCIATION WILL BE RESPONSIBLE FOR PERMANENT EROSION CONTROL MAINTENANCE OF THE SITE.

STRUCTURAL BMP CONSTRUCTION SEQUENCE

THE FOLLOWING MUST OCCUR PRIOR TO FINAL PLAT AND/OR CERTIFICATE OF OCCUPANCY (CO):

1. ALL STORMWATER CONTROL MEASURES (SCMS) MUST BE INSTALLED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DRAWINGS.
2. DURING THE SCM CONVERSION PROCESS, ALL EFFORTS SHALL BE MADE TO PROTECT DOWNSTREAM WATER RESOURCES. THE DRAIN VALVE SHALL NOT BE LEFT OPEN AT ANY TIME DURING SCM CONVERSION. A SKIMMER DRAWDOWN SYSTEM SHALL BE INSTALLED AND UTILIZED UNTIL THE SCM IS FULLY CONVERTED.
3. THE DESIGN ENGINEER MUST SUBMIT AN AS-BUILT PACKAGE WHICH MEETS ALL REQUIREMENTS PRESENTED IN THE TOWN SPEC BOOK INCLUDING A SIGNED AND SEALED CERTIFICATION STATEMENT.
4. FOR SUBDIVISIONS ONLY, A 25% MAINTENANCE GUARANTEE IS REQUIRED TO BE SUBMITTED TO JEAN WEATHERMAN IN DEVELOPMENT SERVICES AT 919-249-3394.
5. THE APPROPRIATE EXECUTED SCM O&M AGREEMENT MUST BE eRECORDED THROUGH JEAN WEATHERMAN IN DEVELOPMENT SERVICES.
6. A FINAL INSPECTION BY THE STORMWATER & UTILITY ENGINEERING STAFF SHALL BE CONDUCTED ONCE THE AS-BUILT SUBMITTAL HAS BEEN RECEIVED. ONCE APPROVED, STAFF WILL SEND AN OFFICIAL SCM APPROVAL LETTER TO THE OWNER.
7. IN LIEU OF SCM COMPLETION AND FINAL APPROVAL BY STAFF, THE TOWN MAY ACCEPT A 125% PERFORMANCE GUARANTEE IN ACCORDANCE WITH UDO SECTION 6.1.12(G). THIS GUARANTEE WILL BE COLLECTED BY JEAN WEATHERMAN IN DEVELOPMENT SERVICES AT 919-249-3394.
8. ALL SCMS ARE REQUIRED TO BE COMPLETED PRIOR TO A FINAL CO FOR A SITE PLAN AND ISSUANCE OF 90% OF COS WITHIN A SUBDIVISION. IF THE SUBDIVISION IS TO BE PHASED, ALL SCMS SHALL BE COMPLETED PRIOR TO ISSUANCE OF 90% OF COS WITHIN THAT PHASE.
9. IF AN SCM COUNTS TOWARDS RCA, THE REQUIRED LANDSCAPING SHALL BE INSTALLED DURING THE APPROPRIATE GROWING SEASON AND COORDINATED WITH THE TOWN ZONING COMPLIANCE OFFICER AT (919) 249-3426.

NOTE:
EROSION & SEDIMENT CONTROL SHALL BE PERMITTED THROUGH NCDEQ.

GRAPHIC SCALE

150 0 75 150 300 600

(IN FEET)
1 inch = 150 ft.

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919-821-0805

Structural Engineer
LHC Structural Engineers
A Division of Bennett & Pless
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Ralelgh, North Carolina 27607
(919) 832-5587

Mechanical / Electrical / Plumbing Engineer
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(704) 247-6230

SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
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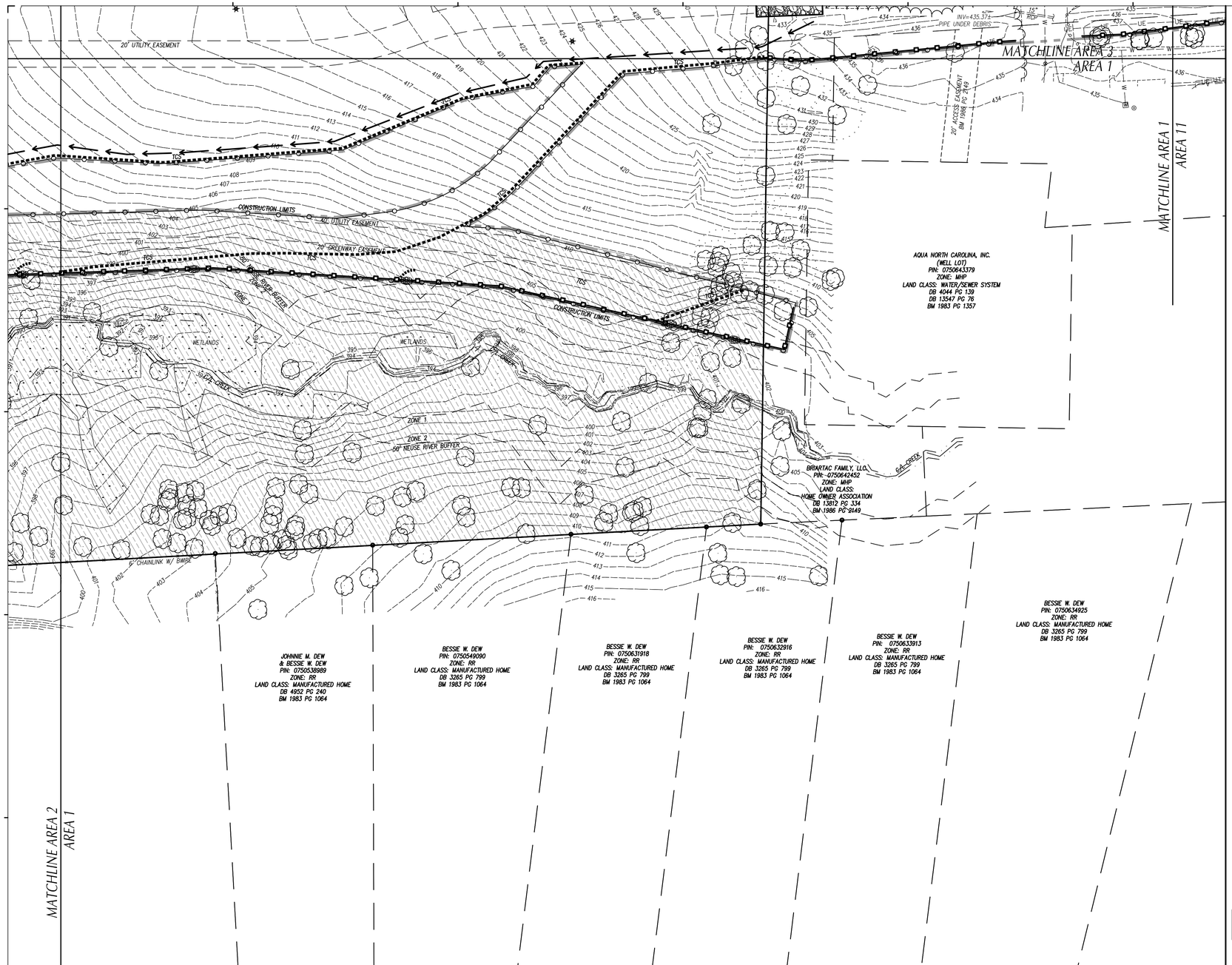
PROJECT NO. 02000.000

SHEET TITLE

INITIAL EROSION CONTROL OVERALL PLAN

SHEET NUMBER

C-04.00



LEGEND

- TEMP. GRAVEL CONSTR. ENTRANCE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION DEVICE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION SILT BAG DEVICE SEE DETAIL SHEET ___
- TEMP. DIVERSION DITCH / BERM SEE DETAIL SHEET ___
- TEMP. SILT FENCE SEE DETAIL SHEET ___
- TEMP. REINFORCED SILT FENCE OUTLET, SEE DETAIL SHEET ___
- PERMANENT OUTLET PROTECTION SEE DETAIL SHEET ___
- TEMP. CONCRETE WASHOUT AREA SEE DETAIL SHEET ___
- TEMP. PLASTIC LINING, SEE TEMP. BASIN BAFFLES ON DETAIL SHEET ___
- TEMP. J-HOOK PROTECTION SEE DETAIL SHEET ___
- TEMP. TIMBER/BRIDGE MAT SEE DETAIL SHEET ___
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- TEMP. SLOPE DRAIN SEE DETAIL SHEET ___
- PROPOSED STORM SEWER PIPES
- EXISTING STORM SEWER PIPES
- CONSTRUCTION LIMITS UNLESS OTHERWISE NOTED.
- TEMP. COMPOST SOCK INLET PROTECTION, SEE DETAIL SHEET ___
- TEMP. DEWATERING SILT BAG SEE DETAIL SHEET ___
- RESOURCE CONSERVATION AREA
- TEMP. COFFER DAM, SEE STREAM CROSSING/CULVERT INSTALLATION DETAIL SHEET ___

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL TOWN OF APEX AND NCDOT STANDARDS, SPECIFICATIONS AND DETAILS.
2. THE CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL CODES IN OBSERVING EROSION CONTROL MEASURES BOTH ON AND OFF SITE. ALL OFF-SITE SOIL BORROW AND WASTE SITES SHALL BE PROPERLY PERMITTED FOR SUCH ACTIVITIES. CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION OF SEDIMENT & EROSION CONTROL PERMIT FOR ANY OFF-SITE SITES TO OWNER PRIOR TO RELOCATING ANY STOCKPILE MATERIALS.
3. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES AFTER EACH RAINFALL EVENT OR AS DIRECTED BY LOCAL AUTHORITIES OR ARCHITECT.
4. TOTAL DISTURBED AREA: 58 AC.
5. ALL OPEN STORM PIPES SHALL BE PROTECTED WITH STONE FILTER PROTECTION AFTER WORK STOPPAGE EACH DAY. SEE DETAIL **SHEET** ___
6. ALL STORM DRAINAGE PIPES SHALL BE THOROUGHLY FLUSHED OF ALL SEDIMENT FOLLOWING SITE STABILIZATION. INTERIOR FLUSHING OF SYSTEM SHALL BE PERFORMED AS NEEDED TO MAINTAIN PROPER FUNCTIONING OF THE DRAINAGE SYSTEM. CLEANING SHALL BE PERFORMED IN A MANNER WHICH PREVENTS SEDIMENT FROM BEING FLUSHED THROUGH PIPES TO THE EXISTING DRAINAGE SYSTEM.
7. THE INDICATED STAGING AREA IS INTENDED FOR VEHICLES AND NON-ERODIBLE MATERIALS ONLY. NO SOIL, SAND OR OTHER ERODIBLE, FINE GRAINED MATERIAL SHALL BE STORED OUTSIDE OF THE LIMITS OF THE SITE PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES.
8. SOIL AND OTHER MATERIALS SHALL ONLY BE TEMPORARILY STOCKPILED WITHIN THE CONSTRUCTION LIMITS PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES. STOCKPILES SHALL BE STABILIZED AS REQUIRED AS INDICATED IN THE SLOPE & SURFACE STABILIZATION NOTES ON THIS PLAN.
9. THE TREE PROTECTION FENCE SHALL BE MAINTAINED ON THE SITE UNTIL ALL SITE WORK IS COMPLETED AND THE FINAL SITE INSPECTION IS SCHEDULED PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY (CO). THE FENCING SHALL BE REMOVED IMMEDIATELY PRIOR TO THE FINAL SITE INSPECTION FOR THE SITE.
10. TREE PROTECTION FENCING SHALL NOT BE MOVED AND THERE SHALL BE NO ENCROACHMENT INTO SUCH PROTECTED AREA(S) WITHOUT WRITTEN AUTHORIZATION OF THE COUNTY ZONING COMPLIANCE STAFF. ANY ACTIVITY (LANDSCAPING, FENCING, OR UTILITY INSTALLATION) SHOWN ON THE APPROVED PLANS IN A TREE PROTECTION AREA, SHALL ALSO NOT OCCUR WITHOUT WRITTEN AUTHORIZATION FROM THE COUNTY ZONING COMPLIANCE STAFF. ANY UNAUTHORIZED ENCROACHMENT OR DISTURBANCE WITHIN THE BOUNDARIES OF A TREE PROTECTION AREA SHALL AUTOMATICALLY RESULT IN FINES AND THE REPLACEMENT OF ANY DAMAGED VEGETATION IN ACCORDANCE WITH THE LAND DEVELOPMENT ORDINANCE.
11. ROADSIDE DITCHES AND CHANNELS SHALL BE STABILIZED DAILY UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
12. INSTALL TEMPORARY MATTING TO TOP OF ALL SIDE SLOPES ON CHANNELS, DIVERSION DITCHES AND TEMPORARY SEDIMENT BASINS. SEE DETAIL SHEET C702 (PERMANENT CHANNEL) AND C702 (TEMPORARY DIVERSION DITCH) FOR TYPE OF MATTING TO USE.
13. ANY DEWATERING OF SEDIMENT CONTAINMENT DEVICES FOR MAINTENANCE, REMOVAL OR CONVERSION PURPOSES IS TO BE DONE THROUGH A SILT BAG.
14. ANY DEWATERING OF STORM/UTILITY TRENCHES IS TO BE DONE THROUGH A SILT BAG.
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16. CONTRACTOR SHALL USE TIRE WASH STATION TO PREVENT SEDIMENT FROM TRACKING ONTO THE ROAD IF CONSTRUCTION ENTRANCE IS FOUND INSUFFICIENT AT NO ADDITIONAL COST TO OWNER.
17. CONTRACTOR SHALL UTILIZE PAM FLOCCULANTS TO REDUCE RUN-OFF TURBIDITY. SEE SPECS.

MAINTENANCE PLAN

1. DURING ALL PHASES OF CONSTRUCTION, GROUNDCOVER ON EXPOSED SLOPES SHALL BE PROVIDED ACCORDING TO GROUND STABILIZATION TABLE **(SHEET C706)** FOLLOWING COMPLETION OF ANY PHASE OF GRADING.
2. FINAL PERMANENT GROUNDCOVER FOR ALL DISTURBED AREAS SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION TABLE (BELOW) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
3. THE ABOVE REQUIREMENTS ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED THOSE ABOVE.
4. SLOPE EROSION CONTROL MATTING SHALL BE INSTALLED FOR TEMPORARY STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER). REFER TO MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.
5. ALL OTHER SEEDED AREAS SHALL BE MULCHED WITH STRAW AND TACKED WITH ASPHALT.

SELF-INSPECTION RULES

SEE **SHEET C706** FOR SELF-INSPECTION REQUIREMENTS.

THE FINANCIALLY RESPONSIBLE PERSON AND/OR HIS AGENT WILL BE PERFORM SELF INSPECTIONS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES USING NCDEMLR'S SELF INSPECTION REPORT (WORKSHEET) AND THIS WILL BE KEPT ONSITE.

SLOPE & SURFACE STABILIZATION

GROUND STABILIZATION SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION NOTES. SEE SHEET C705.

EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE (SECTION II.B(2) (b))

THE REQUIREMENTS ON SHEET C705 ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED MINIMUM REQUIREMENTS.

INSTALL TEMPORARY EXCELSIOR MATTING FOR STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER) AND AREAS OF CONCENTRATED FLOW (CHANNELS, DITCHES, SWALES, ETC.). UTILIZE TEMPORARY COCONUT MAT IN AREAS IDENTIFIED ON PLAN. REFER TO SPECIFICATION SECTION 312500 FOR MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.

NOTE:
EROSION & SEDIMENT CONTROL SHALL BE PERMITTED THROUGH NCDEQ.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

MAGNETIC

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8550 Stephenson Road
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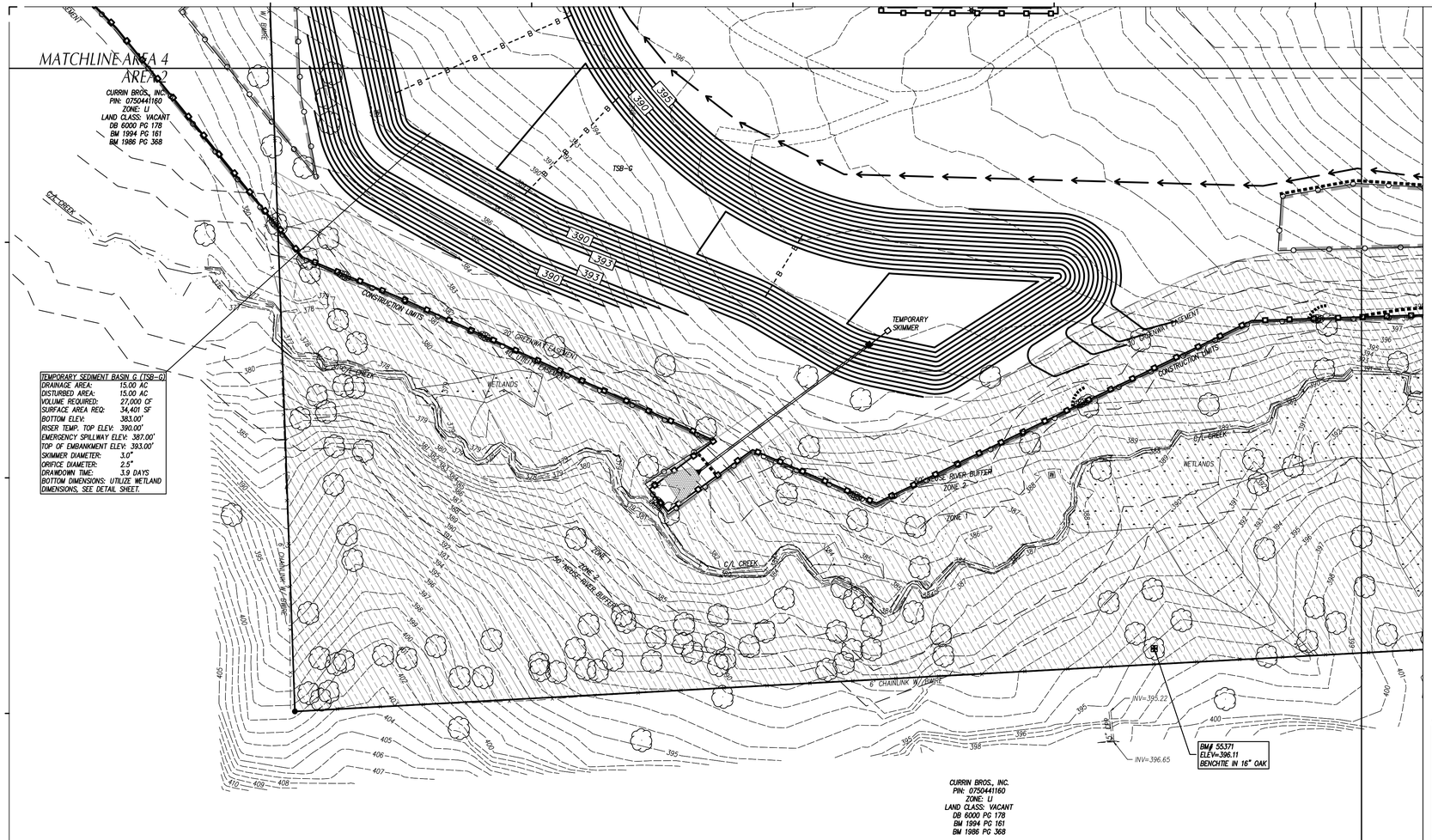
SHEET TITLE

INITIAL EROSION CONTROL PLAN AREA_1

SHEET NUMBER

C-04.01



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GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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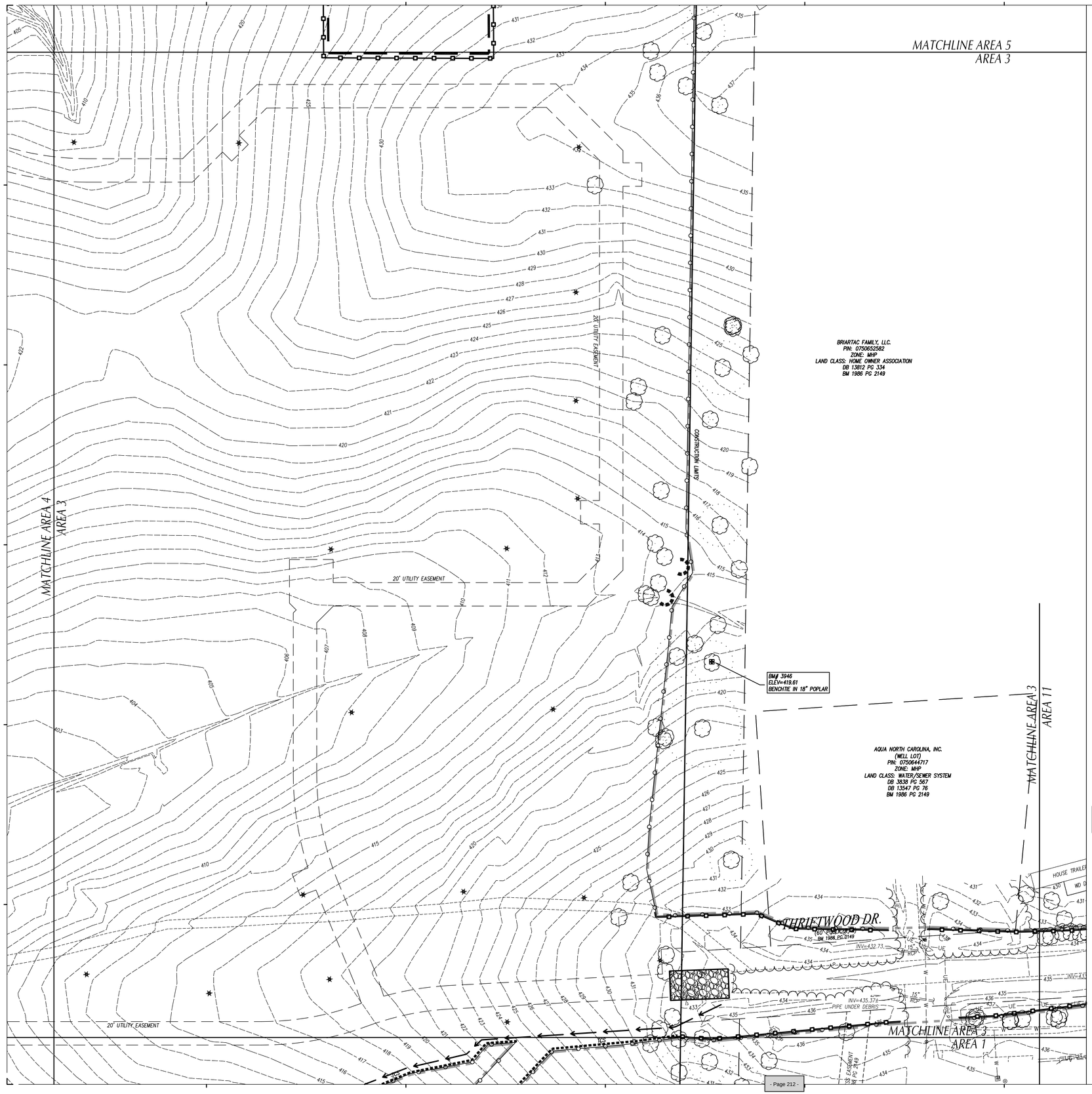
SHEET TITLE
INITIAL EROSION CONTROL PLAN AREA_2

SHEET NUMBER
C-04.02



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3. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES AFTER EACH RAINFALL EVENT OR AS DIRECTED BY LOCAL AUTHORITIES OR ARCHITECT.
4. TOTAL DISTURBED AREA: 58 AC.
5. ALL OPEN STORM PIPES SHALL BE PROTECTED WITH STONE FILTER PROTECTION AFTER WORK STOPPAGE EACH DAY. SEE DETAIL **SHEET __**
6. ALL STORM DRAINAGE PIPES SHALL BE THOROUGHLY FLUSHED OF ALL SEDIMENT FOLLOWING SITE STABILIZATION. INTERIOR FLUSHING OF SYSTEM SHALL BE PERFORMED AS NEEDED TO MAINTAIN PROPER FUNCTIONING OF THE DRAINAGE SYSTEM. CLEANING SHALL BE PERFORMED IN A MANNER WHICH PREVENTS SEDIMENT FROM BEING FLUSHED THROUGH PIPES TO THE EXISTING DRAINAGE SYSTEM.
7. THE INDICATED STAGING AREA IS INTENDED FOR VEHICLES AND NON-ERODIBLE MATERIALS ONLY. NO SOIL, SAND OR OTHER ERODIBLE, FINE GRAINED MATERIAL SHALL BE STORED OUTSIDE OF THE LIMITS OF THE SITE PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES.
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9. THE TREE PROTECTION FENCE SHALL BE MAINTAINED ON THE SITE UNTIL ALL SITE WORK IS COMPLETED AND THE FINAL SITE INSPECTION IS SCHEDULED PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY (CO). THE FENCING SHALL BE REMOVED IMMEDIATELY PRIOR TO THE FINAL SITE INSPECTION FOR THE SITE.
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11. ROADSIDE DITCHES AND CHANNELS SHALL BE STABILIZED DAILY UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
12. INSTALL TEMPORARY MATTING TO TOP OF ALL SIDE SLOPES ON CHANNELS, DIVERSION DITCHES AND TEMPORARY SEDIMENT BASINS. SEE DETAIL SHEET C702 (PERMANENT CHANNEL) AND C702 (TEMPORARY DIVERSION DITCH) FOR TYPE OF MATTING TO USE.
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16. CONTRACTOR SHALL USE TIRE WASH STATION TO PREVENT SEDIMENT FROM TRACKING ONTO THE ROAD IF CONSTRUCTION ENTRANCE IS FOUND INSUFFICIENT AT NO ADDITIONAL COST TO OWNER.
17. CONTRACTOR SHALL UTILIZE PAM FLOCCULANTS TO REDUCE RUN-OFF TURBIDITY. SEE SPECS.

MAINTENANCE PLAN

1. DURING ALL PHASES OF CONSTRUCTION, GROUNDCOVER ON EXPOSED SLOPES SHALL BE PROVIDED ACCORDING TO GROUND STABILIZATION TABLE **(SHEET C706)** FOLLOWING COMPLETION OF ANY PHASE OF GRADING.
2. FINAL PERMANENT GROUNDCOVER FOR ALL DISTURBED AREAS SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION TABLE (BELOW) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
3. THE ABOVE REQUIREMENTS ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED THOSE ABOVE.
4. SLOPE EROSION CONTROL MATTING SHALL BE INSTALLED FOR TEMPORARY STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER). REFER TO MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.
5. ALL OTHER SEEDED AREAS SHALL BE MULCHED WITH STRAW AND TACKED WITH ASPHALT.

SELF-INSPECTION RULES

SEE **SHEET C706** FOR SELF-INSPECTION REQUIREMENTS.

THE FINANCIALLY RESPONSIBLE PERSON AND/OR HIS AGENT WILL BE PERFORM SELF INSPECTIONS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES USING NCDEMLR'S SELF INSPECTION REPORT (WORKSHEET) AND THIS WILL BE KEPT ONSITE.

SLOPE & SURFACE STABILIZATION

GROUND STABILIZATION SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION NOTES. SEE SHEET C705.

EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE (SECTION II.B(2) (b))

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INSTALL TEMPORARY EXCELSIOR MATTING FOR STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER) AND AREAS OF CONCENTRATED FLOW (CHANNELS, DITCHES, SWALES, ETC.). UTILIZE TEMPORARY COCONUT MAT IN AREAS IDENTIFIED ON PLAN. REFER TO SPECIFICATION SECTION 312500 FOR MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.

NOTE:
EROSION & SEDIMENT CONTROL SHALL BE PERMITTED THROUGH NCDEQ.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

MAGNETIC

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
11 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

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Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
A Division of Bennett & Pless
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Raleigh, North Carolina 27607
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Charlotte, North Carolina 28277
(704) 247-6230

SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

RATIO

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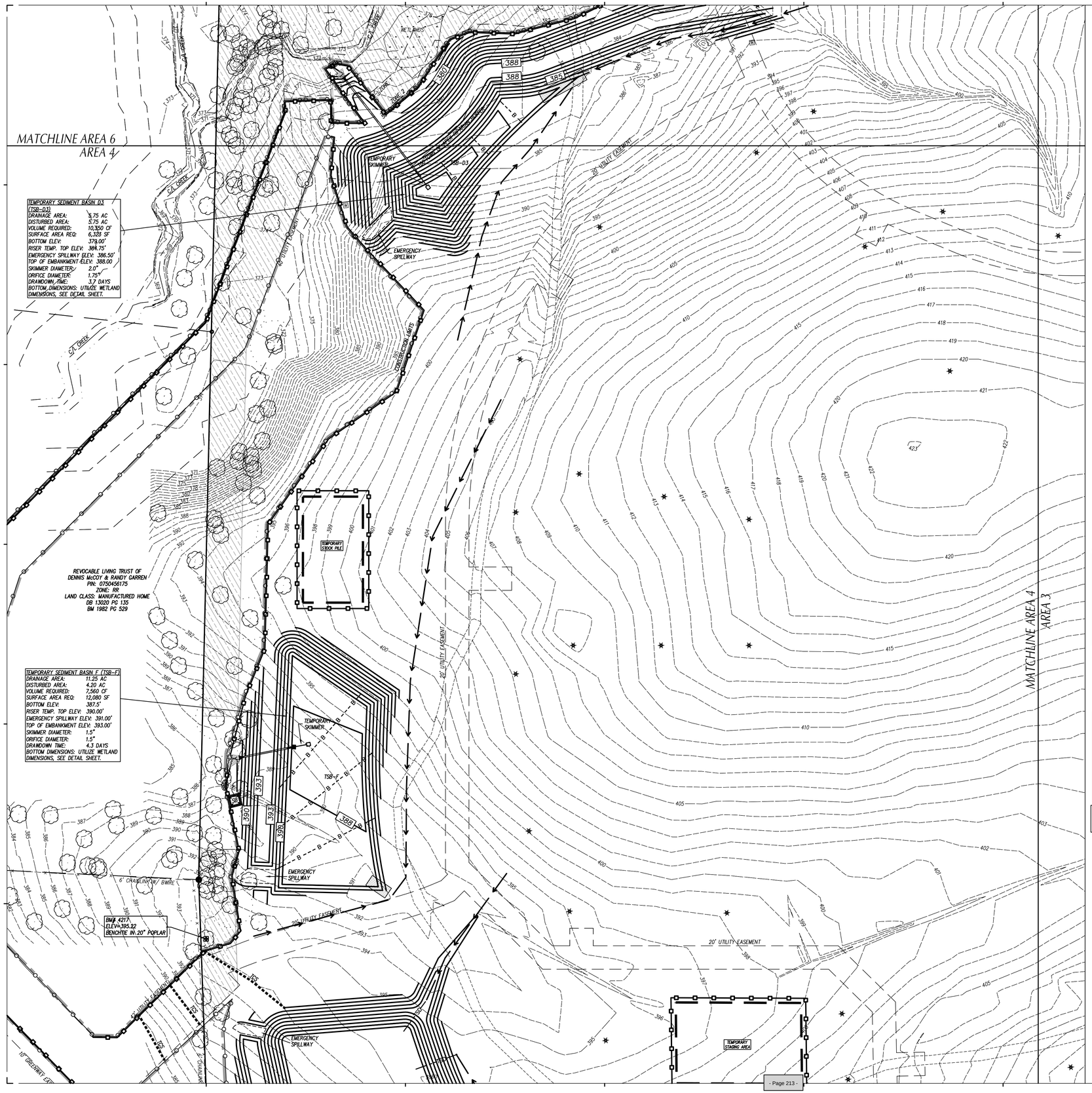
PROJECT NO. 02000.000

SHEET TITLE
INITIAL EROSION CONTROL PLAN AREA_3

SHEET NUMBER
C-04.03



LEGEND

- TEMP. GRAVEL CONSTR. ENTRANCE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION DEVICE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION SILT BAG DEVICE SEE DETAIL SHEET ___
- TEMP. DIVERSION DITCH / BERM SEE DETAIL SHEET ___
- TEMP. SILT FENCE SEE DETAIL SHEET ___
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- PERMANENT OUTLET PROTECTION SEE DETAIL SHEET ___
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- TEMP. PLASTIC LINING, SEE TEMP. BASIN BAFFLES ON DETAIL SHEET ___
- TEMP. J-HOOK PROTECTION SEE DETAIL SHEET ___
- TEMP. TIMBER/BRIDGE MAT SEE DETAIL SHEET ___
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- EXISTING STORM SEWER PIPES
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1 inch = 40 ft.

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Owner
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SEAL | 03/26/2021

PRELIMINARY
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CONSTRUCTION

SHEET ISSUE

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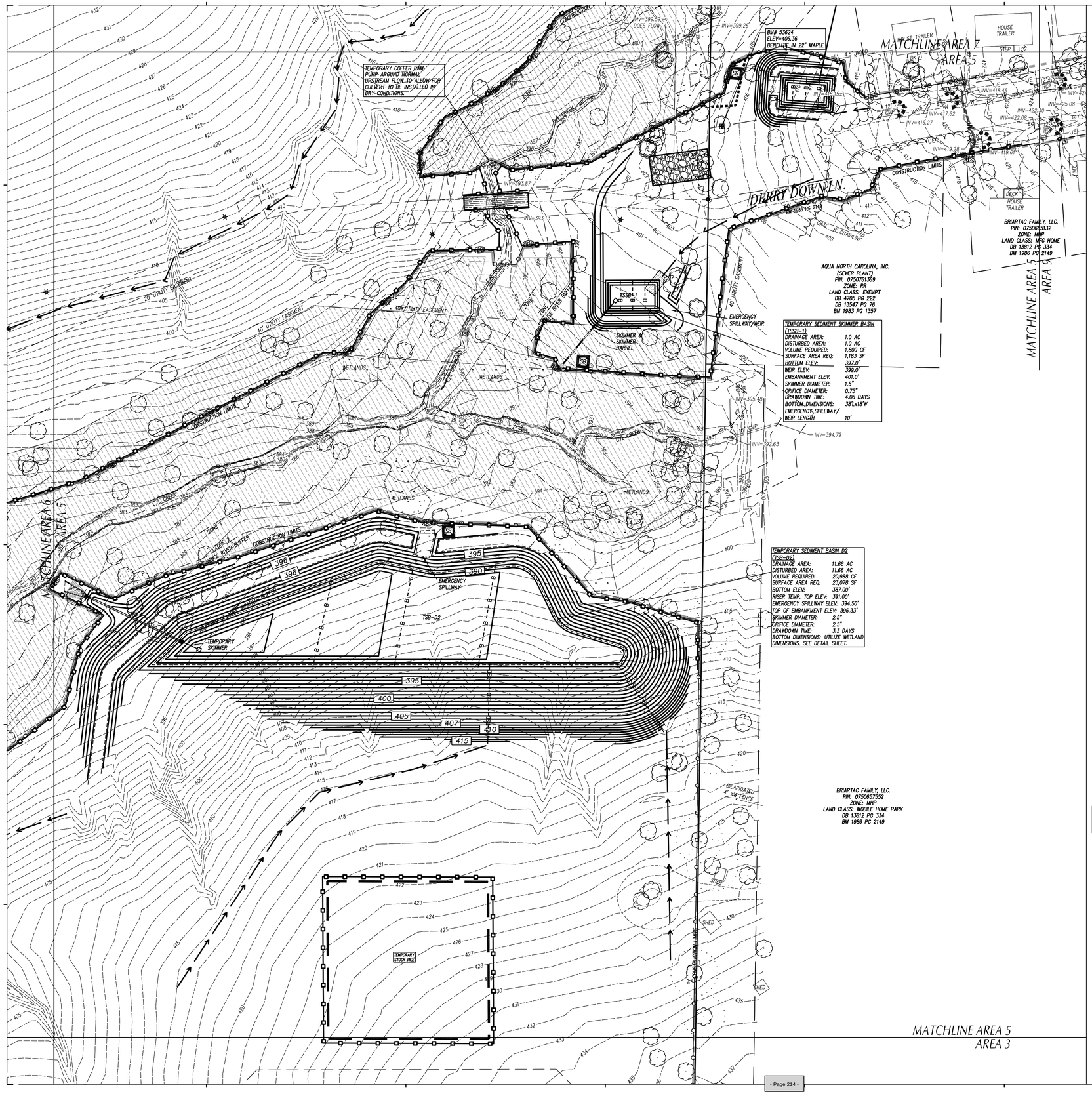
PROJECT NO. 02000.000

SHEET TITLE
INITIAL EROSION CONTROL PLAN AREA_4

SHEET NUMBER
C-04.04



LEGEND

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2. FINAL PERMANENT GROUNDCOVER FOR ALL DISTURBED AREAS SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION TABLE (BELOW) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
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4. SLOPE EROSION CONTROL MATTING SHALL BE INSTALLED FOR TEMPORARY STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER). REFER TO MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.
5. ALL OTHER SEEDED AREAS SHALL BE MULCHED WITH STRAW AND TACKED WITH ASPHALT.

SELF-INSPECTION RULES

SEE **SHEET C706** FOR SELF-INSPECTION REQUIREMENTS.

THE FINANCIALLY RESPONSIBLE PERSON AND/OR HIS AGENT WILL BE PERFORM SELF INSPECTIONS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES USING NCDEMLR'S SELF INSPECTION REPORT (WORKSHEET) AND THIS WILL BE KEPT ONSITE.

SLOPE & SURFACE STABILIZATION

GROUND STABILIZATION SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION NOTES. SEE SHEET C705.

EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE (SECTION II.B(2) (b))

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INSTALL TEMPORARY EXCELSIOR MATTING FOR STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER) AND AREAS OF CONCENTRATED FLOW (CHANNELS, DITCHES, SWALES, ETC.). UTILIZE TEMPORARY COCONUT MAT IN AREAS IDENTIFIED ON PLAN. REFER TO SPECIFICATION SECTION 312500 FOR MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.

NOTE:
EROSION & SEDIMENT CONTROL SHALL BE PERMITTED THROUGH NCDEQ.

GRAPHIC SCALE

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(IN FEET)
1 inch = 40 ft.

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SEAL | 03/26/2021

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PROJECT NO. 02000.000

SHEET TITLE
INITIAL EROSION CONTROL PLAN AREA_5

SHEET NUMBER
C-04.05

LEGEND

- TEMP. GRAVEL CONSTR. ENTRANCE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION DEVICE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION SILT BAG DEVICE SEE DETAIL SHEET ___
- TEMP. DIVERSION DITCH / BERM SEE DETAIL SHEET ___
- TEMP. SILT FENCE SEE DETAIL SHEET ___
- TEMP. REINFORCED SILT FENCE OUTLET, SEE DETAIL SHEET ___
- PERMANENT OUTLET PROTECTION SEE DETAIL SHEET ___
- TEMP. CONCRETE WASHOUT AREA SEE DETAIL SHEET ___
- TEMP. PLASTIC LINING, SEE TEMP. BASIN BAFFLES ON DETAIL SHEET ___
- TEMP. J-HOOK PROTECTION SEE DETAIL SHEET ___
- TEMP. TIMBER/BRIDGE MAT SEE DETAIL SHEET ___
- TEMP. ROCK PIPE INLET PROTECTION SEE DETAIL SHEET ___
- CHANNEL LINING SEE DETAIL SHEET ___
- TEMP. SKIMMER SEDIMENT BASIN SEE DETAIL SHEET ___
- EXISTING CONTOUR
- FINISHED CONTOUR
- TEMP. CONTOUR (TEMP. GRADES DURING CONSTR.)
- TEMPORARY BASIN BAFFLE SEE DETAIL SHEET ___
- TREE PROTECTION FENCE SEE DETAIL SHEET ___
- TEMP. COMPOST SOCK SEE DETAIL SHEET ___
- TEMP. COMPOST SOCK IN CHANNEL SEE DETAIL SHEET ___
- TEMP. SLOPE DRAIN SEE DETAIL SHEET ___
- PROPOSED STORM SEWER PIPES
- EXISTING STORM SEWER PIPES
- CONSTRUCTION LIMITS UNLESS OTHERWISE NOTED.
- TEMP. COMPOST SOCK INLET PROTECTION, SEE DETAIL SHEET ___
- TEMP. DEWATERING SILT BAG SEE DETAIL SHEET ___
- RESOURCE CONSERVATION AREA
- TEMP. COFFER DAM, SEE STREAM CROSSING/CULVERT INSTALLATION DETAIL SHEET ___

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL TOWN OF APEX AND NCDOT STANDARDS, SPECIFICATIONS AND DETAILS.
2. THE CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL CODES IN OBSERVING EROSION CONTROL MEASURES BOTH ON AND OFF SITE. ALL OFF-SITE SOIL BORROW AND WASTE SITES SHALL BE PROPERLY PERMITTED FOR SUCH ACTIVITIES. CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION OF SEDIMENT & EROSION CONTROL PERMIT FOR ANY OFF-SITE SITES TO OWNER PRIOR TO RELOCATING ANY STOCKPILE MATERIALS.
3. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES AFTER EACH RAINFALL EVENT OR AS DIRECTED BY LOCAL AUTHORITIES OR ARCHITECT.
4. TOTAL DISTURBED AREA: 58 AC.
5. ALL OPEN STORM PIPES SHALL BE PROTECTED WITH STONE FILTER PROTECTION AFTER WORK STOPPAGE EACH DAY. SEE DETAIL **SHEET** ___
6. ALL STORM DRAINAGE PIPES SHALL BE THOROUGHLY FLUSHED OF ALL SEDIMENT FOLLOWING SITE STABILIZATION. INTERIOR FLUSHING OF SYSTEM SHALL BE PERFORMED AS NEEDED TO MAINTAIN PROPER FUNCTIONING OF THE DRAINAGE SYSTEM. CLEANING SHALL BE PERFORMED IN A MANNER WHICH PREVENTS SEDIMENT FROM BEING FLUSHED THROUGH PIPES TO THE EXISTING DRAINAGE SYSTEM.
7. THE INDICATED STAGING AREA IS INTENDED FOR VEHICLES AND NON-ERODIBLE MATERIALS ONLY. NO SOIL, SAND OR OTHER ERODIBLE, FINE GRAINED MATERIAL SHALL BE STORED OUTSIDE OF THE LIMITS OF THE SITE PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES.
8. SOIL AND OTHER MATERIALS SHALL ONLY BE TEMPORARILY STOCKPILED WITHIN THE CONSTRUCTION LIMITS PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES. STOCKPILES SHALL BE STABILIZED AS REQUIRED AS INDICATED IN THE SLOPE & SURFACE STABILIZATION NOTES ON THIS PLAN.
9. THE TREE PROTECTION FENCE SHALL BE MAINTAINED ON THE SITE UNTIL ALL SITE WORK IS COMPLETED AND THE FINAL SITE INSPECTION IS SCHEDULED PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY (CO). THE FENCING SHALL BE REMOVED IMMEDIATELY PRIOR TO THE FINAL SITE INSPECTION FOR THE SITE.
10. TREE PROTECTION FENCING SHALL NOT BE MOVED AND THERE SHALL BE NO ENCROACHMENT INTO SUCH PROTECTED AREA(S) WITHOUT WRITTEN AUTHORIZATION OF THE COUNTY ZONING COMPLIANCE STAFF. ANY ACTIVITY (LANDSCAPING, FENCING, OR UTILITY INSTALLATION) SHOWN ON THE APPROVED PLANS IN A TREE PROTECTION AREA, SHALL ALSO NOT OCCUR WITHOUT WRITTEN AUTHORIZATION FROM THE COUNTY ZONING COMPLIANCE STAFF. ANY UNAUTHORIZED ENCROACHMENT OR DISTURBANCE WITHIN THE BOUNDARIES OF A TREE PROTECTION AREA SHALL AUTOMATICALLY RESULT IN FINES AND THE REPLACEMENT OF ANY DAMAGED VEGETATION IN ACCORDANCE WITH THE LAND DEVELOPMENT ORDINANCE.
11. ROADSIDE DITCHES AND CHANNELS SHALL BE STABILIZED DAILY UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
12. INSTALL TEMPORARY MATTING TO TOP OF ALL SIDE SLOPES ON CHANNELS, DIVERSION DITCHES AND TEMPORARY SEDIMENT BASINS. SEE DETAIL SHEET C702 (PERMANENT CHANNEL) AND C702 (TEMPORARY DIVERSION DITCH) FOR TYPE OF MATTING TO USE.
13. ANY DEWATERING OF SEDIMENT CONTAINMENT DEVICES FOR MAINTENANCE, REMOVAL OR CONVERSION PURPOSES IS TO BE DONE THROUGH A SILT BAG.
14. ANY DEWATERING OF STORM/UTILITY TRENCHES IS TO BE DONE THROUGH A SILT BAG.
15. GROUND COVER IS TO BE APPLIED PER CONDITIONS OF THE NPDES PERMIT OR AT THE END OF THE DAY IN CRITICAL AREAS.
16. CONTRACTOR SHALL USE TIRE WASH STATION TO PREVENT SEDIMENT FROM TRACKING ONTO THE ROAD IF CONSTRUCTION ENTRANCE IS FOUND INSUFFICIENT AT NO ADDITIONAL COST TO OWNER.
17. CONTRACTOR SHALL UTILIZE PAM FLOCCULANTS TO REDUCE RUN-OFF TURBIDITY. SEE SPECS.

MAINTENANCE PLAN

1. DURING ALL PHASES OF CONSTRUCTION, GROUNDCOVER ON EXPOSED SLOPES SHALL BE PROVIDED ACCORDING TO GROUND STABILIZATION TABLE **(SHEET C706)** FOLLOWING COMPLETION OF ANY PHASE OF GRADING.
2. FINAL PERMANENT GROUNDCOVER FOR ALL DISTURBED AREAS SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION TABLE (BELOW) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
3. THE ABOVE REQUIREMENTS ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED THOSE ABOVE.
4. SLOPE EROSION CONTROL MATTING SHALL BE INSTALLED FOR TEMPORARY STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER). REFER TO MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.
5. ALL OTHER SEEDED AREAS SHALL BE MULCHED WITH STRAW AND TACKED WITH ASPHALT.

SELF-INSPECTION RULES

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SLOPE & SURFACE STABILIZATION

GROUND STABILIZATION SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION NOTES. SEE SHEET C705.

EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE (SECTION II.B(2) (b))

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NOTE:
EROSION & SEDIMENT CONTROL SHALL BE PERMITTED THROUGH NCDEQ.

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1 inch = 40 ft.

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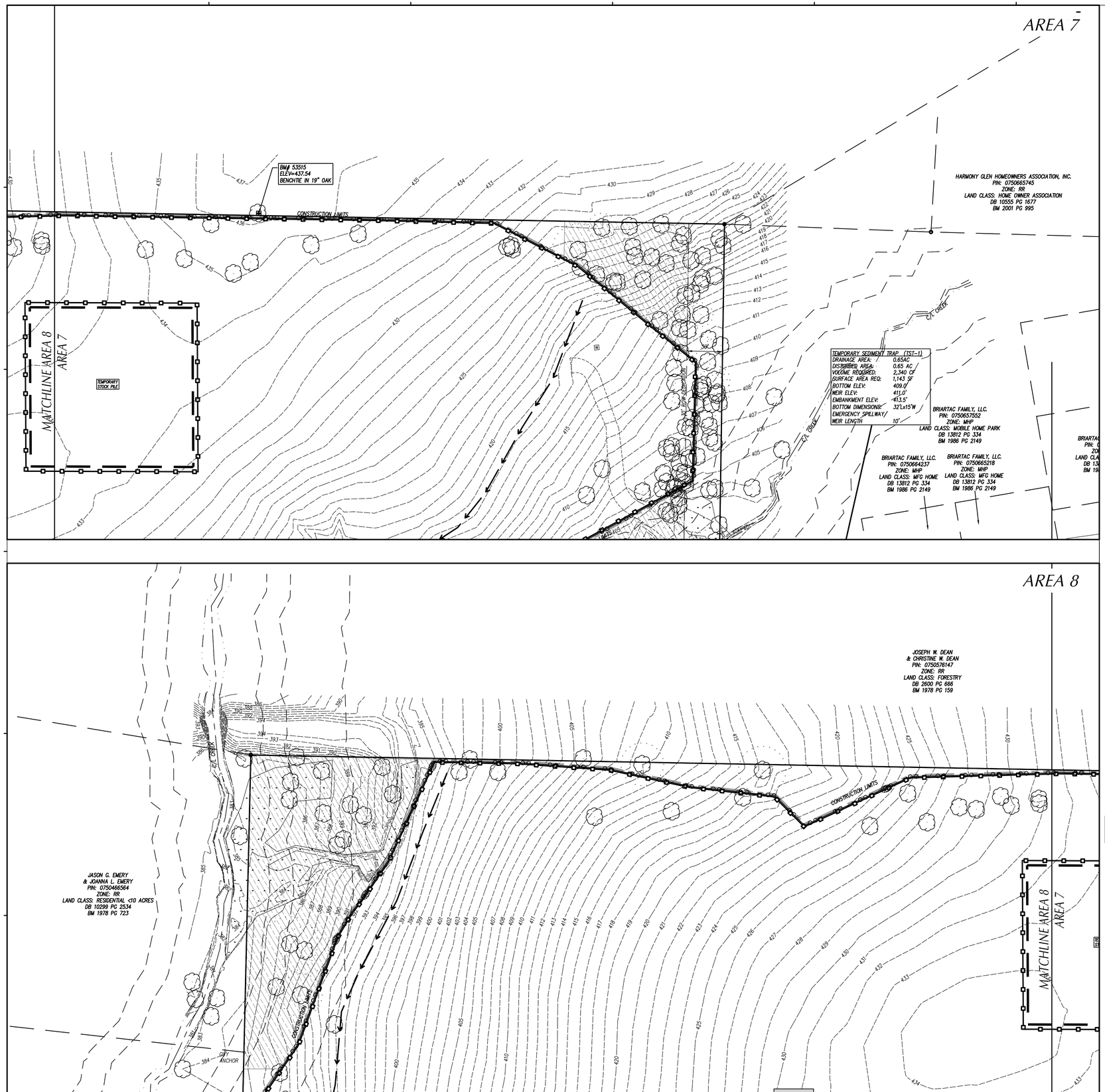
PROJECT NO. 02000.000

SHEET TITLE

INITIAL EROSION CONTROL PLAN AREA_6

SHEET NUMBER

C-04.06



LEGEND

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MAINTENANCE PLAN

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NOTE:
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(IN FEET)
1 inch = 40 ft.

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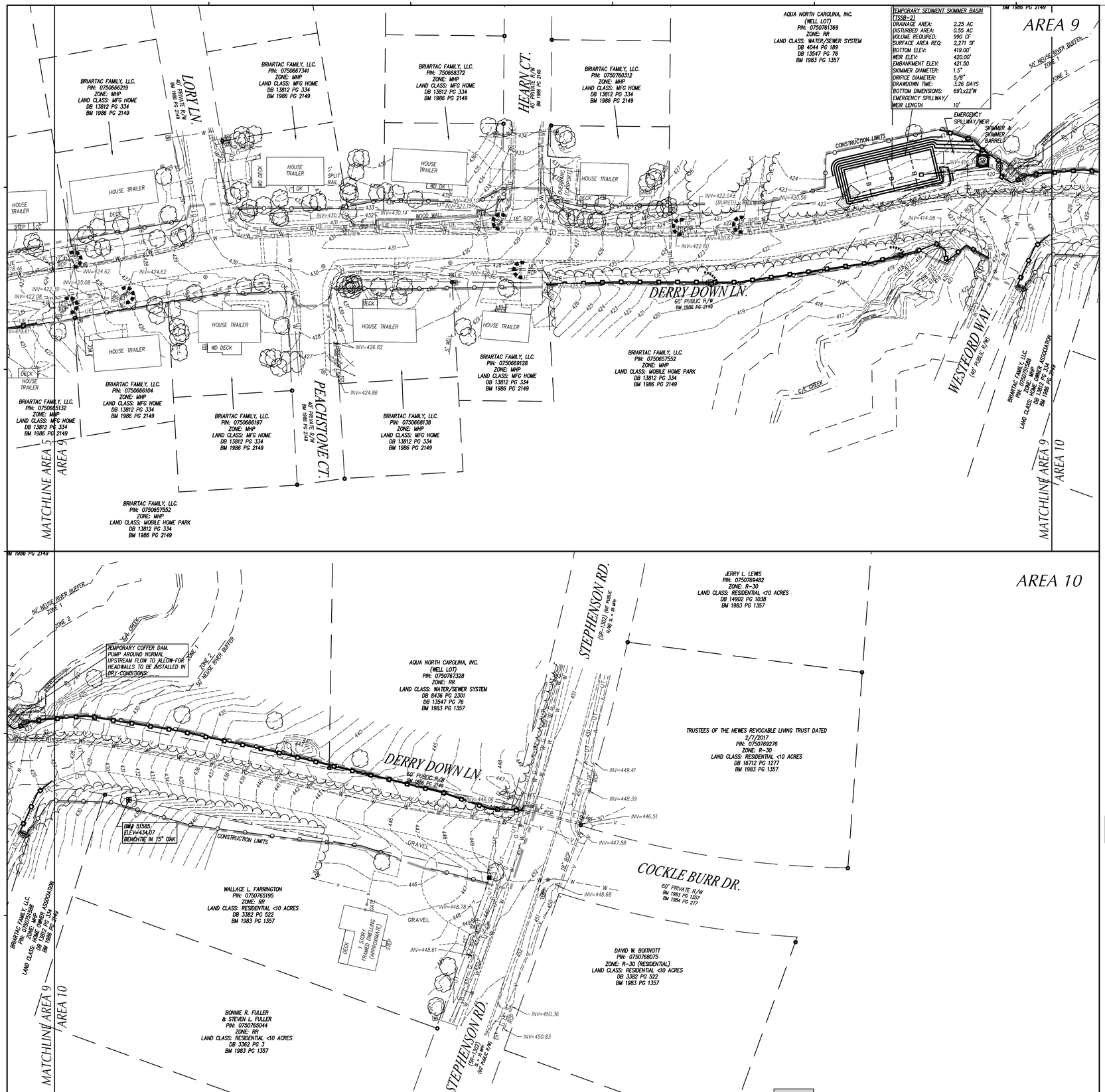
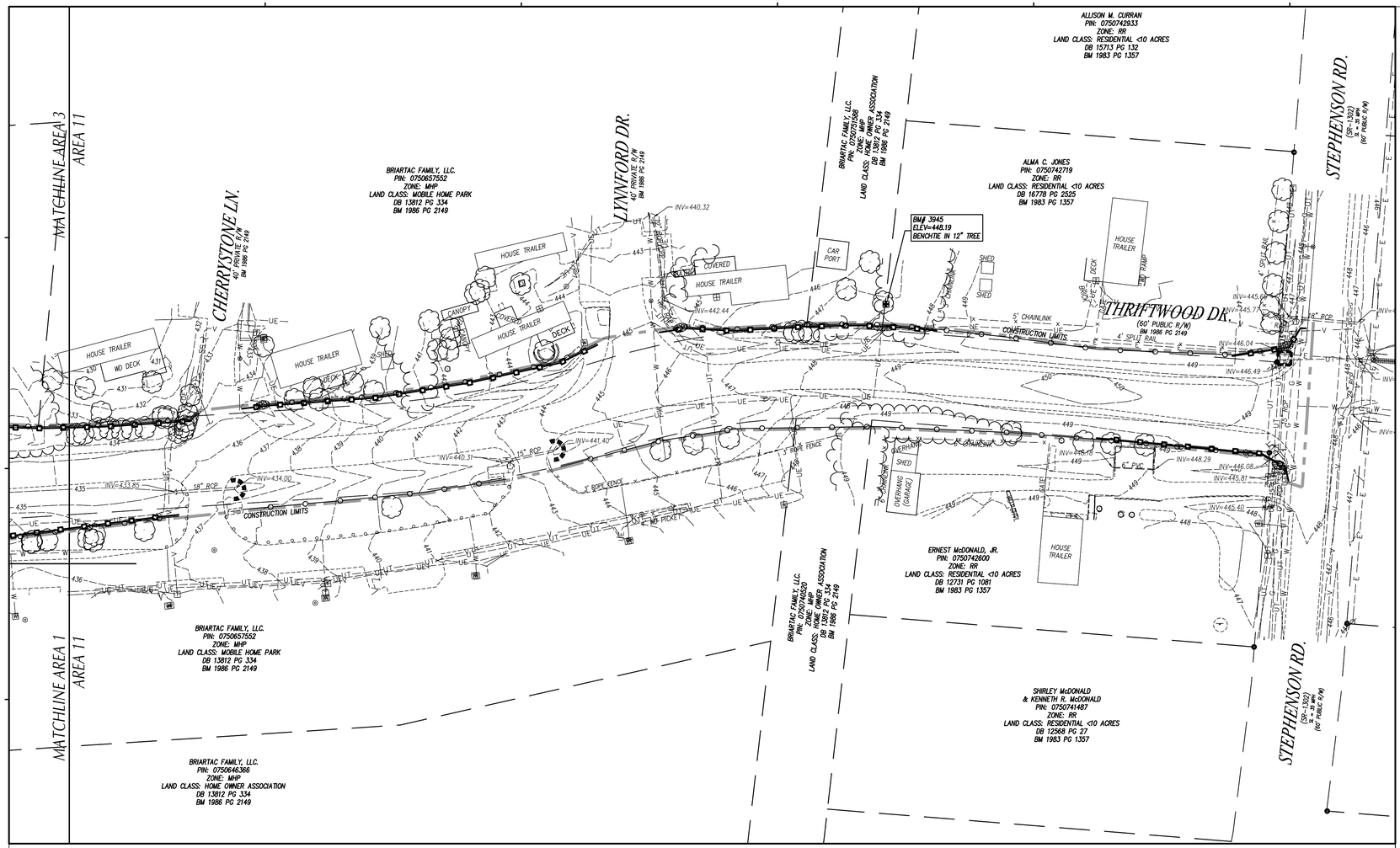
PROJECT NO. 02000.000

SHEET TITLE
INITIAL EROSION CONTROL PLAN AREA_7&8

SHEET NUMBER
C-04.07


AREA 9
AREA 10
MATCHLINE AREA 9
MATCHLINE AREA 9
AREA 10
LORY LN.
HEARN CT.
PEACHSTONE CT.
DERRY DOWN LN.
60' PUBLIC R/W
BM 1995 PG 2149
WESTFORD WAY.
(40' PUBLIC R/W)
STEPHENSON RD.
(SR-1302) (80' PUBLIC R/W & = 32 MPH)
COCKLE BURR DR.
60' PRIVATE R/W
BM 1983 PG 1357
BM 1984 PG 277
50' NEUSE RIVER BUFFER
ZONE 1
ZONE 2
CONSTRUCTION LIMITS
TEMPORARY SEDIMENT SKIMMER BASIN
(TSSB-2)
DRAINAGE AREA: 2.25 AC
DISTURBED AREA: 0.55 AC
VOLUME REQUIRED: 990 CF
SURFACE AREA REQ: 2,271 SF
BOTTOM ELEV: 419.00'
WEIR ELEV: 420.00'
EMBANKMENT ELEV: 421.50
SKIMMER DIAMETER: 1.5"
ORIFICE DIAMETER: 5/8"
DRAWDOWN TIME: 3.26 DAYS
BOTTOM DIMENSIONS: 69'Lx22'W
EMERGENCY SPILLWAY/ WEIR LENGTH 10'
EMERGENCY SPILLWAY/WEIR
SKIMMER & SKIMMER BARREL
TEMPORARY COFFER DAM. PUMP AROUND NORMAL UPSTREAM FLOW TO ALLOW FOR HEADWALLS TO BE INSTALLED IN DRY CONDITIONS.
BM# 5T585, ELEV=434.07 BENCHSITE IN 15" OAK
AQUA NORTH CAROLINA, INC. (WELL LOT) PIN: 0750761369 ZONE: RR LAND CLASS: WATER/SEWER SYSTEM DB 4044 PG 189 DB 13547 PG 76 BM 1983 PG 1357
AQUA NORTH CAROLINA, INC. (WELL LOT) PIN: 0750767328 ZONE: RR LAND CLASS: WATER/SEWER SYSTEM DB 8436 PG 2301 DB 13547 PG 76 BM 1983 PG 1357
JERRY L. LEWIS PIN: 0750769482 ZONE: R-30 LAND CLASS: RESIDENTIAL <10 ACRES DB 14902 PG 1038 BM 1983 PG 1357
TRUSTEES OF THE HEMES REVOCABLE LIVING TRUST DATED 2/7/2017 PIN: 0750769276 ZONE: R-30 LAND CLASS: RESIDENTIAL <10 ACRES DB 16712 PG 1277 BM 1983 PG 1357
WALLACE L. FARRINGTON PIN: 0750765195 ZONE: RR LAND CLASS: RESIDENTIAL <10 ACRES DB 3382 PG 522 BM 1983 PG 1357
DAVID W. BOITNOTT PIN: 0750768075 ZONE: R-30 (RESIDENTIAL) LAND CLASS: RESIDENTIAL <10 ACRES DB 3382 PG 522 BM 1983 PG 1357
BONNIE R. FULLER & STEVEN L. FULLER PIN: 0750765044 ZONE: RR LAND CLASS: RESIDENTIAL <10 ACRES DB 3362 PG 3 BM 1983 PG 1357
BRIARTAC FAMILY, LLC. PIN: 0750666219 ZONE: MHP LAND CLASS: MFG HOME DB 13812 PG 334 BM 1986 PG 2149
BRIARTAC FAMILY, LLC. PIN: 0750667341 ZONE: MHP LAND CLASS: MFG HOME DB 13812 PG 334 BM 1986 PG 2149
BRIARTAC FAMILY, LLC. PIN: 0750668372 ZONE: MHP LAND CLASS: MFG HOME DB 13812 PG 334 BM 1986 PG 2149
BRIARTAC FAMILY, LLC. PIN: 0750760312 ZONE: MHP LAND CLASS: MFG HOME DB 13812 PG 334 BM 1986 PG 2149
BRIARTAC FAMILY, LLC. PIN: 0750665132 ZONE: MHP LAND CLASS: MFG HOME DB 13812 PG 334 BM 1986 PG 2149
BRIARTAC FAMILY, LLC. PIN: 0750666104 ZONE: MHP LAND CLASS: MFG HOME DB 13812 PG 334 BM 1986 PG 2149
BRIARTAC FAMILY, LLC. PIN: 0750668197 ZONE: MHP LAND CLASS: MFG HOME DB 13812 PG 334 BM 1986 PG 2149
BRIARTAC FAMILY, LLC. PIN: 0750668138 ZONE: MHP LAND CLASS: MFG HOME DB 13812 PG 334 BM 1986 PG 2149
BRIARTAC FAMILY, LLC. PIN: 0750669128 ZONE: MHP LAND CLASS: MFG HOME DB 13812 PG 334 BM 1986 PG 2149
BRIARTAC FAMILY, LLC. PIN: 0750657552 ZONE: MHP LAND CLASS: MOBILE HOME PARK



LEGEND

- TEMP. GRAVEL CONSTR. ENTRANCE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION DEVICE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION SILT BAG DEVICE SEE DETAIL SHEET ___
- TEMP. DIVERSION DITCH / BERM SEE DETAIL SHEET ___
- TEMP. SILT FENCE SEE DETAIL SHEET ___
- TEMP. REINFORCED SILT FENCE OUTLET, SEE DETAIL SHEET ___
- PERMANENT OUTLET PROTECTION SEE DETAIL SHEET ___
- TEMP. CONCRETE WASHOUT AREA SEE DETAIL SHEET ___
- TEMP. PLASTIC LINING, SEE TEMP. BASIN BAFFLES ON DETAIL SHEET ___
- TEMP. J-HOOK PROTECTION SEE DETAIL SHEET ___
- TEMP. TIMBER/BRIDGE MAT SEE DETAIL SHEET ___
- TEMP. ROCK PIPE INLET PROTECTION SEE DETAIL SHEET ___
- CHANNEL LINING SEE DETAIL SHEET ___
- TEMP. SKIMMER SEDIMENT BASIN SEE DETAIL SHEET ___
- EXISTING CONTOUR
- FINISHED CONTOUR
- TEMP. CONTOUR (TEMP. GRADES DURING CONSTR.)
- TEMPORARY BASIN BAFFLE SEE DETAIL SHEET ___
- TREE PROTECTION FENCE SEE DETAIL SHEET ___
- TEMP. COMPOST SOCK SEE DETAIL SHEET ___
- TEMP. COMPOST SOCK IN CHANNEL SEE DETAIL SHEET ___
- TEMP. SLOPE DRAIN SEE DETAIL SHEET ___
- PROPOSED STORM SEWER PIPES
- EXISTING STORM SEWER PIPES
- CONSTRUCTION LIMITS UNLESS OTHERWISE NOTED.
- TEMP. COMPOST SOCK INLET PROTECTION, SEE DETAIL SHEET ___
- TEMP. DEWATERING SILT BAG SEE DETAIL SHEET ___
- RESOURCE CONSERVATION AREA
- TEMP. COFFER DAM, SEE STREAM CROSSING PLAN FOR INSTALLATION DETAIL SHEET ___

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL TOWN OF APEX AND NCDOT STANDARDS, SPECIFICATIONS AND DETAILS.
2. THE CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL CODES IN OBSERVING EROSION CONTROL MEASURES BOTH ON AND OFF SITE. ALL OFF-SITE SOIL BORROW AND WASTE SITES SHALL BE PROPERLY PERMITTED FOR SUCH ACTIVITIES. CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION OF SEDIMENT & EROSION CONTROL PERMIT FOR ANY OFF-SITE SITES TO OWNER PRIOR TO RELOCATING ANY STOCKPILE MATERIALS.
3. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES AFTER EACH RAINFALL EVENT OR AS DIRECTED BY LOCAL AUTHORITIES OR ARCHITECT.
4. TOTAL DISTURBED AREA: 58 AC.
5. ALL OPEN STORM PIPES SHALL BE PROTECTED WITH STONE FILTER PROTECTION AFTER WORK STOPPAGE EACH DAY. SEE DETAIL **SHEET** ___
6. ALL STORM DRAINAGE PIPES SHALL BE THOROUGHLY FLUSHED OF ALL SEDIMENT FOLLOWING SITE STABILIZATION. INTERIOR FLUSHING OF SYSTEM SHALL BE PERFORMED AS NEEDED TO MAINTAIN PROPER FUNCTIONING OF THE DRAINAGE SYSTEM. CLEANING SHALL BE PERFORMED IN A MANNER WHICH PREVENTS SEDIMENT FROM BEING FLUSHED THROUGH PIPES TO THE EXISTING DRAINAGE SYSTEM.
7. THE INDICATED STAGING AREA IS INTENDED FOR VEHICLES AND NON-ERODIBLE MATERIALS ONLY. NO SOIL, SAND OR OTHER ERODIBLE, FINE GRAINED MATERIAL SHALL BE STORED OUTSIDE OF THE LIMITS OF THE SITE PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES.
8. SOIL AND OTHER MATERIALS SHALL ONLY BE TEMPORARILY STOCKPILED WITHIN THE CONSTRUCTION LIMITS PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES. STOCKPILES SHALL BE STABILIZED AS REQUIRED AS INDICATED IN THE SLOPE & SURFACE STABILIZATION NOTES ON THIS PLAN.
9. THE TREE PROTECTION FENCE SHALL BE MAINTAINED ON THE SITE UNTIL ALL SITE WORK IS COMPLETED AND THE FINAL SITE INSPECTION IS SCHEDULED PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY (CO). THE FENCING SHALL BE REMOVED IMMEDIATELY PRIOR TO THE FINAL SITE INSPECTION FOR THE SITE.
10. TREE PROTECTION FENCING SHALL NOT BE MOVED AND THERE SHALL BE NO ENCROACHMENT INTO SUCH PROTECTED AREA(S) WITHOUT WRITTEN AUTHORIZATION OF THE COUNTY ZONING COMPLIANCE STAFF. ANY ACTIVITY (LANDSCAPING, FENCING, OR UTILITY INSTALLATION) SHOWN ON THE APPROVED PLANS IN A TREE PROTECTION AREA SHALL ALSO NOT OCCUR WITHOUT WRITTEN AUTHORIZATION FROM THE COUNTY ZONING COMPLIANCE STAFF. ANY UNAUTHORIZED ENCROACHMENT OR DISTURBANCE WITHIN THE BOUNDARIES OF A TREE PROTECTION AREA SHALL AUTOMATICALLY RESULT IN FINES AND THE REPLACEMENT OF ANY DAMAGED VEGETATION IN ACCORDANCE WITH THE LAND DEVELOPMENT ORDINANCE.
11. ROADSIDE DITCHES AND CHANNELS SHALL BE STABILIZED DAILY UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
12. INSTALL TEMPORARY MATTING TO TOP OF ALL SIDE SLOPES ON CHANNELS, DIVERSION DITCHES AND TEMPORARY SEDIMENT BASINS. SEE DETAIL SHEET C702 (PERMANENT CHANNEL) AND C702 (TEMPORARY DIVERSION DITCH) FOR TYPE OF MATTING TO USE.
13. ANY DEWATERING OF SEDIMENT CONTAINMENT DEVICES FOR MAINTENANCE, REMOVAL OR CONVERSION PURPOSES IS TO BE DONE THROUGH A SILT BAG.
14. ANY DEWATERING OF STORM/UTILITY TRENCHES IS TO BE DONE THROUGH A SILT BAG.
15. GROUND COVER IS TO BE APPLIED PER CONDITIONS OF THE NPDES PERMIT OR AT THE END OF THE DAY IN CRITICAL AREAS.
16. CONTRACTOR SHALL USE TIRE WASH STATION TO PREVENT SEDIMENT FROM TRACKING ONTO THE ROAD IF CONSTRUCTION ENTRANCE IS FOUND INSUFFICIENT AT NO ADDITIONAL COST TO OWNER.
17. CONTRACTOR SHALL UTILIZE PAM FLOCCULANTS TO REDUCE RUN-OFF TURBIDITY. SEE SPECS.

MAINTENANCE PLAN

1. DURING ALL PHASES OF CONSTRUCTION, GROUNDCOVER ON EXPOSED SLOPES SHALL BE PROVIDED ACCORDING TO GROUND STABILIZATION TABLE (**SHEET C706**) FOLLOWING COMPLETION OF ANY PHASE OF GRADING.
2. FINAL PERMANENT GROUNDCOVER FOR ALL DISTURBED AREAS SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION TABLE (BELOW) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
3. THE ABOVE REQUIREMENTS ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED THOSE ABOVE.
4. SLOPE EROSION CONTROL MATTING SHALL BE INSTALLED FOR TEMPORARY STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER). REFER TO MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.
5. ALL OTHER SEEDED AREAS SHALL BE MULCHED WITH STRAW AND TACKED WITH ASPHALT.

SELF-INSPECTION RULES

SEE **SHEET C706** FOR SELF-INSPECTION REQUIREMENTS.

THE FINANCIALLY RESPONSIBLE PERSON AND/OR HIS AGENT WILL BE PERFORM SELF INSPECTIONS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES USING NCDEMLR'S SELF INSPECTION REPORT (WORKSHEET) AND THIS WILL BE KEPT ONSITE.

SLOPE & SURFACE STABILIZATION

GROUND STABILIZATION SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION NOTES. SEE SHEET C705.

EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE (SECTION II.B(2) (b))

THE REQUIREMENTS ON SHEET C705 ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED MINIMUM REQUIREMENTS.

INSTALL TEMPORARY EXCELSIOR MATTING FOR STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER) AND AREAS OF CONCENTRATED FLOW (CHANNELS, DITCHES, SWALES, ETC.). UTILIZE TEMPORARY COCONUT MAT IN AREAS IDENTIFIED ON PLAN. REFER TO SPECIFICATION SECTION 312500 FOR MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.

NOTE:
EROSION & SEDIMENT CONTROL SHALL BE PERMITTED THROUGH NCDEQ.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

MAGNETIC

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
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Walker Consultants
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(704) 247-6230

SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

RATIO

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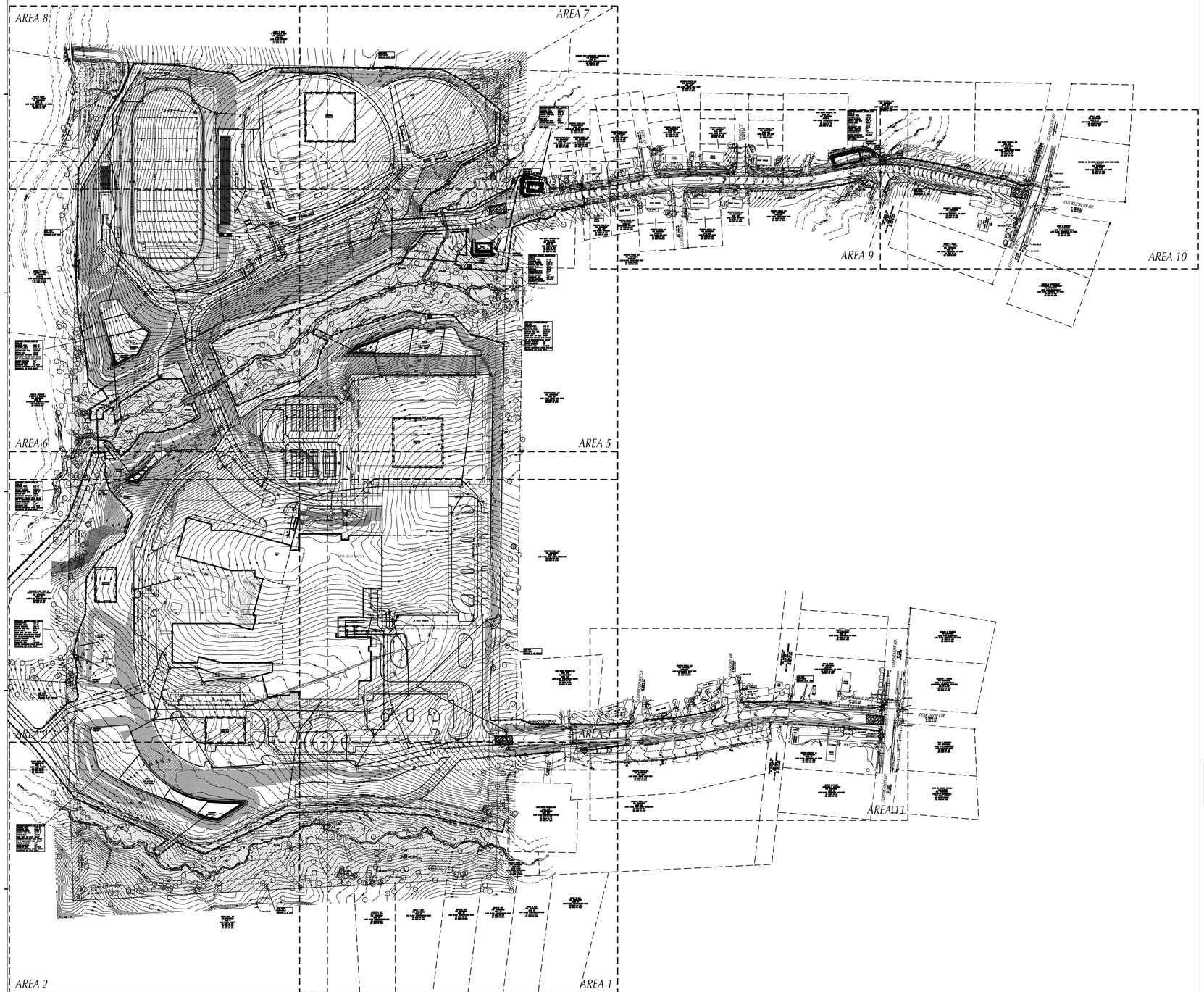
PROJECT NO. 02000.000

SHEET TITLE

INITIAL EROSION CONTROL PLAN AREA_11

SHEET NUMBER

C-04.09



TOWN OF APEX CONSTRUCTION SEQUENCE

THE FOLLOWING BEGINS ONLY AFTER CONSTRUCTION PLANS ARE APPROVED, SIGNED BY TOWN STAFF AND COPIES ARE RECEIVED.

1. THROUGH THE INFRASTRUCTURE INSPECTIONS MANAGER AT 919-249-3386, SCHEDULE A PRE-CONSTRUCTION MEETING WITH INSPECTORS AND OTHER TOWN STAFF.
2. FILL OUT TREE/PROTECTION FENCING INSTALLATION PERMIT APPLICATION (OBTAIN FROM PLANNING DEPARTMENT).
3. HAVE A SURVEYOR FLAG PROPERTY LINES, EASEMENTS, BUFFERS, TREE PROTECTION AREAS, AND FLAG THE PROTECTION LIMITS.
4. CONTACT AN APEX PLANNING DEPARTMENT ZONING COMPLIANCE OFFICER AT 919-249-3426 TO REQUEST APPROVAL FOR TREE PROTECTION FENCING LOCATIONS.
5. INSTALL APPROVED TREE PROTECTION FENCING, SIGNS, AND/OR ANY OTHER PROTECTION MEASURES THAT MAY BE REQUIRED. CALL PLANNING AT 249-3426 FRO A FINAL INSPECTION OF PROTECTION MEASURES. PLANNING WILL FORWARD APPROVAL TO WATER RESOURCES, EROSION CONTROL FIELD STAFF.
6. PROVIDE STATE ISSUED EROSION CONTROL APPROVAL LETTER AND CERTIFICATE OF COMPLIANCE.
7. INSTALL GRAVEL CONSTRUCTION ENTRANCE, TEMPORARY DIVERSIONS, SILT FENCING, SEDIMENT BASINS, BYPASS CHANNELS, AND/OR OTHER MEASURES AS SHOWN ON THE APPROVED PLANS. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES.
8. WHEN COMPLETED, CALL WATER RESOURCES STAFF AT 919-362-8166 FOR AN ON-SITE INSPECTION AND TO REQUEST A CERTIFICATE OF COMPLIANCE.
9. COMPLETE A GRADING PERMIT APPLICATION, IF REQUIRED, FROM THE BUILDING INSPECTIONS & PERMITTING DEPARTMENT.
10. ONCE A GRADING PERMIT IS REVIEWED AND ISSUED BY THE BUILDING INSPECTIONS & PERMITTING DEPARTMENT, ARRANGE A PRE-CONSTRUCTION MEETING WITH TIM SAWYER AT 919-904-8744 OR BRANDON BECK AT 919-208-0362 PRIOR TO ANY GRADING ACTIVITIES. THIS MEETING IS SEPARATE FROM ANY OTHER PRE-CONSTRUCTION MEETINGS REQUIRED IN THE CONSTRUCTION SEQUENCE.
11. POST GRADING PERMIT PROMINENTLY ON SITE AT ALL TIMES.
12. BEGIN CLEARING, GRUBBING, AND ROUGH GRADE OF THE SITE IN ACCORDANCE WITH THE APPROVED GRADING PLAN.
13. STOCKPILE A SUFFICIENT AMOUNT OF TOPSOIL TO COVER 3 INCHES OVER LANDSCAPED AREAS AT THE END OF THE PROJECT.
14. INSTALL STORM SEWER, IF APPLICABLE, AND PROTECT INLETS WITH INLET PROTECTION DEVICES, SEDIMENT DEVICES, AND/OR OTHER APPROVED MEASURES AS SHOWN ON PLANS. MAINTAIN S&E MEASURES AS NEEDED.
15. AFTER COMPLETION OF ANY PHASE OF GRADING OR WHEN LAND-DISTURBING ACTIVITIES HAVE TEMPORARILY CEASED, ESTABLISH GROUND COVER ON SWALES AND DITCHES AND GRADED SLOPES STEEPER THAN 3:1 WITHIN 7 CALENDAR DAYS.
16. STABILIZE SITE AS AREAS ARE BROUGHT UP TO FINISHED GRADE WITH VEGETATION OR PAVING.
17. PRIOR TO PLAT APPROVAL, ALL DISTURBED AREAS BOTH PUBLIC AND PRIVATE, MUST BE PROPERLY STABILIZED. ALL TEMPORARY EROSION CONTROL MEASURES MUST BE INSTALLED, BE FUNCTIONING PROPERLY AND BE MAINTAINED FOR THE ENTIRE AREA CONTAINED WITHIN THE PLAT.
18. FLUSH AND CLEAN ALL STORMWATER SYSTEM PIPES. CLEAN AND REMOVE SEDIMENT FROM TEMPORARY SEDIMENT HOLDING DEVICES. FOLLOW THE SCM CONSTRUCTION SEQUENCE FOUND ON THE GRADING AND/OR SCM DETAIL SHEET ON THE CONSTRUCTION PLAN SET.
19. REMOVE ALL TEMPORARY DIVERSIONS, SILT FENCING, SEDIMENT BASINS, ETC. AND PROVIDE ADEQUATE COVER OR PAVE ANY RESULTING BARE AREAS. ALL PERMANENT EROSION CONTROL DEVICES SHOULD BE INSTALLED AT THIS POINT.
20. WHEN VEGETATION HAS BEEN ESTABLISHED, CALL WATER RESOURCES STAFF AT 919-362-8166 FOR A FINAL SITE INSPECTION AND TO REQUEST A CERTIFICATE OF COMPLETION. THE S&E PERFORMANCE GUARANTEE WILL BE RELEASED WITH THE ISSUANCE OF THE CERTIFICATE OF COMPLETION. VISIT THE STATE WEBSITE LISTED ABOVE AND SUBMIT ELECTRONIC NOTICE OF TERMINATION (e-NOT) TO END COVERAGE UNDER THE NCG01 PERMIT.
21. THE PROPERTY OWNER/HOME OWNERS ASSOCIATION WILL BE RESPONSIBLE FOR PERMANENT EROSION CONTROL MAINTENANCE OF THE SITE.

STRUCTURAL BMP CONSTRUCTION SEQUENCE

THE FOLLOWING MUST OCCUR PRIOR TO FINAL PLAT AND/OR CERTIFICATE OF OCCUPANCY (CO):

1. ALL STORMWATER CONTROL MEASURES (SCMS) MUST BE INSTALLED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DRAWINGS.
2. DURING THE SCM CONVERSION PROCESS, ALL EFFORTS SHALL BE MADE TO PROTECT DOWNSTREAM WATER RESOURCES. THE DRAIN VALVE SHALL NOT BE LEFT OPEN AT ANY TIME DURING SCM CONVERSION. A SKIMMER DRAWDOWN SYSTEM SHALL BE INSTALLED AND UTILIZED UNTIL THE SCM IS FULLY CONVERTED.
3. THE DESIGN ENGINEER MUST SUBMIT AN AS-BUILT PACKAGE WHICH MEETS ALL REQUIREMENTS PRESENTED IN THE TOWN SPEC BOOK INCLUDING A SIGNED AND SEALED CERTIFICATION STATEMENT.
4. FOR SUBDIVISIONS ONLY, A 25% MAINTENANCE GUARANTEE IS REQUIRED TO BE SUBMITTED TO JEAN WEATHERMAN IN DEVELOPMENT SERVICES AT 919-249-3394.
5. THE APPROPRIATE EXECUTED SCM O&M AGREEMENT MUST BE eRECORDED THROUGH JEAN WEATHERMAN IN DEVELOPMENT SERVICES.
6. A FINAL INSPECTION BY THE STORMWATER & UTILITY ENGINEERING STAFF SHALL BE CONDUCTED ONCE THE AS-BUILT SUBMITTAL HAS BEEN RECEIVED. ONCE APPROVED, STAFF WILL SEND AN OFFICIAL SCM APPROVAL LETTER TO THE OWNER.
7. IN LIEU OF SCM COMPLETION AND FINAL APPROVAL BY STAFF, THE TOWN MAY ACCEPT A 125% PERFORMANCE GUARANTEE IN ACCORDANCE WITH UDO SECTION 6.1.12(G). THIS GUARANTEE WILL BE COLLECTED BY JEAN WEATHERMAN IN DEVELOPMENT SERVICES AT 919-249-3394.
8. ALL SCMS ARE REQUIRED TO BE COMPLETED PRIOR TO A FINAL CO FOR A SITE PLAN AND ISSUANCE OF 90% OF COS WITHIN A SUBDIVISION. IF THE SUBDIVISION IS TO BE PHASED, ALL SCMS SHALL BE COMPLETED PRIOR TO ISSUANCE OF 90% OF COS WITHIN THAT PHASE.
9. IF AN SCM COUNTS TOWARDS RCA, THE REQUIRED LANDSCAPING SHALL BE INSTALLED DURING THE APPROPRIATE GROWING SEASON AND COORDINATED WITH THE TOWN ZONING COMPLIANCE OFFICER AT (919) 249-3426.

NOTE:
EROSION & SEDIMENT CONTROL SHALL BE PERMITTED THROUGH NCDEQ.

LEGEND

RESOURCE CONSERVATION AREA

GRAPHIC SCALE

150 0 75 150 300 600

(IN FEET)
1 inch = 150 ft.

MAGNETIC

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
11 Corning Road, Suite 190
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SEAL | 03/26/2021

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SHEET ISSUE

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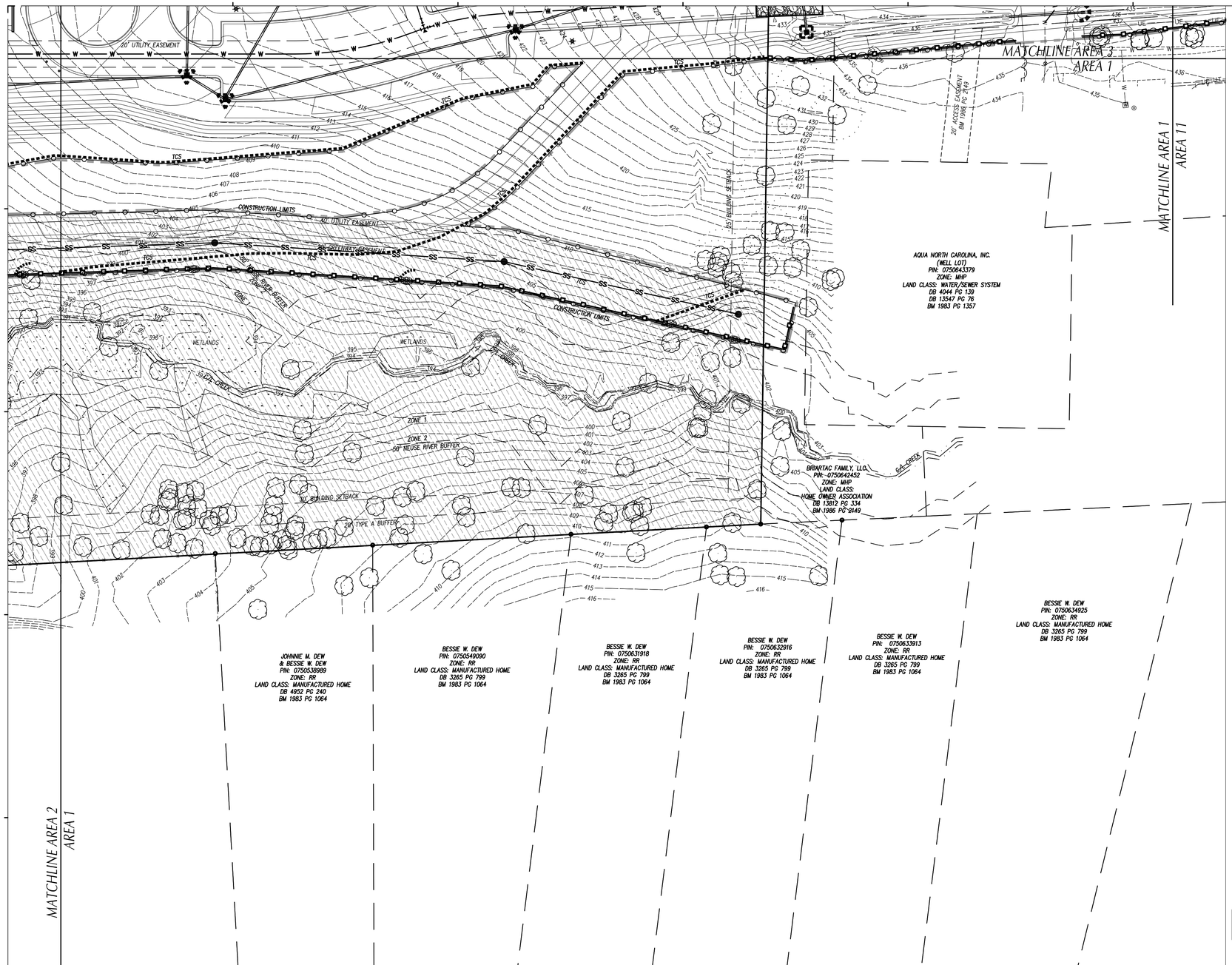
PROJECT NO. 02000.000

SHEET TITLE
FINAL EROSION CONTROL OVERALL PLAN

SHEET NUMBER
C-04.10



LEGEND

- TEMP. GRAVEL CONSTR. ENTRANCE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION DEVICE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION SILT BAG DEVICE SEE DETAIL SHEET ___
- TEMP. DIVERSION DITCH / BERM SEE DETAIL SHEET ___
- TEMP. SILT FENCE SEE DETAIL SHEET ___
- TEMP. REINFORCED SILT FENCE OUTLET, SEE DETAIL SHEET ___
- PERMANENT OUTLET PROTECTION SEE DETAIL SHEET ___
- TEMP. CONCRETE WASHOUT AREA SEE DETAIL SHEET ___
- TEMP. PLASTIC LINING, SEE TEMP. BASIN BAFFLES ON DETAIL SHEET ___
- TEMP. J-HOOK PROTECTION SEE DETAIL SHEET ___
- TEMP. TIMBER/BRIDGE MAT SEE DETAIL SHEET ___
- TEMP. ROCK PIPE INLET PROTECTION SEE DETAIL SHEET ___
- CHANNEL LINING SEE DETAIL SHEET ___
- TEMP. SKIMMER SEDIMENT BASIN SEE DETAIL SHEET ___
- EXISTING CONTOUR
- FINISHED CONTOUR
- TEMP. CONTOUR (TEMP. GRADES DURING CONSTR.)
- TEMPORARY BASIN BAFFLE SEE DETAIL SHEET ___
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- TEMP. COMPOST SOCK SEE DETAIL SHEET ___
- TEMP. COMPOST SOCK IN CHANNEL SEE DETAIL SHEET ___
- TEMP. SLOPE DRAIN SEE DETAIL SHEET ___
- PROPOSED STORM SEWER PIPES
- EXISTING STORM SEWER PIPES
- CONSTRUCTION LIMITS UNLESS OTHERWISE NOTED.
- TEMP. COMPOST SOCK INLET PROTECTION, SEE DETAIL SHEET ___
- TEMP. DEWATERING SILT BAG SEE DETAIL SHEET ___
- RESOURCE CONSERVATION AREA
- TEMP. COFFER DAM, SEE STREAM CROSSING/CULVERT INSTALLATION DETAIL SHEET ___

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL TOWN OF APEX AND NCDOT STANDARDS, SPECIFICATIONS AND DETAILS.
2. THE CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL CODES IN OBSERVING EROSION CONTROL MEASURES BOTH ON AND OFF SITE. ALL OFF-SITE SOIL BORROW AND WASTE SITES SHALL BE PROPERLY PERMITTED FOR SUCH ACTIVITIES. CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION OF SEDIMENT & EROSION CONTROL PERMIT FOR ANY OFF-SITE SITES TO OWNER PRIOR TO RELOCATING ANY STOCKPILE MATERIALS.
3. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES AFTER EACH RAINFALL EVENT OR AS DIRECTED BY LOCAL AUTHORITIES OR ARCHITECT.
4. TOTAL DISTURBED AREA: 58 AC.
5. ALL OPEN STORM PIPES SHALL BE PROTECTED WITH STONE FILTER PROTECTION AFTER WORK STOPPAGE EACH DAY. SEE DETAIL **SHEET** ___
6. ALL STORM DRAINAGE PIPES SHALL BE THOROUGHLY FLUSHED OF ALL SEDIMENT FOLLOWING SITE STABILIZATION. INTERIOR FLUSHING OF SYSTEM SHALL BE PERFORMED AS NEEDED TO MAINTAIN PROPER FUNCTIONING OF THE DRAINAGE SYSTEM. CLEANING SHALL BE PERFORMED IN A MANNER WHICH PREVENTS SEDIMENT FROM BEING FLUSHED THROUGH PIPES TO THE EXISTING DRAINAGE SYSTEM.
7. THE INDICATED STAGING AREA IS INTENDED FOR VEHICLES AND NON-ERODIBLE MATERIALS ONLY. NO SOIL, SAND OR OTHER ERODIBLE, FINE GRAINED MATERIAL SHALL BE STORED OUTSIDE OF THE LIMITS OF THE SITE PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES.
8. SOIL AND OTHER MATERIALS SHALL ONLY BE TEMPORARILY STOCKPILED WITHIN THE CONSTRUCTION LIMITS PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES. STOCKPILES SHALL BE STABILIZED AS REQUIRED AS INDICATED IN THE SLOPE & SURFACE STABILIZATION NOTES ON THIS PLAN.
9. THE TREE PROTECTION FENCE SHALL BE MAINTAINED ON THE SITE UNTIL ALL SITE WORK IS COMPLETED AND THE FINAL SITE INSPECTION IS SCHEDULED PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY (CO). THE FENCING SHALL BE REMOVED IMMEDIATELY PRIOR TO THE FINAL SITE INSPECTION FOR THE SITE.
10. TREE PROTECTION FENCING SHALL NOT BE MOVED AND THERE SHALL BE NO ENCROACHMENT INTO SUCH PROTECTED AREA(S) WITHOUT WRITTEN AUTHORIZATION OF THE COUNTY ZONING COMPLIANCE STAFF. ANY ACTIVITY (LANDSCAPING, FENCING, OR UTILITY INSTALLATION) SHOWN ON THE APPROVED PLANS IN A TREE PROTECTION AREA, SHALL ALSO NOT OCCUR WITHOUT WRITTEN AUTHORIZATION FROM THE COUNTY ZONING COMPLIANCE STAFF. ANY UNAUTHORIZED ENCROACHMENT OR DISTURBANCE WITHIN THE BOUNDARIES OF A TREE PROTECTION AREA SHALL AUTOMATICALLY RESULT IN FINES AND THE REPLACEMENT OF ANY DAMAGED VEGETATION IN ACCORDANCE WITH THE LAND DEVELOPMENT ORDINANCE.
11. ROADSIDE DITCHES AND CHANNELS SHALL BE STABILIZED DAILY UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
12. INSTALL TEMPORARY MATTING TO TOP OF ALL SIDE SLOPES ON CHANNELS, DIVERSION DITCHES AND TEMPORARY SEDIMENT BASINS. SEE DETAIL SHEET C702 (PERMANENT CHANNEL) AND C702 (TEMPORARY DIVERSION DITCH) FOR TYPE OF MATTING TO USE.
13. ANY DEWATERING OF SEDIMENT CONTAINMENT DEVICES FOR MAINTENANCE, REMOVAL OR CONVERSION PURPOSES IS TO BE DONE THROUGH A SILT BAG.
14. ANY DEWATERING OF STORM/UTILITY TRENCHES IS TO BE DONE THROUGH A SILT BAG.
15. GROUND COVER IS TO BE APPLIED PER CONDITIONS OF THE NPDES PERMIT OR AT THE END OF THE DAY IN CRITICAL AREAS.
16. CONTRACTOR SHALL USE TIRE WASH STATION TO PREVENT SEDIMENT FROM TRACKING ONTO THE ROAD IF CONSTRUCTION ENTRANCE IS FOUND INSUFFICIENT AT NO ADDITIONAL COST TO OWNER.
17. CONTRACTOR SHALL UTILIZE PAM FLOCCULANTS TO REDUCE RUN-OFF TURBIDITY. SEE SPECS.

MAINTENANCE PLAN

1. DURING ALL PHASES OF CONSTRUCTION, GROUNDCOVER ON EXPOSED SLOPES SHALL BE PROVIDED ACCORDING TO GROUND STABILIZATION TABLE **(SHEET C706)** FOLLOWING COMPLETION OF ANY PHASE OF GRADING.
2. FINAL PERMANENT GROUNDCOVER FOR ALL DISTURBED AREAS SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION TABLE (BELOW) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
3. THE ABOVE REQUIREMENTS ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED THOSE ABOVE.
4. SLOPE EROSION CONTROL MATTING SHALL BE INSTALLED FOR TEMPORARY STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER). REFER TO MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.
5. ALL OTHER SEEDED AREAS SHALL BE MULCHED WITH STRAW AND TACKED WITH ASPHALT.

SELF-INSPECTION RULES

SEE **SHEET C706** FOR SELF-INSPECTION REQUIREMENTS.

THE FINANCIALLY RESPONSIBLE PERSON AND/OR HIS AGENT WILL BE PERFORM SELF INSPECTIONS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES USING NCDEMLR'S SELF INSPECTION REPORT (WORKSHEET) AND THIS WILL BE KEPT ONSITE.

SLOPE & SURFACE STABILIZATION

GROUND STABILIZATION SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION NOTES. SEE SHEET C705.

EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE (SECTION II.B(2) (b))

THE REQUIREMENTS ON SHEET C705 ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED MINIMUM REQUIREMENTS.

INSTALL TEMPORARY EXCELSIOR MATTING FOR STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER) AND AREAS OF CONCENTRATED FLOW (CHANNELS, DITCHES, SWALES, ETC.). UTILIZE TEMPORARY COCONUT MAT IN AREAS IDENTIFIED ON PLAN. REFER TO SPECIFICATION SECTION 312500 FOR MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.

NOTE:
EROSION & SEDIMENT CONTROL SHALL BE PERMITTED THROUGH NCDEQ.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

MAGNETIC

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
11 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
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227 Fayetteville Street, Suite 301
Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
A Division of Bennett & Pless
5430 Wade Park Blvd #400
Raleigh, North Carolina 27607
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Mechanical / Electrical / Plumbing Engineer
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(919) 463-9995

Parking Consultant
Walker Consultants
13860 Ballantyne Corporate Pl, Suite 140
Charlotte, North Carolina 28277
(704) 247-6230

SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

RATIO

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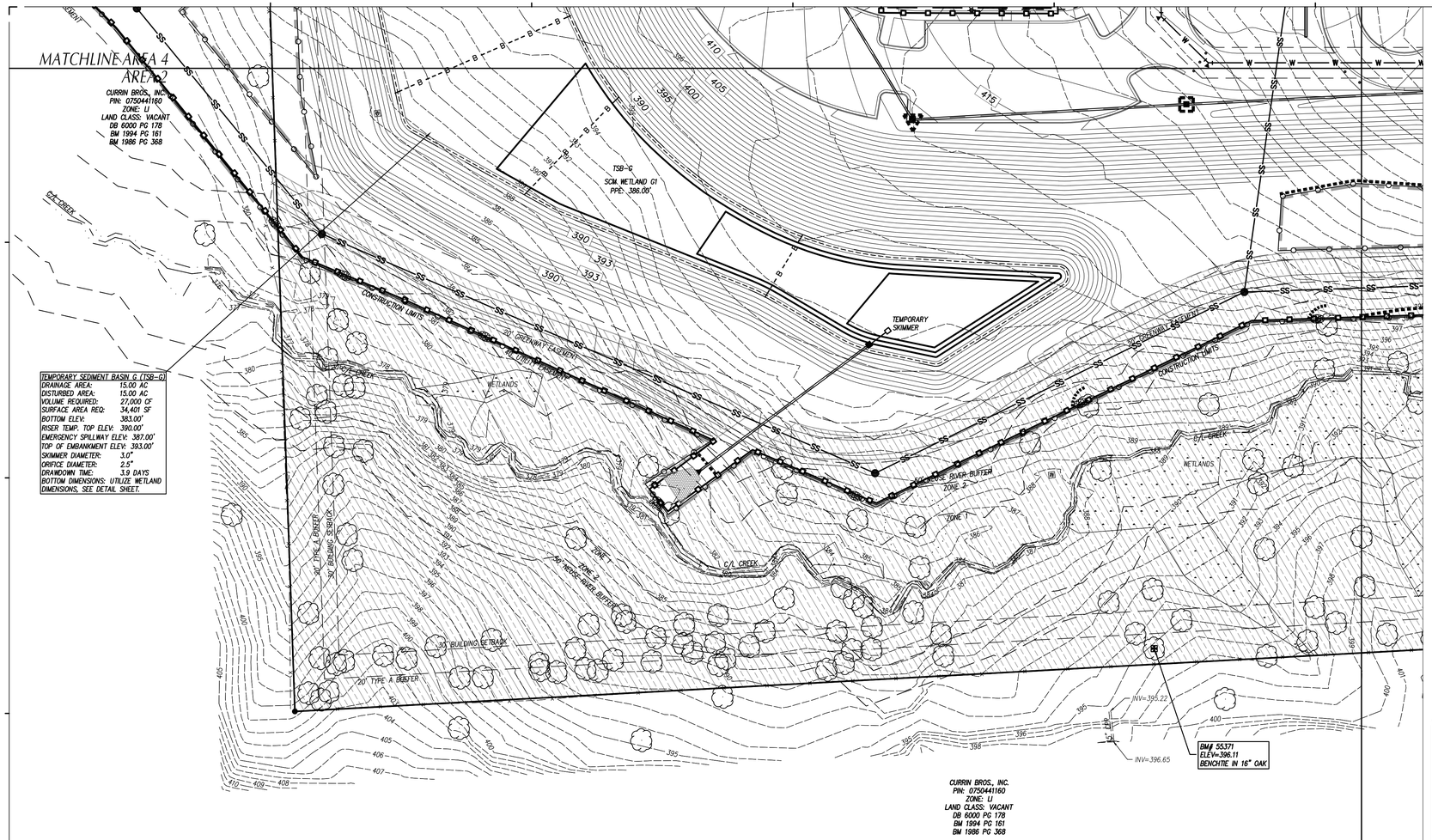
PROJECT NO. 02000.000

SHEET TITLE

FINAL EROSION CONTROL PLAN AREA_1

SHEET NUMBER

C-04.11



LEGEND

- TEMP. GRAVEL CONSTR. ENTRANCE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION DEVICE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION SILT BAG DEVICE SEE DETAIL SHEET ___
- TEMP. DIVERSION DITCH / BERM SEE DETAIL SHEET ___
- TEMP. SILT FENCE SEE DETAIL SHEET ___
- TEMP. REINFORCED SILT FENCE OUTLET, SEE DETAIL SHEET ___
- PERMANENT OUTLET PROTECTION SEE DETAIL SHEET ___
- TEMP. CONCRETE WASHOUT AREA SEE DETAIL SHEET ___
- TEMP. PLASTIC LINING, SEE TEMP. BASIN BAFFLES ON DETAIL SHEET ___
- TEMP. J-HOOK PROTECTION SEE DETAIL SHEET ___
- TEMP. TIMBER/BRIDGE MAT SEE DETAIL SHEET ___
- TEMP. ROCK PIPE INLET PROTECTION SEE DETAIL SHEET ___
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- TEMPORARY BASIN BAFFLE SEE DETAIL SHEET ___
- TREE PROTECTION FENCE SEE DETAIL SHEET ___
- TEMP. COMPOST SOCK SEE DETAIL SHEET ___
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12. INSTALL TEMPORARY MATTING TO TOP OF ALL SIDE SLOPES ON CHANNELS, DIVERSION DITCHES AND TEMPORARY SEDIMENT BASINS. SEE DETAIL SHEET C702 (PERMANENT CHANNEL) AND C702 (TEMPORARY DIVERSION DITCH) FOR TYPE OF MATTING TO USE.
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MAINTENANCE PLAN

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SELF-INSPECTION RULES

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SLOPE & SURFACE STABILIZATION

GROUND STABILIZATION SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION NOTES. SEE SHEET C705.

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NOTE:
EROSION & SEDIMENT CONTROL SHALL BE PERMITTED THROUGH NCDEQ.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

MAGNETIC

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
11 Corning Road, Suite 190
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Walker Consultants
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(704) 247-6230

SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
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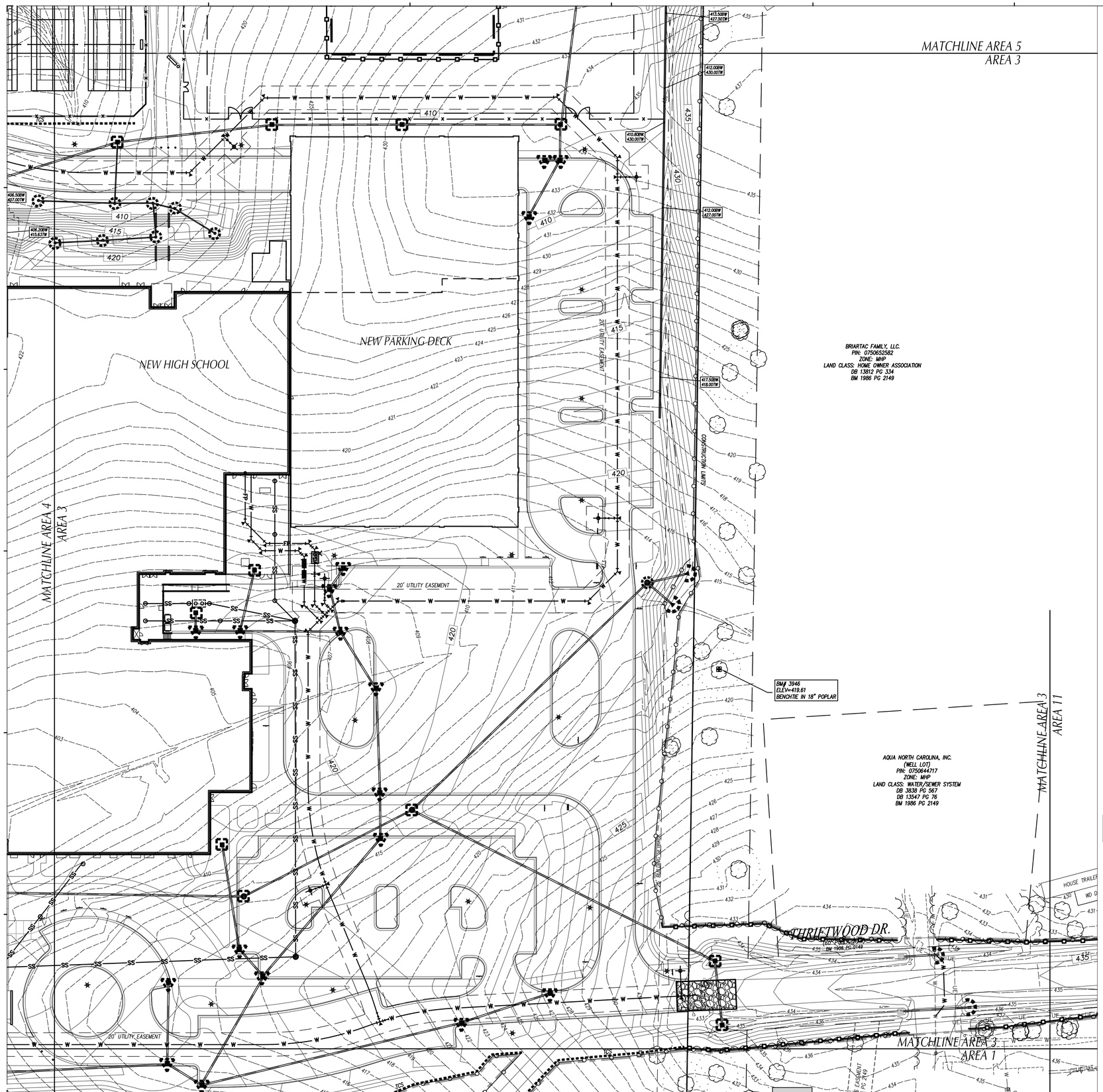
PROJECT NO. 02000.000

SHEET TITLE

FINAL EROSION CONTROL PLAN AREA_2

SHEET NUMBER

C-04.12



LEGEND

- TEMP. GRAVEL CONSTR. ENTRANCE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION DEVICE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION SILT BAG DEVICE SEE DETAIL SHEET ___
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17. CONTRACTOR SHALL UTILIZE PAM FLOCCULANTS TO REDUCE RUN-OFF TURBIDITY. SEE SPECS.

MAINTENANCE PLAN

1. DURING ALL PHASES OF CONSTRUCTION, GROUNDCOVER ON EXPOSED SLOPES SHALL BE PROVIDED ACCORDING TO GROUND STABILIZATION TABLE (**SHEET C706**) FOLLOWING COMPLETION OF ANY PHASE OF GRADING.
2. FINAL PERMANENT GROUNDCOVER FOR ALL DISTURBED AREAS SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION TABLE (BELOW) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
3. THE ABOVE REQUIREMENTS ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED THOSE ABOVE.
4. SLOPE EROSION CONTROL MATTING SHALL BE INSTALLED FOR TEMPORARY STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER). REFER TO MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.
5. ALL OTHER SEEDED AREAS SHALL BE MULCHED WITH STRAW AND TACKED WITH ASPHALT.

SELF-INSPECTION RULES

SEE **SHEET C706** FOR SELF-INSPECTION REQUIREMENTS.

THE FINANCIALLY RESPONSIBLE PERSON AND/OR HIS AGENT WILL BE PERFORM SELF INSPECTIONS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES USING NCDEMLR'S SELF INSPECTION REPORT (WORKSHEET) AND THIS WILL BE KEPT ONSITE.

SLOPE & SURFACE STABILIZATION

GROUND STABILIZATION SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION NOTES. SEE SHEET C705.

EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE (SECTION II.B(2) (b))

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NOTE:
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GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
11 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
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Raleigh, North Carolina 27601
919-821-0805

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(704) 247-6230

SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

RATIO

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PROJECT NO. 02000.000

SHEET TITLE
FINAL EROSION CONTROL PLAN AREA_3

SHEET NUMBER
C-04.13

LEGEND

- TEMP. GRAVEL CONSTR. ENTRANCE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION DEVICE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION SILT BAG DEVICE SEE DETAIL SHEET ___
- TEMP. DIVERSION DITCH / BERM SEE DETAIL SHEET ___
- TEMP. SILT FENCE SEE DETAIL SHEET ___
- TEMP. REINFORCED SILT FENCE OUTLET, SEE DETAIL SHEET ___
- PERMANENT OUTLET PROTECTION SEE DETAIL SHEET ___
- TEMP. CONCRETE WASHOUT AREA SEE DETAIL SHEET ___
- TEMP. PLASTIC LINING, SEE TEMP. BASIN BAFFLES ON DETAIL SHEET ___
- TEMP. J-HOOK PROTECTION SEE DETAIL SHEET ___
- TEMP. TIMBER/BRIDGE MAT SEE DETAIL SHEET ___
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- CHANNEL LINING SEE DETAIL SHEET ___
- TEMP. SKIMMER SEDIMENT BASIN SEE DETAIL SHEET ___
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- FINISHED CONTOUR
- TEMP. CONTOUR (TEMP. GRADES DURING CONSTR.)
- TEMPORARY BASIN BAFFLE SEE DETAIL SHEET ___
- TREE PROTECTION FENCE SEE DETAIL SHEET ___
- TEMP. COMPOST SOCK SEE DETAIL SHEET ___
- TEMP. COMPOST SOCK IN CHANNEL SEE DETAIL SHEET ___
- TEMP. SLOPE DRAIN SEE DETAIL SHEET ___
- PROPOSED STORM SEWER PIPES
- EXISTING STORM SEWER PIPES
- CONSTRUCTION LIMITS UNLESS OTHERWISE NOTED.
- TEMP. COMPOST SOCK INLET PROTECTION, SEE DETAIL SHEET ___
- TEMP. DEWATERING SILT BAG SEE DETAIL SHEET ___
- RESOURCE CONSERVATION AREA
- TEMP. COFFER DAM, SEE STREAM CROSSING/CULVERT INSTALLATION DETAIL SHEET ___

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL TOWN OF APEX AND NCDOT STANDARDS, SPECIFICATIONS AND DETAILS.
2. THE CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL CODES IN OBSERVING EROSION CONTROL MEASURES BOTH ON AND OFF SITE. ALL OFF-SITE SOIL BORROW AND WASTE SITES SHALL BE PROPERLY PERMITTED FOR SUCH ACTIVITIES. CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION OF SEDIMENT & EROSION CONTROL PERMIT FOR ANY OFF-SITE SITES TO OWNER PRIOR TO RELOCATING ANY STOCKPILE MATERIALS.
3. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES AFTER EACH RAINFALL EVENT OR AS DIRECTED BY LOCAL AUTHORITIES OR ARCHITECT.
4. TOTAL DISTURBED AREA: 58 AC.
5. ALL OPEN STORM PIPES SHALL BE PROTECTED WITH STONE FILTER PROTECTION AFTER WORK STOPPAGE EACH DAY. SEE DETAIL **SHEET** ___
6. ALL STORM DRAINAGE PIPES SHALL BE THOROUGHLY FLUSHED OF ALL SEDIMENT FOLLOWING SITE STABILIZATION. INTERIOR FLUSHING OF SYSTEM SHALL BE PERFORMED AS NEEDED TO MAINTAIN PROPER FUNCTIONING OF THE DRAINAGE SYSTEM. CLEANING SHALL BE PERFORMED IN A MANNER WHICH PREVENTS SEDIMENT FROM BEING FLUSHED THROUGH PIPES TO THE EXISTING DRAINAGE SYSTEM.
7. THE INDICATED STAGING AREA IS INTENDED FOR VEHICLES AND NON-ERODIBLE MATERIALS ONLY. NO SOIL, SAND OR OTHER ERODIBLE, FINE GRAINED MATERIAL SHALL BE STORED OUTSIDE OF THE LIMITS OF THE SITE PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES.
8. SOIL AND OTHER MATERIALS SHALL ONLY BE TEMPORARILY STOCKPILED WITHIN THE CONSTRUCTION LIMITS PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES. STOCKPILES SHALL BE STABILIZED AS REQUIRED AS INDICATED IN THE SLOPE & SURFACE STABILIZATION NOTES ON THIS PLAN.
9. THE TREE PROTECTION FENCE SHALL BE MAINTAINED ON THE SITE UNTIL ALL SITE WORK IS COMPLETED AND THE FINAL SITE INSPECTION IS SCHEDULED PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY (CO). THE FENCING SHALL BE REMOVED IMMEDIATELY PRIOR TO THE FINAL SITE INSPECTION FOR THE SITE.
10. TREE PROTECTION FENCING SHALL NOT BE MOVED AND THERE SHALL BE NO ENCROACHMENT INTO SUCH PROTECTED AREA(S) WITHOUT WRITTEN AUTHORIZATION OF THE COUNTY ZONING COMPLIANCE STAFF. ANY ACTIVITY (LANDSCAPING, FENCING, OR UTILITY INSTALLATION) SHOWN ON THE APPROVED PLANS IN A TREE PROTECTION AREA SHALL ALSO NOT OCCUR WITHOUT WRITTEN AUTHORIZATION FROM THE COUNTY ZONING COMPLIANCE STAFF. ANY UNAUTHORIZED ENCROACHMENT OR DISTURBANCE WITHIN THE BOUNDARIES OF A TREE PROTECTION AREA SHALL AUTOMATICALLY RESULT IN FINES AND THE REPLACEMENT OF ANY DAMAGED VEGETATION IN ACCORDANCE WITH THE LAND DEVELOPMENT ORDINANCE.
11. ROADSIDE DITCHES AND CHANNELS SHALL BE STABILIZED DAILY UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
12. INSTALL TEMPORARY MATTING TO TOP OF ALL SIDE SLOPES ON CHANNELS, DIVERSION DITCHES AND TEMPORARY SEDIMENT BASINS. SEE DETAIL SHEET C702 (PERMANENT CHANNEL) AND C702 (TEMPORARY DIVERSION DITCH) FOR TYPE OF MATTING TO USE.
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16. CONTRACTOR SHALL USE TIRE WASH STATION TO PREVENT SEDIMENT FROM TRACKING ONTO THE ROAD IF CONSTRUCTION ENTRANCE IS FOUND INSUFFICIENT AT NO ADDITIONAL COST TO OWNER.
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(IN FEET)
1 inch = 40 ft.

MAGNETIC

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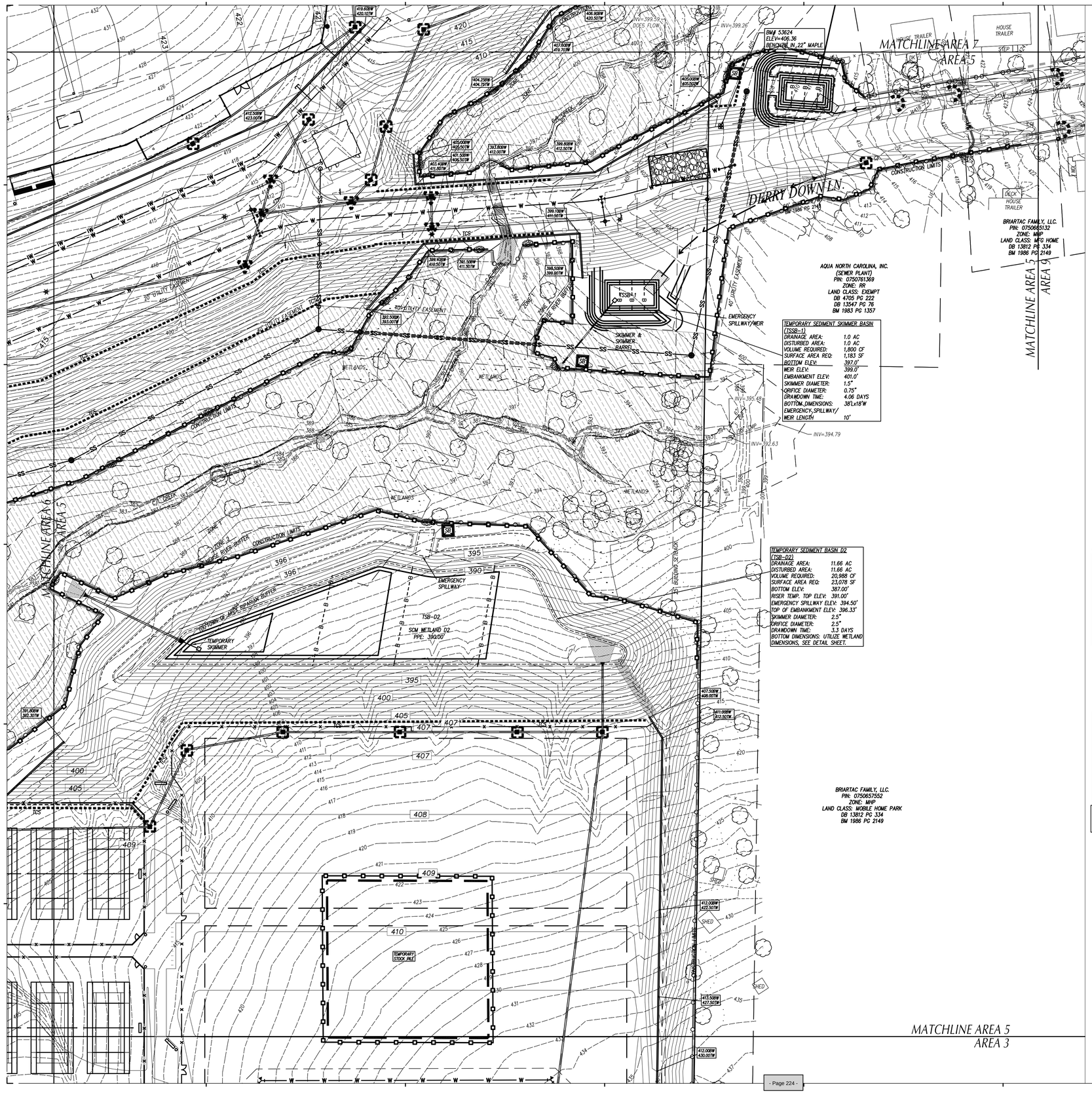
PROJECT NO. 02000.000

SHEET TITLE
FINAL EROSION CONTROL PLAN AREA_4

SHEET NUMBER
C-04.14


MATCHLINE AREA 6 AREA 5
MATCHLINE AREA 5 AREA 7
MATCHLINE AREA 5 AREA 3
MATCHLINE AREA 5 AREA 9
DERRY DOWN LN.
HOUSE TRAILER
DECK
STEP
BM# 53624
ELEV=406.36
BENCHMK IN 22" MAPLE
CONSTRUCTION LIMITS
20' UTILITY EASEMENT
40' UTILITY EASEMENT
EMERGENCY SPILLWAY/WEIR
SKIMMER & SKIMMER BARREL
TSSB-1
TSB-01
TSB-02
SCM WETLAND D2
PPE: 394.00'
TEMPORARY SKIMMER
EMERGENCY SPILLWAY
TEMPORARY STOCK PILE
WETLANDS
CA. CREEK
ZONE 1
ZONE 2
TREE RIVER BUFFER
TREE RIVER BUFFER - DRAINAGE BUFFER
INV=399.59 FLOW
INV=399.26
INV=395.48
INV=394.79
INV=392.63
INV=391.79
INV=391.63
INV=391.48
INV=391.33
INV=391.18
INV=391.03
INV=390.88
INV=390.73
INV=390.58
INV=390.43
INV=390.28
INV=390.13
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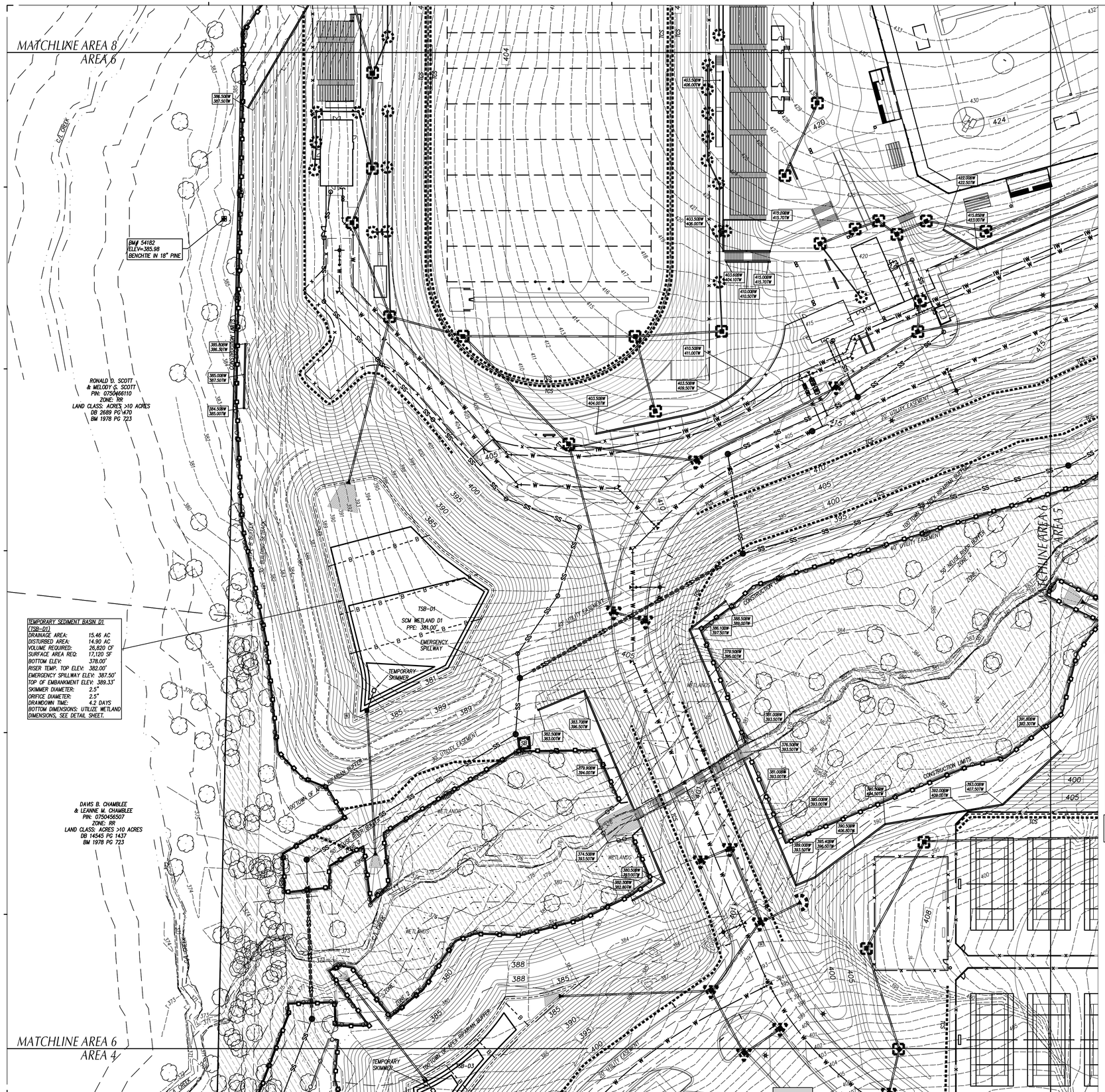
INV=385.78



LEGEND

- TEMP. GRAVEL CONSTR. ENTRANCE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION DEVICE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION SILT BAG DEVICE SEE DETAIL SHEET ___
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GRAPHIC SCALE

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(IN FEET)
1 inch = 40 ft.

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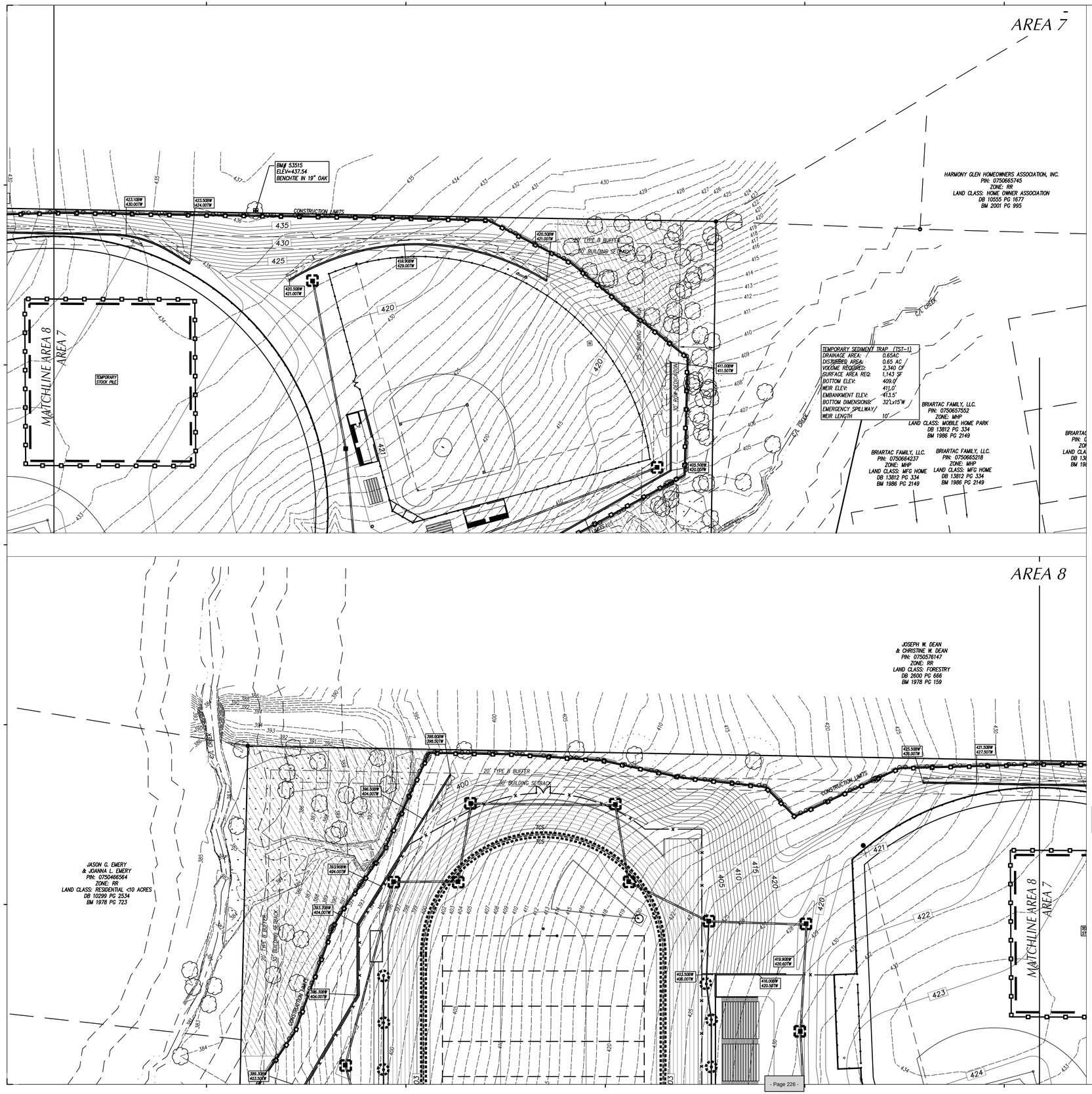
PROJECT NO. 02000.000

SHEET TITLE

FINAL EROSION CONTROL PLAN AREA_6

SHEET NUMBER

C-04.16



LEGEND

- TEMP. GRAVEL CONSTR. ENTRANCE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION DEVICE SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION SILT BAG DEVICE SEE DETAIL SHEET ___
- TEMP. DIVERSION DITCH / BERM SEE DETAIL SHEET ___
- TEMP. SILT FENCE SEE DETAIL SHEET ___
- TEMP. REINFORCED SILT FENCE OUTLET, SEE DETAIL SHEET ___
- PERMANENT OUTLET PROTECTION SEE DETAIL SHEET ___
- TEMP. CONCRETE WASHOUT AREA SEE DETAIL SHEET ___
- TEMP. PLASTIC LINING, SEE TEMP. BASIN BAFFLES ON DETAIL SHEET ___
- TEMP. J-HOOK PROTECTION SEE DETAIL SHEET ___
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- TREE PROTECTION FENCE SEE DETAIL SHEET ___
- TEMP. COMPOST SOCK SEE DETAIL SHEET ___
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- TEMP. SLOPE DRAIN SEE DETAIL SHEET ___
- PROPOSED STORM SEWER PIPES
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- CONSTRUCTION LIMITS UNLESS OTHERWISE NOTED.
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- TEMP. DEWATERING SILT BAG SEE DETAIL SHEET ___
- RESOURCE CONSERVATION AREA
- TEMP. COFFER DAM, SEE STREAM CROSSING/CULVERT INSTALLATION DETAIL SHEET ___

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL TOWN OF APEX AND NCDOT STANDARDS, SPECIFICATIONS AND DETAILS.
2. THE CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL CODES IN OBSERVING EROSION CONTROL MEASURES BOTH ON AND OFF SITE. ALL OFF-SITE SOIL BORROW AND WASTE SITES SHALL BE PROPERLY PERMITTED FOR SUCH ACTIVITIES. CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION OF SEDIMENT & EROSION CONTROL PERMIT FOR ANY OFF-SITE SITES TO OWNER PRIOR TO RELOCATING ANY STOCKPILE MATERIALS.
3. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES AFTER EACH RAINFALL EVENT OR AS DIRECTED BY LOCAL AUTHORITIES OR ARCHITECT.
4. TOTAL DISTURBED AREA: 58 AC.
5. ALL OPEN STORM PIPES SHALL BE PROTECTED WITH STONE FILTER PROTECTION AFTER WORK STOPPAGE EACH DAY. SEE DETAIL **SHEET ___**
6. ALL STORM DRAINAGE PIPES SHALL BE THOROUGHLY FLUSHED OF ALL SEDIMENT FOLLOWING SITE STABILIZATION. INTERIOR FLUSHING OF SYSTEM SHALL BE PERFORMED AS NEEDED TO MAINTAIN PROPER FUNCTIONING OF THE DRAINAGE SYSTEM. CLEANING SHALL BE PERFORMED IN A MANNER WHICH PREVENTS SEDIMENT FROM BEING FLUSHED THROUGH PIPES TO THE EXISTING DRAINAGE SYSTEM.
7. THE INDICATED STAGING AREA IS INTENDED FOR VEHICLES AND NON-ERODIBLE MATERIALS ONLY. NO SOIL, SAND OR OTHER ERODIBLE, FINE GRAINED MATERIAL SHALL BE STORED OUTSIDE OF THE LIMITS OF THE SITE PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES.
8. SOIL AND OTHER MATERIALS SHALL ONLY BE TEMPORARILY STOCKPILED WITHIN THE CONSTRUCTION LIMITS PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES. STOCKPILES SHALL BE STABILIZED AS REQUIRED AS INDICATED IN THE SLOPE & SURFACE STABILIZATION NOTES ON THIS PLAN.
9. THE TREE PROTECTION FENCE SHALL BE MAINTAINED ON THE SITE UNTIL ALL SITE WORK IS COMPLETED AND THE FINAL SITE INSPECTION IS SCHEDULED PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY (CO). THE FENCING SHALL BE REMOVED IMMEDIATELY PRIOR TO THE FINAL SITE INSPECTION FOR THE SITE.
10. TREE PROTECTION FENCING SHALL NOT BE MOVED AND THERE SHALL BE NO ENCROACHMENT INTO SUCH PROTECTED AREA(S) WITHOUT WRITTEN AUTHORIZATION OF THE COUNTY ZONING COMPLIANCE STAFF. ANY ACTIVITY (LANDSCAPING, FENCING, OR UTILITY INSTALLATION) SHOWN ON THE APPROVED PLANS IN A TREE PROTECTION AREA SHALL ALSO NOT OCCUR WITHOUT WRITTEN AUTHORIZATION FROM THE COUNTY ZONING COMPLIANCE STAFF. ANY UNAUTHORIZED ENCROACHMENT OR DISTURBANCE WITHIN THE BOUNDARIES OF A TREE PROTECTION AREA SHALL AUTOMATICALLY RESULT IN FINES AND THE REPLACEMENT OF ANY DAMAGED VEGETATION IN ACCORDANCE WITH THE LAND DEVELOPMENT ORDINANCE.
11. ROADSIDE DITCHES AND CHANNELS SHALL BE STABILIZED DAILY UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
12. INSTALL TEMPORARY MATTING TO TOP OF ALL SIDE SLOPES ON CHANNELS, DIVERSION DITCHES AND TEMPORARY SEDIMENT BASINS. SEE DETAIL SHEET C702 (PERMANENT CHANNEL) AND C702 (TEMPORARY DIVERSION DITCH) FOR TYPE OF MATTING TO USE.
13. ANY DEWATERING OF SEDIMENT CONTAINMENT DEVICES FOR MAINTENANCE, REMOVAL OR CONVERSION PURPOSES IS TO BE DONE THROUGH A SILT BAG.
14. ANY DEWATERING OF STORM/UTILITY TRENCHES IS TO BE DONE THROUGH A SILT BAG.
15. GROUND COVER IS TO BE APPLIED PER CONDITIONS OF THE NPDES PERMIT OR AT THE END OF THE DAY IN CRITICAL AREAS.
16. CONTRACTOR SHALL USE TIRE WASH STATION TO PREVENT SEDIMENT FROM TRACKING ONTO THE ROAD IF CONSTRUCTION ENTRANCE IS FOUND INSUFFICIENT AT NO ADDITIONAL COST TO OWNER.
17. CONTRACTOR SHALL UTILIZE PAM FLOCCULANTS TO REDUCE RUN-OFF TURBIDITY. SEE SPECS.

MAINTENANCE PLAN

1. DURING ALL PHASES OF CONSTRUCTION, GROUNDCOVER ON EXPOSED SLOPES SHALL BE PROVIDED ACCORDING TO GROUND STABILIZATION TABLE **(SHEET C706)** FOLLOWING COMPLETION OF ANY PHASE OF GRADING.
2. FINAL PERMANENT GROUNDCOVER FOR ALL DISTURBED AREAS SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION TABLE (BELOW) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
3. THE ABOVE REQUIREMENTS ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED THOSE ABOVE.
4. SLOPE EROSION CONTROL MATTING SHALL BE INSTALLED FOR TEMPORARY STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER). REFER TO MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.
5. ALL OTHER SEEDED AREAS SHALL BE MULCHED WITH STRAW AND TACKED WITH ASPHALT.

SELF-INSPECTION RULES

SEE **SHEET C706** FOR SELF-INSPECTION REQUIREMENTS.

THE FINANCIALLY RESPONSIBLE PERSON AND/OR HIS AGENT WILL BE PERFORM SELF INSPECTIONS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES USING NCDEMLR'S SELF INSPECTION REPORT (WORKSHEET) AND THIS WILL BE KEPT ONSITE.

SLOPE & SURFACE STABILIZATION

GROUND STABILIZATION SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION NOTES. SEE SHEET C705.

EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE (SECTION II.B(2) (b))

THE REQUIREMENTS ON SHEET C705 ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED MINIMUM REQUIREMENTS.

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PROJECT NO. 02000.000

SHEET TITLE
FINAL EROSION CONTROL PLAN AREA_7&8

SHEET NUMBER
C-04.17

LEGEND

- TEMP. GRAVEL CONSTR. ENTRANCE — SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION DEVICE — SEE DETAIL SHEET ___
- TEMP. INLET PROTECTION SILT BAG DEVICE — SEE DETAIL SHEET ___
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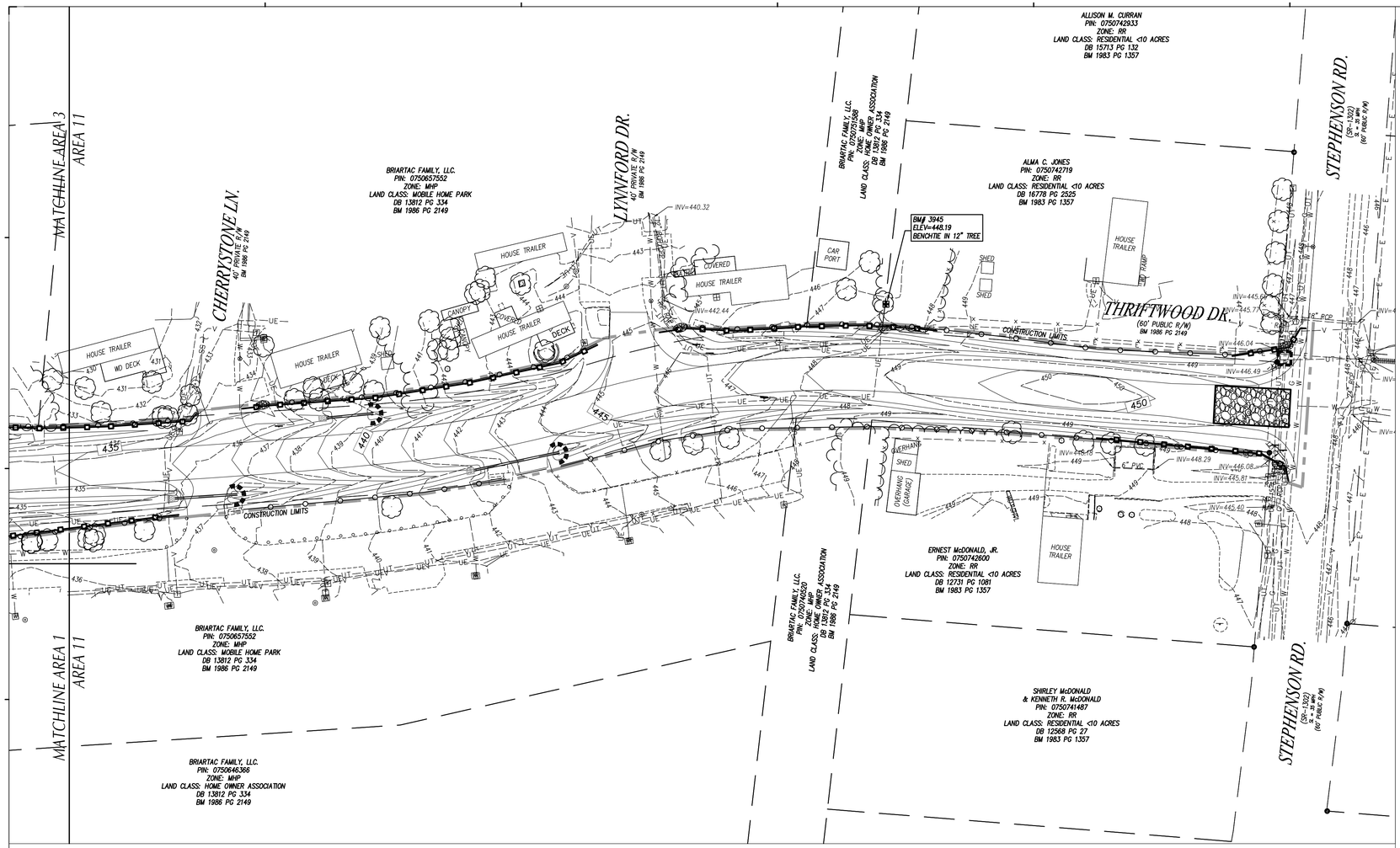
PROJECT NO. 02000.000

SHEET TITLE
FINAL EROSION CONTROL PLAN AREA_9&10

SHEET NUMBER
C-04.18



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- TEMP. DEWATERING SILT BAG SEE DETAIL SHEET ___
- RESOURCE CONSERVATION AREA
- TEMP. COFFER DAM, SEE STREAM CROSSING CULVERT INSTALLATION DETAIL SHEET ___

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL TOWN OF APEX AND NCDOT STANDARDS, SPECIFICATIONS AND DETAILS.
2. THE CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL CODES IN OBSERVING EROSION CONTROL MEASURES BOTH ON AND OFF SITE. ALL OFF-SITE SOIL BORROW AND WASTE SITES SHALL BE PROPERLY PERMITTED FOR SUCH ACTIVITIES. CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION OF SEDIMENT & EROSION CONTROL PERMIT FOR ANY OFF-SITE SITES TO OWNER PRIOR TO RELOCATING ANY STOCKPILE MATERIALS.
3. THE CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL DEVICES AFTER EACH RAINFALL EVENT OR AS DIRECTED BY LOCAL AUTHORITIES OR ARCHITECT.
4. TOTAL DISTURBED AREA: 58 AC.
5. ALL OPEN STORM PIPES SHALL BE PROTECTED WITH STONE FILTER PROTECTION AFTER WORK STOPPAGE EACH DAY. SEE DETAIL **SHEET** ___
6. ALL STORM DRAINAGE PIPES SHALL BE THOROUGHLY FLUSHED OF ALL SEDIMENT FOLLOWING SITE STABILIZATION. INTERIOR FLUSHING OF SYSTEM SHALL BE PERFORMED AS NEEDED TO MAINTAIN PROPER FUNCTIONING OF THE DRAINAGE SYSTEM. CLEANING SHALL BE PERFORMED IN A MANNER WHICH PREVENTS SEDIMENT FROM BEING FLUSHED THROUGH PIPES TO THE EXISTING DRAINAGE SYSTEM.
7. THE INDICATED STAGING AREA IS INTENDED FOR VEHICLES AND NON-ERODIBLE MATERIALS ONLY. NO SOIL, SAND OR OTHER ERODIBLE, FINE GRAINED MATERIAL SHALL BE STORED OUTSIDE OF THE LIMITS OF THE SITE PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES.
8. SOIL AND OTHER MATERIALS SHALL ONLY BE TEMPORARILY STOCKPILED WITHIN THE CONSTRUCTION LIMITS PROTECTED BY SEDIMENT AND EROSION CONTROL DEVICES AND MEASURES. STOCKPILES SHALL BE STABILIZED AS REQUIRED AS INDICATED IN THE SLOPE & SURFACE STABILIZATION NOTES ON THIS PLAN.
9. THE TREE PROTECTION FENCE SHALL BE MAINTAINED ON THE SITE UNTIL ALL SITE WORK IS COMPLETED AND THE FINAL SITE INSPECTION IS SCHEDULED PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY (CO). THE FENCING SHALL BE REMOVED IMMEDIATELY PRIOR TO THE FINAL SITE INSPECTION FOR THE SITE.
10. TREE PROTECTION FENCING SHALL NOT BE MOVED AND THERE SHALL BE NO ENCROACHMENT INTO SUCH PROTECTED AREA(S) WITHOUT WRITTEN AUTHORIZATION OF THE COUNTY ZONING COMPLIANCE STAFF. ANY ACTIVITY (LANDSCAPING, FENCING, OR UTILITY INSTALLATION) SHOWN ON THE APPROVED PLANS IN A TREE PROTECTION AREA SHALL ALSO NOT OCCUR WITHOUT WRITTEN AUTHORIZATION FROM THE COUNTY ZONING COMPLIANCE STAFF. ANY UNAUTHORIZED ENCROACHMENT OR DISTURBANCE WITHIN THE BOUNDARIES OF A TREE PROTECTION AREA SHALL AUTOMATICALLY RESULT IN FINES AND THE REPLACEMENT OF ANY DAMAGED VEGETATION IN ACCORDANCE WITH THE LAND DEVELOPMENT ORDINANCE.
11. ROADSIDE DITCHES AND CHANNELS SHALL BE STABILIZED DAILY UNTIL PERMANENT GROUND COVER IS ESTABLISHED.
12. INSTALL TEMPORARY MATTING TO TOP OF ALL SIDE SLOPES ON CHANNELS, DIVERSION DITCHES AND TEMPORARY SEDIMENT BASINS. SEE DETAIL SHEET C702 (PERMANENT CHANNEL) AND C702 (TEMPORARY DIVERSION DITCH) FOR TYPE OF MATTING TO USE.
13. ANY DEWATERING OF SEDIMENT CONTAINMENT DEVICES FOR MAINTENANCE, REMOVAL OR CONVERSION PURPOSES IS TO BE DONE THROUGH A SILT BAG.
14. ANY DEWATERING OF STORM/UTILITY TRENCHES IS TO BE DONE THROUGH A SILT BAG.
15. GROUND COVER IS TO BE APPLIED PER CONDITIONS OF THE NPDES PERMIT OR AT THE END OF THE DAY IN CRITICAL AREAS.
16. CONTRACTOR SHALL USE TIRE WASH STATION TO PREVENT SEDIMENT FROM TRACKING ONTO THE ROAD IF CONSTRUCTION ENTRANCE IS FOUND INSUFFICIENT AT NO ADDITIONAL COST TO OWNER.
17. CONTRACTOR SHALL UTILIZE PAM FLOCCULANTS TO REDUCE RUN-OFF TURBIDITY. SEE SPECS.

MAINTENANCE PLAN

1. DURING ALL PHASES OF CONSTRUCTION, GROUNDCOVER ON EXPOSED SLOPES SHALL BE PROVIDED ACCORDING TO GROUND STABILIZATION TABLE (**SHEET C706**) FOLLOWING COMPLETION OF ANY PHASE OF GRADING.
2. FINAL PERMANENT GROUNDCOVER FOR ALL DISTURBED AREAS SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION TABLE (BELOW) FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
3. THE ABOVE REQUIREMENTS ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED THOSE ABOVE.
4. SLOPE EROSION CONTROL MATTING SHALL BE INSTALLED FOR TEMPORARY STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER). REFER TO MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.
5. ALL OTHER SEEDED AREAS SHALL BE MULCHED WITH STRAW AND TACKED WITH ASPHALT.

SELF-INSPECTION RULES

SEE **SHEET C706** FOR SELF-INSPECTION REQUIREMENTS.

THE FINANCIALLY RESPONSIBLE PERSON AND/OR HIS AGENT WILL BE PERFORM SELF INSPECTIONS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES USING NCDEMLR'S SELF INSPECTION REPORT (WORKSHEET) AND THIS WILL BE KEPT ONSITE.

SLOPE & SURFACE STABILIZATION

GROUND STABILIZATION SHALL BE PROVIDED ON ALL DISTURBED AREAS ACCORDING TO GROUND STABILIZATION NOTES. SEE SHEET C705.

EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE (SECTION II.B(2) (b))

THE REQUIREMENTS ON SHEET C705 ARE THE MINIMUM NECESSARY TO MEET EROSION AND SEDIMENT CONTROL REGULATIONS. THE CONTRACT DOCUMENTS INCLUDE ADDITIONAL SEEDING AND STABILIZATION REQUIREMENTS AND SCHEDULES WHICH MAY EXCEED MINIMUM REQUIREMENTS.

INSTALL TEMPORARY EXCELSIOR MATTING FOR STABILIZATION DURING THE ESTABLISHMENT OF VEGETATIVE COVER ON ALL STEEP SLOPES (6:1 OR STEEPER) AND AREAS OF CONCENTRATED FLOW (CHANNELS, DITCHES, SWALES, ETC.). UTILIZE TEMPORARY COCONUT MAT IN AREAS IDENTIFIED ON PLAN. REFER TO SPECIFICATION SECTION 312500 FOR MATERIAL SPECIFICATIONS. INSTALL MATTING PER MANUFACTURER'S INSTRUCTIONS.

NOTE:
EROSION & SEDIMENT CONTROL SHALL BE PERMITTED THROUGH NCDEQ.

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

RATIO

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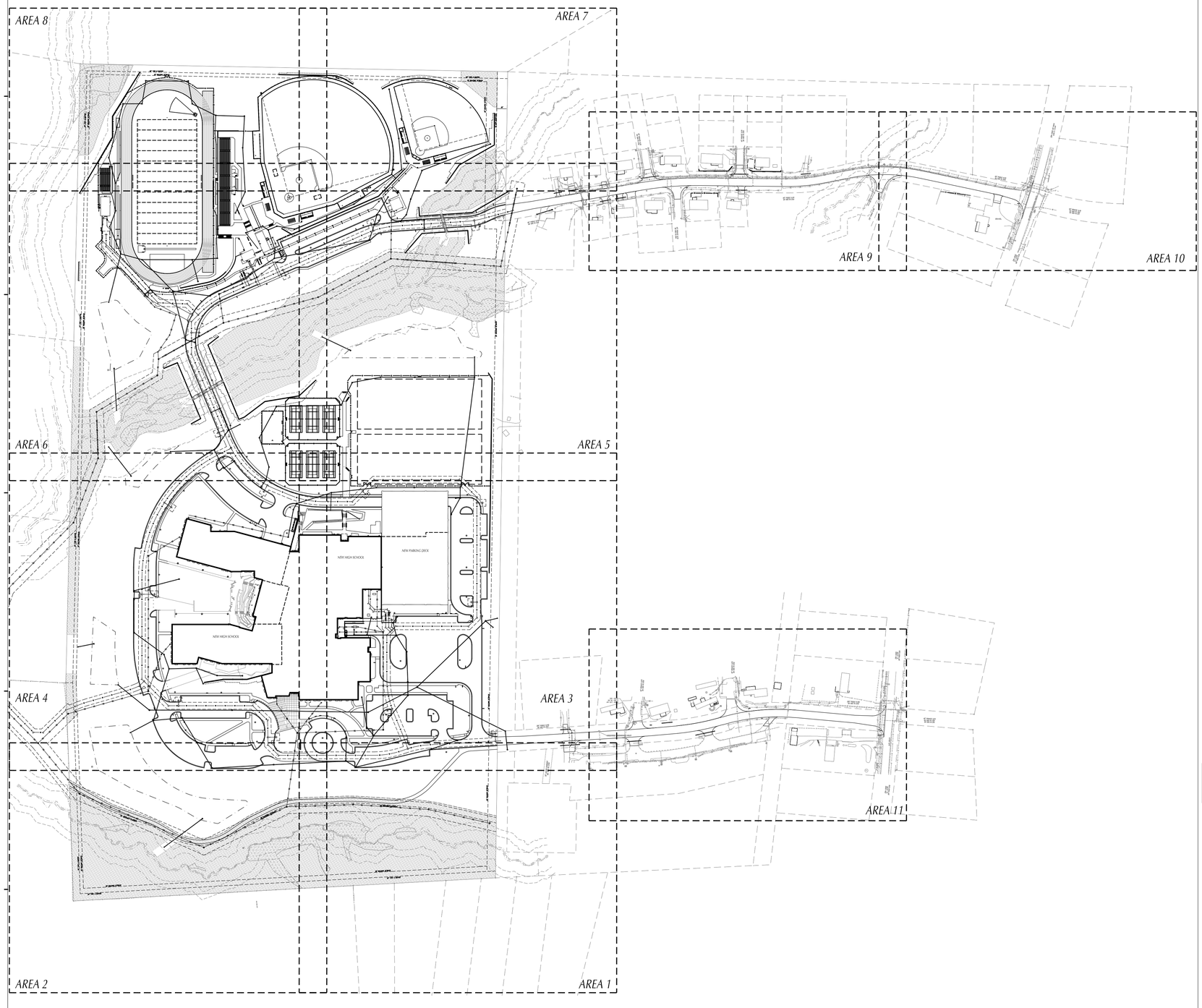
PROJECT NO. 02000.000

SHEET TITLE

FINAL EROSION CONTROL PLAN AREA_11

SHEET NUMBER

C-04.19



LEGEND

RESOURCE CONSERVATION AREA

GRAPHIC SCALE

150 0 75 150 300 600

(IN FEET)
1 inch = 150 ft.

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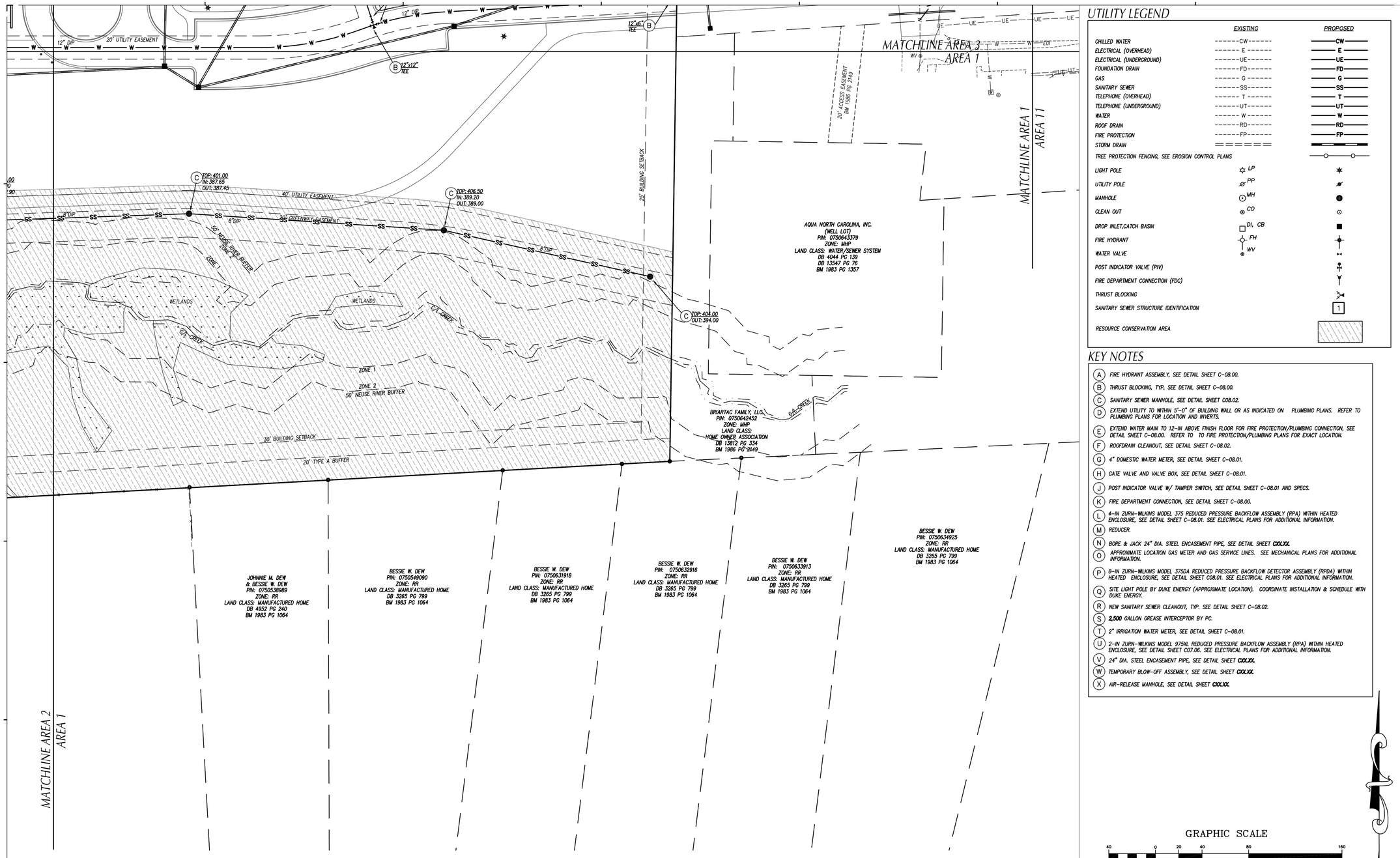
PROJECT NO. 02000.000

SHEET TITLE

UTILITY OVERALL PLAN

SHEET NUMBER

C-05.00



UTILITY LEGEND

	EXISTING	PROPOSED
CHILLED WATER	------CW------	CW
ELECTRICAL (OVERHEAD)	------ E ------	E
ELECTRICAL (UNDERGROUND)	------UE------	UE
FOUNDATION DRAIN	------FD------	FD
GAS	------ G ------	G
SANITARY SEWER	------SS------	SS
TELEPHONE (OVERHEAD)	------ T ------	T
TELEPHONE (UNDERGROUND)	------UT------	UT
WATER	------ W ------	W
ROOF DRAIN	------RD------	RD
FIRE PROTECTION	------FP------	FP
STORM DRAIN		
TREE PROTECTION FENCING, SEE EROSION CONTROL PLANS		
LIGHT POLE	LP	
UTILITY POLE	PP	
MANHOLE	MH	
CLEAN OUT	CO	
DROP INLET,CATCH BASIN	DI, CB	
FIRE HYDRANT	FH	
WATER VALVE	WV	
POST INDICATOR VALVE (PIV)		
FIRE DEPARTMENT CONNECTION (FDC)		
THRUST BLOCKING		
SANITARY SEWER STRUCTURE IDENTIFICATION		1
RESOURCE CONSERVATION AREA		

KEY NOTES

(A) FIRE HYDRANT ASSEMBLY, SEE DETAIL SHEET C-08.00.

(B) THRUST BLOCKING, TYP, SEE DETAIL SHEET C-08.00.

(C) SANITARY SEWER MANHOLE, SEE DETAIL SHEET C08.02.

(D) EXTEND UTILITY TO WITHIN 5'-0" OF BUILDING WALL OR AS INDICATED ON PLUMBING PLANS. REFER TO PLUMBING PLANS FOR LOCATION AND INVERTS.

(E) EXTEND WATER MAIN TO 12-IN ABOVE FINISH FLOOR FOR FIRE PROTECTION/PLUMBING CONNECTION, SEE DETAIL SHEET C-08.00. REFER TO TO FIRE PROTECTION/PLUMBING PLANS FOR EXACT LOCATION.

(F) ROOFDRAIN CLEANOUT, SEE DETAIL SHEET C-08.02.

(G) 4" DOMESTIC WATER METER, SEE DETAIL SHEET C-08.01.

(H) GATE VALVE AND VALVE BOX, SEE DETAIL SHEET C-08.01.

(J) POST INDICATOR VALVE W/ TAMPER SWITCH, SEE DETAIL SHEET C-08.01 AND SPECS.

(K) FIRE DEPARTMENT CONNECTION, SEE DETAIL SHEET C-08.00.

(L) 4-IN ZURN-WILKINS MODEL 375 REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C-08.01. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

(M) REDUCER.

(N) BORE & JACK 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C0X.XX.**

(O) APPROXIMATE LOCATION GAS METER AND GAS SERVICE LINES. SEE MECHANICAL PLANS FOR ADDITIONAL INFORMATION.

(P) 8-IN ZURN-WILKINS MODEL 375DA REDUCED PRESSURE BACKFLOW DETECTOR ASSEMBLY (RPDA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C08.01. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

(Q) SITE LIGHT POLE BY DUKE ENERGY (APPROXIMATE LOCATION). COORDINATE INSTALLATION & SCHEDULE WITH DUKE ENERGY.

(R) NEW SANITARY SEWER CLEANOUT, TYP. SEE DETAIL SHEET C-08.02.

(S) 2,500 GALLON GREASE INTERCEPTOR BY PC.

(T) 2" IRRIGATION WATER METER, SEE DETAIL SHEET C-08.01.

(U) 2-IN ZURN-WILKINS MODEL 975XL REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C07.06. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

(V) 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C0X.XX.**

(W) TEMPORARY BLOW-OFF ASSEMBLY, SEE DETAIL SHEET **C0X.XX.**

(X) AIR-RELEASE MANHOLE, SEE DETAIL SHEET **C0X.XX.**

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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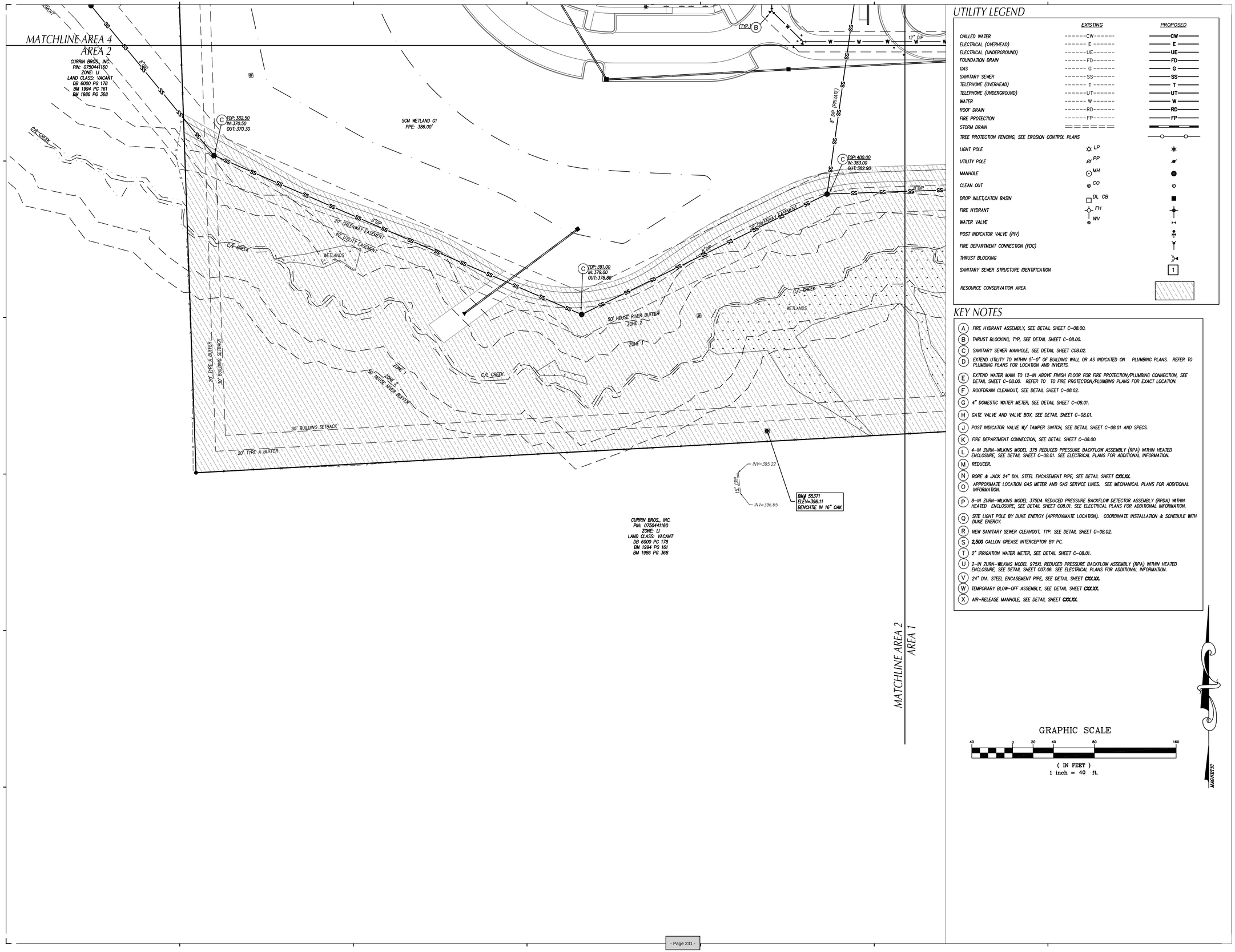
PROJECT NO. 02000.000

SHEET TITLE
UTILITY
PLAN
AREA_1

SHEET NUMBER
C-05.01



UTILITY LEGEND

	EXISTING	PROPOSED
CHILLED WATER	------CW------	CW
ELECTRICAL (OVERHEAD)	------ E ------	E
ELECTRICAL (UNDERGROUND)	------UE------	UE
FOUNDATION DRAIN	------FD------	FD
GAS	------ G ------	G
SANITARY SEWER	------SS------	SS
TELEPHONE (OVERHEAD)	------ T ------	T
TELEPHONE (UNDERGROUND)	------UT------	UT
WATER	------ W ------	W
ROOF DRAIN	------RD------	RD
FIRE PROTECTION	------FP------	FP
STORM DRAIN		
TREE PROTECTION FENCING, SEE EROSION CONTROL PLANS		
LIGHT POLE	LP	
UTILITY POLE	PP	
MANHOLE	MH	
CLEAN OUT	CO	
DROP INLET,CATCH BASIN	DI, CB	
FIRE HYDRANT	FH	
WATER VALVE	WV	
POST INDICATOR VALVE (PIV)		
FIRE DEPARTMENT CONNECTION (FDC)		
THRUST BLOCKING		
SANITARY SEWER STRUCTURE IDENTIFICATION		1
RESOURCE CONSERVATION AREA		

KEY NOTES

(A) FIRE HYDRANT ASSEMBLY, SEE DETAIL SHEET C-08.00.

(B) THRUST BLOCKING, TYP, SEE DETAIL SHEET C-08.00.

(C) SANITARY SEWER MANHOLE, SEE DETAIL SHEET C08.02.

(D) EXTEND UTILITY TO WITHIN 5'-0" OF BUILDING WALL OR AS INDICATED ON PLUMBING PLANS. REFER TO PLUMBING PLANS FOR LOCATION AND INVERTS.

(E) EXTEND WATER MAIN TO 12-IN ABOVE FINISH FLOOR FOR FIRE PROTECTION/PLUMBING CONNECTION, SEE DETAIL SHEET C-08.00. REFER TO TO FIRE PROTECTION/PLUMBING PLANS FOR EXACT LOCATION.

(F) ROOFDRAIN CLEANOUT, SEE DETAIL SHEET C-08.02.

(G) 4" DOMESTIC WATER METER, SEE DETAIL SHEET C-08.01.

(H) GATE VALVE AND VALVE BOX, SEE DETAIL SHEET C-08.01.

(J) POST INDICATOR VALVE W/ TAMPER SWITCH, SEE DETAIL SHEET C-08.01 AND SPECS.

(K) FIRE DEPARTMENT CONNECTION, SEE DETAIL SHEET C-08.00.

(L) 4-IN ZURN-WILKINS MODEL 375 REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C-08.01. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

(M) REDUCER.

(N) BORE & JACK 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C00.XX.**

(O) APPROXIMATE LOCATION GAS METER AND GAS SERVICE LINES. SEE MECHANICAL PLANS FOR ADDITIONAL INFORMATION.

(P) 8-IN ZURN-WILKINS MODEL 375DA REDUCED PRESSURE BACKFLOW DETECTOR ASSEMBLY (RPDA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C08.01. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

(Q) SITE LIGHT POLE BY DUKE ENERGY (APPROXIMATE LOCATION). COORDINATE INSTALLATION & SCHEDULE WITH DUKE ENERGY.

(R) NEW SANITARY SEWER CLEANOUT, TYP. SEE DETAIL SHEET C-08.02.

(S) 2,500 GALLON GREASE INTERCEPTOR BY PC.

(T) 2" IRRIGATION WATER METER, SEE DETAIL SHEET C-08.01.

(U) 2-IN ZURN-WILKINS MODEL 975XL REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C07.06. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

(V) 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C00.XX.**

(W) TEMPORARY BLOW-OFF ASSEMBLY, SEE DETAIL SHEET **C00.XX.**

(X) AIR-RELEASE MANHOLE, SEE DETAIL SHEET **C00.XX.**

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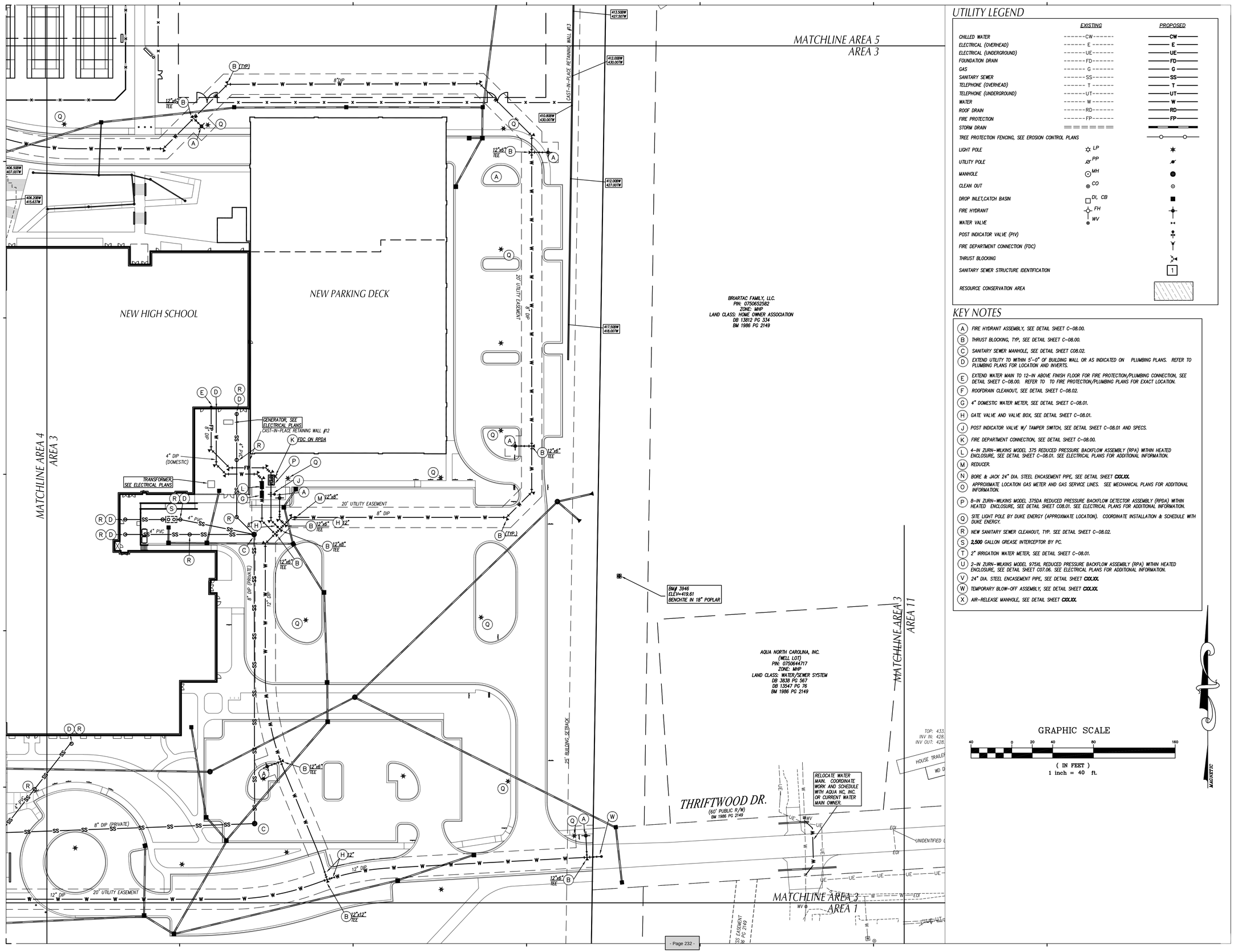
PROJECT NO. 02000.000

SHEET TITLE
UTILITY PLAN AREA_2

SHEET NUMBER
C-05.02



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SANITARY SEWER	------SS------	SS
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WATER	------ W ------	W
ROOF DRAIN	------RD------	RD
FIRE PROTECTION	------FP------	FP
STORM DRAIN		
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THRUST BLOCKING		
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RESOURCE CONSERVATION AREA		

KEY NOTES

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(B) THRUST BLOCKING, TYP, SEE DETAIL SHEET C-08.00.

(C) SANITARY SEWER MANHOLE, SEE DETAIL SHEET C08.02.

(D) EXTEND UTILITY TO WITHIN 5'-0" OF BUILDING WALL OR AS INDICATED ON PLUMBING PLANS. REFER TO PLUMBING PLANS FOR LOCATION AND INVERTS.

(E) EXTEND WATER MAIN TO 12-IN ABOVE FINISH FLOOR FOR FIRE PROTECTION/PLUMBING CONNECTION, SEE DETAIL SHEET C-08.00. REFER TO TO FIRE PROTECTION/PLUMBING PLANS FOR EXACT LOCATION.

(F) ROOFDRAIN CLEANOUT, SEE DETAIL SHEET C-08.02.

(G) 4" DOMESTIC WATER METER, SEE DETAIL SHEET C-08.01.

(H) GATE VALVE AND VALVE BOX, SEE DETAIL SHEET C-08.01.

(J) POST INDICATOR VALVE W/ TAMPER SWITCH, SEE DETAIL SHEET C-08.01 AND SPECS.

(K) FIRE DEPARTMENT CONNECTION, SEE DETAIL SHEET C-08.00.

(L) 4-IN ZURN-WILKINS MODEL 375 REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C-08.01. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

(M) REDUCER.

(N) BORE & JACK 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C00.XX.**

(O) APPROXIMATE LOCATION GAS METER AND GAS SERVICE LINES. SEE MECHANICAL PLANS FOR ADDITIONAL INFORMATION.

(P) 8-IN ZURN-WILKINS MODEL 375DA REDUCED PRESSURE BACKFLOW DETECTOR ASSEMBLY (RPDA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C08.01. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

(Q) SITE LIGHT POLE BY DUKE ENERGY (APPROXIMATE LOCATION). COORDINATE INSTALLATION & SCHEDULE WITH DUKE ENERGY.

(R) NEW SANITARY SEWER CLEANOUT, TYP. SEE DETAIL SHEET C-08.02.

(S) 2,500 GALLON GREASE INTERCEPTOR BY PC.

(T) 2" IRRIGATION WATER METER, SEE DETAIL SHEET C-08.01.

(U) 2-IN ZURN-WILKINS MODEL 975U, REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C07.06. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

(V) 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C00.XX.**

(W) TEMPORARY BLOW-OFF ASSEMBLY, SEE DETAIL SHEET **C00.XX.**

(X) AIR-RELEASE MANHOLE, SEE DETAIL SHEET **C00.XX.**

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

Felton Grove High School

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5	60% Construction Documents	3/26/21

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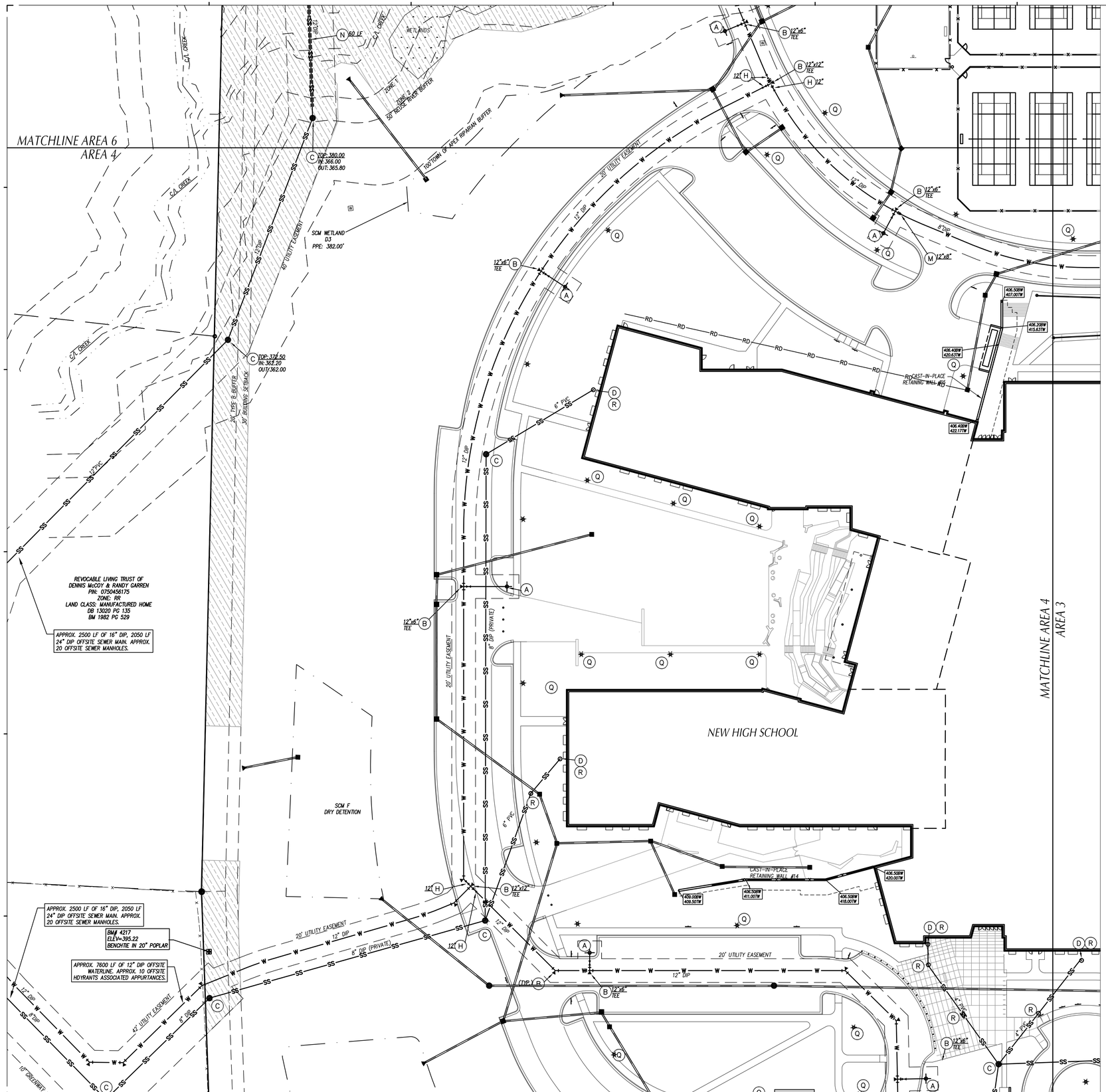
PROJECT NO. 02000.000

SHEET TITLE
UTILITY
PLAN
AREA_3

SHEET NUMBER
C-05.03



UTILITY LEGEND

	EXISTING	PROPOSED
CHILLED WATER	------CW------	CW
ELECTRICAL (OVERHEAD)	------ E ------	E
ELECTRICAL (UNDERGROUND)	------UE------	UE
FOUNDATION DRAIN	------FD------	FD
GAS	------ G ------	G
SANITARY SEWER	------SS------	SS
TELEPHONE (OVERHEAD)	------ T ------	T
TELEPHONE (UNDERGROUND)	------UT------	UT
WATER	------ W ------	W
ROOF DRAIN	------RD------	RD
FIRE PROTECTION	------FP------	FP
STORM DRAIN		
TREE PROTECTION FENCING, SEE EROSION CONTROL PLANS		
LIGHT POLE	LP	
UTILITY POLE	PP	
MANHOLE	MH	
CLEAN OUT	CO	
DROP INLET,CATCH BASIN	DI, CB	
FIRE HYDRANT	FH	
WATER VALVE	WV	
POST INDICATOR VALVE (PIV)		
FIRE DEPARTMENT CONNECTION (FDC)		
THRUST BLOCKING		
SANITARY SEWER STRUCTURE IDENTIFICATION		1
RESOURCE CONSERVATION AREA		

KEY NOTES

- (A) FIRE HYDRANT ASSEMBLY, SEE DETAIL SHEET C-08.00.
- (B) THRUST BLOCKING, TYP, SEE DETAIL SHEET C-08.00.
- (C) SANITARY SEWER MANHOLE, SEE DETAIL SHEET C08.02.
- (D) EXTEND UTILITY TO WITHIN 5'-0" OF BUILDING WALL OR AS INDICATED ON PLUMBING PLANS. REFER TO PLUMBING PLANS FOR LOCATION AND INVERTS.
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- (F) ROOFDRAIN CLEANOUT, SEE DETAIL SHEET C-08.02.
- (G) 4" DOMESTIC WATER METER, SEE DETAIL SHEET C-08.01.
- (H) GATE VALVE AND VALVE BOX, SEE DETAIL SHEET C-08.01.
- (J) POST INDICATOR VALVE W/ TAMPER SWITCH, SEE DETAIL SHEET C-08.01 AND SPECS.
- (K) FIRE DEPARTMENT CONNECTION, SEE DETAIL SHEET C-08.00.
- (L) 4-IN ZURN-WILKINS MODEL 375 REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C-08.01. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
- (M) REDUCER.
- (N) BORE & JACK 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C0X.XX.**
- (O) APPROXIMATE LOCATION GAS METER AND GAS SERVICE LINES. SEE MECHANICAL PLANS FOR ADDITIONAL INFORMATION.
- (P) 8-IN ZURN-WILKINS MODEL 375DA REDUCED PRESSURE BACKFLOW DETECTOR ASSEMBLY (RPDA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C08.01. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
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- (R) NEW SANITARY SEWER CLEANOUT, TYP. SEE DETAIL SHEET C-08.02.
- (S) 2,500 GALLON GREASE INTERCEPTOR BY PC.
- (T) 2" IRRIGATION WATER METER, SEE DETAIL SHEET C-08.01.
- (U) 2-IN ZURN-WILKINS MODEL 975XL REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C07.06. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
- (V) 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C0X.XX.**
- (W) TEMPORARY BLOW-OFF ASSEMBLY, SEE DETAIL SHEET **C0X.XX.**
- (X) AIR-RELEASE MANHOLE, SEE DETAIL SHEET **C0X.XX.**

GRAPHIC SCALE

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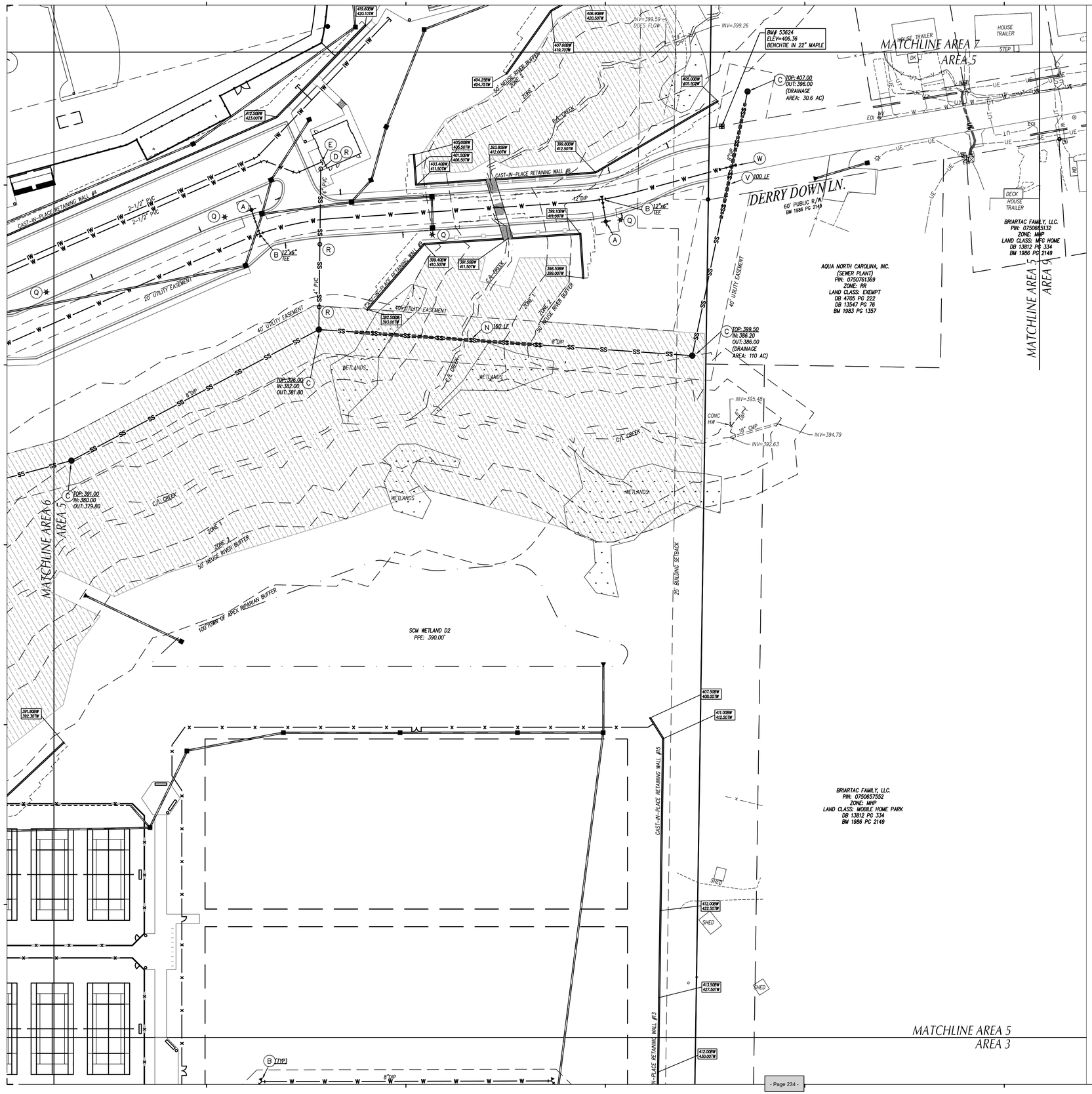
PROJECT NO. 02000.000

SHEET TITLE
UTILITY PLAN AREA_4

SHEET NUMBER
C-05.04



UTILITY LEGEND

	EXISTING	PROPOSED
CHILLED WATER	------CW------	CW
ELECTRICAL (OVERHEAD)	------ E ------	E
ELECTRICAL (UNDERGROUND)	------UE------	UE
FOUNDATION DRAIN	------FD------	FD
GAS	------ G ------	G
SANITARY SEWER	------SS------	SS
TELEPHONE (OVERHEAD)	------ T ------	T
TELEPHONE (UNDERGROUND)	------UT------	UT
WATER	------ W ------	W
ROOF DRAIN	------RD------	RD
FIRE PROTECTION	------FP------	FP
STORM DRAIN		
TREE PROTECTION FENCING, SEE EROSION CONTROL PLANS		
LIGHT POLE	LP	
UTILITY POLE	PP	
MANHOLE	MH	
CLEAN OUT	CO	
DROP INLET,CATCH BASIN	DI, CB	
FIRE HYDRANT	FH	
WATER VALVE	WV	
POST INDICATOR VALVE (PIV)		
FIRE DEPARTMENT CONNECTION (FDC)		
THRUST BLOCKING		
SANITARY SEWER STRUCTURE IDENTIFICATION		1
RESOURCE CONSERVATION AREA		

KEY NOTES

(A) FIRE HYDRANT ASSEMBLY, SEE DETAIL SHEET C-08.00.

(B) THRUST BLOCKING, TYP, SEE DETAIL SHEET C-08.00.

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(F) ROOFDRAIN CLEANOUT, SEE DETAIL SHEET C-08.02.

(G) 4" DOMESTIC WATER METER, SEE DETAIL SHEET C-08.01.

(H) GATE VALVE AND VALVE BOX, SEE DETAIL SHEET C-08.01.

(J) POST INDICATOR VALVE W/ TAMPER SWITCH, SEE DETAIL SHEET C-08.01 AND SPECS.

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(N) BORE & JACK 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C00.XX.**

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(T) 2" IRRIGATION WATER METER, SEE DETAIL SHEET C-08.01.

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(V) 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C00.XX.**

(W) TEMPORARY BLOW-OFF ASSEMBLY, SEE DETAIL SHEET **C00.XX.**

(X) AIR-RELEASE MANHOLE, SEE DETAIL SHEET **C00.XX.**

GRAPHIC SCALE

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(IN FEET)
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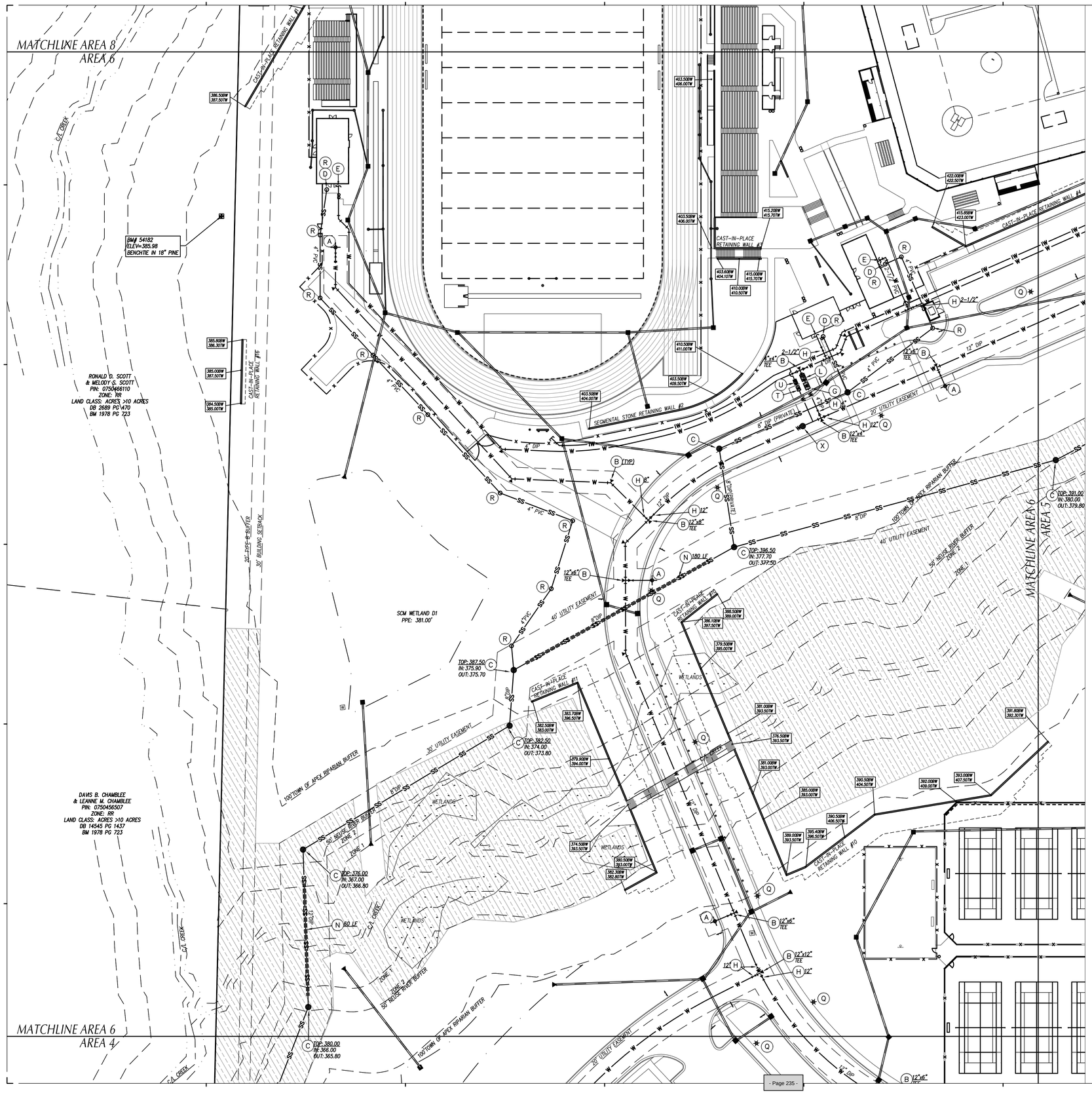
PROJECT NO. 02000.000

SHEET TITLE
UTILITY
PLAN
AREA_5

SHEET NUMBER
C-05.05



UTILITY LEGEND

	EXISTING	PROPOSED
CHILLED WATER	------CW------	CW
ELECTRICAL (OVERHEAD)	------ E ------	E
ELECTRICAL (UNDERGROUND)	------UE------	UE
FOUNDATION DRAIN	------FD------	FD
GAS	------ G ------	G
SANITARY SEWER	------SS------	SS
TELEPHONE (OVERHEAD)	------ T ------	T
TELEPHONE (UNDERGROUND)	------UT------	UT
WATER	------ W ------	W
ROOF DRAIN	------RD------	RD
FIRE PROTECTION	------FP------	FP
STORM DRAIN		
TREE PROTECTION FENCING, SEE EROSION CONTROL PLANS		
LIGHT POLE	LP	
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FIRE DEPARTMENT CONNECTION (FDC)		
THRUST BLOCKING		
SANITARY SEWER STRUCTURE IDENTIFICATION		1
RESOURCE CONSERVATION AREA		

KEY NOTES

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(W) TEMPORARY BLOW-OFF ASSEMBLY, SEE DETAIL SHEET **C00.XX.**

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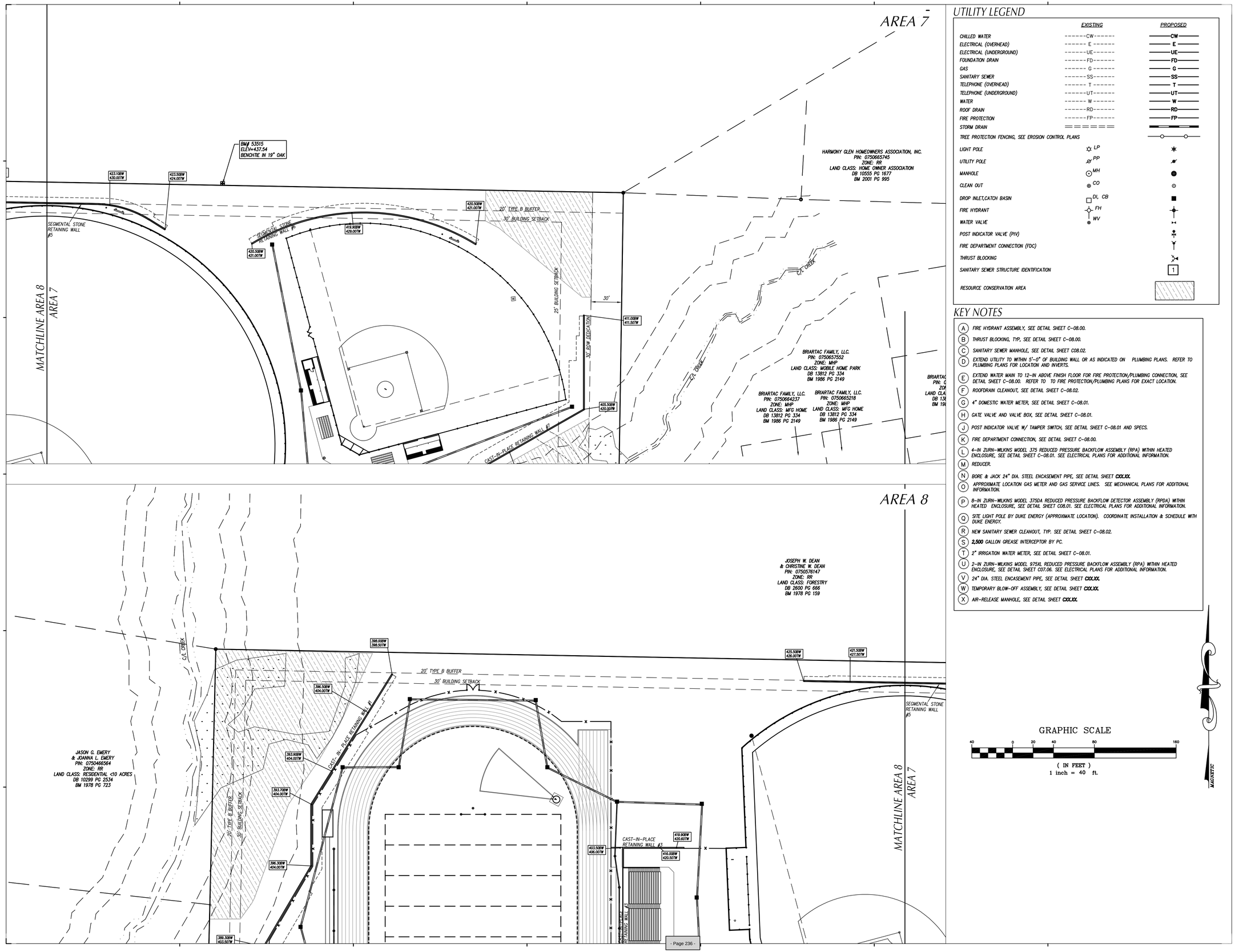
SHEET TITLE
UTILITY
PLAN
AREA_6

SHEET NUMBER
C-05.06



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CHILLED WATER	------CW------	CW
ELECTRICAL (OVERHEAD)	------ E ------	E
ELECTRICAL (UNDERGROUND)	------UE------	UE
FOUNDATION DRAIN	------FD------	FD
GAS	------ G ------	G
SANITARY SEWER	------SS------	SS
TELEPHONE (OVERHEAD)	------ T ------	T
TELEPHONE (UNDERGROUND)	------UT------	UT
WATER	------ W ------	W
ROOF DRAIN	------RD------	RD
FIRE PROTECTION	------FP------	FP
STORM DRAIN	==========	
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MANHOLE	MH	
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THRUST BLOCKING		
SANITARY SEWER STRUCTURE IDENTIFICATION		1
RESOURCE CONSERVATION AREA		

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- (B) THRUST BLOCKING, TYP, SEE DETAIL SHEET C-08.00.
- (C) SANITARY SEWER MANHOLE, SEE DETAIL SHEET C08.02.
- (D) EXTEND UTILITY TO WITHIN 5'-0" OF BUILDING WALL OR AS INDICATED ON PLUMBING PLANS. REFER TO PLUMBING PLANS FOR LOCATION AND INVERTS.
- (E) EXTEND WATER MAIN TO 12-IN ABOVE FINISH FLOOR FOR FIRE PROTECTION/PLUMBING CONNECTION, SEE DETAIL SHEET C-08.00. REFER TO TO FIRE PROTECTION/PLUMBING PLANS FOR EXACT LOCATION.
- (F) ROOFDRAIN CLEANOUT, SEE DETAIL SHEET C-08.02.
- (G) 4" DOMESTIC WATER METER, SEE DETAIL SHEET C-08.01.
- (H) GATE VALVE AND VALVE BOX, SEE DETAIL SHEET C-08.01.
- (J) POST INDICATOR VALVE W/ TAMPER SWITCH, SEE DETAIL SHEET C-08.01 AND SPECS.
- (K) FIRE DEPARTMENT CONNECTION, SEE DETAIL SHEET C-08.00.
- (L) 4-IN ZURN-WILKINS MODEL 375 REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C-08.01. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
- (M) REDUCER.
- (N) BORE & JACK 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C00.XX.**
- (O) APPROXIMATE LOCATION GAS METER AND GAS SERVICE LINES. SEE MECHANICAL PLANS FOR ADDITIONAL INFORMATION.
- (P) 8-IN ZURN-WILKINS MODEL 375DA REDUCED PRESSURE BACKFLOW DETECTOR ASSEMBLY (RPDA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C08.01. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
- (Q) SITE LIGHT POLE BY DUKE ENERGY (APPROXIMATE LOCATION). COORDINATE INSTALLATION & SCHEDULE WITH DUKE ENERGY.
- (R) NEW SANITARY SEWER CLEANOUT, TYP. SEE DETAIL SHEET C-08.02.
- (S) 2,500 GALLON GREASE INTERCEPTOR BY PC.
- (T) 2" IRRIGATION WATER METER, SEE DETAIL SHEET C-08.01.
- (U) 2-IN ZURN-WILKINS MODEL 975XL REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C07.06. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.
- (V) 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C00.XX.**
- (W) TEMPORARY BLOW-OFF ASSEMBLY, SEE DETAIL SHEET **C00.XX.**
- (X) AIR-RELEASE MANHOLE, SEE DETAIL SHEET **C00.XX.**

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

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CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

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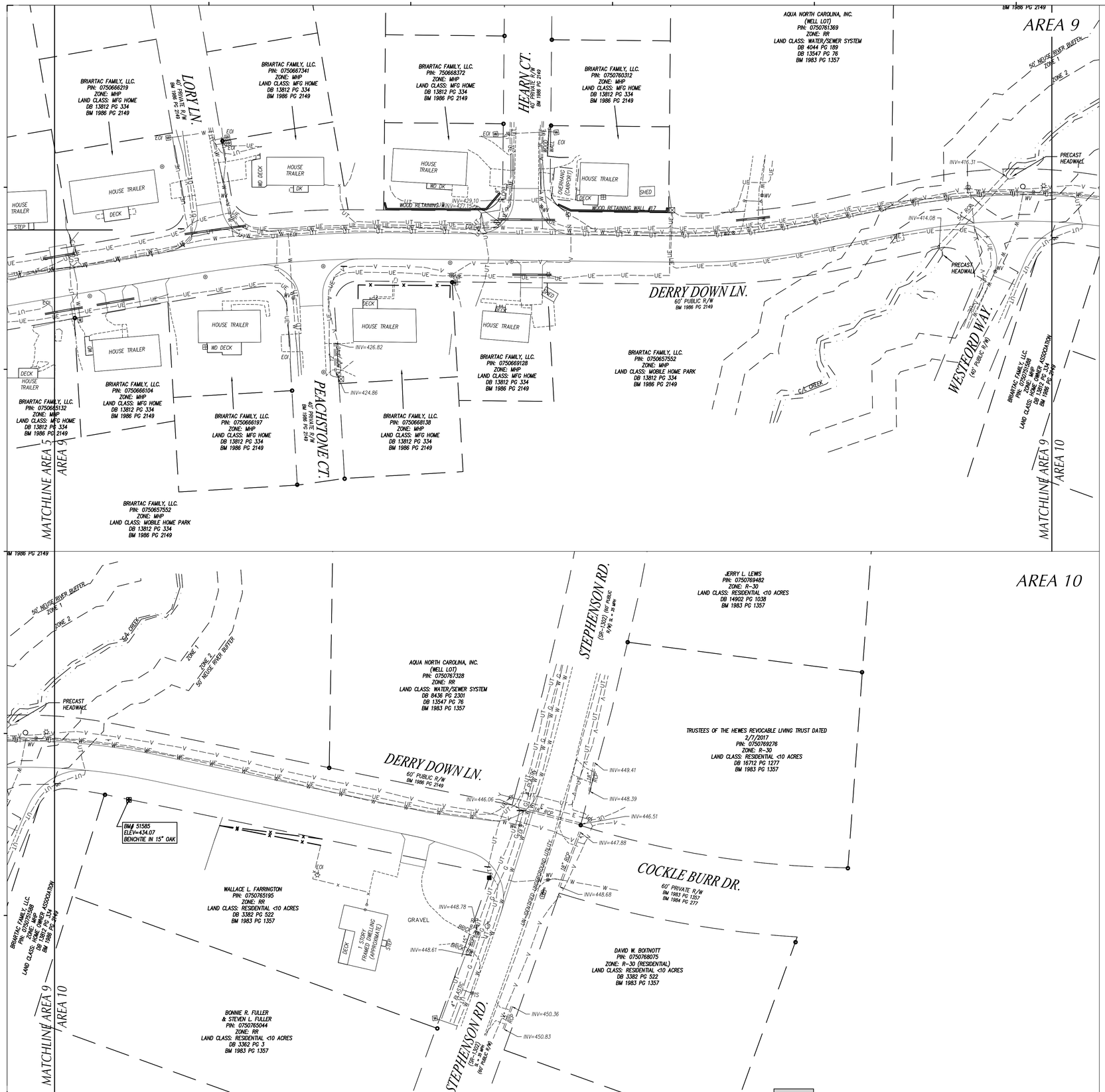
PROJECT NO. 02000.000

SHEET TITLE
UTILITY
PLAN
AREA_7&8

SHEET NUMBER
C-05.07



UTILITY LEGEND

	EXISTING	PROPOSED
CHILLED WATER	------CW------	CW
ELECTRICAL (OVERHEAD)	------ E ------	E
ELECTRICAL (UNDERGROUND)	------UE------	UE
FOUNDATION DRAIN	------FD------	FD
GAS	------ G ------	G
SANITARY SEWER	------SS------	SS
TELEPHONE (OVERHEAD)	------ T ------	T
TELEPHONE (UNDERGROUND)	------UT------	UT
WATER	------ W ------	W
ROOF DRAIN	------RD------	RD
FIRE PROTECTION	------FP------	FP
STORM DRAIN		
TREE PROTECTION FENCING, SEE EROSION CONTROL PLANS		
LIGHT POLE	LP	
UTILITY POLE	PP	
MANHOLE	MH	
CLEAN OUT	CO	
DROP INLET,CATCH BASIN	DI, CB	
FIRE HYDRANT	FH	
WATER VALVE	WV	
POST INDICATOR VALVE (PIV)		
FIRE DEPARTMENT CONNECTION (FDC)		
THRUST BLOCKING		
SANITARY SEWER STRUCTURE IDENTIFICATION		1
RESOURCE CONSERVATION AREA		

KEY NOTES

(A) FIRE HYDRANT ASSEMBLY, SEE DETAIL SHEET C-08.00.

(B) THRUST BLOCKING, TYP, SEE DETAIL SHEET C-08.00.

(C) SANITARY SEWER MANHOLE, SEE DETAIL SHEET C08.02.

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(F) ROOFDRAIN CLEANOUT, SEE DETAIL SHEET C-08.02.

(G) 4" DOMESTIC WATER METER, SEE DETAIL SHEET C-08.01.

(H) GATE VALVE AND VALVE BOX, SEE DETAIL SHEET C-08.01.

(J) POST INDICATOR VALVE W/ TAMPER SWITCH, SEE DETAIL SHEET C-08.01 AND SPECS.

(K) FIRE DEPARTMENT CONNECTION, SEE DETAIL SHEET C-08.00.

(L) 4-IN ZURN-WILKINS MODEL 375 REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C-08.01. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

(M) REDUCER.

(N) BORE & JACK 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C0X.XX.**

(O) APPROXIMATE LOCATION GAS METER AND GAS SERVICE LINES. SEE MECHANICAL PLANS FOR ADDITIONAL INFORMATION.

(P) 8-IN ZURN-WILKINS MODEL 375DA REDUCED PRESSURE BACKFLOW DETECTOR ASSEMBLY (RPDA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C08.01. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

(Q) SITE LIGHT POLE BY DUKE ENERGY (APPROXIMATE LOCATION). COORDINATE INSTALLATION & SCHEDULE WITH DUKE ENERGY.

(R) NEW SANITARY SEWER CLEANOUT, TYP. SEE DETAIL SHEET C-08.02.

(S) **2,500** GALLON GREASE INTERCEPTOR BY PC.

(T) 2" IRRIGATION WATER METER, SEE DETAIL SHEET C-08.01.

(U) 2-IN ZURN-WILKINS MODEL 975XL REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE, SEE DETAIL SHEET C07.06. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

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(W) TEMPORARY BLOW-OFF ASSEMBLY, SEE DETAIL SHEET **C0X.XX.**

(X) AIR-RELEASE MANHOLE, SEE DETAIL SHEET **C0X.XX.**

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GRAPHIC SCALE

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(IN FEET)
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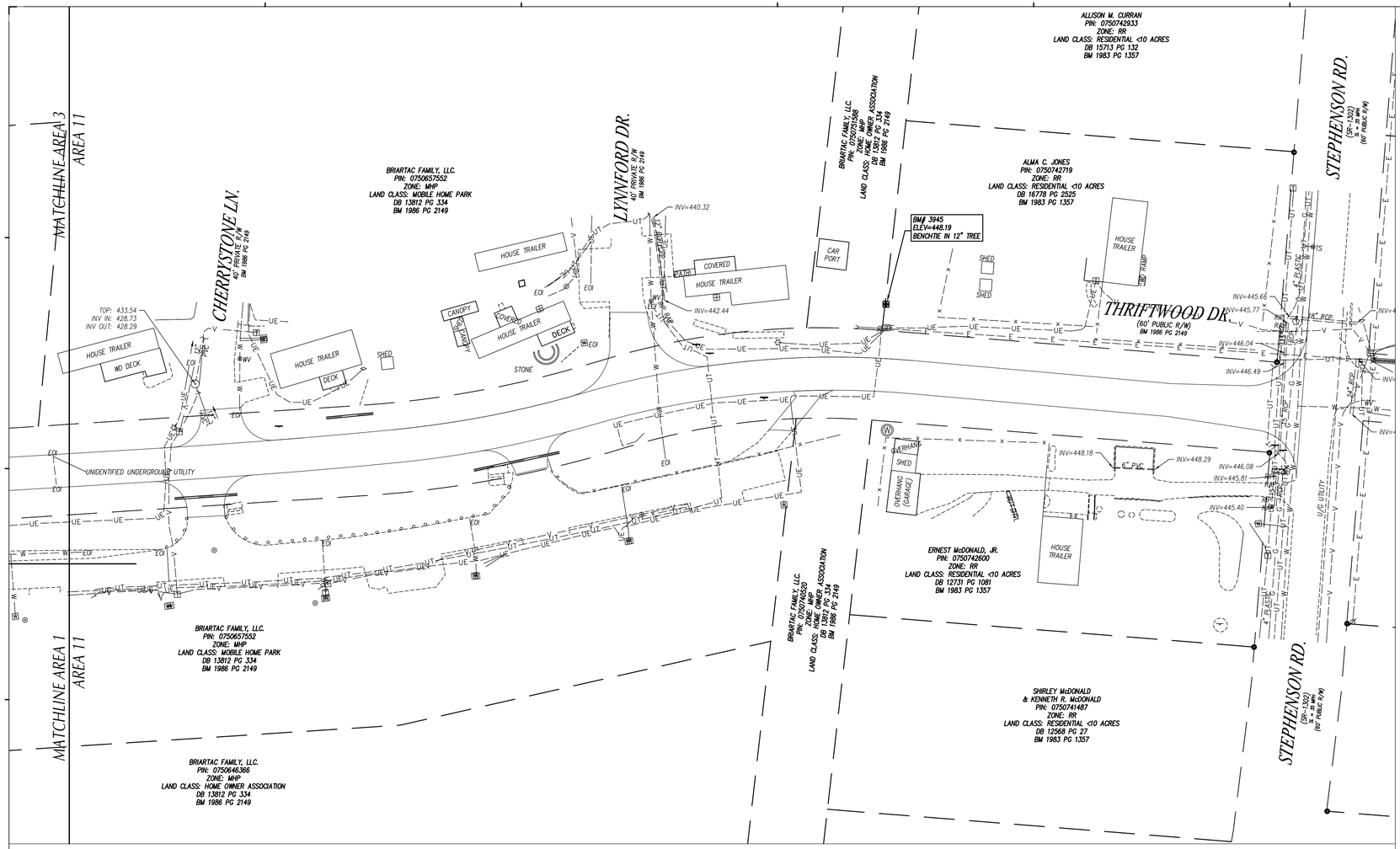
PROJECT NO. 02000.000

SHEET TITLE
UTILITY
PLAN
AREA_9&10

SHEET NUMBER
C-05.08



UTILITY LEGEND

	EXISTING	PROPOSED
CHILLED WATER	------CW------	CW
ELECTRICAL (OVERHEAD)	------ E ------	E
ELECTRICAL (UNDERGROUND)	------UE------	UE
FOUNDATION DRAIN	------FD------	FD
GAS	------ G ------	G
SANITARY SEWER	------SS------	SS
TELEPHONE (OVERHEAD)	------ T ------	T
TELEPHONE (UNDERGROUND)	------UT------	UT
WATER	------ W ------	W
ROOF DRAIN	------RD------	RD
FIRE PROTECTION	------FP------	FP
STORM DRAIN	==========	
TREE PROTECTION FENCING, SEE EROSION CONTROL PLANS		
LIGHT POLE	LP	
UTILITY POLE	PP	
MANHOLE	MH	
CLEAN OUT	CO	
DROP INLET,CATCH BASIN	DI, CB	
FIRE HYDRANT	FH	
WATER VALVE	WV	
POST INDICATOR VALVE (PIV)		
FIRE DEPARTMENT CONNECTION (FDC)		
THRUST BLOCKING		
SANITARY SEWER STRUCTURE IDENTIFICATION		1
RESOURCE CONSERVATION AREA		

KEY NOTES

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(G) 4" DOMESTIC WATER METER, SEE DETAIL SHEET C-08.01.

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(T) 2" IRRIGATION WATER METER, SEE DETAIL SHEET C-08.01.

(U) 2-IN ZURN-WILKINS MODEL 975XL REDUCED PRESSURE BACKFLOW ASSEMBLY (RPA) WITHIN HEATED ENCLOSURE. SEE DETAIL SHEET C07.06. SEE ELECTRICAL PLANS FOR ADDITIONAL INFORMATION.

(V) 24" DIA. STEEL ENCASEMENT PIPE, SEE DETAIL SHEET **C00.XX.**

(W) TEMPORARY BLOW-OFF ASSEMBLY, SEE DETAIL SHEET **C00.XX.**

(X) AIR-RELEASE MANHOLE, SEE DETAIL SHEET **C00.XX.**

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GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

MAGNETIC

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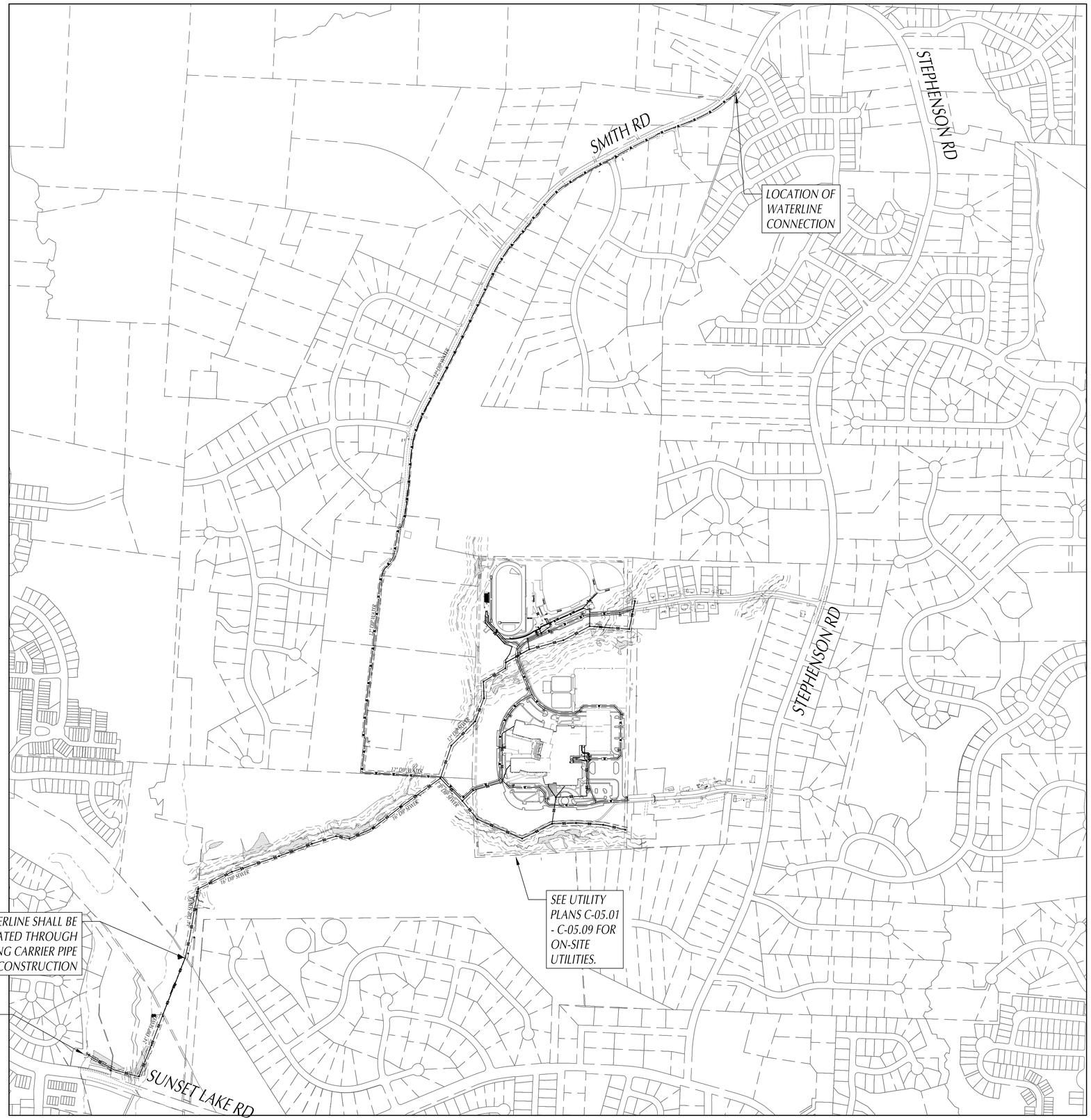
PROJECT NO. 02000.000

SHEET TITLE
UTILITY
PLAN
AREA_11

SHEET NUMBER
C-05.09



NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

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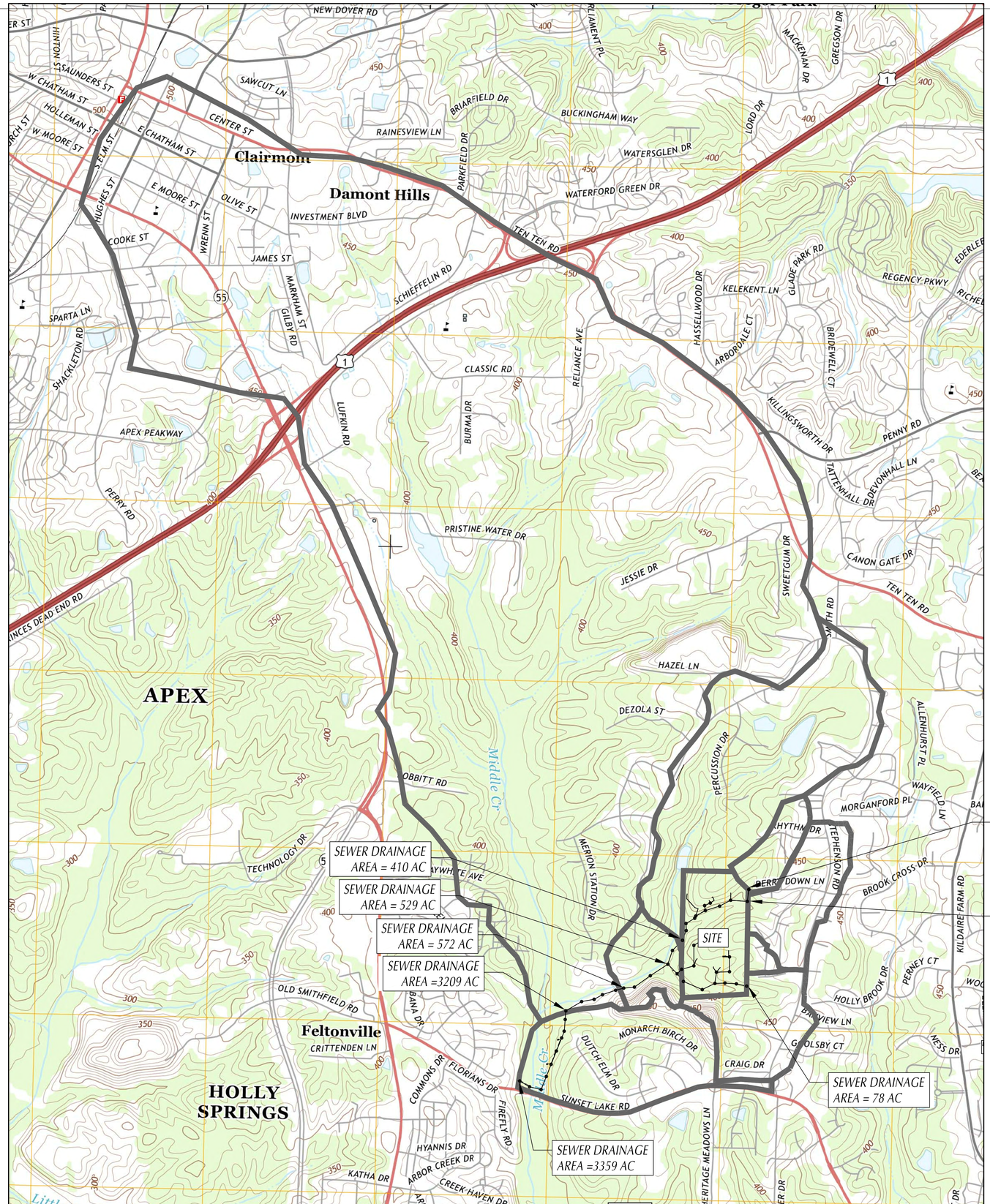
SHEET TITLE

OVERALL OFFSITE UTILITY PLAN

SHEET NUMBER

C-05.10



SEE SHEET C-5.10 FOR OFFSITE UTILITIES.

GRAPHIC SCALE

1000 0 500 1000 2000 4000

(IN FEET)
1 inch = 1000 ft.

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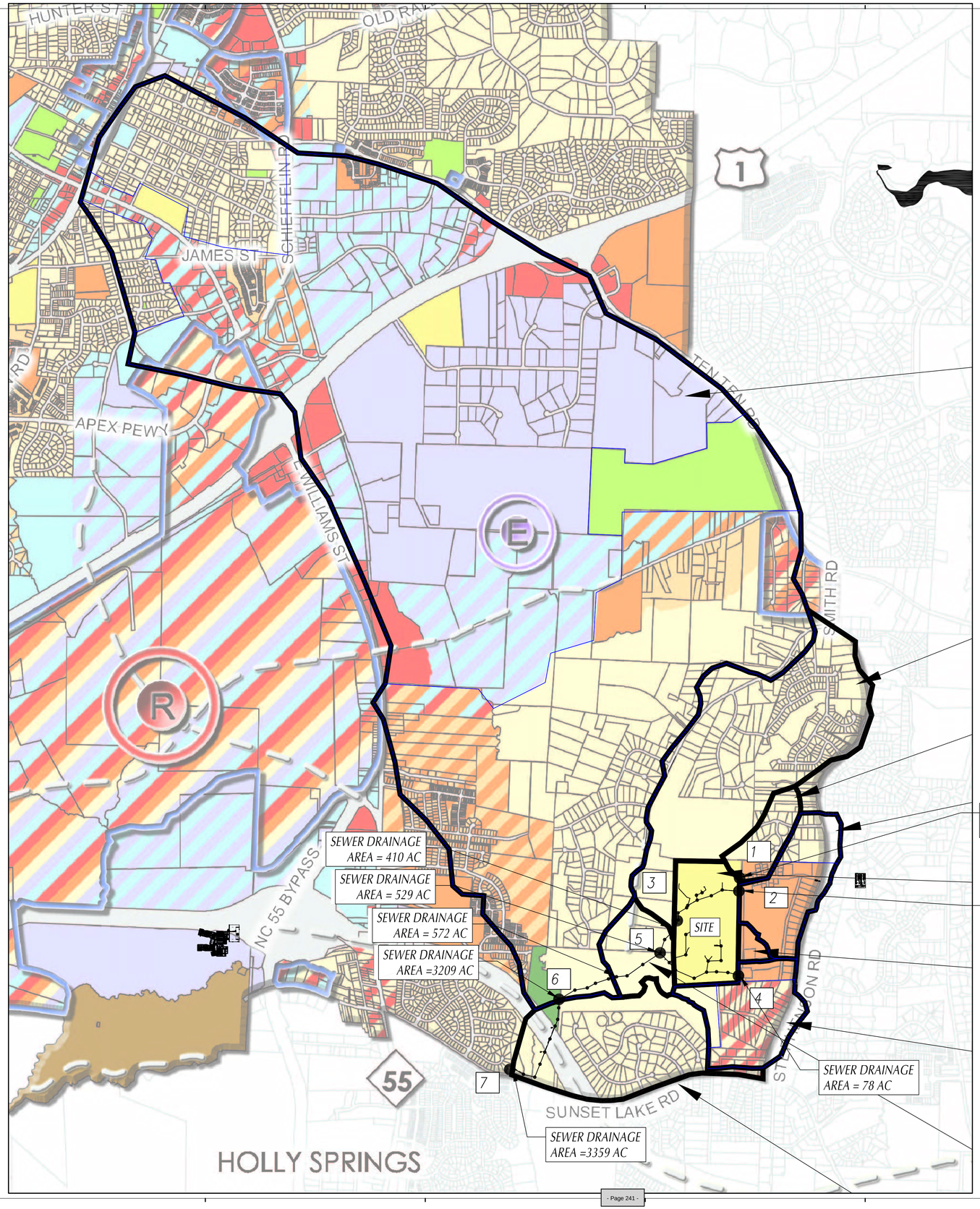
PROJECT NO. 02000.000

SHEET TITLE

OVERALL SEWER DRAINAGE AREA MAP

SHEET NUMBER

C-05.11



SEE SHEET C-5.10 FOR OFFSITE UTILITIES.

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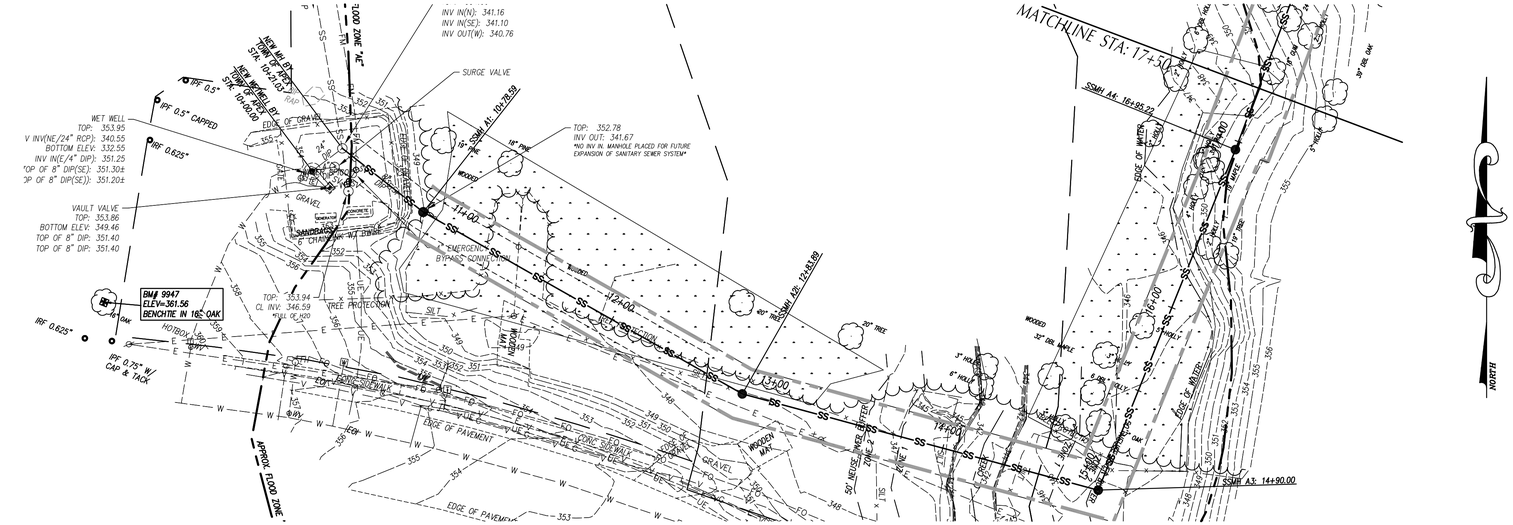
PROJECT NO. 02000.000

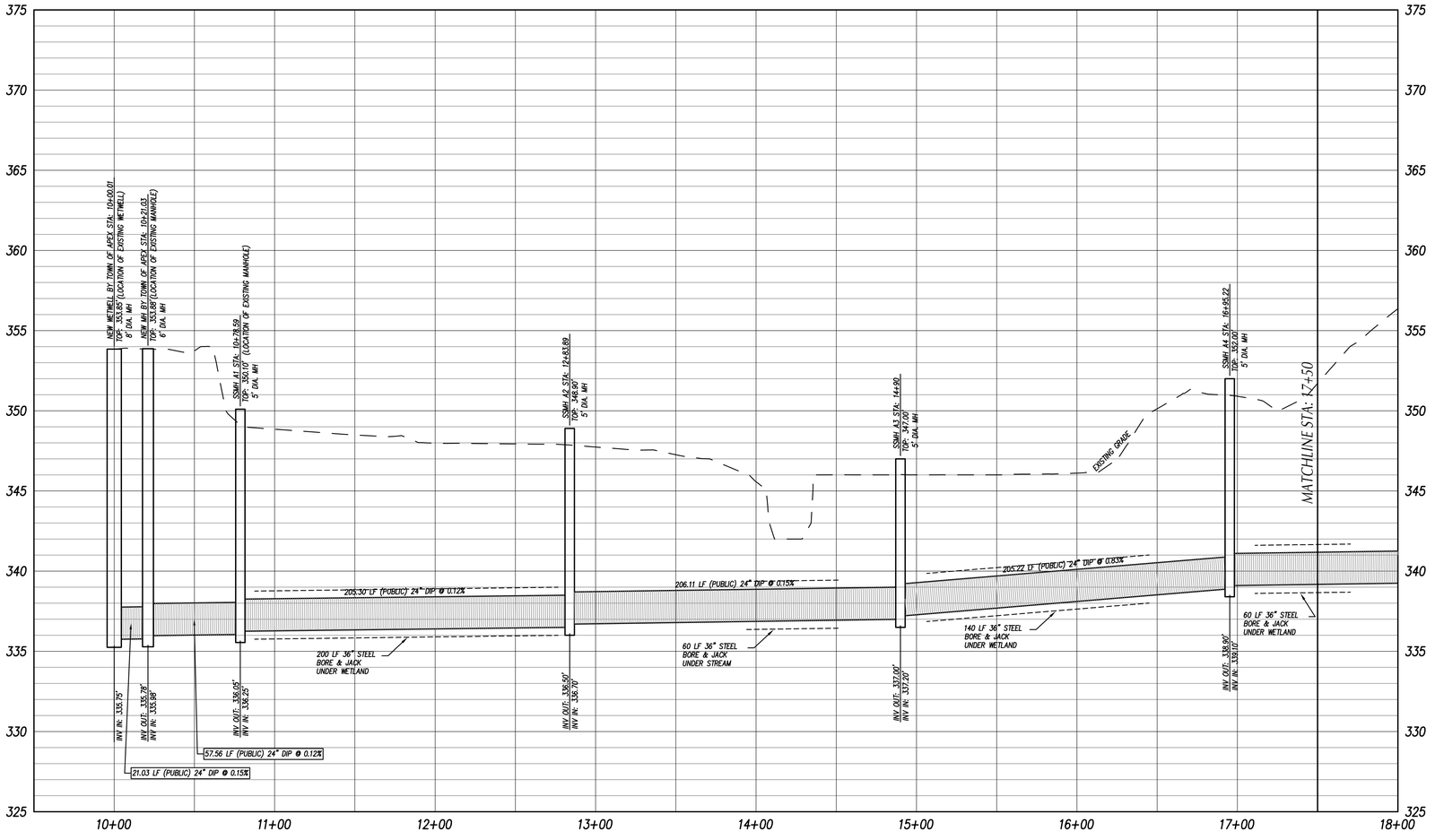
SHEET TITLE

OVERALL SEWER DRAINAGE AREA MAP

SHEET NUMBER

C-05.12





GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.
HORIZONTAL SCALE: 1"=40' VERTICAL SCALE 1"=4'

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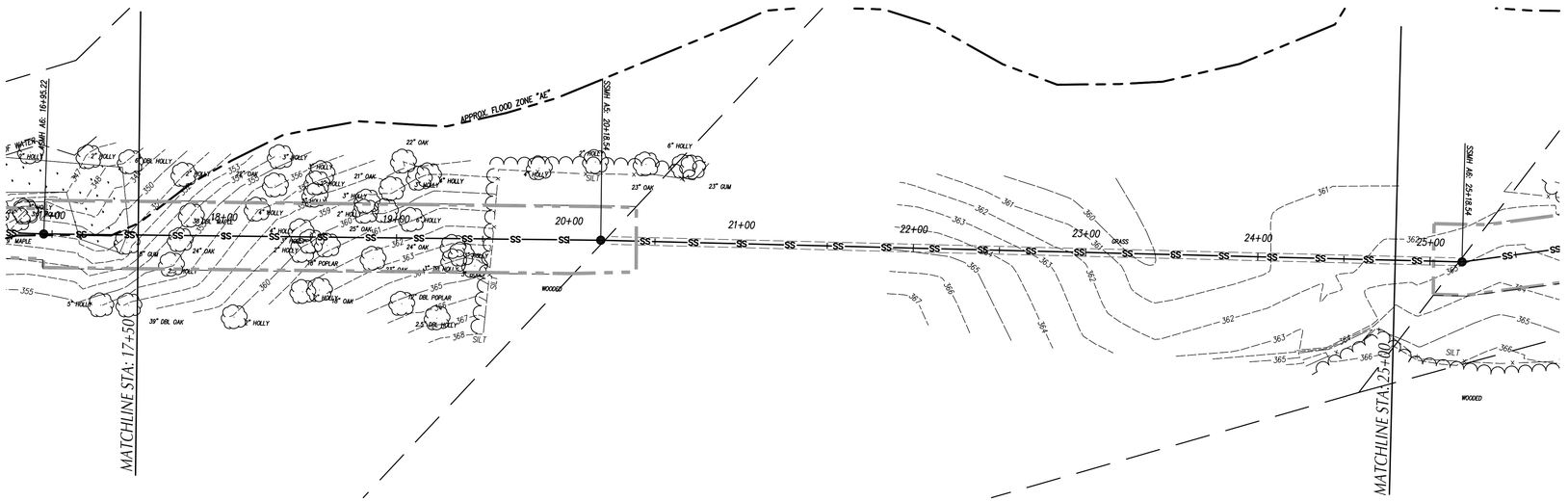
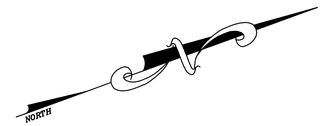
SHEET TITLE
SANITARY SEWER PLAN & PROFILE LINE 'A'

SHEET NUMBER
C-05.13





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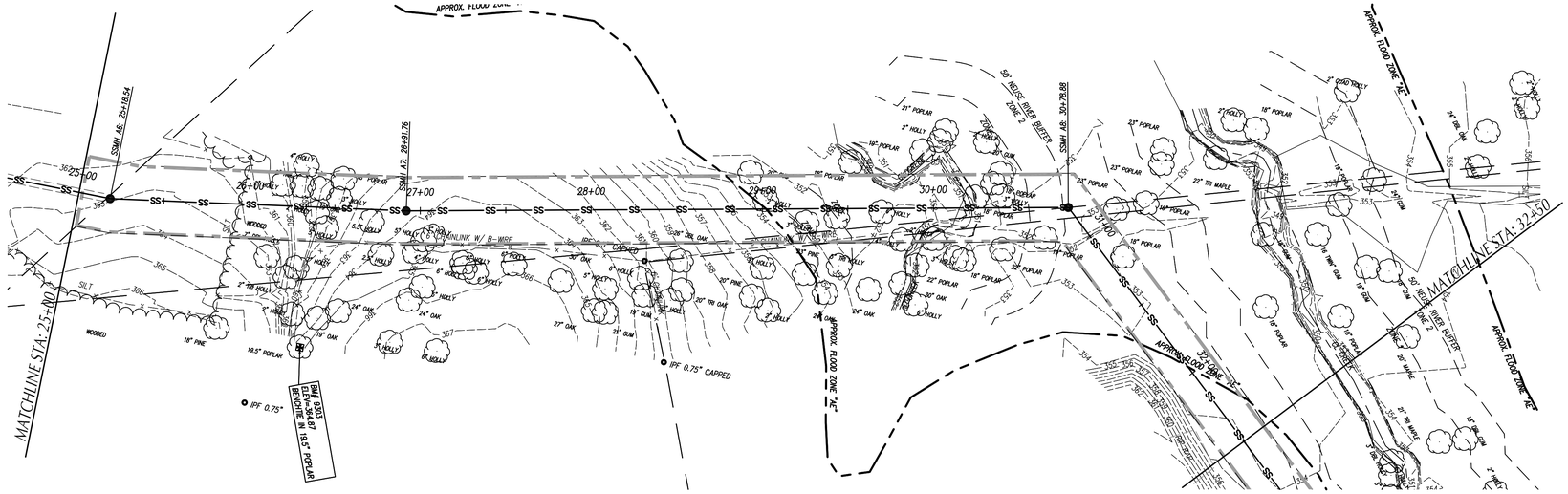
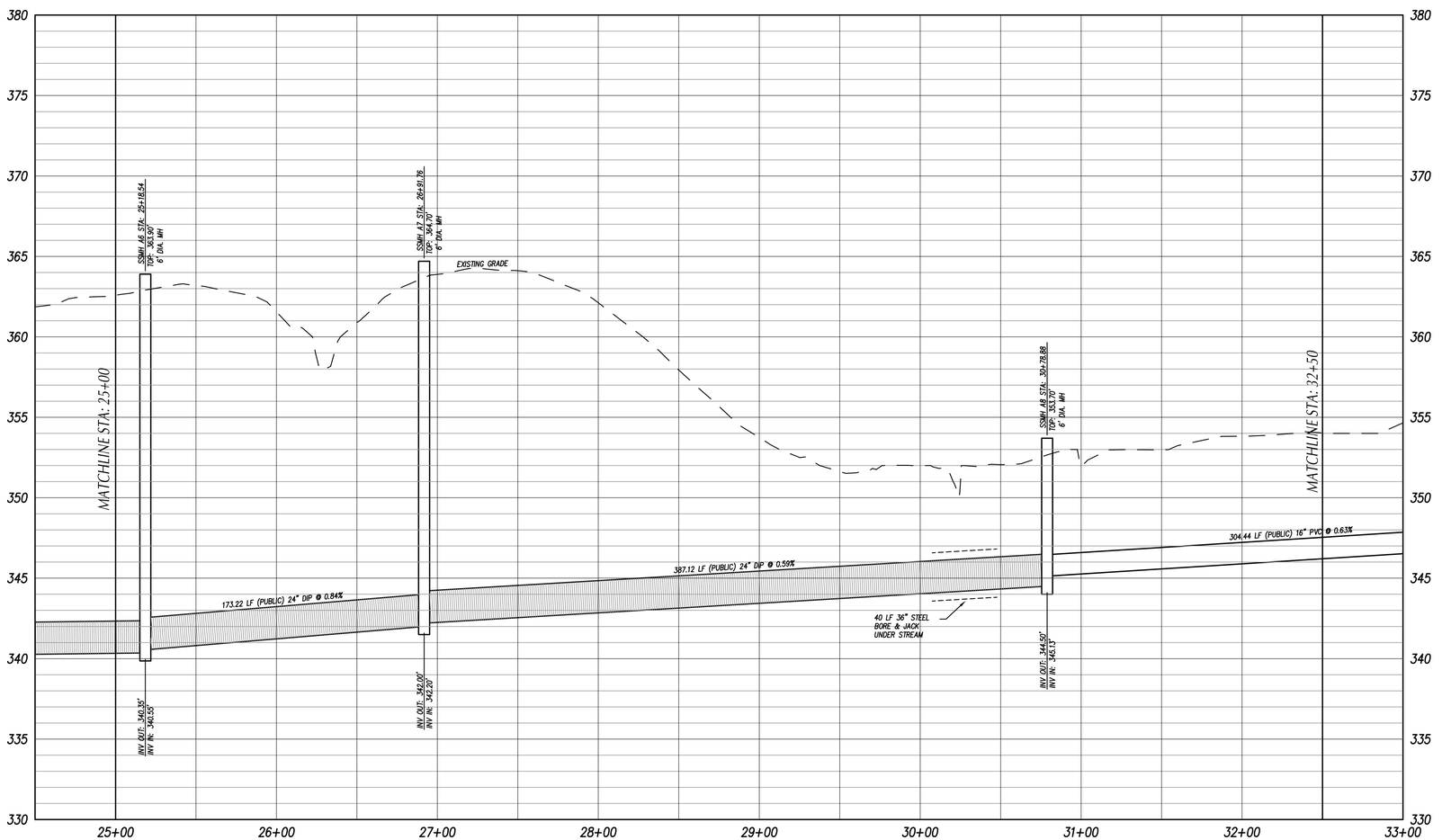
SHEET TITLE
SANITARY SEWER PLAN & PROFILE LINE 'A'

SHEET NUMBER
C-05.14





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SHEET TITLE
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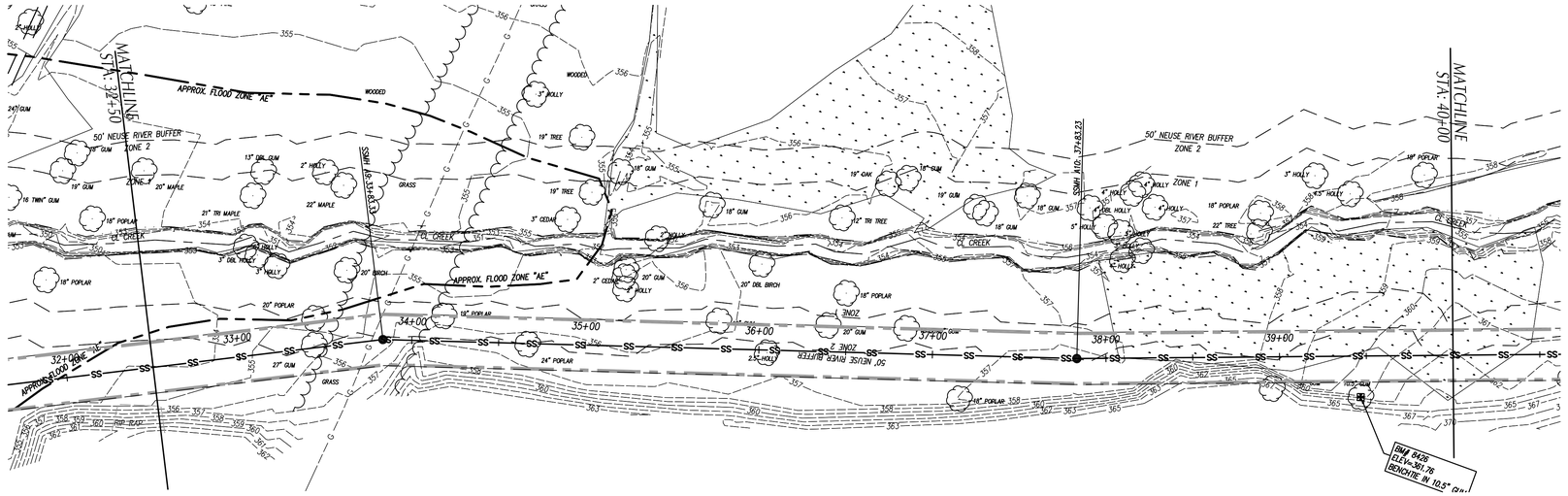
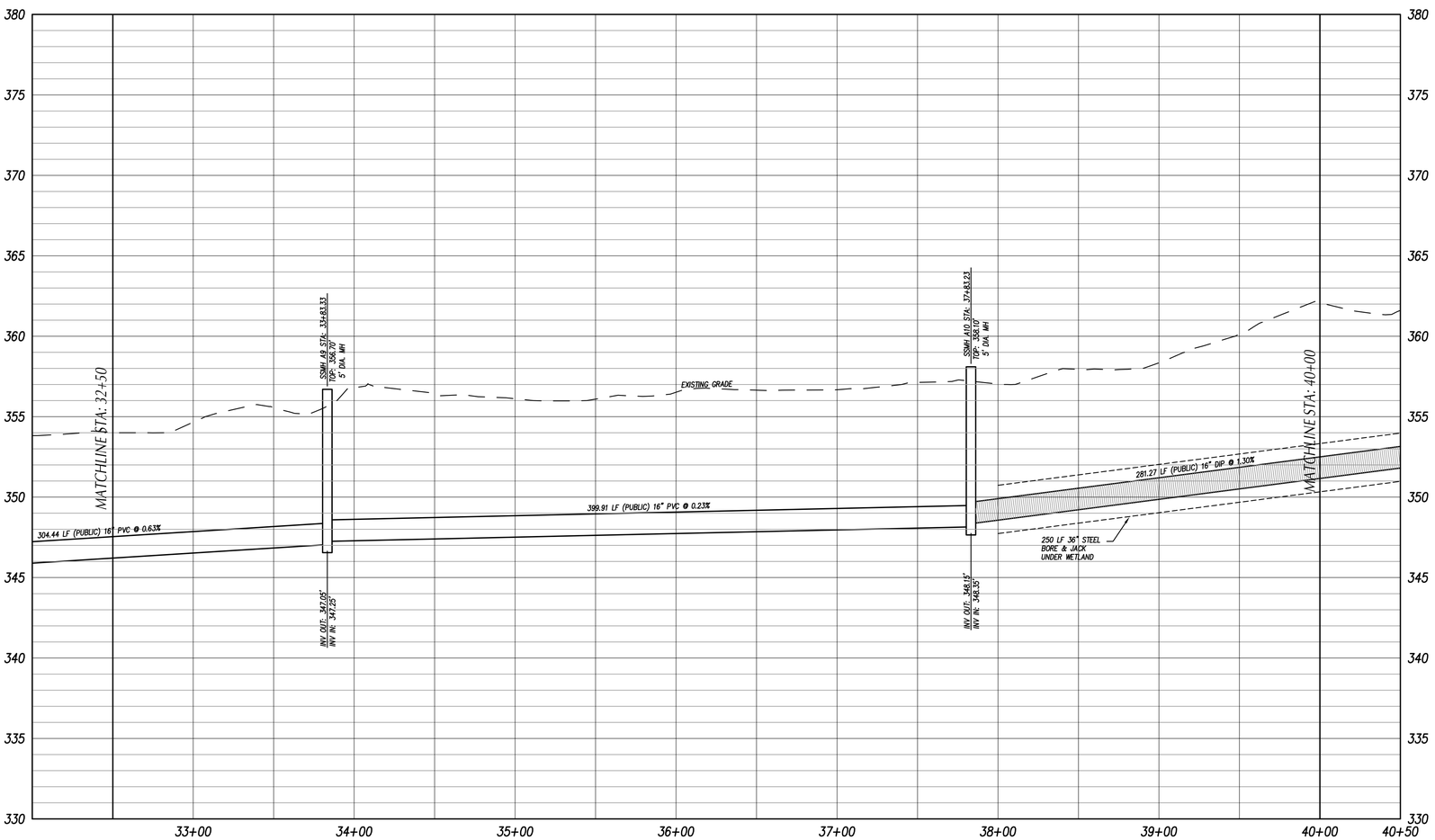
SHEET NUMBER
C-05.15





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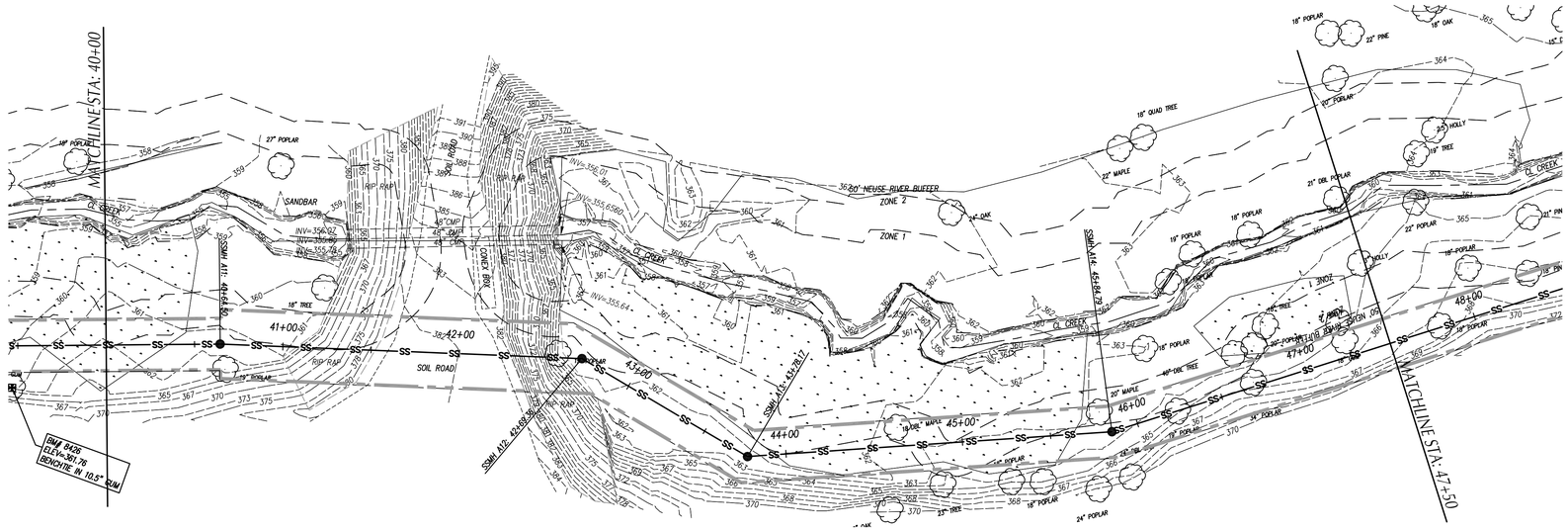
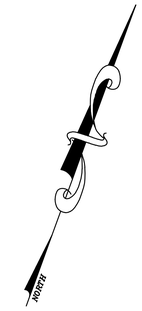
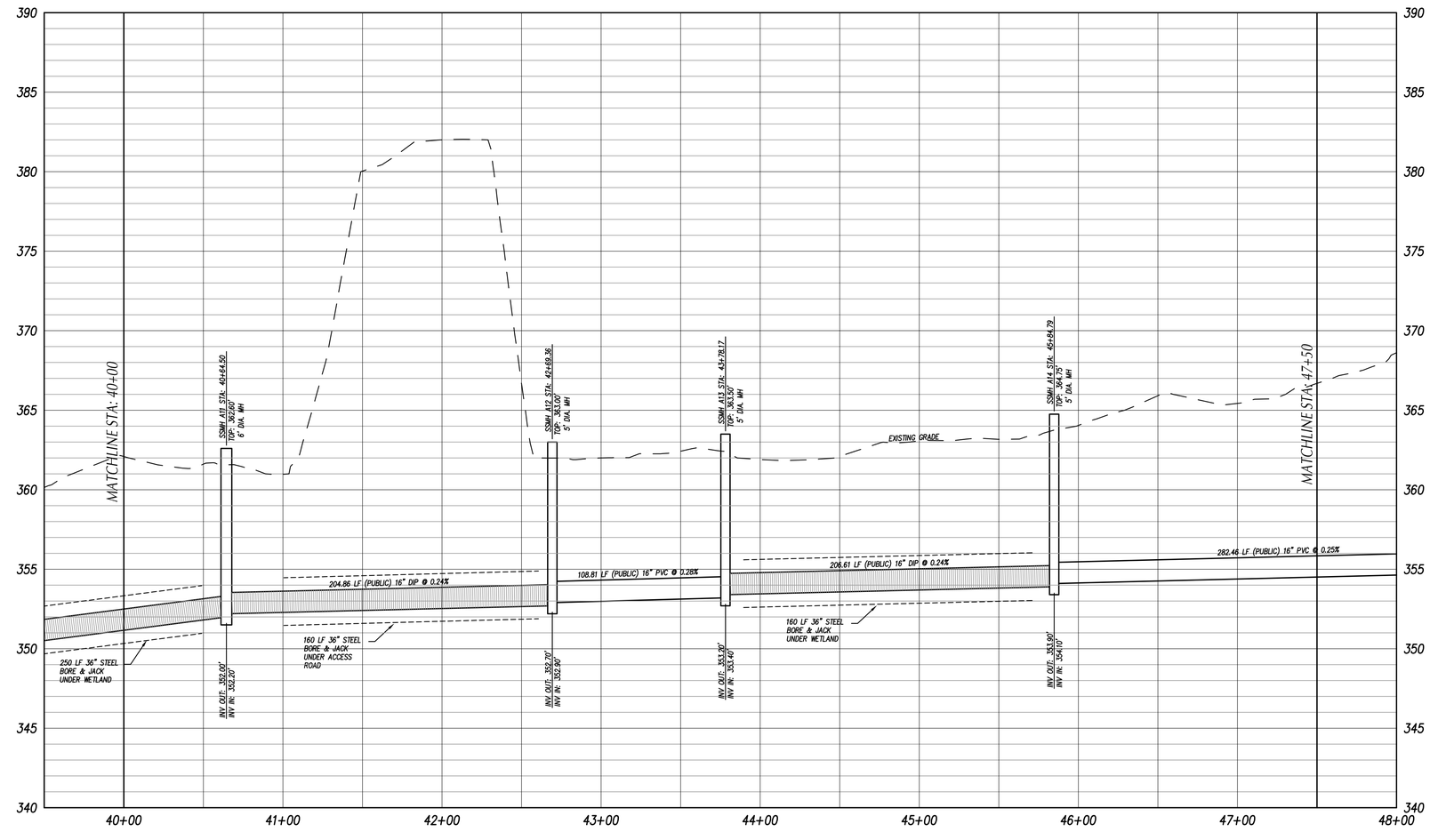
SHEET TITLE
SANITARY SEWER PLAN & PROFILE LINE 'A'

SHEET NUMBER
C-05.16







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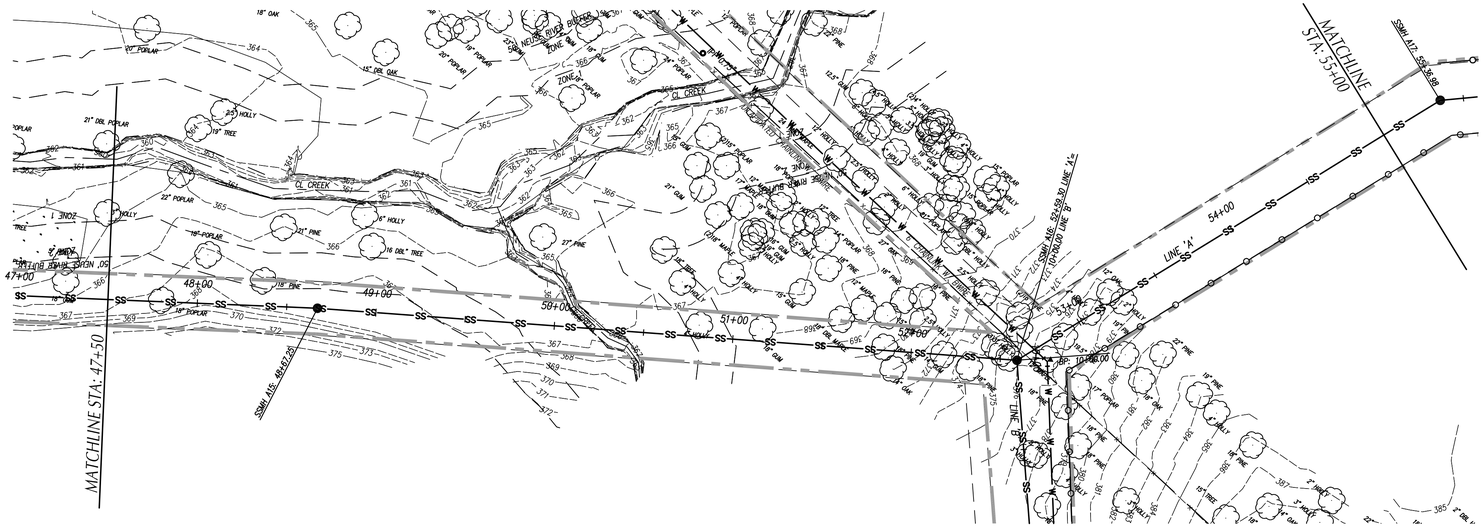
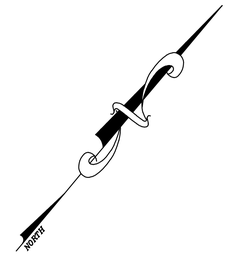
C-05.17





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SHEET TITLE
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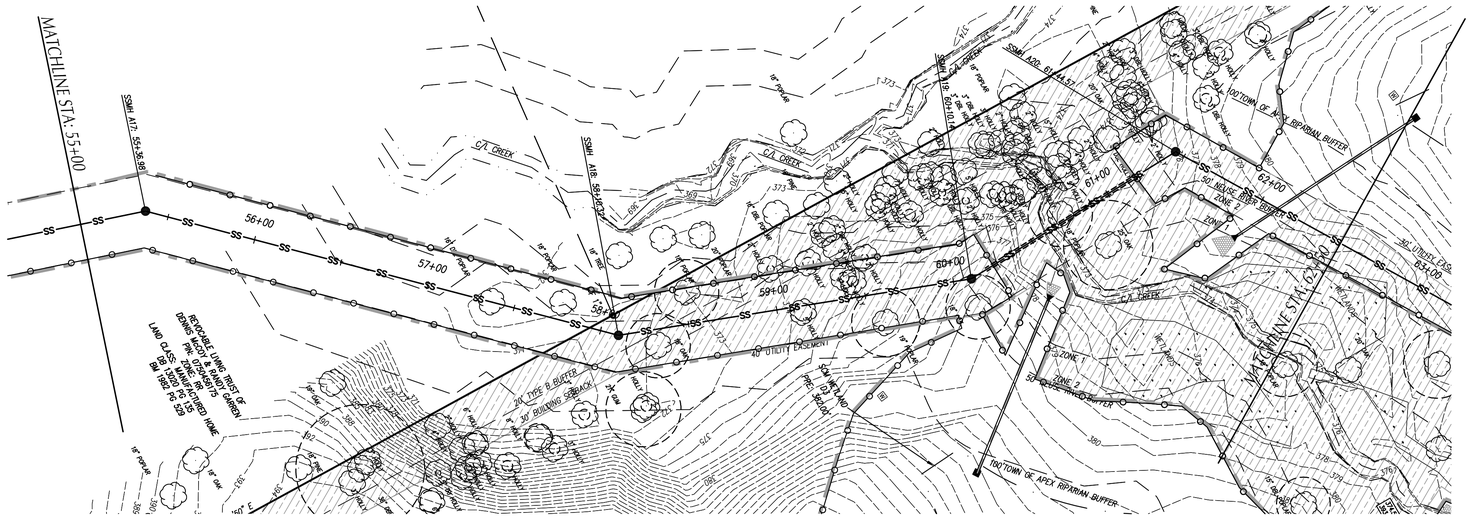
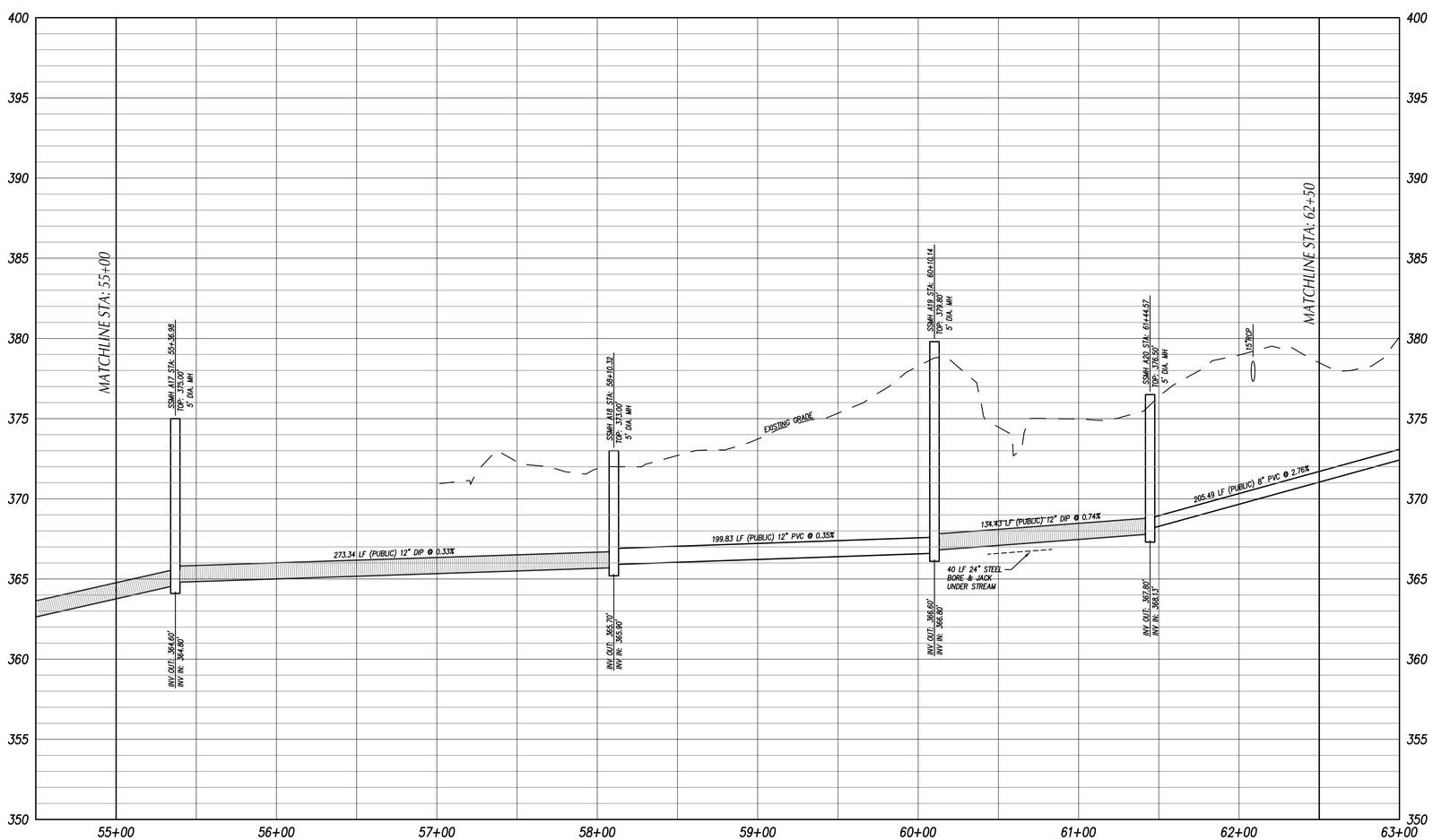
SHEET NUMBER
C-05.18


MATCHLINE STA: 55+00
SSMH A12- 55+36.98
56+00
57+00
58+00
59+00
60+00
61+00
62+00
63+00
SSMH A18- 58+10.32
SSMH A19- 60+10.14
SSMH A20- 61+44.57
MATCHLINE STA: 62+50
C/L CREEK
20' UTILITY EASEMENT
30' BUILDING SETBACK
3X TYPE B BUFFER
50' NEUSE RIVER BUFFER ZONE 1
50' NEUSE RIVER BUFFER ZONE 2
100' TOWN OF APEX RIPARIAN BUFFER
RECORDED LIVING TRUST OF DENNIS MCCOY & SHARON PIN: 0650-04-9075
LAND CLASS: SINGLE WIDED HOME
DB 1820, PG 135
DB 1882, PG 529
NORTH



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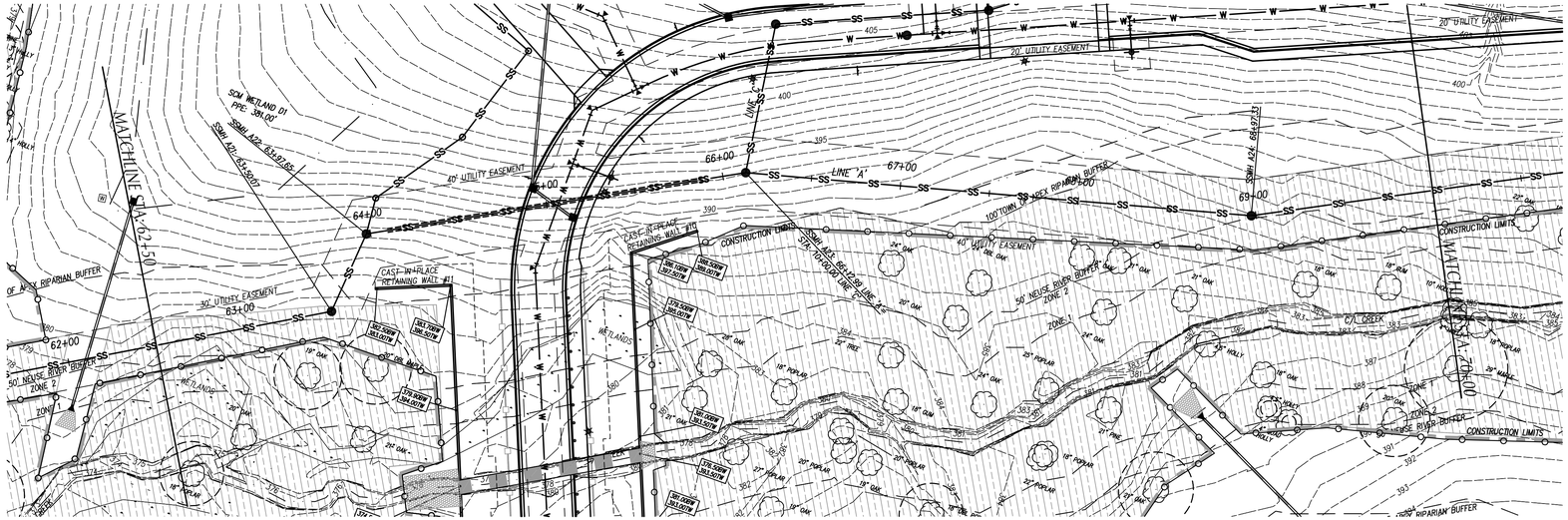
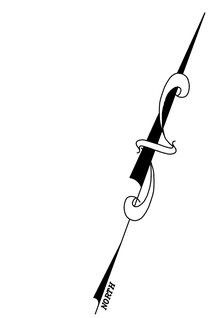
SHEET NUMBER
C-05.19





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SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
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4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

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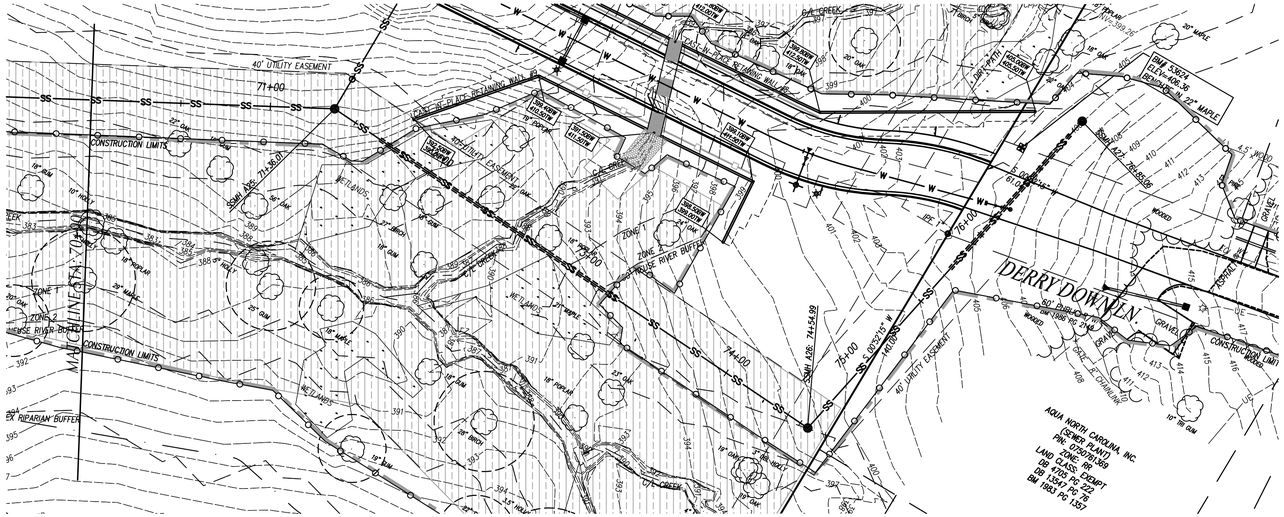
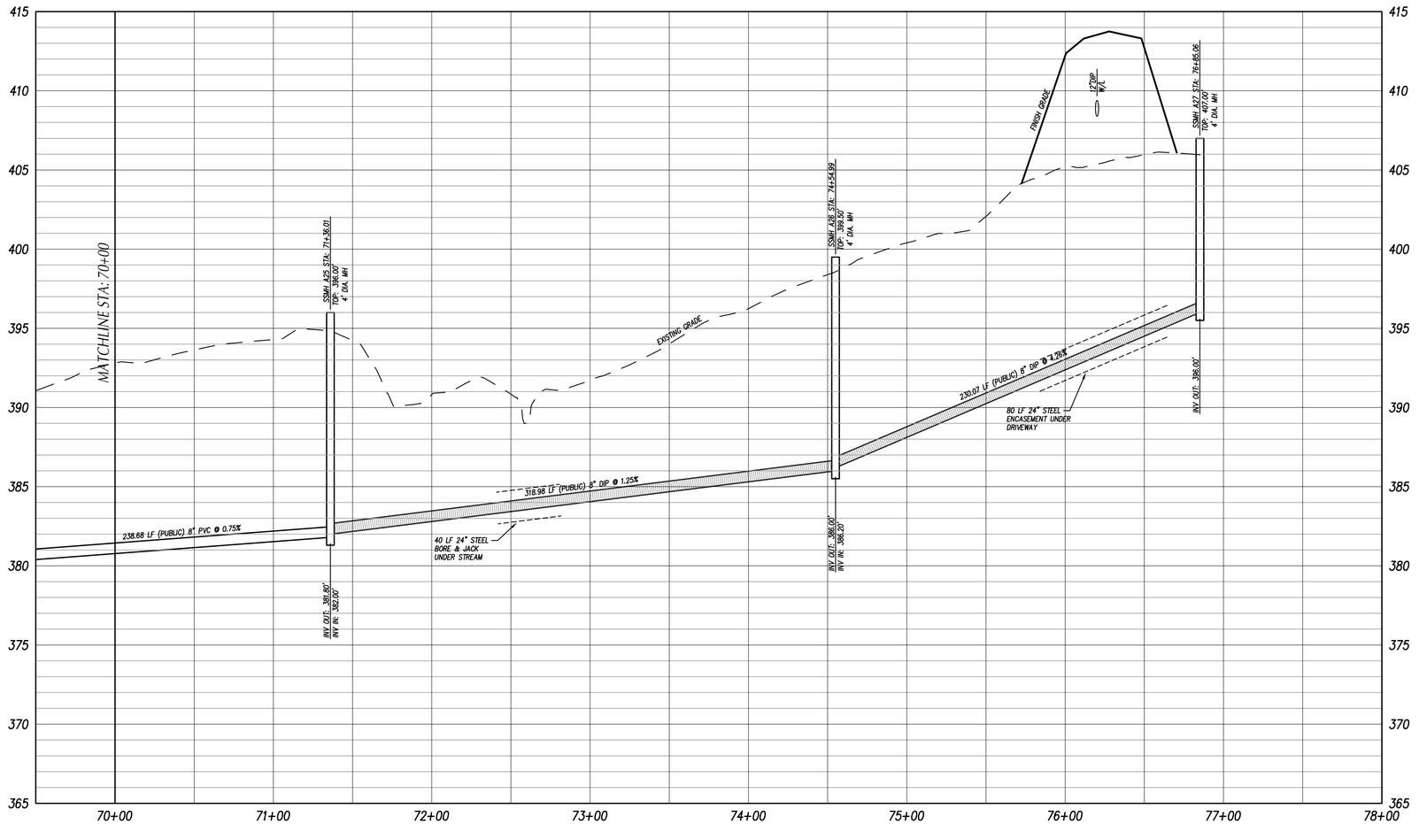
PROJECT NO. 02000.000

SHEET TITLE
SANITARY SEWER PLAN & PROFILE LINE 'A'

SHEET NUMBER
C-05.20





GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.
HORIZONTAL SCALE: 1"=40' VERTICAL SCALE 1"=4'

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SHEET TITLE
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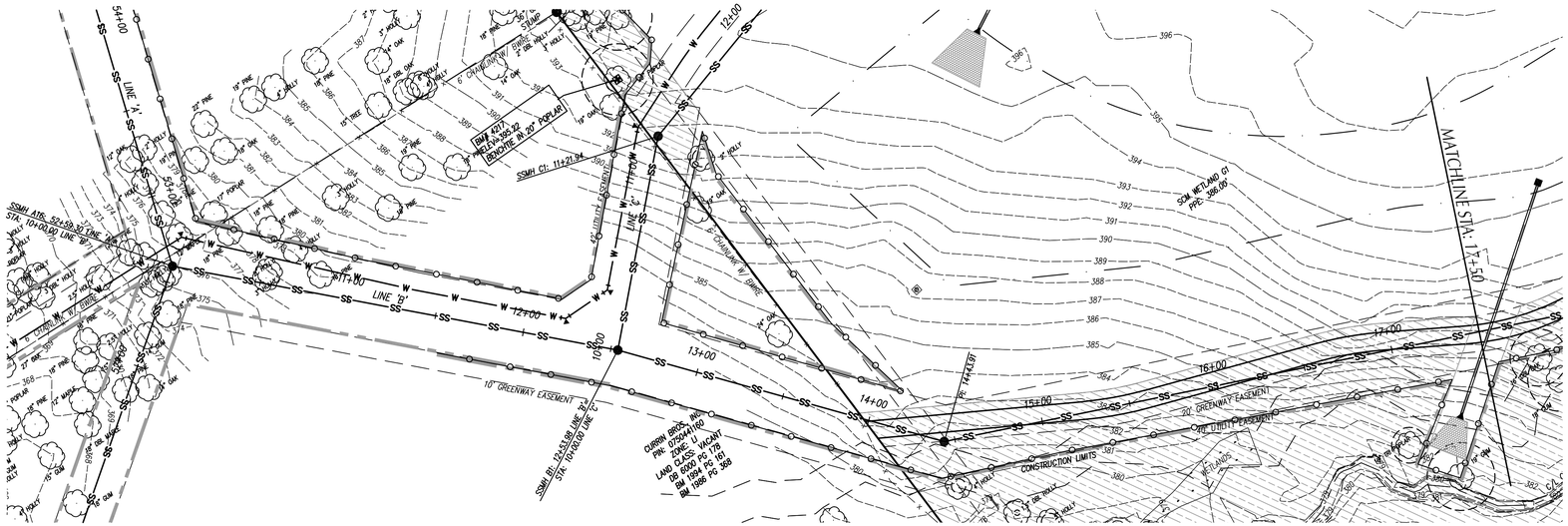
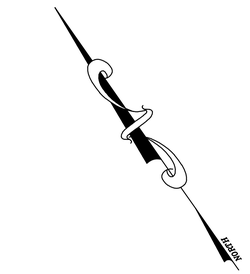
SHEET NUMBER
C-05.21





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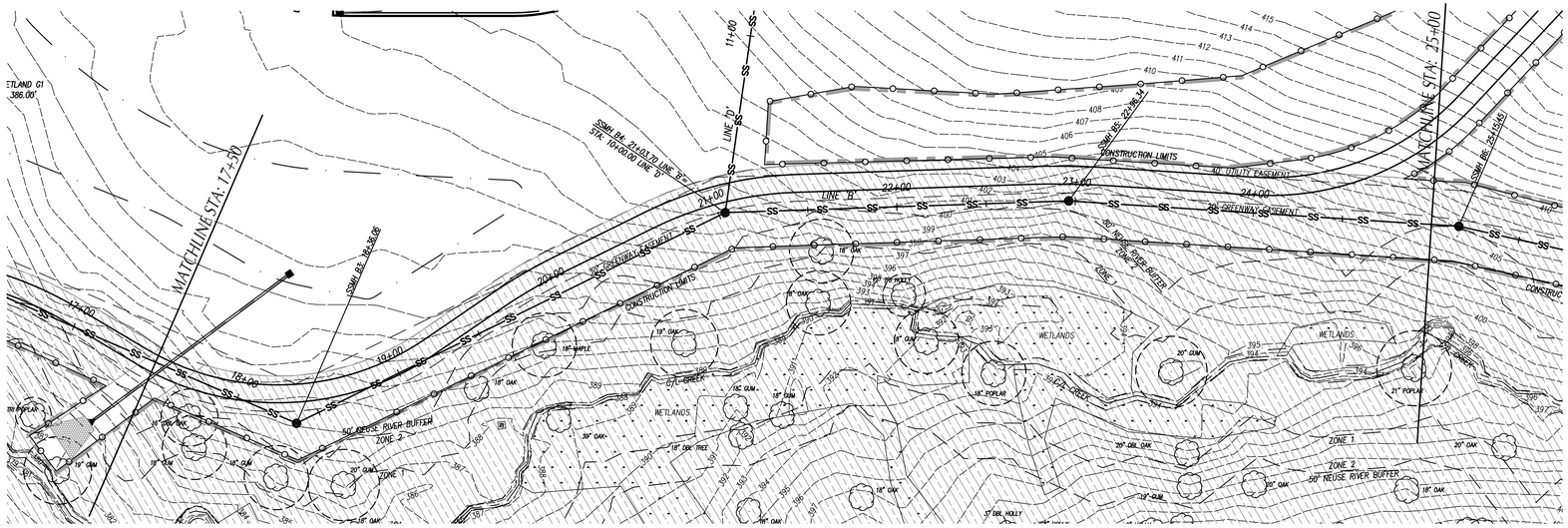
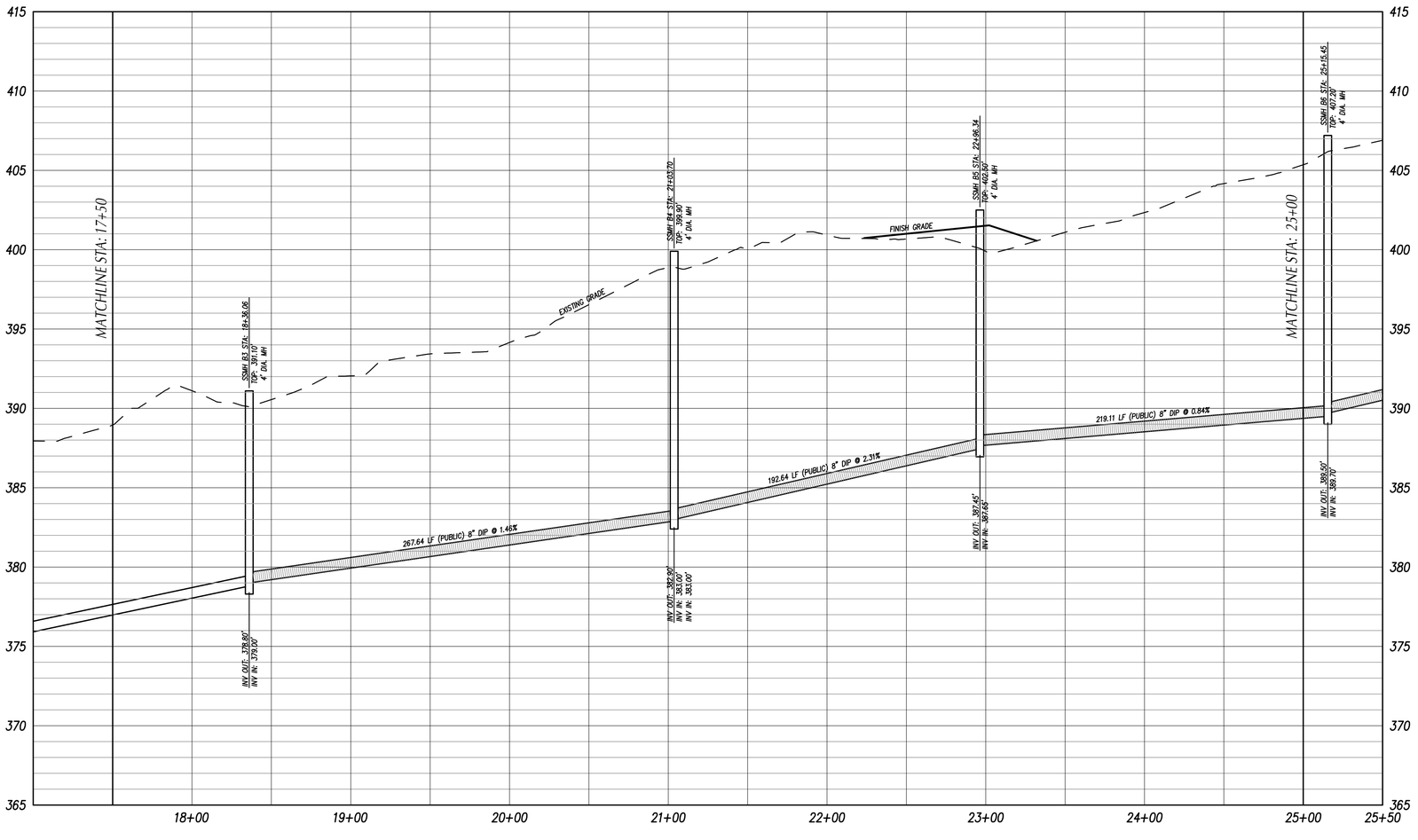
SHEET TITLE

SANITARY SEWER PLAN & PROFILE LINE 'B'

SHEET NUMBER

C-05.22





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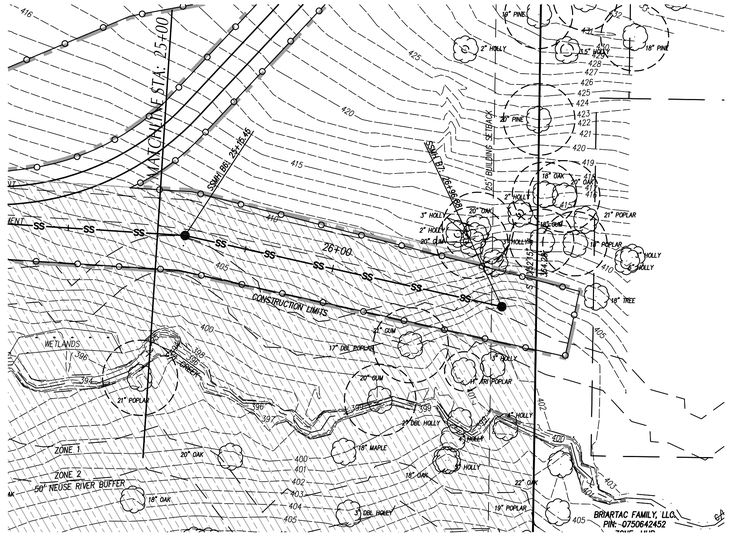
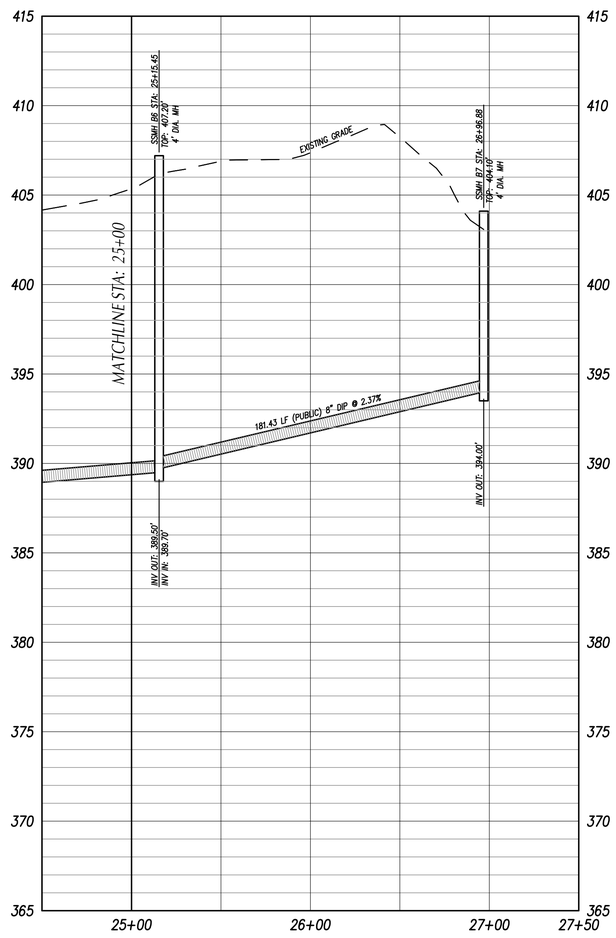
SHEET TITLE
SANITARY SEWER PLAN & PROFILE LINE 'B'

SHEET NUMBER
C-05.23





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SHEET TITLE
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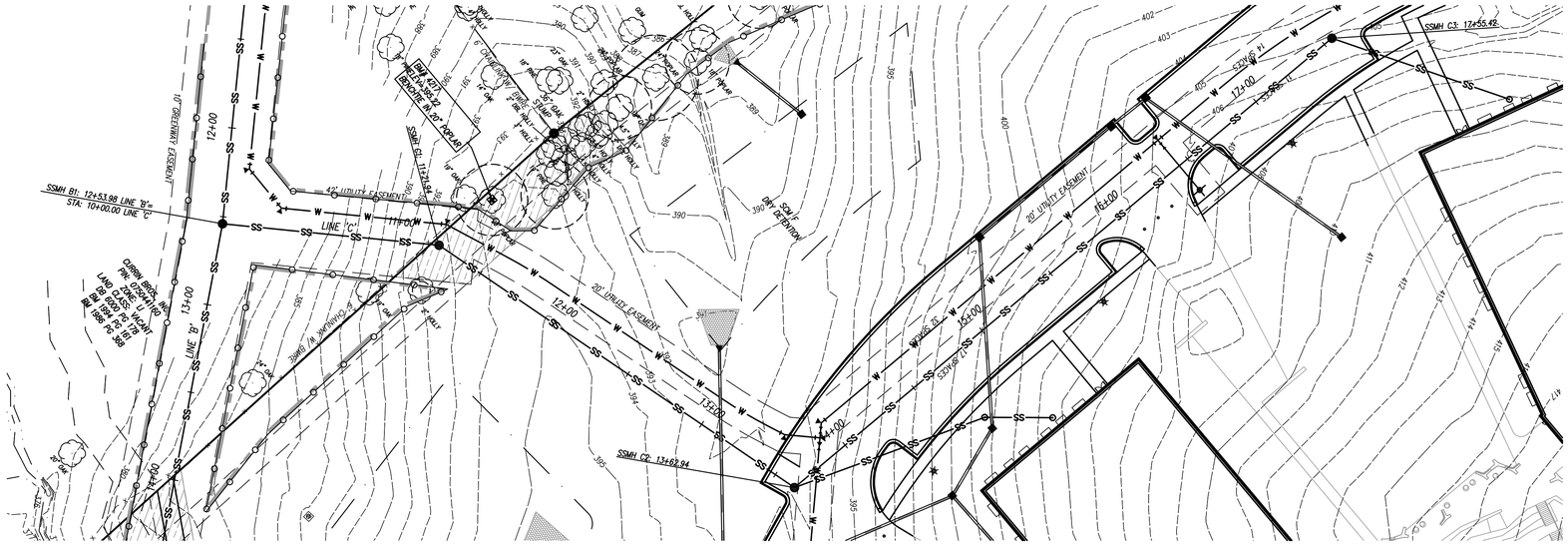
SHEET NUMBER
C-05.24



NORTH

GRAPHIC SCALE

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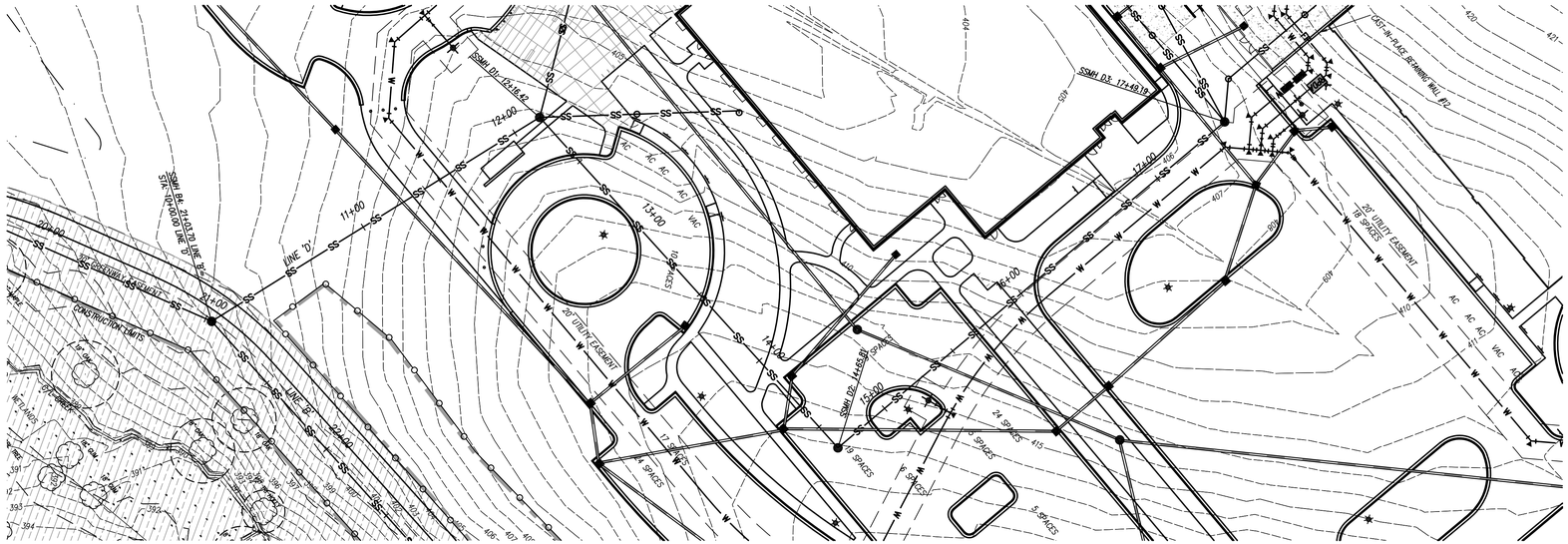
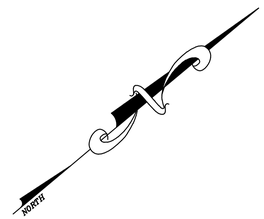
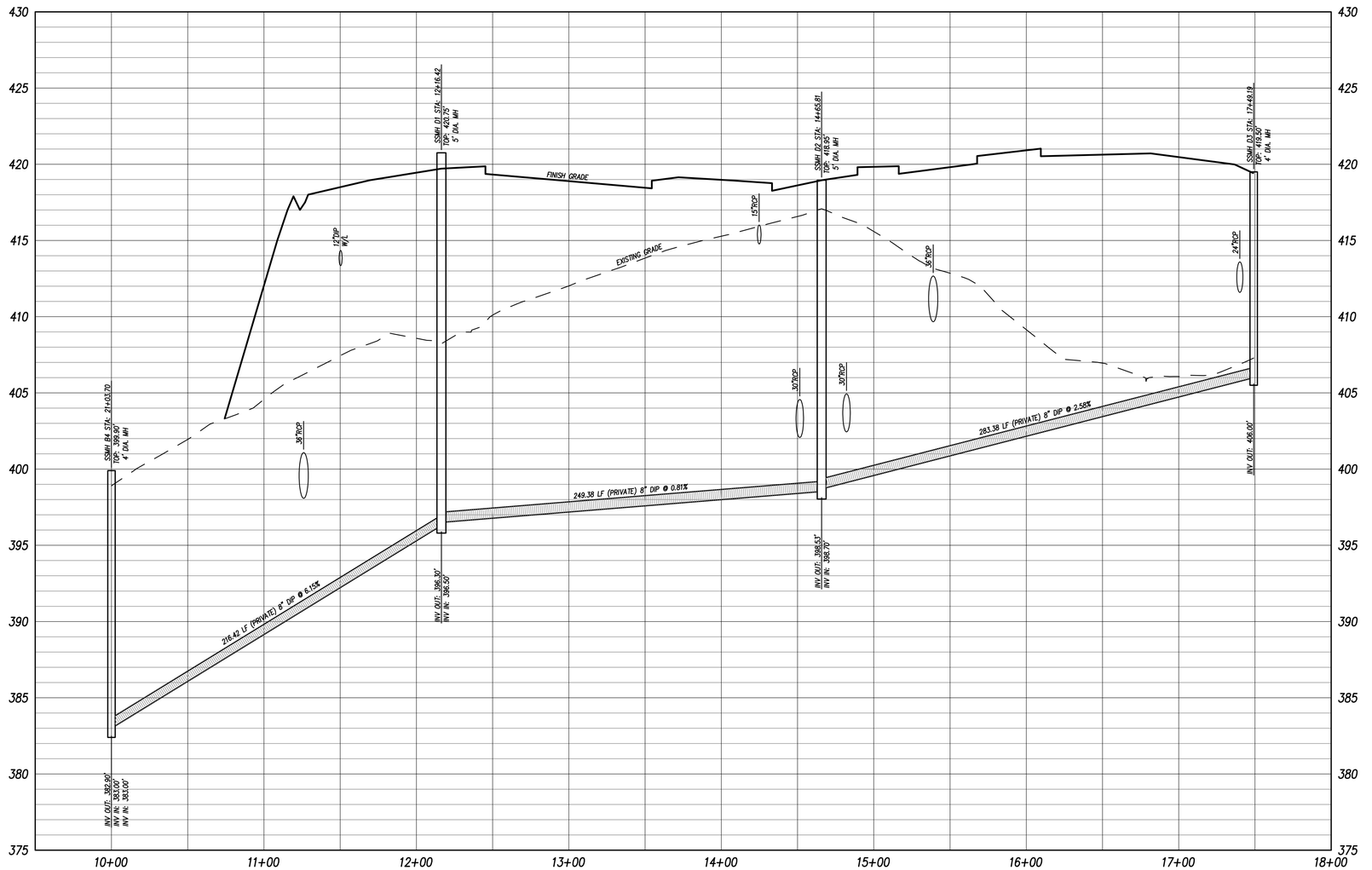
SHEET TITLE
SANITARY SEWER PLAN & PROFILE LINE 'C'

SHEET NUMBER
C-05.25







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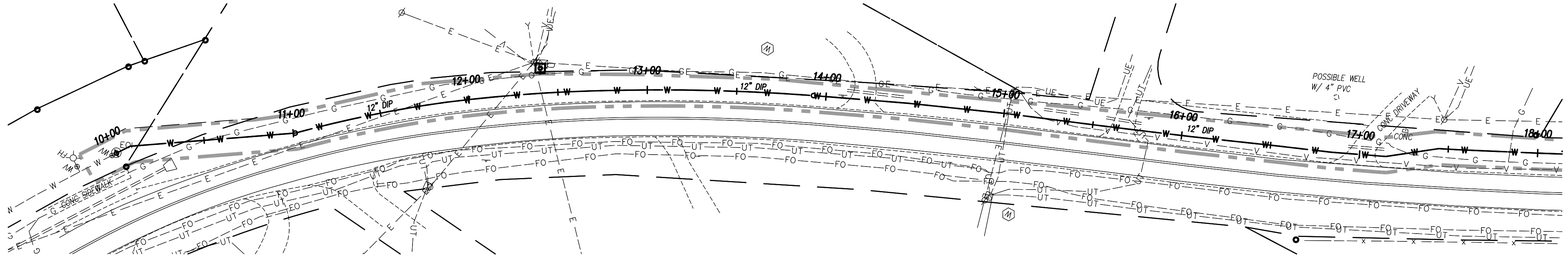
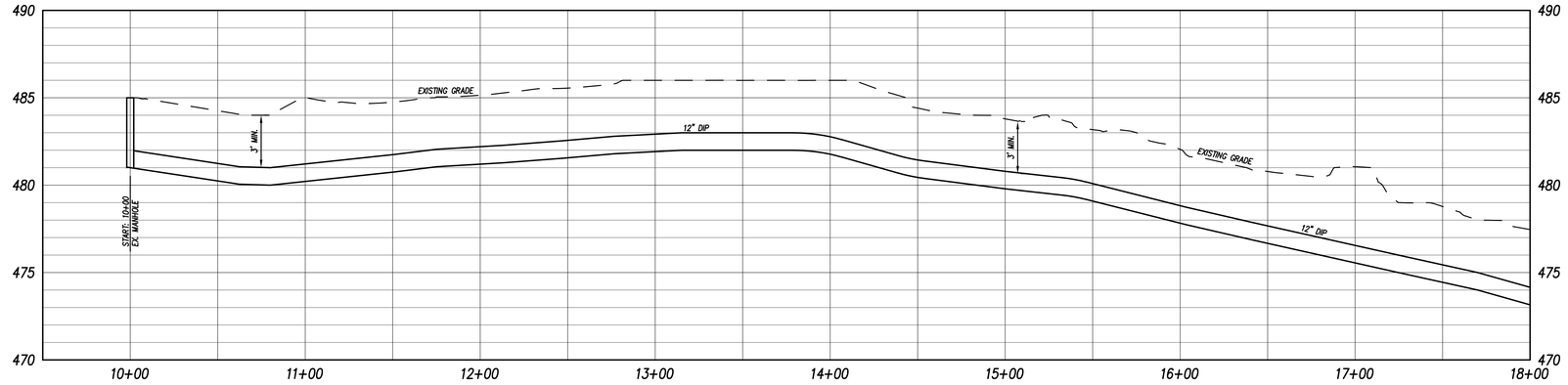
SHEET TITLE

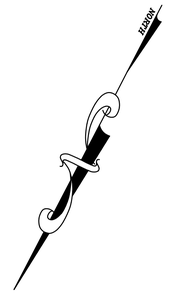
SANITARY SEWER PLAN & PROFILE LINE 'D'

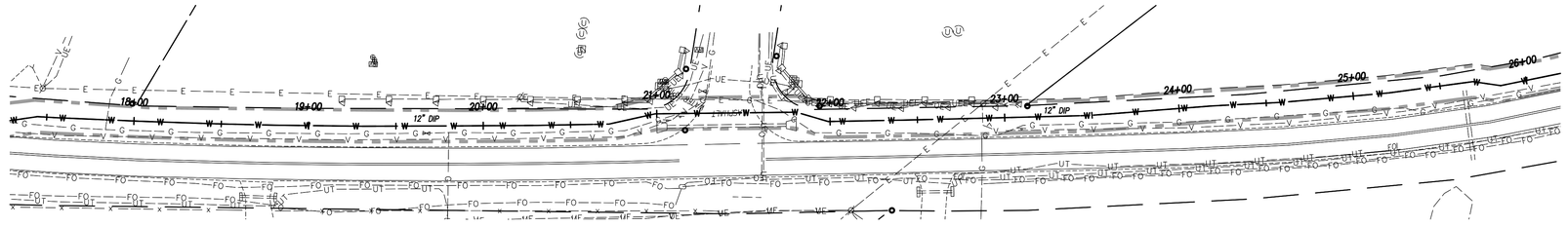
SHEET NUMBER

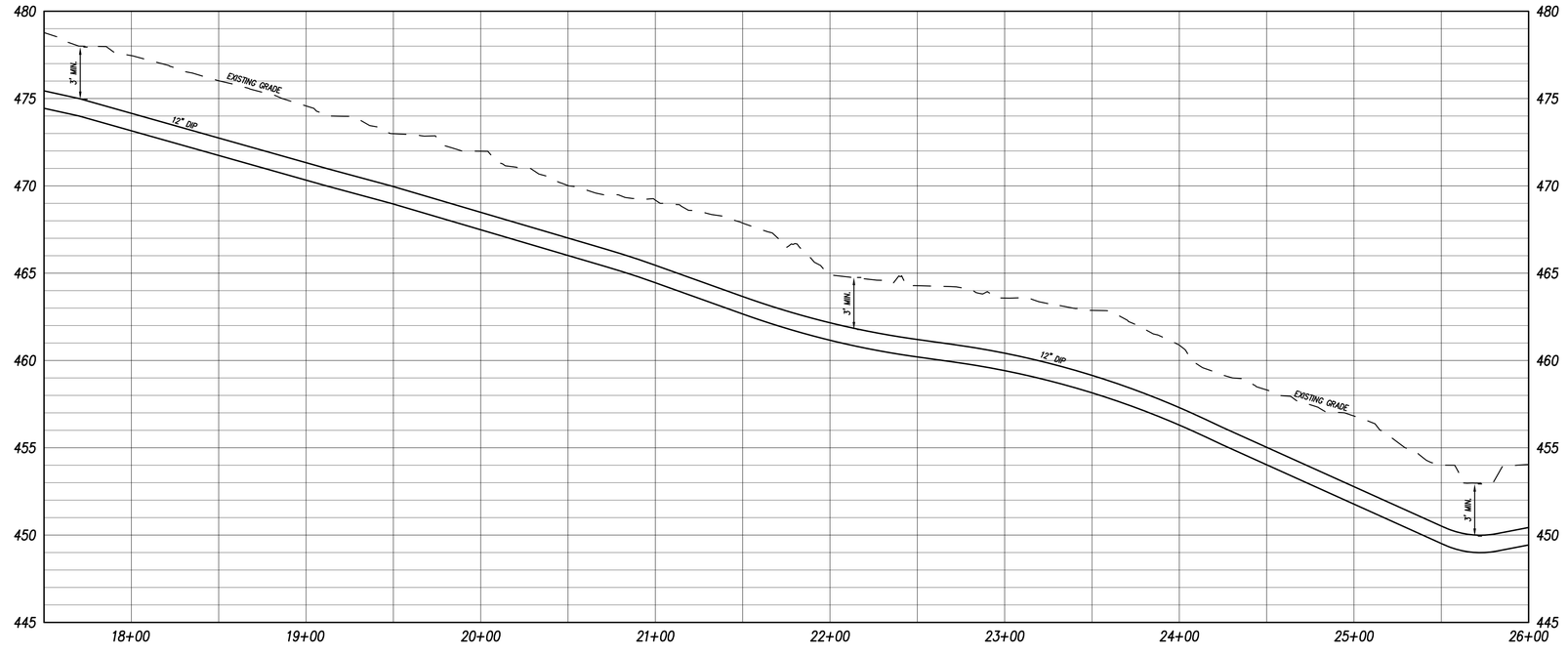
C-05.26

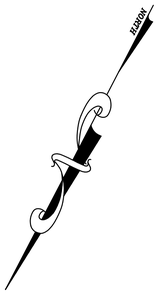












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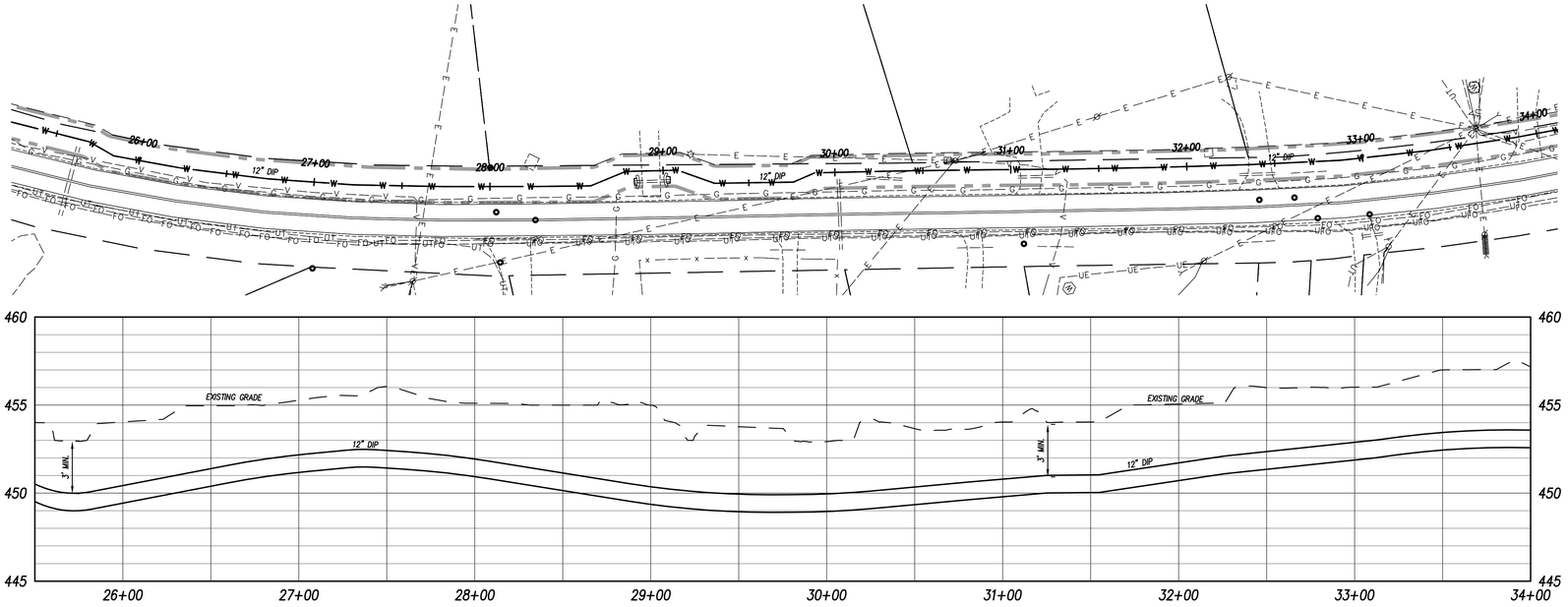
PROJECT NO. 02000.000

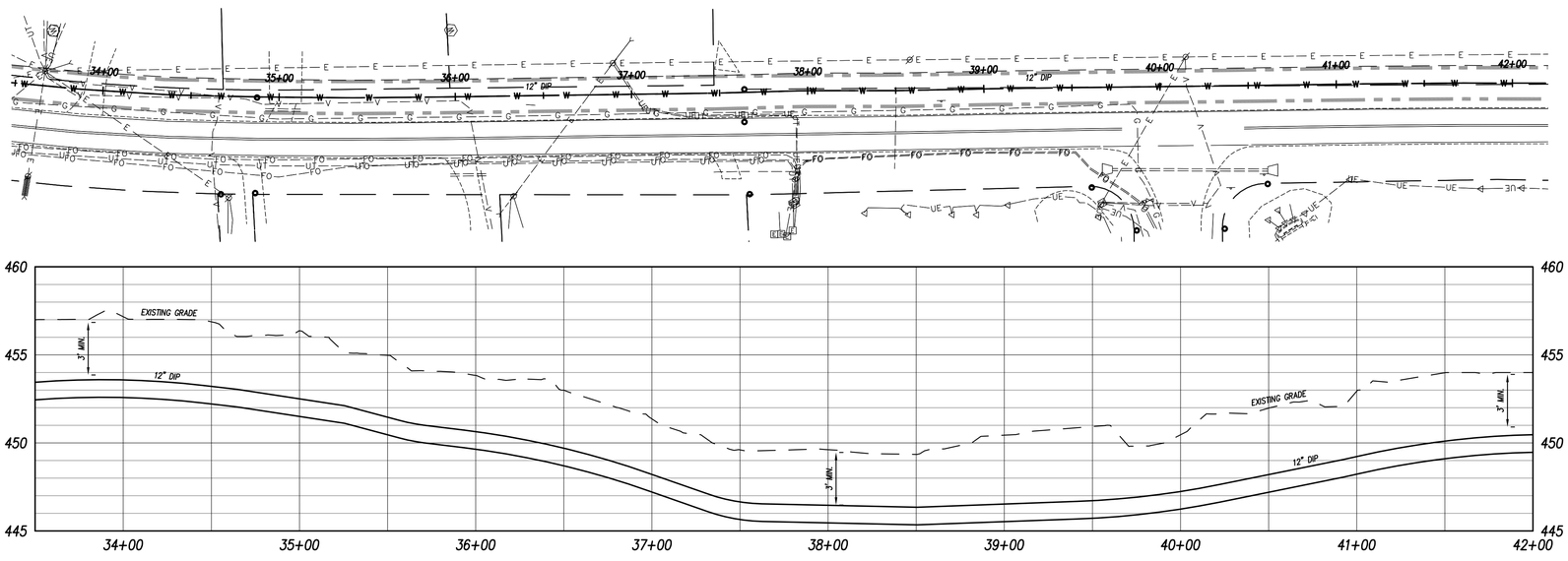
SHEET TITLE

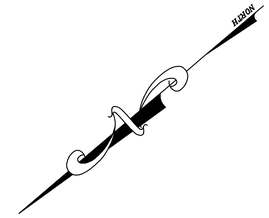
WATER
PLAN & PROFILE
LINE 'A'

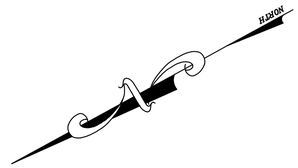
SHEET NUMBER

C-05.27









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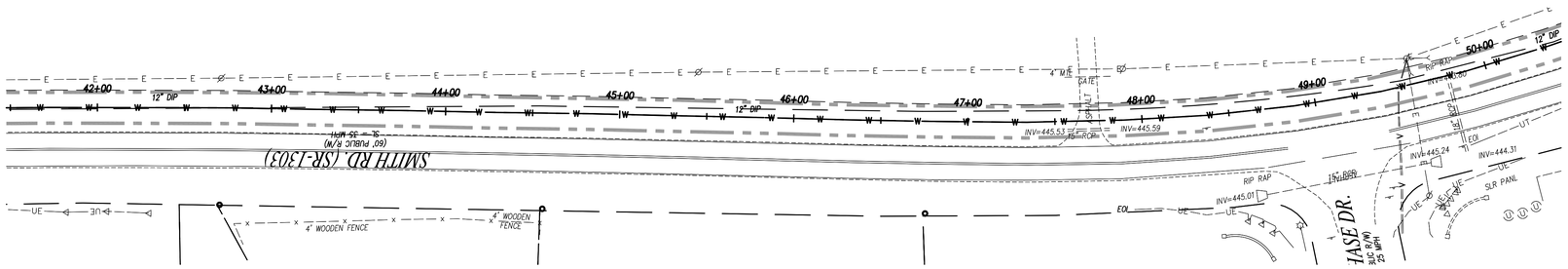
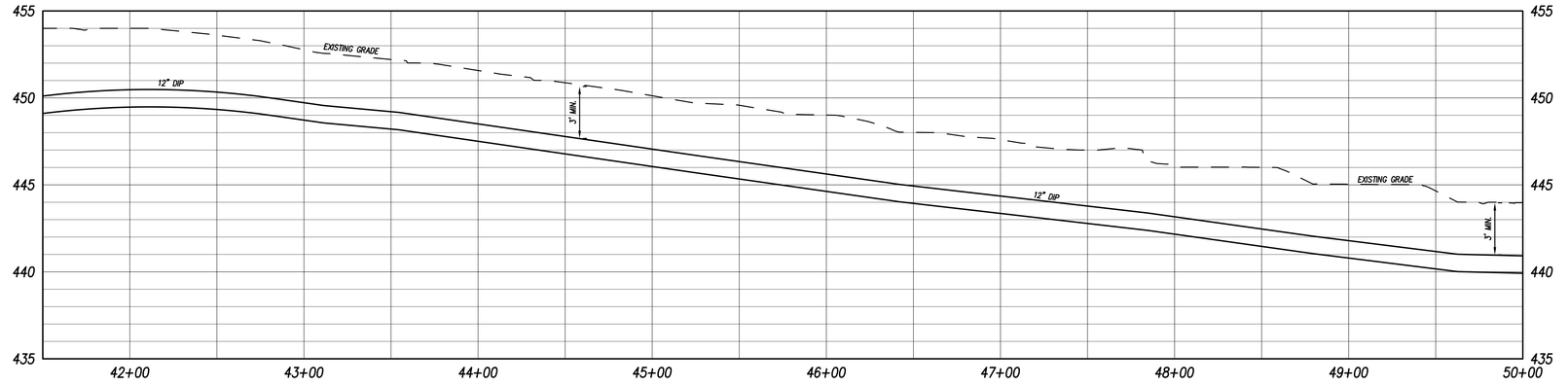
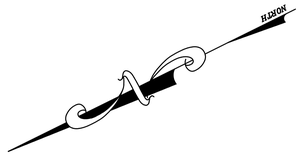
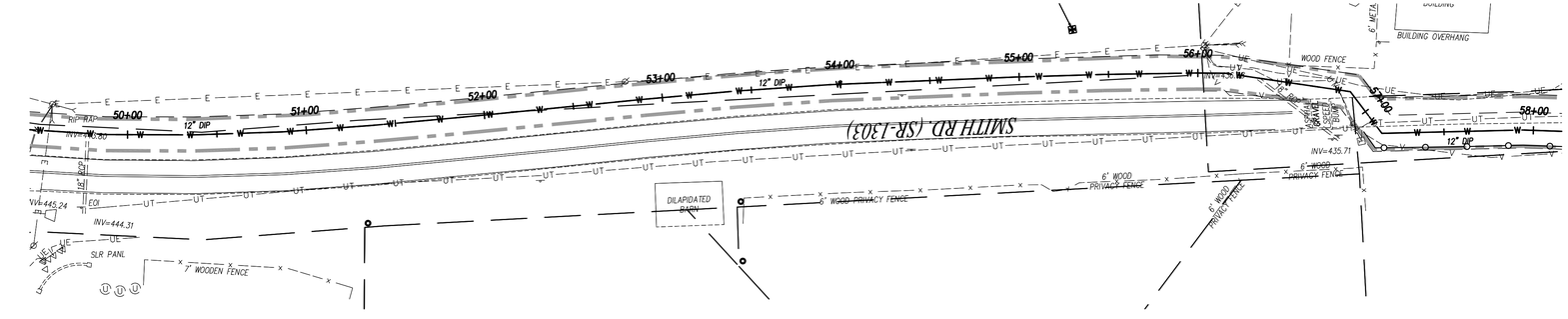
SHEET TITLE
WATER
PLAN & PROFILE
LINE 'A'

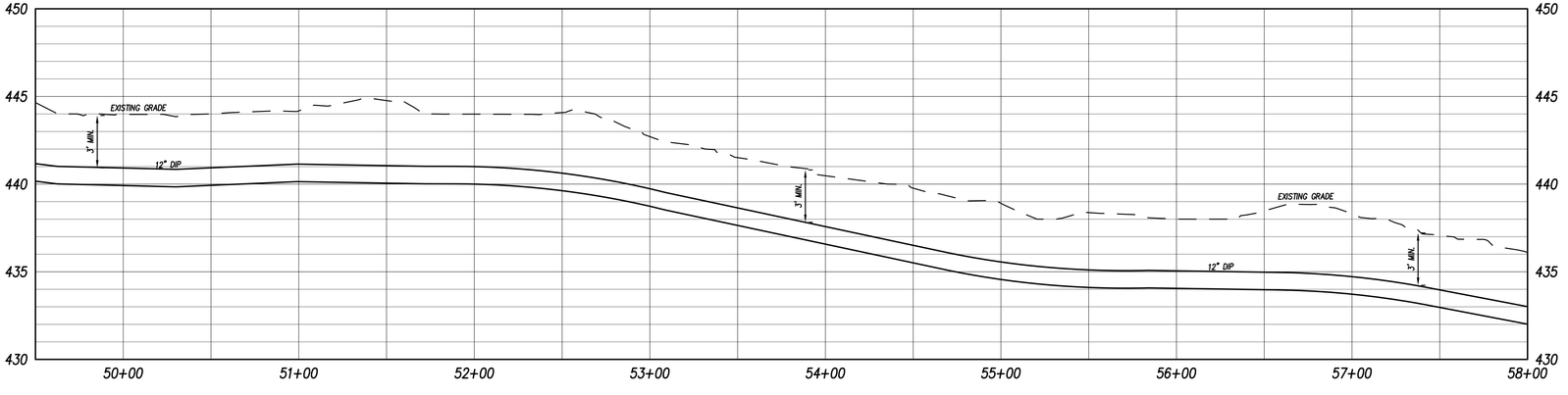
SHEET NUMBER
C-05.28











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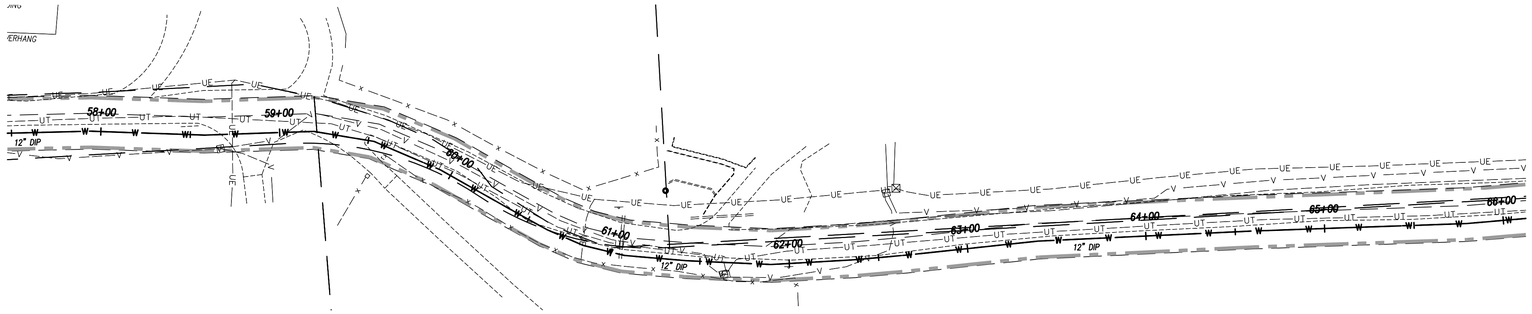
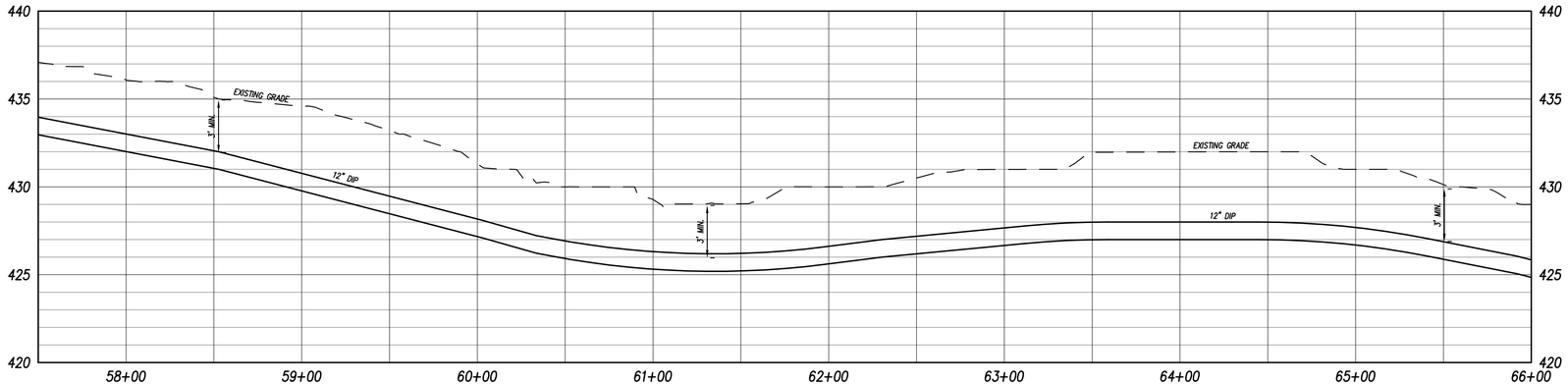
WATER
PLAN & PROFILE
LINE 'A'

SHEET NUMBER
C-05.29





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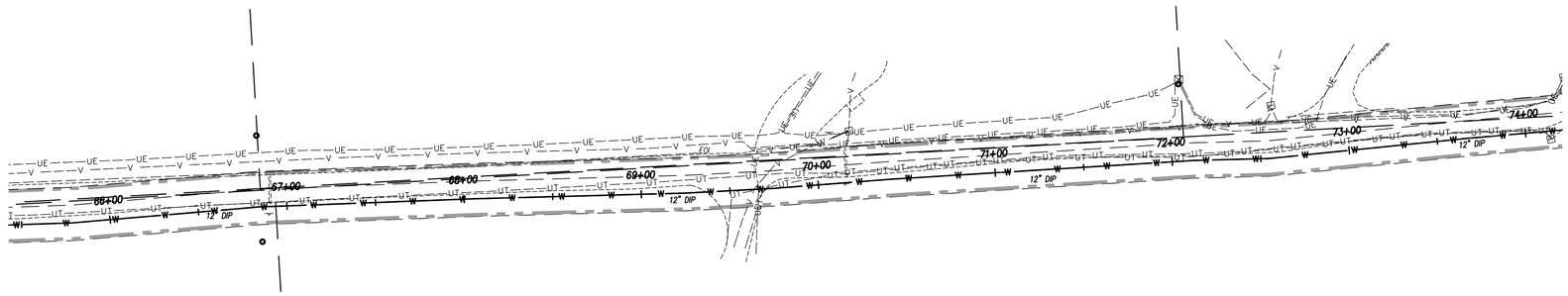
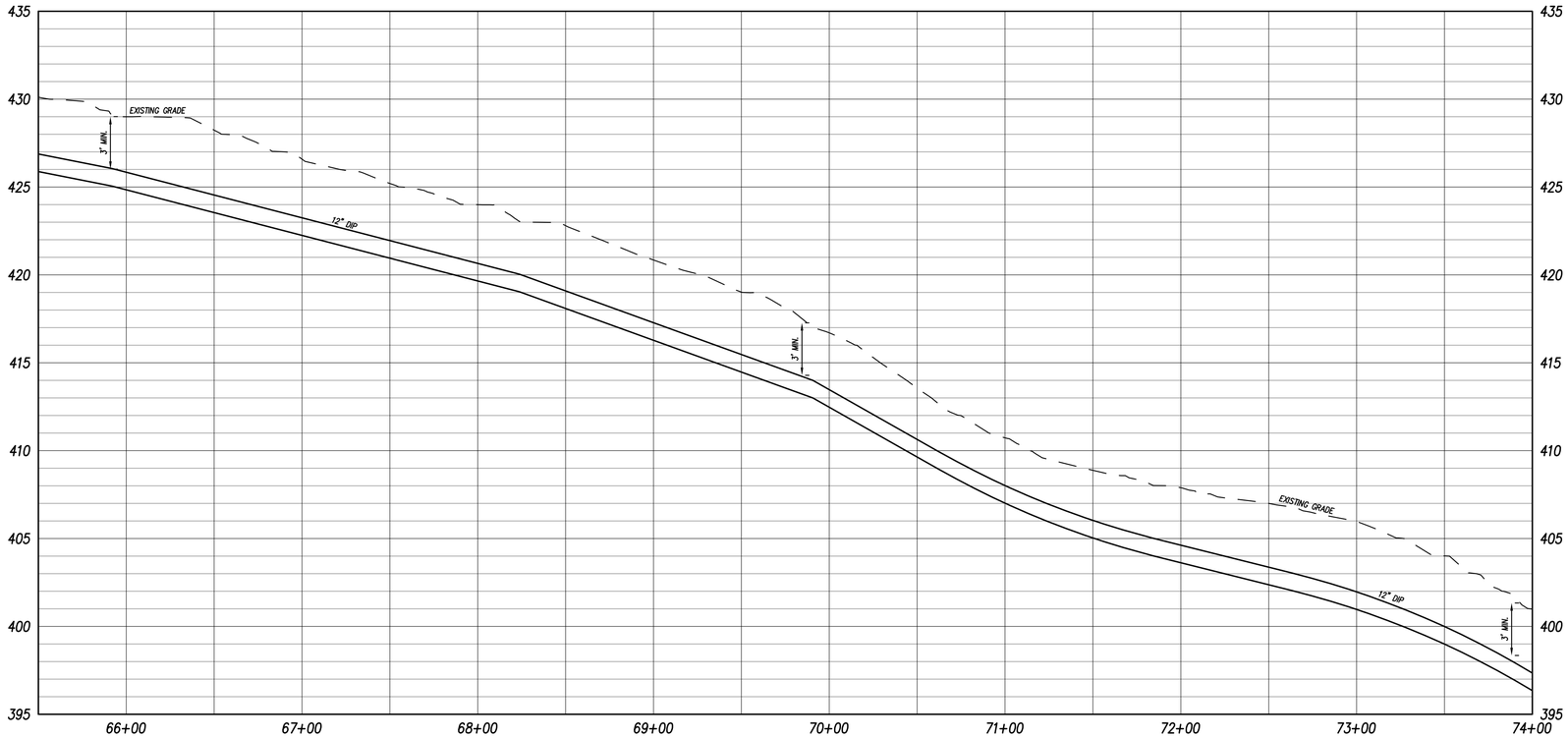
SHEET TITLE
WATER
PLAN & PROFILE
LINE 'A'

SHEET NUMBER
C-05.30





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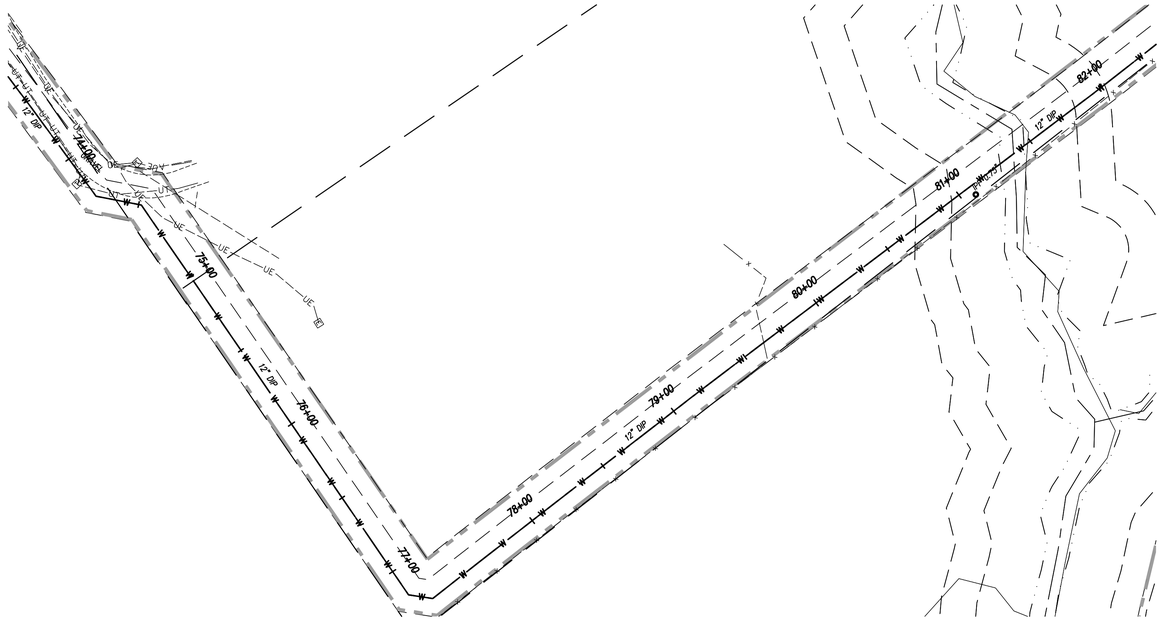
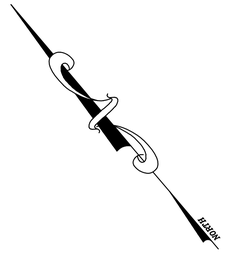
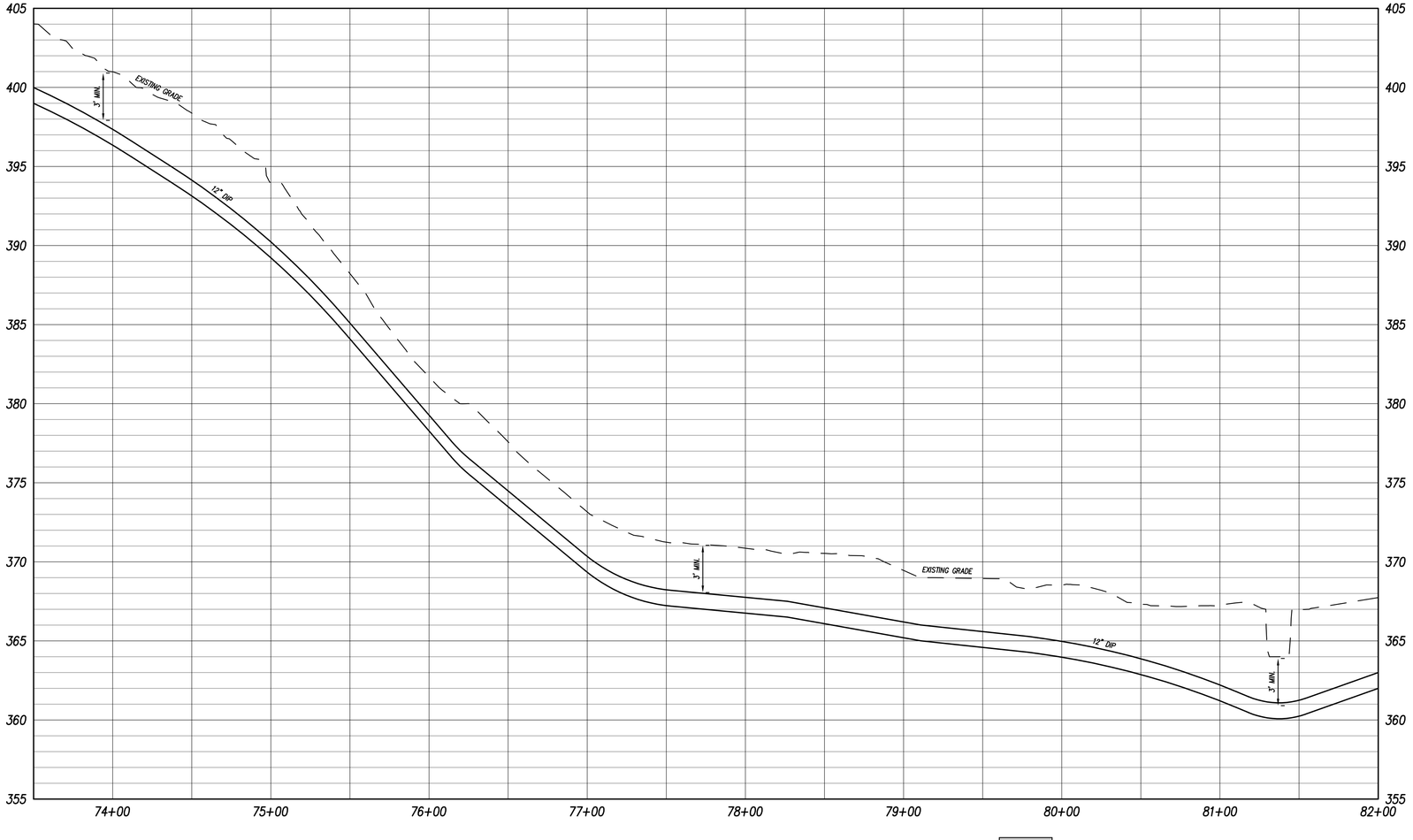
WATER
PLAN & PROFILE
LINE 'A'

SHEET NUMBER

C-05.31







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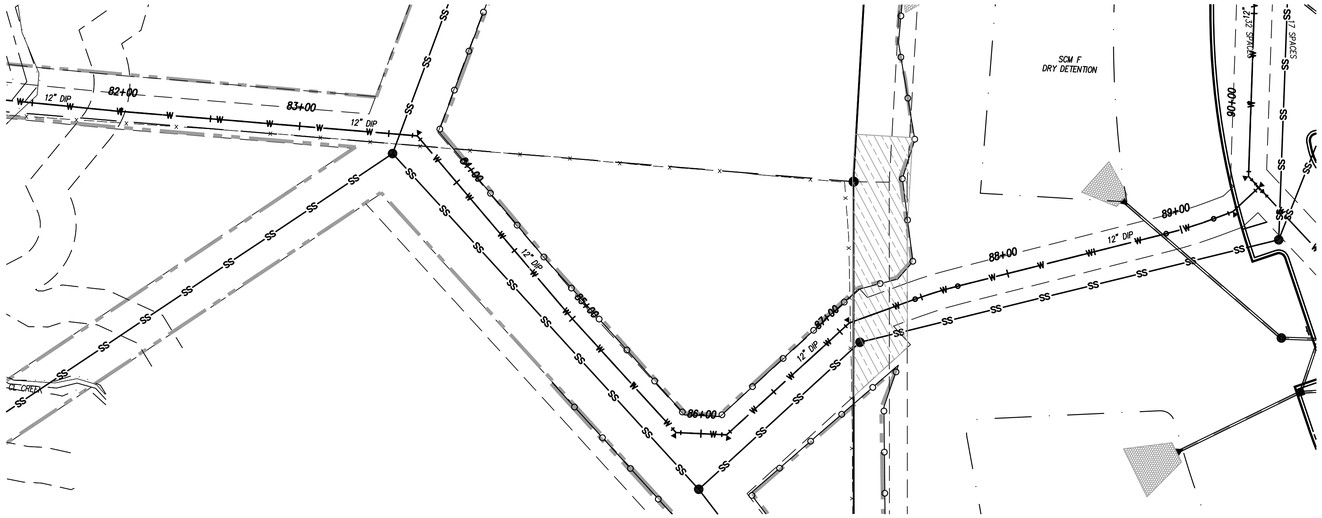

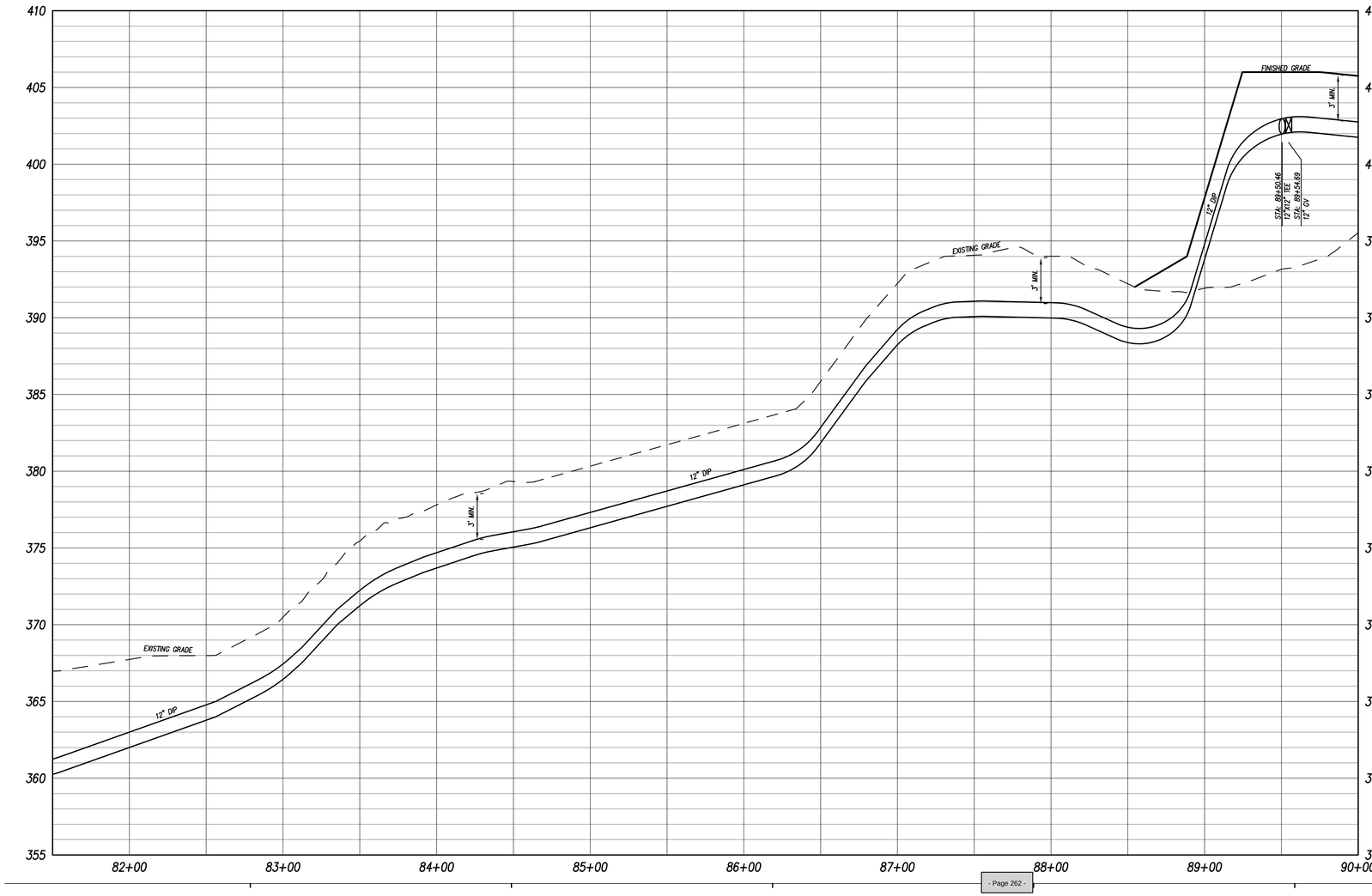

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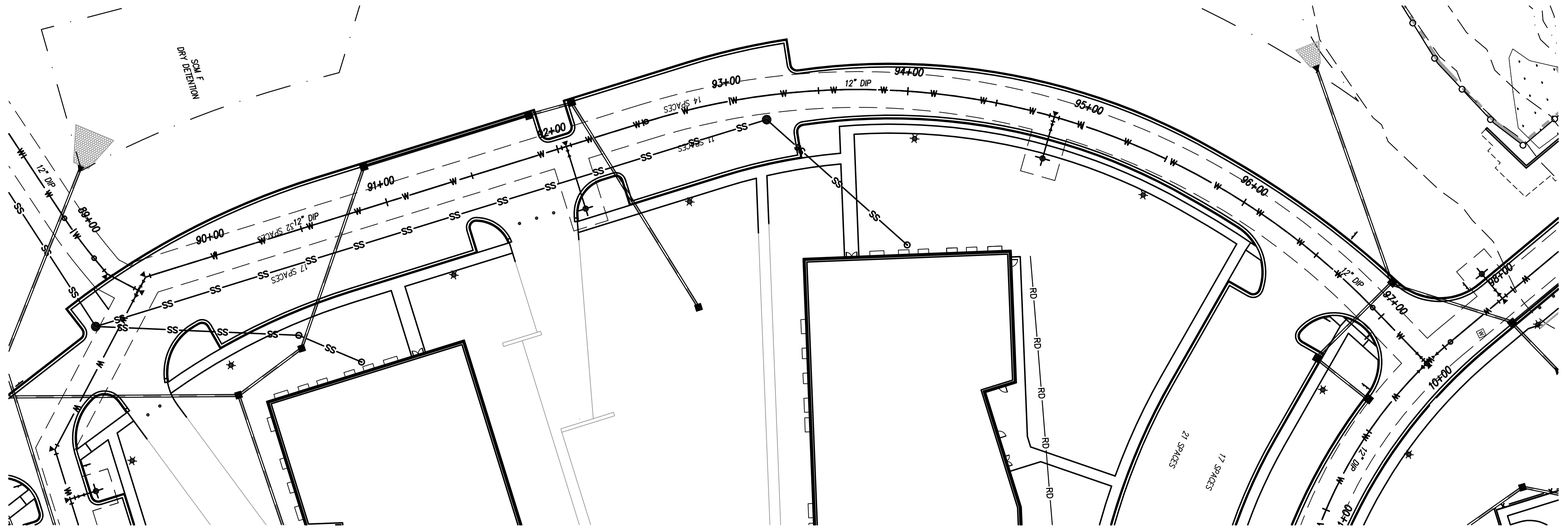

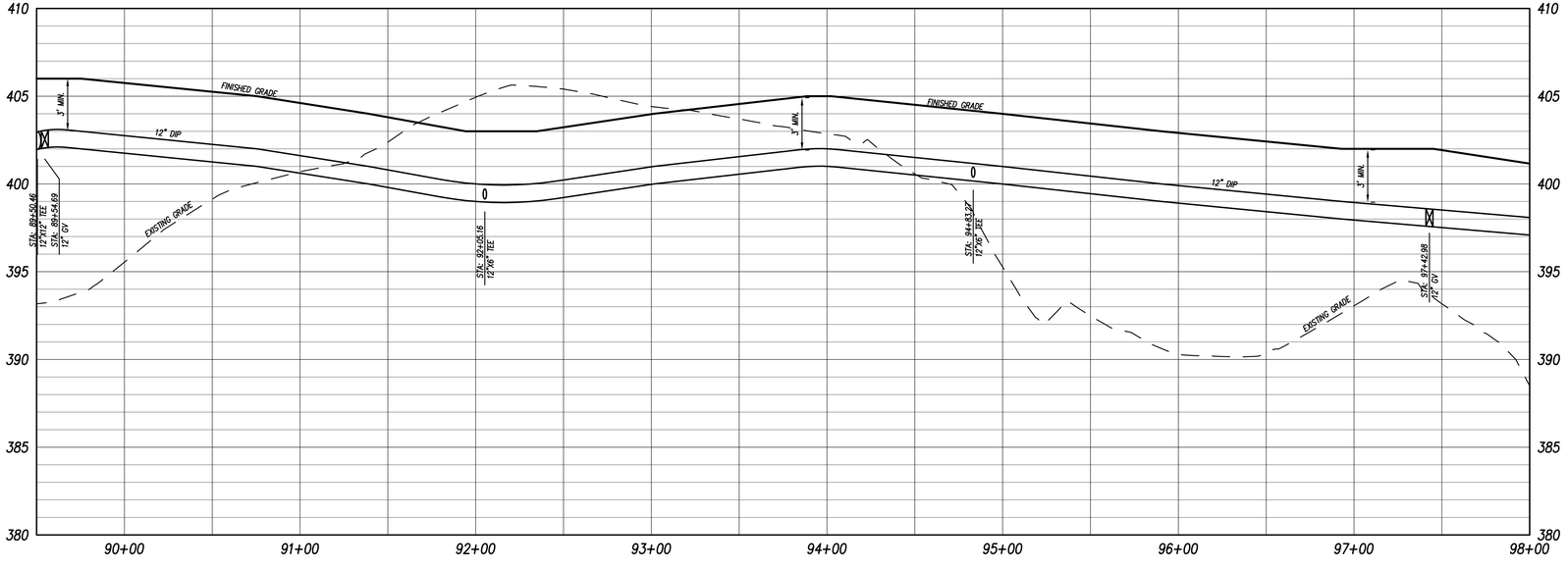

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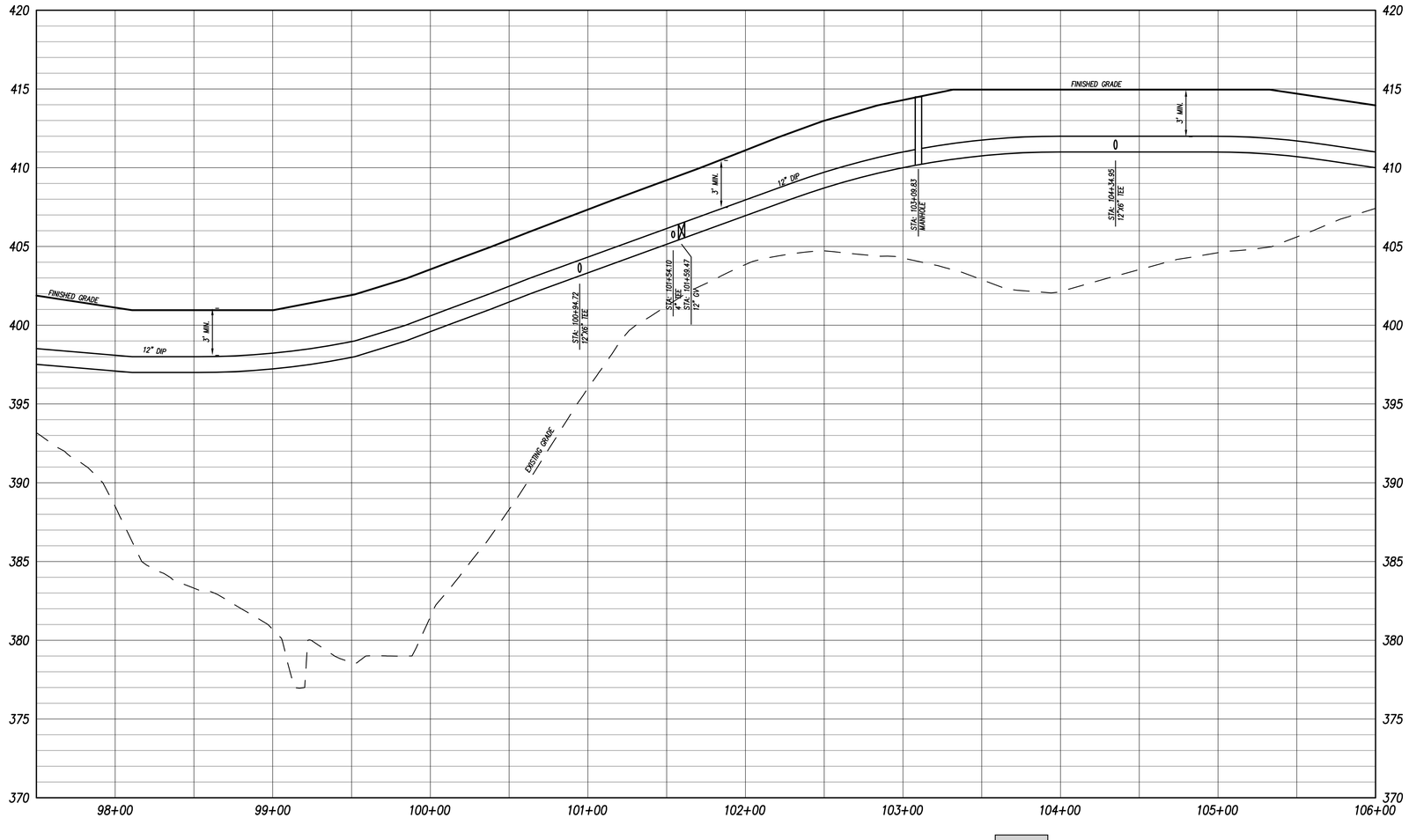

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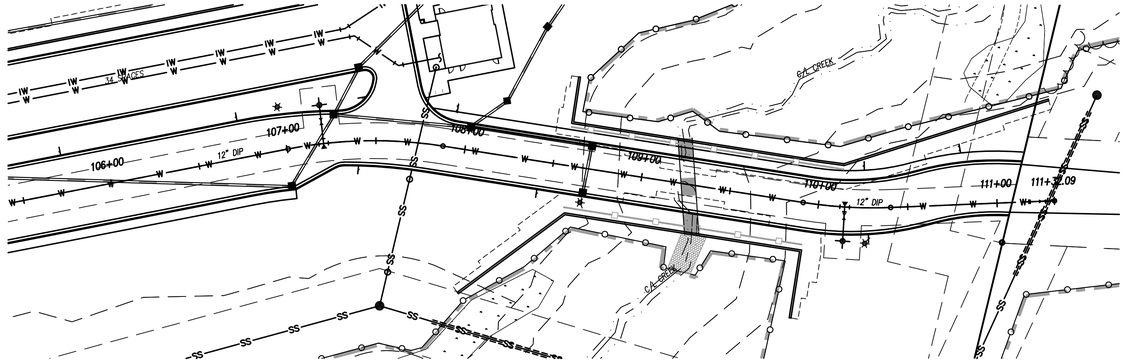
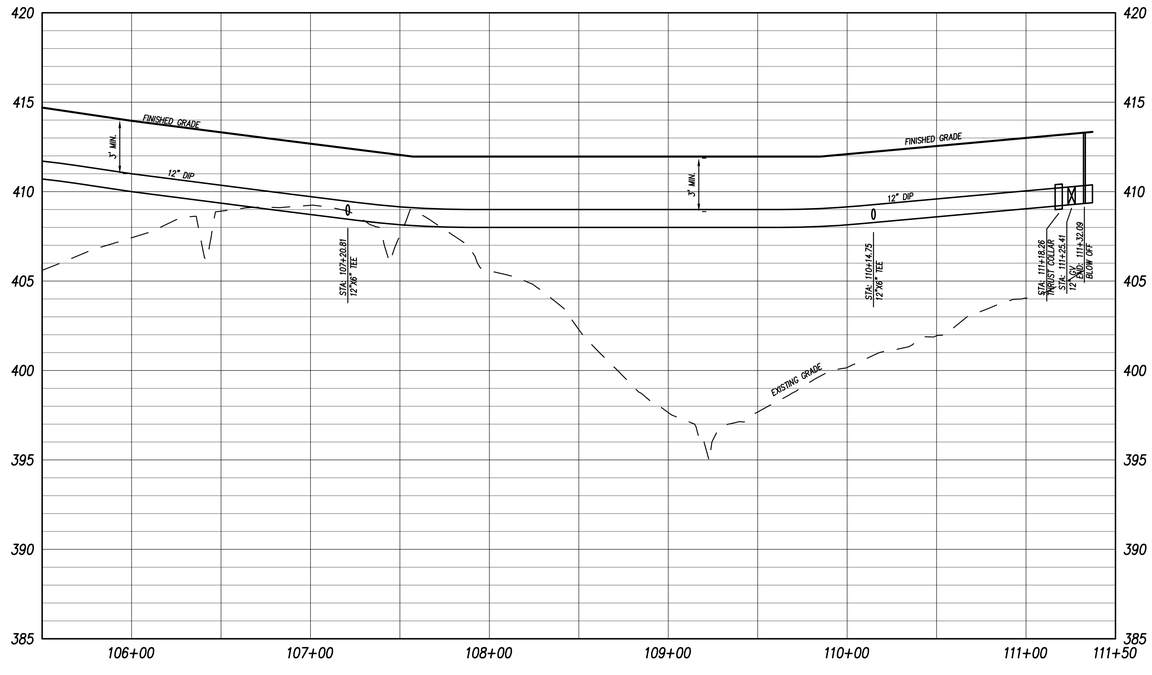
SHEET TITLE
WATER
PLAN & PROFILE
LINE 'A'

SHEET NUMBER
C-05.35





GRAPHIC SCALE

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(IN FEET)
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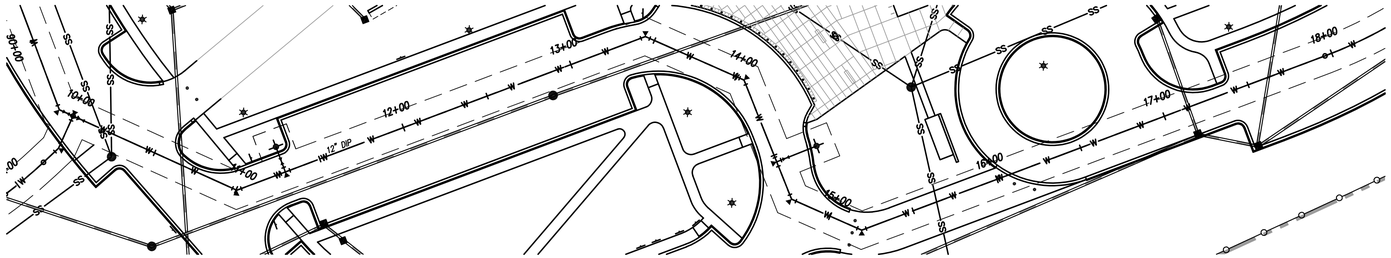
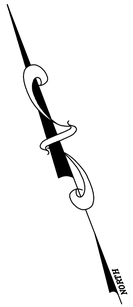
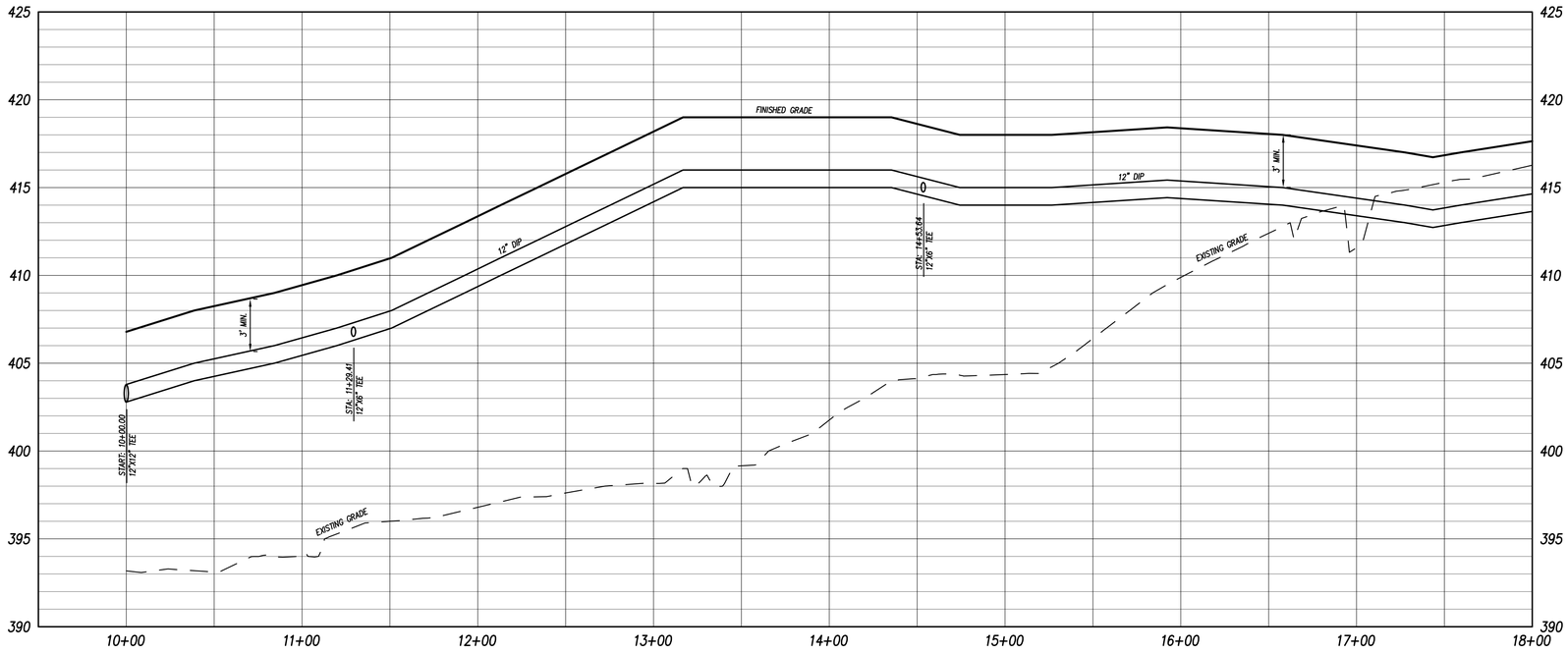
SHEET NUMBER
C-05.36







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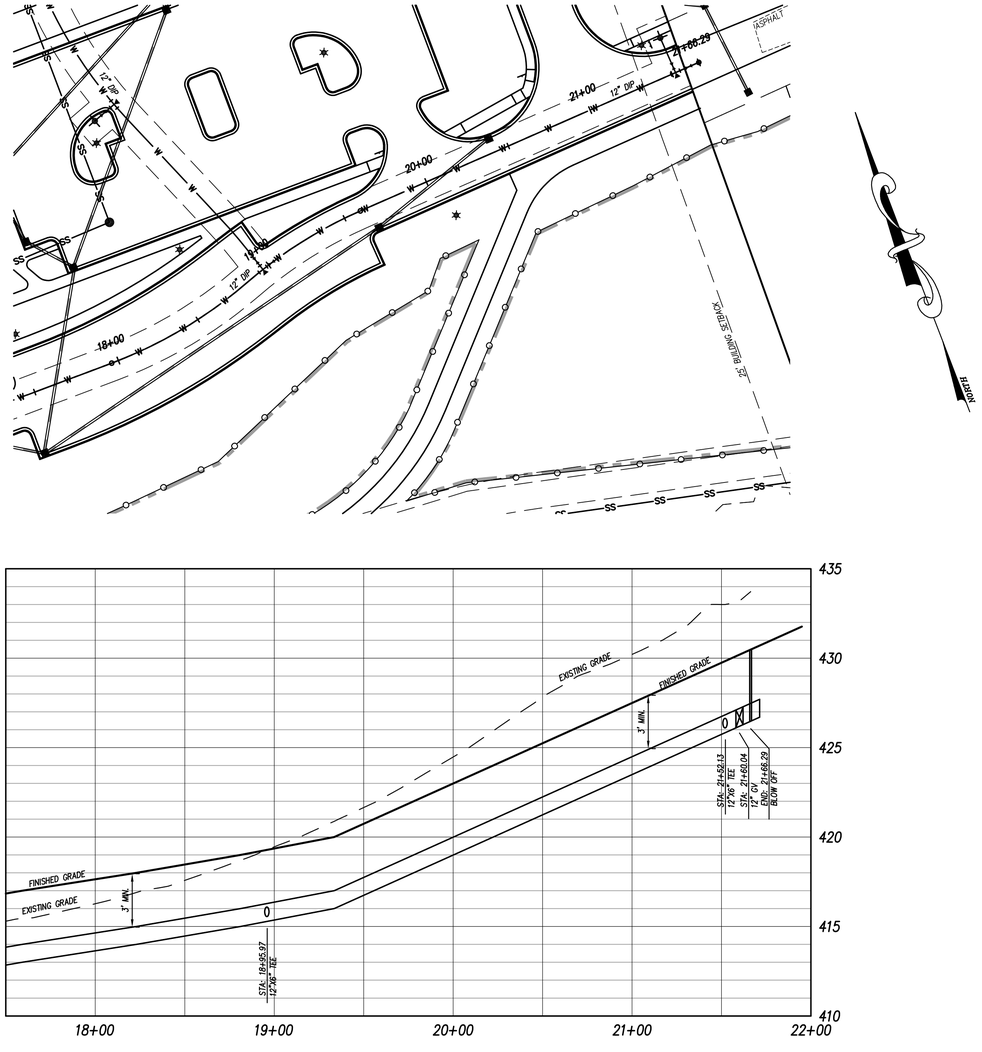
SHEET NUMBER
C-05.37



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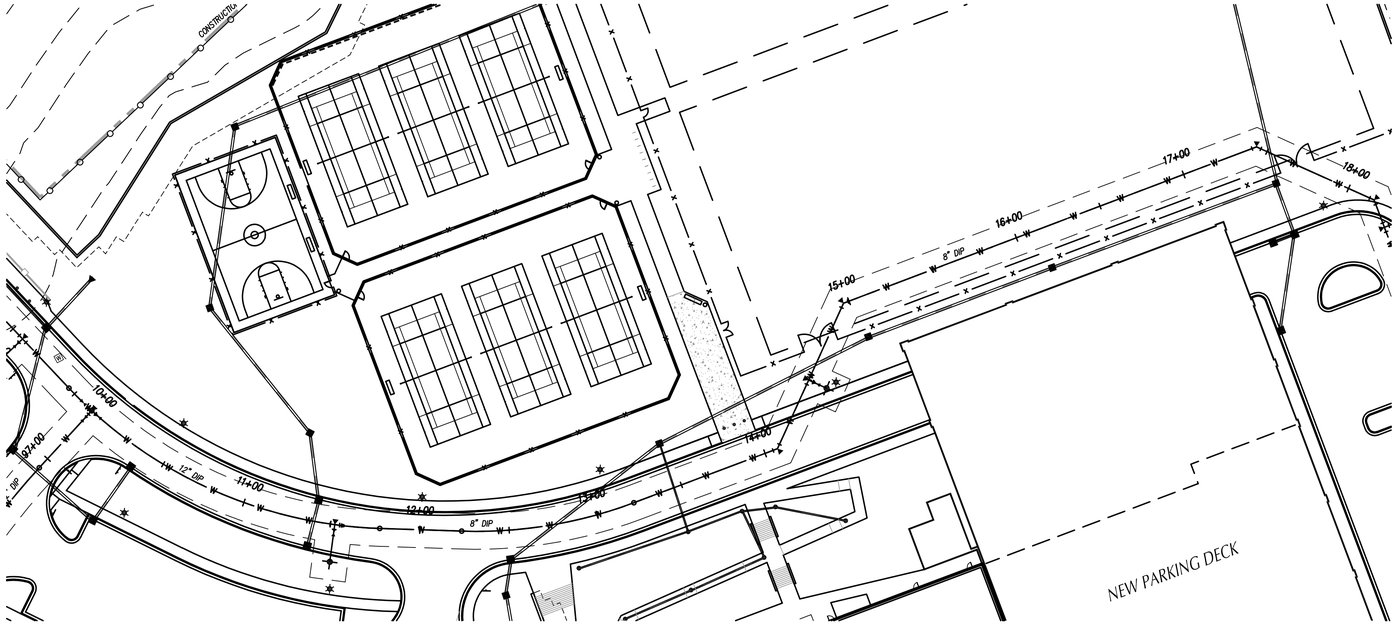

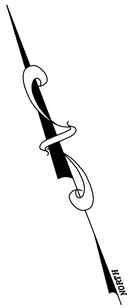

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SHEET TITLE
WATER
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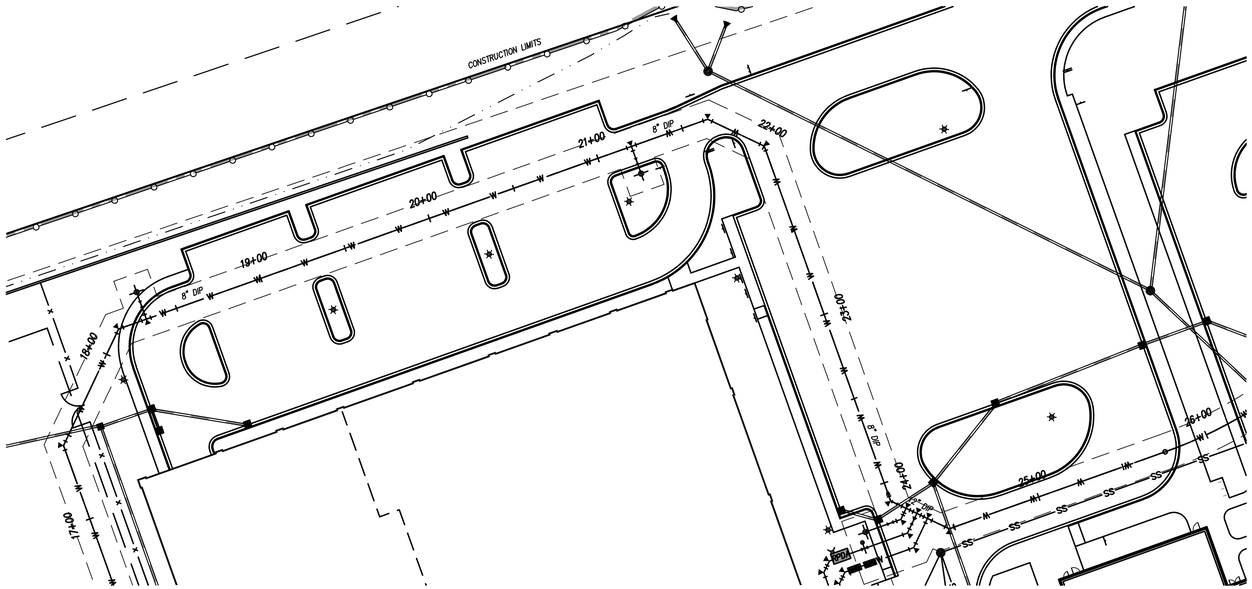
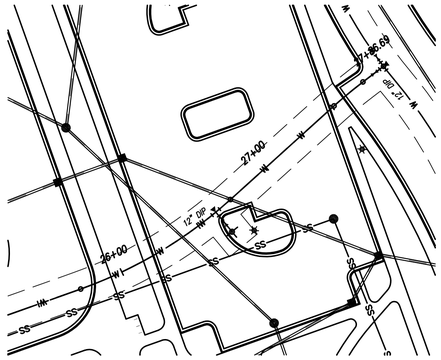
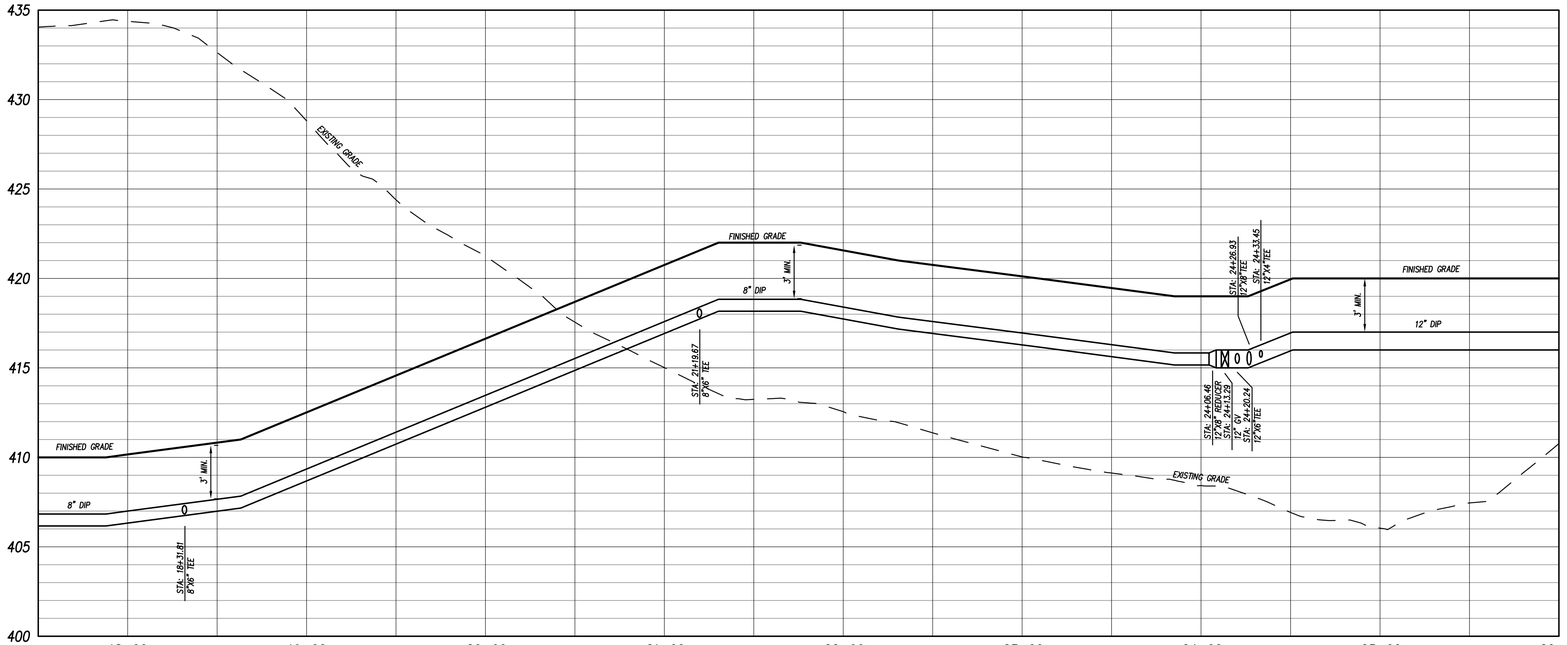
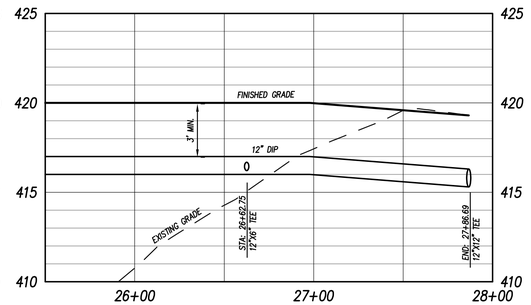
LINE 'C'

SHEET NUMBER
C-05.39









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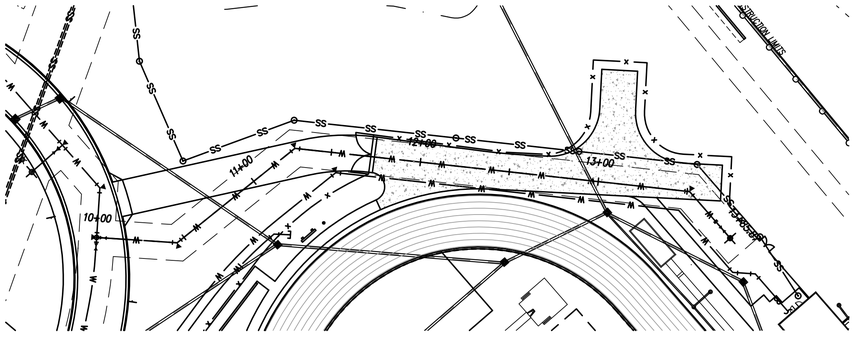
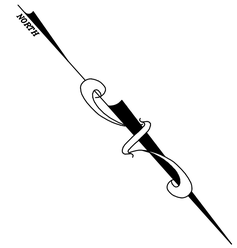
SHEET TITLE

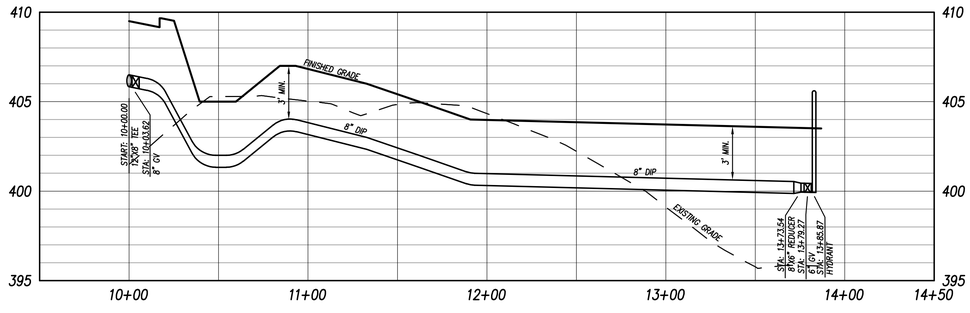
WATER PLAN & PROFILE LINE 'C'

SHEET NUMBER

C-05.40







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SHEET TITLE
WATER
PLAN & PROFILE
LINE 'D'

SHEET NUMBER
C-05.41

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

1. Never bury or burn waste. Place litter and debris in approved waste containers.
2. Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
3. Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
4. Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
5. Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
6. Anchor all lightweight items in waste containers during times of high winds.
7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
8. Dispose waste off-site at an approved disposal facility.
9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

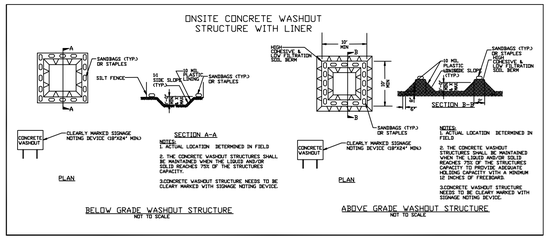
1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled, sized and placed appropriately for the needs of site.
5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

PORTABLE TOILETS

1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

EARTHEN STOCKPILE MANAGEMENT

1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.



CONCRETE WASHOUTS

1. Do not discharge concrete or cement slurry from the site.
2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
4. Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
5. Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
6. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
8. Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES

1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
3. Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
4. Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE

1. Create designated hazardous waste collection areas on-site.
2. Place hazardous waste containers under cover or in secondary containment.
3. Do not store hazardous chemicals, drums or bagged materials directly on the ground.

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

Felton Grove High School

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SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

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PROJECT NO. 02000.000

SHEET TITLE
EROSION CONTROL DETAILS

SHEET NUMBER
C-07.00

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those un-attended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calerdar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were ope·ating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDOs)	At least once per 7 calerdar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication of visible sediment leaving the site, 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calerdar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calerdar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)[a) of this permit.
(6) Ground stabilization measures	After each phase of gracing	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be kept on site and available for inspection at all times during normal business hours.

Item to Document	Documentation Requirements
(a) Each E&SC measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&SC plan.	Initial and date each E&SC measure on a copy of the approved E&SC plan or complete, date and sign an inspection report that lists each E&SC measure shown on the approved E&SC plan. This documentation is required upon the initial installation of the E&SC measures or if the E&SC measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&SC plan.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&SC measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&SC measures.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation to be Kept on Site

In addition to the E&SC plan documents above, the following items shall be kept on the site and available for inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This General Permit as well as the Certificate of Coverage, after it is received.

(b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(d) Anticipated bypasses and unanticipated bypasses.

(e) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Department's Environmental Emergency Center personnel at (800) 858-0368.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible***. The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days,*** a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

PART II, SECTION G, ITEM (4)
DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT

Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible. The circumstances in which it is not feasible to withdraw water from the surface shall be rare (for example, times with extended cold weather). Non-surface withdrawals from sediment basins shall be allowed only when all of the following criteria have been met:

(a) The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&SC plan authority has approved these items,
(b) The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit,
(c) Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems,
(d) Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above,
(e) Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
(f) Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

Felton Grove High School

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SEAL | 03/26/2021

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RATIO

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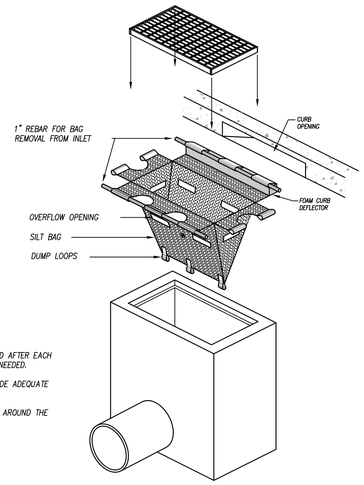
PROJECT NO. 02000.000

SHEET TITLE

EROSION CONTROL DETAILS

SHEET NUMBER

C-07.01



MAINTENANCE NOTES:

1. INSPECT THE BARRIER AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL AND MAKE REPAIRS AS NEEDED.
2. REMOVE SEDIMENT AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR SUBSEQUENT RAINS.
3. APPROPRIATELY STABILIZE ALL BARE AREAS AROUND THE INLET.

NOTES:

1. CONTRACTOR TO INSPECT SILT BAG EVERY TWO WEEKS OR AFTER EVERY SUBSTANTIAL RAIN EVENT.
2. CONTRACTOR TO REMOVE AND DISPOSE OF COLLECTED SILT AT AN ACCEPTABLE OFF SITE LOCATION.
3. COLLECTED SEDIMENT TO BE REMOVED ROUTINELY TO ENSURE FUNCTIONALITY OF SILT BAG.
4. DEVICE SHALL BE MANUFACTURED FROM WOVEN POLYPROPYLENE GEOTEXTILE TO FIT THE OPENING OF A CATCH BASIN OR DROP INLET TO FILTER SEDIMENT FROM RUNOFF ENTERING THE INLET. DEVICE SHALL BE PROVIDED WITH AN INTEGRAL CURB DEFLECTOR IF INSTALLED AT A CATCH BASIN WITH A VERTICAL OPENING ADJACENT TO A HORIZONTAL GRATE.
5. THE DEVICE SHALL BE A HIGH FLOW "SILTSACK" AS MANUFACTURED BY ACF ENVIRONMENTAL, INC. OR APPROVED EQUAL.
6. INSTALL DEVICE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND INSTALL A CURB DEFLECTOR IF APPROPRIATE.
7. INSPECT DEVICE AFTER EACH RAIN EVENT AND AT INTERVALS NOT EXCEEDING TWO WEEKS DURING CONSTRUCTION. REMOVE, EMPTY, CLEAN, AND REPLACE THE DEVICE AS NEEDED DURING CONSTRUCTION. EMPTY COLLECTED SEDIMENT IN APPROVED, PROTECTED LOCATION. REMOVE AND DISPOSE OF DEVICE FOLLOWING FULL AND PERMANENT STABILIZATION OF THE CONTRIBUTING DRAINAGE AREA.

SILT BAG INLET PROTECTION

N.T.S.

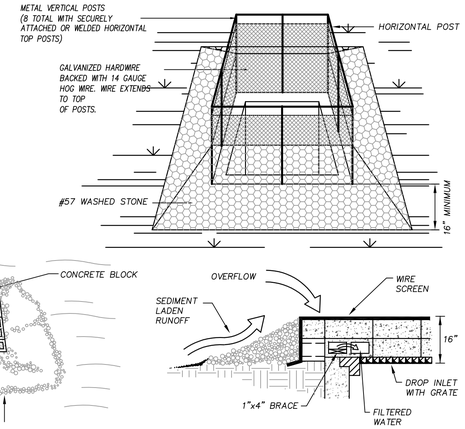
MAINTENANCE NOTES:

1. INSPECT THE BARRIER AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL AND MAKE REPAIRS AS NEEDED.
2. REMOVE SEDIMENT AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR SUBSEQUENT RAINS.
3. APPROPRIATELY STABILIZE ALL BARE AREAS AROUND THE INLET.

NOTES:

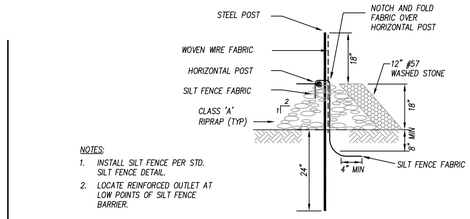
1. PLACE CONCRETE BLOCKS LENGTHWISE ON THEIR SIDES IN A SINGLE ROW AROUND THE PERIMETER OF THE INLET WITH THE ENDS OF ADJACENT BLOCKS ABUTTING. THE HEIGHT OF THE BLOCKS SHALL BE 12".
2. WIRE MESH OR HARDWARE CLOTH SHALL BE PLACED OVER THE OUTSIDE VERTICAL FACE (WEBBING) OF THE BLOCKS, TO PREVENT STONE FROM BEING WASHED THROUGH THE HOLES IN THE BLOCKS.
3. #57 WASHED STONE SHALL BE PILED AGAINST THE WIRE TO THE TOP OF THE BLOCK.
4. MAINTAIN DEVICE AFTER EACH RAIN. REPLACE #57 WASHED STONE IF IT CLOGS W/ SEDIMENT.
5. PLACE 1"x4" BOARDS THROUGH THE HOLES OF CORNER BLOCKS.

NOTE:
TEMPORARY INLET PROTECTION MAY BE SUBSTITUTED WITH A PROPERLY SIZED FILTREXX COMPOST SOCK OR APPROVED EQUAL IN ACCORDANCE WITH STATE AND LOCAL REQUIREMENTS.



CATCH BASIN AND YARD INLET PROTECTION

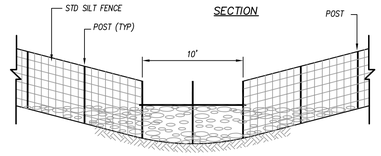
N.T.S.



NOTES:

1. INSTALL SILT FENCE PER STD. SILT FENCE DETAIL.
2. LOCATE REINFORCED OUTLET AT LOW POINTS OF SILT FENCE BARRIER.

SECTION



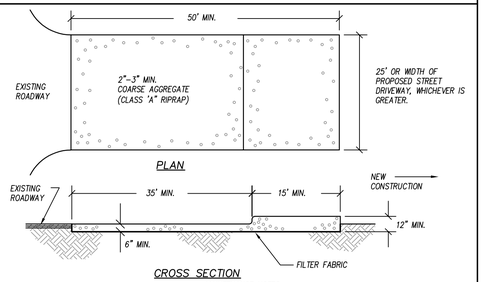
ELEVATION

MAINTENANCE NOTES:

1. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE/OUTLET. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT. REMOVE & REPLACE STONE AS NECESSARY AS IT BECOMES CLOGGED WITH SEDIMENT.
2. REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

REINFORCED SILT FENCE OUTLET

N.T.S.



PLAN

CROSS SECTION

NOTES:

1. ENTRANCE(S) SHALL BE LOCATED TO PROVIDE MAXIMUM UTILITY BY ALL CONSTRUCTION VEHICLES.
2. TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS SHALL TO BE PROVIDED.
3. ENTRANCES MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY. CONTRACTOR SHALL MAINTAIN AS NECESSARY.
4. ANY MATERIAL WHICH STILL MAKES IT ONTO THE ROAD MUST BE CLEANED UP IMMEDIATELY.
5. FREQUENT CHECKS OF THE ENTRANCE(S) AND TIMELY MAINTENANCE SHALL BE PROVIDED.
6. NOTES ARE APPLICABLE AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED.

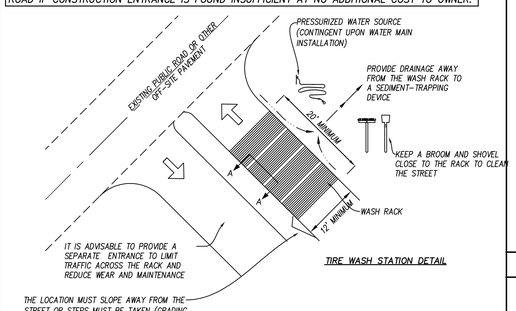
MAINTENANCE NOTES:

1. MAINTAIN THE GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE SITE. MAY REQUIRE PERIODIC TOPDRESSING WITH 2-INCH STONE.
2. AFTER EACH RAINFALL, INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY.
3. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED OR TRACKED ONTO PUBLIC ROADWAYS.

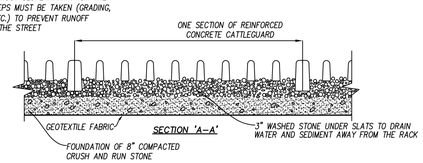
CONSTRUCTION SPECIFICATIONS:

1. CLEAR THE ENTRANCE AND EXIT AREA OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL AND PROPERLY GRADE IT.
2. PLACE THE GRAVEL TO THE SPECIFIC GRADE AND DIMENSIONS SHOWN ON THE PLANS, AND SMOOTH IT.
3. PROVIDE DRAINAGE TO CARRY WATER TO A SEDIMENT TRAP OR SUITABLE OTHER OUTLET.
4. USE GEOTEXTILE FABRIC TO IMPROVE STABILITY OF THE FOUNDATION IN LOCATIONS SUBJECT TO SEEPAGE OR HIGH WATER TABLE.

CONTRACTOR SHALL USE TIRE WASH STATION TO PREVENT SEDIMENT FROM TRACKING ONTO THE ROAD IF CONSTRUCTION ENTRANCE IS FOUND INSUFFICIENT AT NO ADDITIONAL COST TO OWNER.

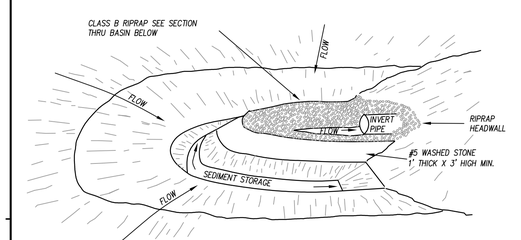


TIRE WASH STATION DETAIL

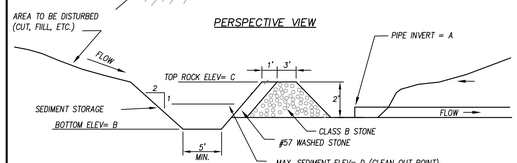


GRAVEL CONSTRUCTION ENTRANCE

N.T.S.



PERSPECTIVE VIEW



SECTION

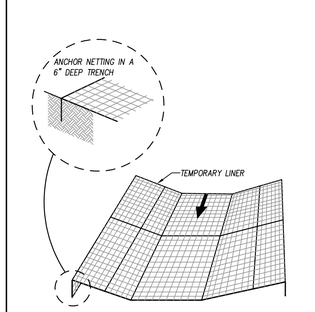
MAINTENANCE NOTES:

1. INSPECT THE BARRIER AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL AND REPAIR IMMEDIATELY.
2. REMOVE SEDIMENT AND RESTORE SEDIMENT STORAGE AREA TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH OF THE TRAP.
3. CHECK THE STRUCTURE FOR DAMAGE AND REPLACE ANY DISPLACED RIPRAP IMMEDIATELY.
4. APPROPRIATELY STABILIZE ALL BARE AREAS AROUND THE INLET.

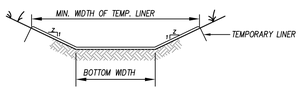
BASIN NUMBER	INLET NUMBER	A (FT)	B (FT)	C (FT)	D (FT)
1	EXIST. CULVERT	376.79	375.29	378.79	377.04
2	Q7	382.47	380.97	384.47	382.72
3	EXIST. CULVERT	360.64	359.14	362.64	360.89
4	M1	357.28	355.78	359.28	357.53
5	M5	356.30	354.80	358.30	356.55
6	P1	316.50	315.00	318.50	316.75

TEMPORARY ROCK PIPE INLET PROTECTION

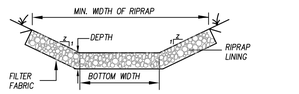
N.T.S.



CHANNEL LINER



GRASS-LINED CHANNEL
NTS



RIPRAP - LINED CHANNEL
NTS

CONSTRUCTION NOTES:

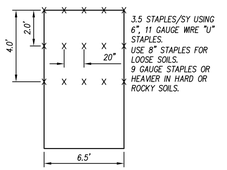
1. SEE SPECIFICATIONS FOR TEMP. LINING, RIPRAP AND FILTER FABRIC REQUIREMENTS.
2. RIPRAP CHANNELS SHALL BE OVER-EXCAVATED RIPRAP TO BE PLACED FLUSH WITH PROPOSED CHANNEL GRADE.
3. PREPARE SOIL BEFORE INSTALLING MATS OR NETS, INCLUDING APPLICATION OF LIME, FERTILIZER AND SEED.
4. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE NET OR MAT IN A 6" DEEP TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
5. ROLL CENTER MAT OR NET IN DIRECTION OF WATER FLOW ON BOTTOM OF CHANNEL.
6. PLACE MAT OR NET END OVER END (SHINGLE STYLE) WITH A 6" OVERLAP. USE DOUBLE ROW OF STAGGERED STAPLES 4" APART TO SECURE.
7. FULL LENGTH EDGE OF MAT OR NET AT TOP SIDE SLOPES SHALL BE ANCHORED IN 6" DEEP TRENCH AFTER STAPLING.
8. MATS OR NETS SHALL BE OVERLAPPED 4" OVER THE CENTER BLANKET AND STAPLED.
9. THE TERMINAL END OF THE MAT OR NET MUST BE ANCHORED IN A 6" DEEP TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

MAINTENANCE NOTES:

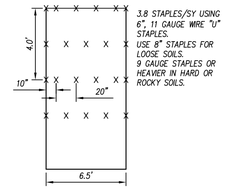
1. GRASSED-LINED CHANNELS TO BE INSPECTED WEEKLY AND AFTER EVERY RAINFALL EVENT, DURING THE ESTABLISHMENT AND AFTER THE ESTABLISHMENT PERIOD.
2. REPAIRS ARE TO BE MADE IMMEDIATELY.
3. REMOVE SEDIMENT ACCUMULATIONS TO MAINTAIN DESIGNED CARRYING CAPACITY.
4. GRASS IS TO BE HEALTHY AND IN VIGOROUS CONDITIONS AT ALL TIMES.

CHANNEL SECTIONS

N.T.S.



EXCELSIOR MAT STAPLE PATTERN
NTS



SYNTHETIC MAT STAPLE PATTERN
NTS

CHANNEL SCHEDULE

CHANNEL	BOTTOM WIDTH (FT)	SIDE SLOPE (H:V)	CHANNEL GRADE	CHANNEL LENGTH	PERM. LINING	TEMP. LINING	MIN. TOP WIDTH OF LINING (FT)	RIPRAP DEPTH (IN)
1	2	3:1	5.2%	200 LF	GRASS	SYNTHETIC MAT	8	N/A
2	2	3:1	7.1%	85 LF	GRASS	SYNTHETIC MAT	8	N/A
3	2	3:1	5.6%	60 LF	GRASS	EXCELSIOR	8	N/A
4	2	3:1	1.6%	65 LF	GRASS	EXCELSIOR	8	N/A
5	0	3:1	1.9%	130 LF	GRASS	EXCELSIOR	8	N/A
6	0	3:1	6.0%	35 LF	GRASS	EXCELSIOR	6	N/A
7	0	3:1	1.5%	415 LF	GRASS	EXCELSIOR	6	N/A
8	2	3:1	7.2%	330 LF	GRASS	EXCELSIOR	8	N/A
9	2	3:1	1.4%	105 LF	GRASS	EXCELSIOR	8	N/A
10	0	3:1	1.4%	505 LF	GRASS	EXCELSIOR	6	N/A
11	0	3:1	0.8%	380 LF	GRASS	EXCELSIOR	6	N/A
12	0	3:1	1.2%	380 LF	GRASS	EXCELSIOR	6	N/A
13	0	3:1	2.2%	295 LF	GRASS	EXCELSIOR	6	N/A
14	2	3:1	8.4%	55 LF	GRASS	EXCELSIOR	8	N/A
15	0	3:1	2.0%	160 LF	GRASS	EXCELSIOR	6	N/A
16	0	3:1	5.2%	305 LF	GRASS	EXCELSIOR	6	N/A
17	2	3:1	10.8%	235 LF	GRASS	EXCELSIOR	8	N/A
18	2	3:1	5.3%	520 LF	GRASS	SYNTHETIC MAT	8	N/A
19	0	3:1	4.0%	80 LF	GRASS	EXCELSIOR	6	N/A
20	0	3:1	1.3%	175 LF	GRASS	EXCELSIOR	6	N/A
21	0	3:1	1.9%	600 LF	GRASS	EXCELSIOR	6	N/A
22	0	3:1	2.5%	105 LF	GRASS	EXCELSIOR	6	N/A
23	4	3:1	9.8%	70 LF	CLASS 1	RIP RAP	10	27
24	4	3:1	3.0%	140 LF	CLASS 1	RIP RAP	16	27
25	4	3:1	1.0%	10 LF	CLASS 1	RIP RAP	16	27
** 26	2	3:1	5.0%	175 LF	GRASS	EXCELSIOR	8	N/A
27	0	3:1	5.6%	805 LF	GRASS	SYNTHETIC MAT	6	N/A
28	0	3:1	10.0%	125 LF	CLASS 2	RIP RAP	6	32
29	0	3:1	1.4%	210 LF	GRASS	EXCELSIOR	6	N/A
30	0	3:1	1.0%	135 LF	GRASS	EXCELSIOR	6	N/A
31	0	3:1	1.8%	375 LF	GRASS	EXCELSIOR	6	N/A
32	0	3:1	2.8%	80 LF	GRASS	EXCELSIOR	6	N/A
33	0	3:1	0.8%	610 LF	GRASS	EXCELSIOR	6	N/A
34	0	3:1	0.8%	115 LF	GRASS	EXCELSIOR	6	N/A
35	0	3:1	1.7%	790 LF	GRASS	EXCELSIOR	6	N/A
36	0	3:1	1.3%	410 LF	GRASS	EXCELSIOR	6	N/A
37	0	3:1	0.7%	315 LF	GRASS	EXCELSIOR	6	N/A
38	0	3:1	2.2%	370 LF	GRASS	EXCELSIOR	6	N/A
39	0	3:1	1.7%	275 LF	GRASS	EXCELSIOR	6	N/A
40	0	3:1	1.3%	160 LF	GRASS	EXCELSIOR	6	N/A
41	0	3:1	2.2%	200 LF	GRASS	EXCELSIOR	6	N/A
42	0	3:1	1.5%	50 LF	GRASS	EXCELSIOR	6	N/A
43	0	3:1	0.7%	145 LF	GRASS	EXCELSIOR	6	N/A
44	0	3:1	0.4%	255 LF	GRASS	EXCELSIOR	6	N/A
45	0	3:1	0.8%	205 LF	GRASS	EXCELSIOR	6	N/A
46	0	3:1	1.7%	45 LF	GRASS	EXCELSIOR	6	N/A
47	0	3:1	0.5%	100 LF	GRASS	EXCELSIOR	6	N/A
48	0	3:1	0.2%	325 LF	GRASS	EXCELSIOR	12	N/A
49	0	3:1	1.6%	110 LF	GRASS	EXCELSIOR	6	N/A
50	0	3:1	1.0%	145 LF	GRASS	EXCELSIOR	6	N/A
51	0	3:1	0.9%	300 LF	GRASS	EXCELSIOR	6	N/A
52	0	3:1	1.7%	145 LF	GRASS	EXCELSIOR	6	N/A
53	4	4:1	25%	30 LF	GRASS	EXCELSIOR	12	N/A
54	4	4:1	25%	45 LF	GRASS	EXCELSIOR	12	N/A
55	4	4:1	25%	45 LF	GRASS	EXCELSIOR	12	N/A
** 56	4	3:1	1.7%	105 lf	GRASS	EXCELSIOR	10	N/A
* TC-1	2	3:1	4.2%	40 LF	CLASS B	STONE	8	22

* TEMPORARY CHANNEL 1

** CHANNEL #26 IS REMOVED AND CHANNEL #56 IS ADDED IF GYMNASIUM ALTERNATE IS NOT ACCEPTED.

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
11 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
RATIO
227 Fayetteville Street, Suite 301
Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
A Division of Bennett & Pless
5430 Wade Park Blvd #400
Raleigh, North Carolina 27607
(919) 832-5587

Mechanical / Electrical / Plumbing Engineer
The Wooten Company
120 North Boylan Avenue
Raleigh, North Carolina 27603
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Civil Engineer and Landscape Architect
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400 Regency Forest Drive, Suite 120
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Rick Nuhn Engineering
1913 Thayer Circle
Greensboro, North Carolina 27407
(336) 855-1182

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KRM
4230 Folkston Drive
Charlotte, North Carolina 28205
(704) 724-1045

Theatrical & Acoustic Consultant
Thorburn Associates
2500 Gateway Centre Blvd, Suite 800
Morrisville, North Carolina 27560
(919) 463-9995

Parking Consultant
Walker Consultants
13860 Ballantyne Corporate Pl, Suite 140
Charlotte, North Carolina 28277
(704) 247-6230

SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

RATIO

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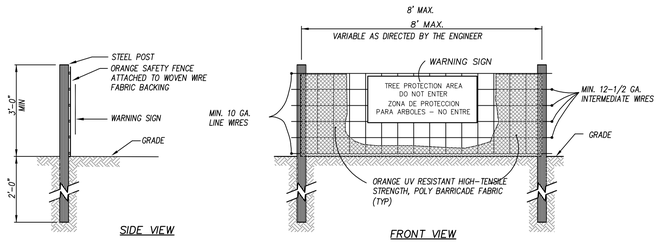
PROJECT NO. 02000.000

SHEET TITLE
EROSION CONTROL DETAILS

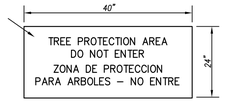
SHEET NUMBER
C-07.02

TEMPORARY TREE PROTECTION FENCE — N.T.S.



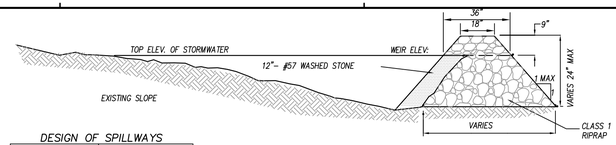
NOTES:

1. INSTALL TREE PROTECTION FENCING PRIOR TO PERFORMING ANY CLEARING OF THE SITE.
2. WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.
3. LETTERS TO BE 3" HIGH MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED.
4. SIGNS SHALL BE PLACED AT 100' MAXIMUM INTERVALS. PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 100' ON CENTER THEREAFTER.
5. FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA.
6. ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
7. MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.



WARNING SIGN DETAIL

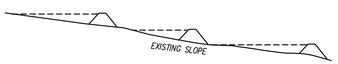
CHECK DAM — N.T.S.



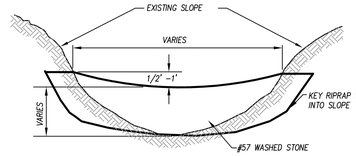
DESIGN OF SPILLWAYS

DRAINAGE AREA (ACRES)	MIN. WEIR LENGTH (FT)
1	4.0
2	6.0
3	8.0
4	10.0
5	12.0

SIDE VIEW



STEP SEQUENCE



FRONT VIEW

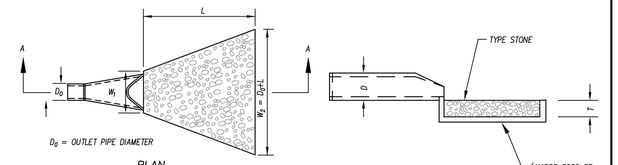
NOTES:

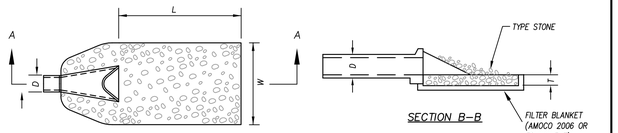
1. HEIGHT AND WIDTH DETERMINED BY EXISTING TOPOGRAPHY AND SEDIMENT STORAGE REQUIRED.
2. KEY RIP RAP INTO SLOPES FOR STABILITY.

MAINTENANCE NOTES:

1. INSPECT CHECK PROTECTION WEEKLY AND AFTER ½" OR GREATER RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE SEDIMENT STRAW, LIMBS, OR OTHER DEBRIS THAT COULD CLOG THE CHANNEL WHEN NEEDED.
2. IMMEDIATELY CORRECT ANY DAMAGE CAUSED BY SUBMERGENCE AND DEPOSITION ABOVE THE CHECK DAM AND FROM HIGH FLOWS AROUND THE EDGES.
3. REMOVE SEDIMENT ACCUMULATED BEHIND THE DAMS AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION, ALLOW THE CHANNEL TO DRAIN THROUGH THE STONE CHECK DAM, AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE DAM. ADD STONES TO DAMS AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.

OUTLET PROTECTION — N.T.S.





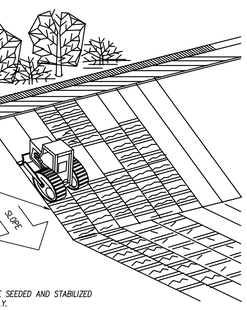
MAINTENANCE NOTES:

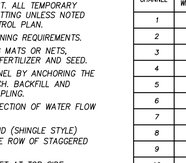
1. RIP RAP OUTLET STRUCTURES TO BE INSPECTED WEEKLY AND AFTER EVERY RAINFALL EVENT.
2. REPAIR DISLODGED STONES TO DESIGN DIMENSIONS IMMEDIATELY.
3. IF MORE SUBSTANTIAL DAMAGE OCCURS, NOTIFY ENGINEER TO DETERMINE A REPAIR SOLUTION.

NOTES:

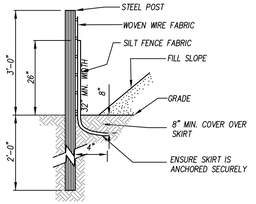
1. TOP OF RIP RAP AT DOWNSTREAM END OF APRON SHALL BE FLUSH WITH NATURAL GRADE OF THE RECEIVING CHANNEL.
2. VEGETATE ALL DISTURBED AREAS WITH VEGETATION IMMEDIATELY AFTER INSTALLATION.
3. SEE EROSION CONTROL PLAN FOR APRON DIMENSIONS.

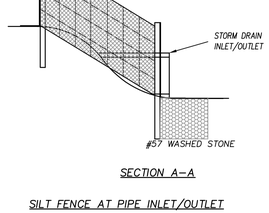
STANDARD TEMPORARY SILT FENCE — N.T.S.





INSTALLATION NOTE:
USE SILT FENCE ONLY WHEN DRAINAGE AREA DOES NOT EXCEED 1/4 ACRE AND NEVER IN AREAS OF CONCENTRATED FLOW.

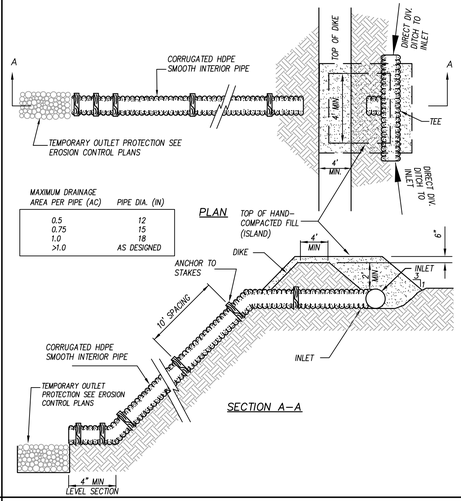




MAINTENANCE NOTES:

1. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT.
2. REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
3. REPAIR SILT FENCE FAILURES WITH NO. 57 WASHED STONE BERM.

TEMPORARY SLOPE DRAIN — N.T.S.



MAXIMUM DRAINAGE AREA PER PIPE (AC)	PIPE DIA. (IN)
0.5	12
0.75	15
1.0	18
>1.0	AS DESIGNED

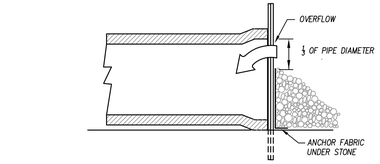
CONSTRUCTION NOTES:

1. PLACE SLOPE DRAINS ON UNDISTURBED SOIL OR WELL COMPACTED FILL AT LOCATIONS SHOWN ON THE PLANS.
2. SLIGHTLY SLOPE THE SECTION OF PIPE UNDER THE DIKE TOWARDS ITS OUTLET.
3. HAND TAMP THE SOIL UNDER AND AROUND THE ENTRANCE SECTION IN LIFTS NOT TO EXCEED 6–IN.
4. ENSURE THAT FILL OVER THE DRAIN AT THE TOP OF THE SLOPE HAS MINIMUM DIMENSIONS OF 1.5 FT DEPTH, 4 FT TOP WIDTH AND 3:1 SIDE SLOPES.
5. ENSURE THE SETTLED, COMPACTED DIKE RIDGE IS NO LESS THAN 1–FT ABOVE THE PIPE AT ALL LOCATIONS.
6. ENSURE ALL PIPE CONNECTIONS ARE WATER–TIGHT.
7. ENSURE THAT ALL FILL MATERIAL IS WELL COMPACTED. SECURELY FASTEN THE EXPOSED SECTION OF THE DRAIN WITH GROMMETS OR STAKES SPACED NO MORE THAN 10–FT APART.
8. EXTEND THE DRAIN BEYOND THE TOE OF THE SLOPE AND ADEQUATELY PROTECT THE OUTLET FROM EROSION.
9. IMMEDIATELY STABILIZE ALL DISTURBED AREAS FOLLOWING CONSTRUCTION.

MAINTENANCE NOTES:

1. INSPECT THE SLOPE DRAIN AND SUPPORTING DIVERSIONS AFTER EVERY RAINFALL AND MAKE NECESSARY REPAIRS PROMPTLY.
2. CLEAR ACCUMULATED SEDIMENT FROM THE PIPE ENTRANCES AND OUTLET.

PROTECTION OF STORM DRAIN UNDER CONSTRUCTION — N.T.S.



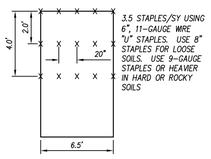
MAINTENANCE NOTES:

1. ALL OPEN STORM DRAIN PIPES SHALL BE PROTECTED AFTER STOPPAGE OF WORK EACH DAY AS ILLUSTRATED.
2. ACCUMULATED SEDIMENT SHALL BE REMOVED AND PROPERLY DISPOSED OF AND THE TRENCH BOTTOM REGRADED AND COMPACTED IN ACCORDANCE w/ SPECIFICATIONS PRIOR TO CONTINUANCE OF LAYING PIPE.

SLOPE TRACKING — N.T.S.

MAINTENANCE NOTE:
PERIODICALLY CHECK THE SEEDED SLOPES FOR RILLS AND WASHES. FILL THESE AREAS SLIGHTLY ABOVE THE ORIGINAL GRADE, THEN RESEED AND MULCH AS SOON AS POSSIBLE.

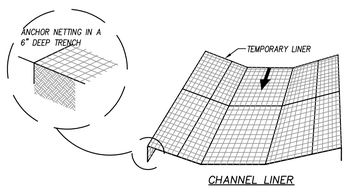
TEMPORARY DIVERSION DITCH / BERM — N.T.S.



TEMPORARY MAT STAPLE PATTERN
NTS

MATTING INSTALLATION NOTES:

1. INSTALL TEMPORARY CHANNEL MATTING IN ALL DIVERSION SWALES OR OTHER GRASSED AREAS OF CONCENTRATED STORMWATER FLOW DURING BOTH TEMPORARY AND PERMANENT GRASS ESTABLISHMENT. ALL TEMPORARY MATTING SHALL BE EXCELSIOR MATTING UNLESS NOTED OTHERWISE ON THE EROSION CONTROL PLAN.
2. SEE SPECIFICATIONS FOR TEMP. LINING REQUIREMENTS.
3. PREPARE SOIL BEFORE INSTALLING MATS OR NETS, INCLUDING APPLICATION OF LIME, FERTILIZER AND SEED.
4. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE NET OR MAT IN A 6" DEEP TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
5. ROLL CENTER MAT OR NET IN DIRECTION OF WATER FLOW ON BOTTOM OF CHANNEL.
6. PLACE MAT OR NET END OVER END (SHINGLE STYLE) WITH A 6" OVERLAP. USE DOUBLE ROW OF STAGGERED STAPLES 4" APART TO SECURE.
7. FULL LENGTH EDGE OF MAT OR NET AT TOP SIDE SLOPES SHALL BE ANCHORED IN 6" DEEP TRENCH AFTER STAPLING.
8. MATS OR NETS SHALL BE OVERLAPPED 4" OVER THE CENTER BLANKET AND STAPLED.
9. THE TERMINAL END OF THE MAT OR NET MUST BE ANCHORED IN A 6" DEEP TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.



DIVISION DITCH SCHEDULE

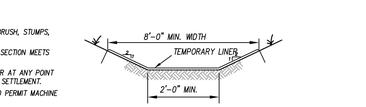
CHANNEL	BOTTOM WIDTH (FT)	SIDE SLOPE (h:v)	CHANNEL GRADE	CHANNEL LENGTH	PERM. LINING	TEMP. LINING	MIN. TOP WIDTH OF LINING (FT)	RIPRAP DEPTH (IN)
1	2	2:1	5.5%	390 LF	GRASS	EXCELSIOR	6	N/A
2	2	2:1	2.0%	325 LF	GRASS	EXCELSIOR	6	N/A
3	4	2:1	1.0%	270 LF	GRASS	EXCELSIOR	12	N/A
4	2	2:1	2.7%	265 LF	GRASS	EXCELSIOR	6	N/A
5	2	2:1	12%	75 LF	GRASS	SYNTHETIC MAT	6	N/A
6	2	2:1	2.0%	100 LF	GRASS	EXCELSIOR	6	N/A
7	2	2:1	1.3%	175 LF	GRASS	EXCELSIOR	6	N/A
8	2	2:1	1.0%	155 LF	GRASS	EXCELSIOR	6	N/A
9	2	2:1	1.0%	90 LF	GRASS	EXCELSIOR	6	N/A
10	2	2:1	1.0%	145 LF	GRASS	EXCELSIOR	6	N/A
11	2	2:1	1.0%	110 LF	GRASS	EXCELSIOR	6	N/A
12	2	2:1	9.1%	120 LF	GRASS	EXCELSIOR	6	N/A
13	2	2:1	6.0%	105 LF	GRASS	EXCELSIOR	6	N/A
14	2	2:1	13%	610 LF	GRASS	EXCELSIOR	6	N/A
15	3	2:1	13%	840 LF	GRASS	SYNTHETIC MAT	7	N/A

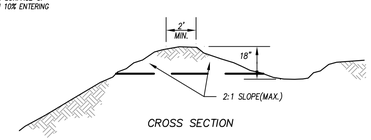
CONSTRUCTION SPECIFICATIONS:

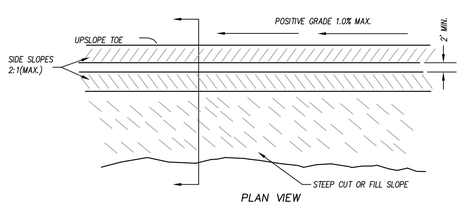
1. REMOVE AND PROPERLY DISPOSE OF ALL TREES, BRUSH, STUMPS, AND OTHER OBJECTIONABLE MATERIALS.
2. ENSURE THAT THE MINIMUM CONSTRUCTED CROSS SECTION MEETS ALL DESIGN REQUIREMENTS.
3. ENSURE THAT THE TOP OF THE DIKE IS NOT LOWER AT ANY POINT THAN THE DESIGN ELEVATION PLUS THE SPECIFIED SETTLEMENT.
4. PROVIDE SUFFICIENT ROOM AROUND DIVERSIONS TO PERMIT MACHINE REGRADING AND CLEANOUT.
5. VEGETATE THE RIDGE IMMEDIATELY AFTER CONSTRUCTION, UNLESS IT WILL REMAIN IN PLACE LESS THAN 30 WORKING DAYS.
6. APPLY SOLID PLASTIC (BLACK, 20 MIL) LINING ON SURFACE OF DIVERSION DITCH ON ANY SLOPES GREATER THAN 10% ENTERING BASINS/PONDS.

MAINTENANCE NOTES:

1. INSPECT TEMPORARY DIVERSIONS ONCE A WEEK AND AFTER EVERY RAINFALL.
2. IMMEDIATELY REMOVE SEDIMENT FROM THE FLOW AREA AND REPAIR DIVERSION DITCH.
3. INSPECT AND MAKE TIMELY REPAIRS AS NEEDED.







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SEAL | 03/26/2021

PRELIMINARY NOT FOR CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

RATIO

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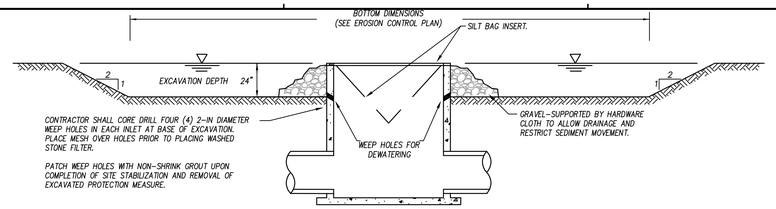
PROJECT NO. 02000.000

SHEET TITLE
EROSION CONTROL DETAILS

SHEET NUMBER
C-07.03



SECTION

CONSTRUCTION NOTES:

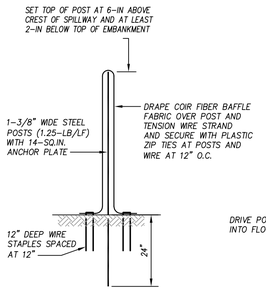
1. PROVIDE WEEP HOLES IN SIDE OF INLET AT BOTTOM OF EXCAVATION FOR DEWATERING.
2. WIRE MESH OR HARDWARE CLOTH SHALL BE PLACED OVER THE OUTSIDE VERTICAL FACE OF THE INLET, TO PREVENT STONE FROM BEING WASHED THROUGH THE WEEP HOLES.
3. #57 WASHED STONE SHALL BE PILED AGAINST THE WIRE.
4. MAINTAIN DEVICE AFTER EACH RAIN. REPLACE #57 WASHED STONE IF IT CLOGS WITH SEDIMENT.
5. CONTRACTOR TO PAINT CLEANOUT MARK ON STRUCTURE AT HALF CAPACITY ELEVATION. SILT IS TO BE REMOVED AND TRAP REPAIRED EACH TIME IT REACHES THIS MARK.
6. CLEAR THE AREA OF ALL DEBRIS THAT MIGHT HINDER EXCAVATION AND DISPOSAL OF SPOIL.
7. GRADE TEH APPROACH TO THE INLET UNIFORMLY.
8. WHEN CONTRIBUTING DRAINAGE AREA HAS BEEN PERMANENTLY STABILIZED, SEAL WEEP HOLES, FILL THE BASIN WITH COMPACTED, DRY, SUITABLE SOIL TO FINAL GRADES AND APPLY FINAL SURFACING.

MAINTENANCE NOTES:

1. INSPECT, CLEAN, AND PROPERLY MAINTAIN THE EXCAVATED BASIN AFTER EVERY STORM UNTIL THE CONTRIBUTING DRAINAGE AREA HAS BEEN PERMANENTLY STABILIZED.
2. REMOVE SEDIMENT WHEN THE VOLUME OF THE BASIN HAS BEEN REDUCED BY ONE-HALF. DISPOSE OF REMOVED SEDIMENT PROPERLY AT AN OFFSITE LOCATION.
3. SPREAD ALL EXCAVATED MATERIAL EVENLY OVER THE SURROUNDING LAND AREA OR STOCKPILE AND STABILIZE IT APPROPRIATELY.
4. SHOULD MANUAL DEWATERING BECOME NECESSARY FOR MAINTENANCE OR FINAL REMOVAL, UTILIZE A MUD PUMP WITH FLOATING SUCTION INLET AND DISCHARGE FLOW ONLY THROUGH A PROPERLY INSTALLED SILT BAG. MONITOR PUMPING TO ENSURE FLOW CAPACITY OF SILT BAG IS NOT EXCEEDED.

EXCAVATED INLET PROTECTION

N.T.S.

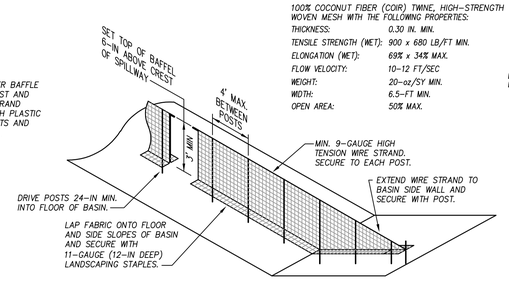


BAFFLE SECTION

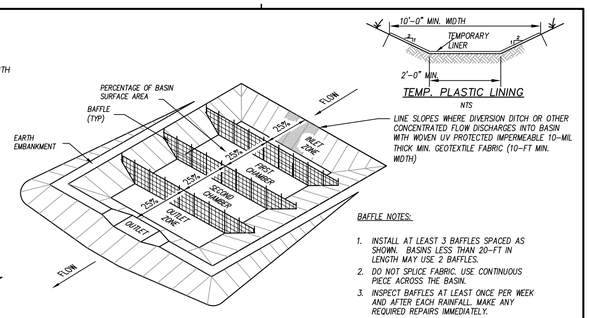
BAFFLE FABRIC:

100% COCONUT FIBER (COIR) TWINE, HIGH-STRENGTH WOVEN MESH WITH THE FOLLOWING PROPERTIES:

THICKNESS:	0.30 IN. MIN.
TENSILE STRENGTH (WET):	900 x 680 LB/FT MIN.
ELONGATION (WET):	69% x 34% MAX.
FLOW VELOCITY:	10-12 FT/SEC
WEIGHT:	20-oz/SY MIN.
WIDTH:	6.5-FT MIN.
OPEN AREA:	50% MAX.



BAFFLE INSTALLATION



BAFFLE PLACEMENT

TEMP. PLASTIC LINING

NTS

LINE SLOPES WHERE DIVERSION DITCH OR OTHER CONCENTRATED FLOW DISCHARGES INTO BASIN WITH WOVEN UV PROTECTED IMPERMEABLE 10-MIL THICK MIN. GEOTEXTILE FABRIC (10-FT MIN. WIDTH)

BAFFLE NOTES:

1. INSTALL AT LEAST 3 BAFFLES SPACED AS SHOWN. BASINS LESS THAN 20-FT IN LENGTH MAY USE 2 BAFFLES.
2. DO NOT SPLICE FABRIC. USE CONTINUOUS PIECE ACROSS THE BASIN.
3. INSPECT BAFFLES AT LEAST ONCE PER WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
4. SHOULD BAFFLE FABRIC COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE PROMPTLY.
5. TAKE CARE TO AVOID DAMAGE TO BAFFLES DURING PERIODIC SEDIMENT REMOVAL. REPAIR ANY DAMAGE AS NEEDED.

TEMPORARY BASIN BAFFLES

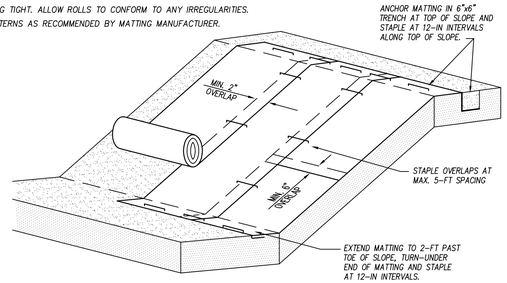
N.T.S.

MAINTENANCE NOTES:

1. INSPECT MATTING AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2-IN OR GREATER) RAINFALL AND REPAIR IMMEDIATELY AS NEEDED.
2. ENSURE GOOD CONTACT WITH SOIL SURFACE IS MAINTAINED AND EROSION DOES NOT OCCUR BENEATH MATTING.
3. AREAS OF MATTING THAT ARE DAMAGED OR WHERE NOT IN CLOSE CONTACT WITH THE SOIL SHALL BE REPAIRED AND STAPLED.
4. IF EROSION OCCURS DUE TO POORLY CONTROLLED DAMAGE, THE PROBLEM SHALL BE FIXED AND THE ERODED AREAS PROTECTED.
5. MONITOR AND REPAIR MATTING AS NECESSARY UNTIL GROUND COVER IS ESTABLISHED.

NOTES:

1. SLOPE SURFACE SHALL BE SMOOTH PRIOR TO PLACEMENT OF MATTING TO ENSURE PROPER SOIL CONTACT.
2. LIME, FERTILIZE, AND SEED PRIOR TO PLACING MATTING. PLANT SHRUBS, TREES, ETC. FOLLOWING PLACEMENT OF MATTING.
3. ON SLOPES FLATTER THAN 4:1, ROLLS MAY BE PLACED IN HORIZONTAL STRIPS.
4. DO NOT STRETCH MATTING TIGHT. ALLOW ROLLS TO CONFORM TO ANY IRREGULARITIES.
5. INSTALL STAPLES IN PATTERNS AS RECOMMENDED BY MATTING MANUFACTURER.



SLOPE PROTECTION MATTING

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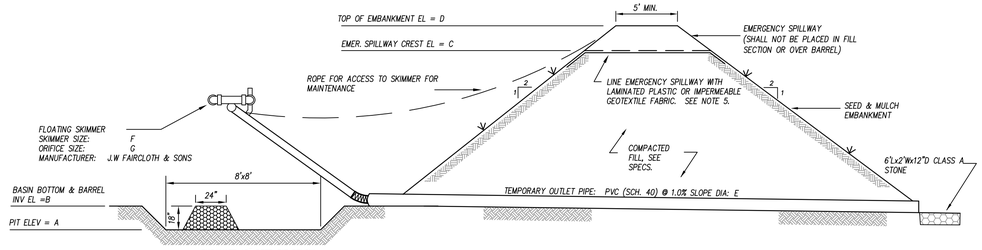
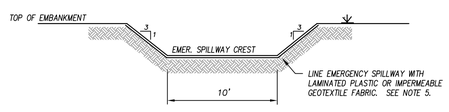


BASIN SECTION

NTS



EMERGENCY SPILLWAY SECTION

NTS

BASIN NUMBER	A (FT) PIT ELEV	B (FT) BASIN BOTTOM	C (FT) EMERG. SPILLWAY	D (FT) EMBANK. TOP	E (IN) OUTLET PIPE DIA.	F (IN) SKIMMER SIZE	G (IN) ORIFICE DIA
1	374.0	372.5	376.0	378.0	4	2	1.5

CONSTRUCTION NOTES:

1. PLACE TEMPORARY SEDIMENT CONTROL MEASURES BELOW BASIN AS INDICATED. CLEAR, GRUB AND STRIP THE AREA UNDER THE EMBANKMENT OF ALL VEGETATION AND ROOT MAT. REMOVE ALL SURFACE SOILS CONTAINING HIGH AMOUTS OF ORGANIC MATTER.
2. PLACE OUTLET BARREL ON A FIRM, SMOOTH FOUNDATION OF IMERVIOUS SOIL. DO NOT USE PERVIOUS MATERIAL SUCH AS SAND, GRAVEL OR CRUSHED STONE AS BACKFILL AROUND PIPE. PLACE FILL MAERIAL AROUND PIPE IN 4-IN LAYERS AND COMPACT IT UNDER AND AROUND THE PIPE TO AT LEAST 90% OF THE STANDARD PROCTOR DENSITY. CARE SHALL BE TAKEN TO NOT RAISE THE PIPE FROM FIRM CONTACT WITH ITS FOUNDATION.
3. ASSEMBLE THE SKIMMER IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. ATTACH SKIMMER TO BARREL PIPE WITH FLEXIBLE JOINT AND POSITION THE SKIMMER OVER THE EXCAVATED PIT. ATTACH A ROPE TO THE SKIMMER AND ANCHOR IT TO THE SIDE OF THE BASIN.
4. EMBANKMENT SHALL BE CONSTRUCTED OF CLEAN STRUCTURAL SOIL, FREE OF ROOTS, VEGETATION, ROCKS & OTHER OBJECTIONABLE MATERIAL. SCARIFY SURFACES BEFORE PLACING FILL. PLACE FILL IN 6-8 INCH LOOSE LIFTS. COMPACT TO AT LEAST 90% OF THE STANDARD PROCTOR DENSITY.
5. LINE THE ENTIRE EMERGENCY SPILLWAY WITH LAMINATED PLASTIC OR IMPERMEABLE GEOTEXTILE FABRIC. FABRIC SHALL BE WIDE ENOUGH TO COVER THE BOTTOM AND SIDES OF THE SPILLWAY AND EXTEND ONTO THE TOP OF THE DAM FOR ANCHORING IN A TRENCH. THE EDGES SHALL BE SECURED WITH 8-IN STAPLES OR PINS. THE FABRIC SHALL BE LONG ENOUGH TO EXTEND DOWN THE SLOPE AND EXIT ONTO STABLE GROUND. THE WIDTH OF THE FABRIC SHALL BE ONE PIECE, NOT JOINED OR SPLICED. IF THE LENGTH OF THE FABRIC IS INSUFFICIENT FOR THE ENTIRE LENGTH OF THE SPILLWAY, MULTIPLE SECTIONS, SPANNING THE COMPLETE WIDTH, MAY BE USED. THE UPPER SECTIONS SHALL OVERLAP THE LOWER SECTIONS SO WATER CANNOT FLOW UNDER THE FABRIC. SECURE THE UPPER EDGE AND SIDES OF THE FABRIC IN A TRENCH WITH STAPLES OR PINS.
6. INSTALL BAFFLES ACROSS BOTTOM OF BASIN.

MAINTENANCE NOTES:

1. INSPECT DEVICE AFTER EACH RAINFALL. REMOVE SEDIMENT WHEN SEDIMENT REACHES A DEPTH OF NO MORE THAN ONE-HALF THE HEIGHT OF THE RISER. REPAIR BAFFELS IF THEY ARE DAMAGED.
2. PULL SKIMMER TO SIDE OF BASIN WITH ROPE AND INSPECT REGULARLY. KEEP SKIMMER HEAD, ORIFICE AND PIPE FREE OF DEBRIS. REMOVE SEDIMENT FROM BENEATH SKIMMER AND ENUSRE VEGETATION DOES NOT INTERFERE WITH SKIMMER OPERATION.
3. CHECK FABRIC LINED SPILLWAY FOR DAMAGE AND MAKE ANY REPAIRS WITH FABRIC THAT SPANS THE FULL WIDTH OF THE SPILLWAY.

TEMPORARY SKIMMER SEDIMENT BASIN

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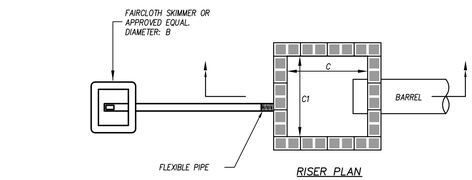
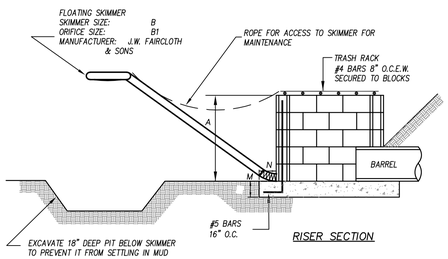
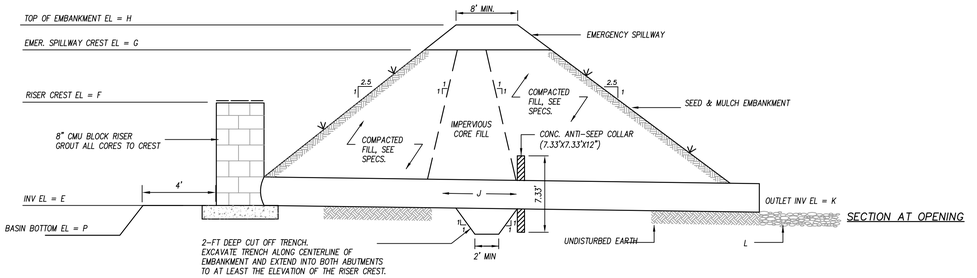


RISER PLAN



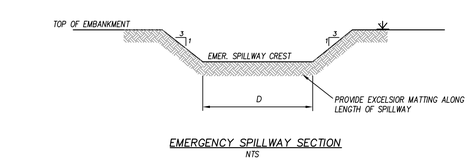
RISER SECTION



BASIN SECTION

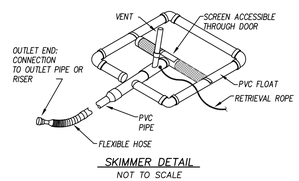
NTS

SECTION AT OPENING



EMERGENCY SPILLWAY SECTION

NTS



SKIMMER DETAIL

NOT TO SCALE

CONSTRUCTION NOTES:

1. PLACE TEMPORARY SEDIMENT CONTROL MEASURES BELOW BASIN AS INDICATED. CLEAR, GRUB AND STRIP THE AREA UNDER THE EMBANKMENT OF ALL VEGETATION AND ROOT MAT. REMOVE ALL SURFACE SOILS CONTAINING ORGANIC MATTER.
2. PLACE OUTLET BARREL ON A FIRM, SMOOTH FOUNDATION OF IMPERVIOUS SOIL. DO NOT USE PERVIOUS MATERIAL SUCH AS SAND, GRAVEL OR CRUSHED STONE AS BACKFILL AROUND PIPE. PLACE FILL MATERIAL AROUND PIPE IN 4-IN LAYERS AND COMPACT IT UNDER AND AROUND THE PIPE TO AT LEAST 95% OF THE STANDARD PROCTOR DENSITY. CARE SHALL BE TAKEN TO NOT RAISE THE PIPE FROM FIRM CONTACT WITH ITS FOUNDATION.
3. INSTALL OUTLET PROTECTION AND CONCRETE ANTI-SEEP COLLAR.
4. CONSTRUCT OUTLET RISER STRUCTURE.
5. ASSEMBLE THE SKIMMER IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. ATTACH SKIMMER TO RISER WITH FLEXIBLE JOINT AND POSITION THE SKIMMER OVER THE EXCAVATED PIT. ATTACH A ROPE TO THE SKIMMER AND ANCHOR IT TO THE SIDE OF THE BASIN.
6. EMBANKMENT SHALL BE CONSTRUCTED OF CLEAN STRUCTURAL SOIL, FREE OF ROOTS, VEGETATION, ROCKS & OTHER OBJECTIONABLE MATERIAL. CONSTRUCT EMBANKMENT CORE AND CUT-OFF TRENCH OF IMPERVIOUS SOILS. SCARIFY SURFACES BEFORE PLACING FILL. PLACE FILL IN 6-8 INCH LOOSE LIFTS. COMPACT TO AT LEAST 95% OF THE STANDARD PROCTOR DENSITY.
7. APPLY SEED AND LINE THE ENTIRE EMERGENCY SPILLWAY WITH EXCELSIOR MATTING.
8. INSTALL BAFFLES ACROSS BOTTOM OF BASIN.

MAINTENANCE NOTES:

1. INSPECT DEVICE AFTER EACH RAINFALL. REMOVE SEDIMENT WHEN SEDIMENT REACHES A DEPTH OF NO MORE THAN ONE-HALF THE HEIGHT OF THE RISER. REPAIR BAFFELS IF THEY ARE DAMAGED.
2. PULL SKIMMER TO SIDE OF BASIN WITH ROPE AND INSPECT REGULARLY. KEEP SKIMMER HEAD, ORIFICE AND PIPE FREE OF DEBRIS. REMOVE SEDIMENT FROM BENEATH SKIMMER AND ENUSRE VEGETATION DOES NOT INTERFERE WITH SKIMMER OPERATION.
3. CHECK FABRIC LINED SPILLWAY FOR DAMAGE AND MAKE ANY REPAIRS WITH FABRIC THAT SPANS THE FULL WIDTH OF THE SPILLWAY.

SEDIMENT BASIN SCHEDULE

SED. BASIN NO.	RISER A (FT)	RISER B (IN)	RISER B1 (IN)	RISER C (FT)	RISER C1 (FT)	EMERG. D (FT)	ELEVATIONS E (FT)	ELEVATIONS F (FT)	ELEVATIONS G (FT)	ELEVATIONS H (FT)	ELEVATIONS P (FT)	OUTLET BARREL J	OUTLET BARREL K (FT)	OUTLET PROTECTION L	FOOTING M (IN)	FOOTING N (IN)	DEWATERING TIME (HRS)
1	2.5	3	3	3	3	12	411.50	414.00	415.00	417.00	410.50	42 LF 15" CMP	411.00	8'Lx4'Wx22"TH CLASS B STONE	6	6	35.6
2	2.5	3	3	3	3	20	399.50	402.00	403.00	405.00	398.50	46 LF 18" CMP	398.95	9'Lx5'Wx22"TH CLASS B STONE	6	6	84.4

TEMPORARY SEDIMENT BASIN

N.T.S.

Felton Grove High School
8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
11 Corning Road, Suite 190
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(919)588-3602

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Raleigh, North Carolina 27601
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Walker Consultants
13860 Ballantyne Corporate Pl, Suite 140
Charlotte, North Carolina 28277
(704) 247-6230

SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
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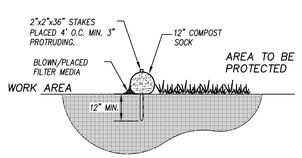
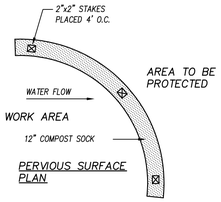
PROJECT NO. 02000.000

SHEET TITLE
EROSION CONTROL DETAILS

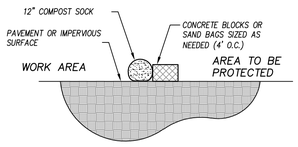
SHEET NUMBER
C-07.04



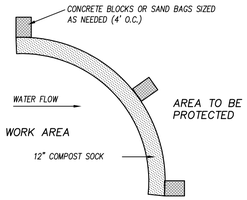
PERVIOUS SURFACE SECTION



PERVIOUS SURFACE PLAN



IMPERVIOUS SURFACE SECTION



IMPERVIOUS SURFACE PLAN

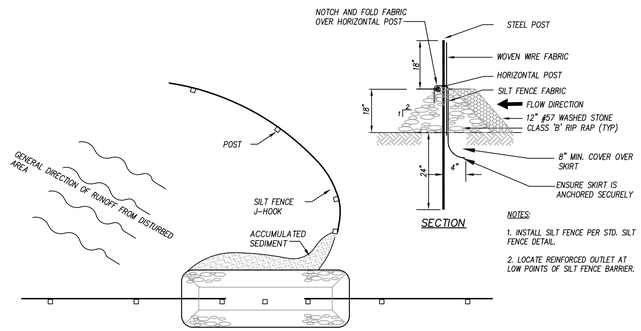
NOTES:

1. MATERIALS TO BE FILTREXX OR APPROVED EQUAL.
2. ALL MATERIAL AND INSTALLATION TO MEET STATE AND LOCAL SPECIFICATIONS.
3. COMPOST SOCKS SHALL BE INSTALLED PARALLEL TO THE BASE OF THE SLOPE OR OTHER AFFECTED AREAS, PERPENDICULAR TO SHEET FLOW. COMPOST SOCKS ARE EFFECTIVE IN AREAS WHERE SEDIMENT ACCUMULATION OF LESS THAN SIX INCHES IS EXPECTED.
4. COMPOST SOCKS CAN BE APPLIED ON SLOPES UP TO A 2:1 GRADE WITH A MAXIMUM HEIGHT OF 10 FEET. COMPOST SOCK SHOULD NOT BE USED ALONE BELOW GRADED SLOPES GREATER THAN 10 FEET IN HEIGHT.
5. 2"X2" OAK OR OTHER DURABLE HARDWOOD STAKES SHALL BE USED. STAKES SHALL BE PLACES AT A MAXIMUM INTERVAL OF 4 FEET, OR A MAXIMUM INTERVAL OF 8 FEET IF THE SOCK IS PLACER IN A 4 INCH TRENCH. STAKES SHALL BE DRIVEN TO A MINIMUM DEPTH OF 12 INCHES, WITH A MINIMUM OF 3 INCHES PROTRUDING ABOVE THE COMPOST SOCKS.
6. COMPOST SOCKS SHALL BE SLEEVED WHEN SECTIONS LONGER THAN 200-LF ARE REQUIRED. STAKES SHALL BE PLACED ON SLEEVED AREAS TO KEEP SECTIONS TOGETHER.
7. IN THE EVENT STAKING IS NOT POSSIBLE (I.E., WHEN SOCKS ARE USED ON PAVEMENT) HEAVY CONCRETE BLOCKS OR SAND BAGS SHALL BE USED BEHIND THE SOCK TO HOLD IT IN PLACE DURING RUNOFF EVENTS.
8. COMPOST SOCK SHOULD BE PLACED AT A 10 FOOT MINIMUM DISTANCE FROM THE TOE OF THE SLOPE TO ALLOW FOR A PROPER RUNOFF ACCUMULATION AND MAXIMUM SEDIMENT STORAGE. ON FLAT AREAS, COMPOST SOCK SHALL BE PLACED AT THE EDGE OF DISTURBED AREAS.
9. THE ENDS OF THE SOCKS SHOULD BE TURNED SLIGHTLY UP SLOPE TO PREVENT RUNOFF FROM GOING AROUND THE END OF THE SOCKS.

MAINTENANCE NOTES:

1. INSPECT COMPOST SOCKS WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT (1/2 INCH OR GREATER).
2. SEDIMENT SHOULD BE REMOVED FROM BEHIND CHECK DAM ONCE THE ACCUMULATED HEIGHT HAS REACHED ½ THE HEIGHT OF THE CHECK DAM.
3. THE COMPOST SOCK MUST BE REPLACED IF CLOGGED OR TORN.
4. IF PONDING BECOMES EXCESSIVE, THE SOCK MAY NEED TO BE REPLACED WITH A LARGER DIAMETER OR A DIFFERENT MEASURE.
5. THE SOCK NEEDS TO BE REINSTALLED IF UNDERMINED OR DISLODGED.
6. THE COMPOST SOCK SHALL BE INSPECTED UNTIL LAND DISTURBANCE IS COMPLETE AND THE AREA ABOVE THE MEASURE HAS BEEN PERMANENTLY STABILIZED.

TEMPORARY COMPOST SOCK PERIMETER FENCE N.T.S.

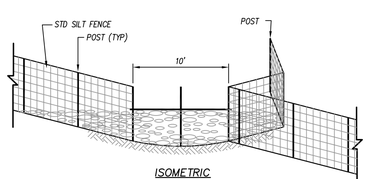


SECTION

NOTES:

1. INSTALL SILT FENCE PER STD. SILT FENCE DETAIL.
2. LOCATE REINFORCED OUTLET AT LOW POINTS OF SILT FENCE BARRIER.

PLAN VIEW REINFORCED SILT FENCE WITH J-HOOK OUTLET



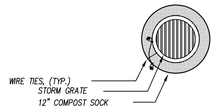
ISOMETRIC

MAINTENANCE NOTES:

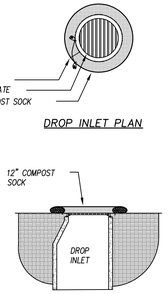
1. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE/OUTLET. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT. REMOVE & REPLACE STONE AS NECESSARY AS IT BECOMES CLOGGED WITH SEDIMENT.

   REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND
2. STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

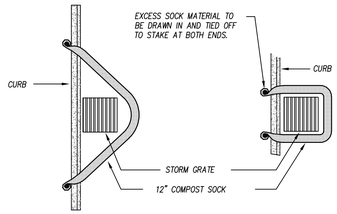
TEMPORARY REINFORCED SILT FENCE J-HOOK INSTALLATION N.T.S.



DROP INLET PLAN

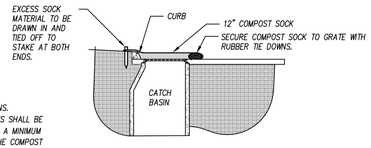


DROP INLET SECTION



CURBSIDE OPTION "A" PLAN

CURBSIDE OPTION "B" PLAN



CURBSIDE SECTION

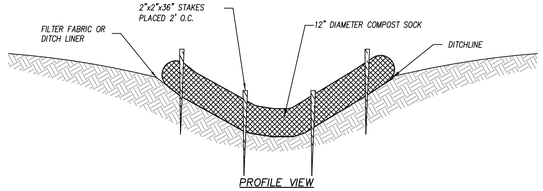
NOTES:

1. MATERIALS TO BE FILTREXX OR APPROVED EQUAL.
2. ALL MATERIAL AND INSTALLATION TO MEET STATE AND LOCAL SPECIFICATIONS.
3. 2"X2" OAK OR OTHER DURABLE HARDWOOD STAKES SHALL BE USED. STAKES SHALL BE PLACES AT A MAXIMUM INTERVAL OF 4 FEET. STAKES SHALL BE DRIVEN TO A MINIMUM DEPTH OF 12 INCHES, WITH A MINIMUM OF 3 INCHES PROTRUDING ABOVE THE COMPOST SOCKS.
4. IN THE EVENT STAKING IS NOT POSSIBLE (I.E., WHEN SOCKS ARE USED ON PAVEMENT) HEAVY CONCRETE BLOCKS OR SAND BAGS SHALL BE USED BEHIND THE SOCK TO HOLD IT IN PLACE DURING RUNOFF EVENTS.
5. THE ENDS OF THE SOCKS SHOULD BE TURNED SLIGHTLY UP SLOPE TO PREVENT RUNOFF FROM GOING AROUND THE END OF THE SOCKS.

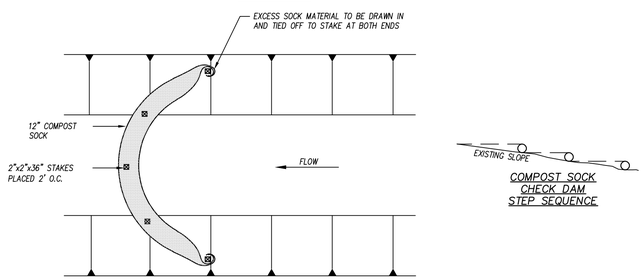
MAINTENANCE NOTES:

1. INSPECT COMPOST SOCKS WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT (1/2 INCH OR GREATER).
2. SEDIMENT SHOULD BE REMOVED FROM BEHIND CHECK DAM ONCE THE ACCUMULATED HEIGHT HAS REACHED ½ THE HEIGHT OF THE CHECK DAM.
3. THE COMPOST SOCK MUST BE REPLACED IF CLOGGED OR TORN.
4. IF PONDING BECOMES EXCESSIVE, THE SOCK MAY NEED TO BE REPLACED WITH A LARGER DIAMETER OR A DIFFERENT MEASURE.
5. THE SOCK NEEDS TO BE REINSTALLED IF UNDERMINED OR DISLODGED.
6. THE COMPOST SOCK SHALL BE INSPECTED UNTIL LAND DISTURBANCE IS COMPLETE AND THE AREA ABOVE THE MEASURE HAS BEEN PERMANENTLY STABILIZED.

TEMPORARY COMPOST SOCK INLET PROTECTION N.T.S.



PROFILE VIEW



COMPOST SOCK CHECK DAM STEP SEQUENCE

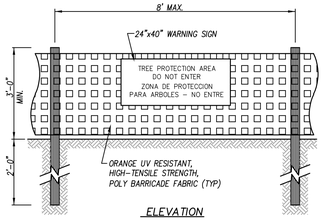
NOTES:

1. MATERIALS TO BE FILTREXX OR APPROVED EQUAL.
2. ALL MATERIAL AND INSTALLATION TO MEET STATE AND LOCAL SPECIFICATIONS.
3. COMPOST SOCK MAY BE USED AS CHECK DAMS IN DITCHES NOT EXCEEDING 3 FEET IN DEPTH.
4. PRIOR TO SOCK INSTALLATION, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND OTHER DEBRIS GREATER THAN ONE INCH THAT MAY INTERFERE WITH PROPER FUNCTION.
5. 2"X2" OAK OR OTHER DURABLE HARDWOOD STAKES SHALL BE USED. STAKES SHALL BE PLACED AT A MAXIMUM INTERVAL OF 2 FEET. STAKES SHALL BE DRIVEN TO A MINIMUM DEPTH OF 12 INCHES, WITH A MINIMUM OF 3 INCHES PROTRUDING ABOVE THE COMPOST SOCKS.
6. THE ENDS OF THE SOCKS SHOULD BE TURNED SLIGHTLY UP SLOPE TO PREVENT RUNOFF FROM GOING AROUND THE END OF THE SOCKS.
7. CHECK DAM SHOULD BE USED IN AREAS THAT DRAIN 10 ACRES OR LESS.
8. CHECK DAM CAN BE DIRECT SEEDED AT THE TIME OF INSTALLATION.

MAINTENANCE NOTES:

1. INSPECT COMPOST SOCKS WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT (1/2 INCH OR GREATER).
2. SEDIMENT SHOULD BE REMOVED FROM BEHIND CHECK DAM ONCE THE ACCUMULATED HEIGHT HAS REACHED ½ THE HEIGHT OF THE CHECK DAM.
3. THE COMPOST SOCK MUST BE REPLACED IF CLOGGED OR TORN.
4. IF PONDING BECOMES EXCESSIVE, THE SOCK MAY NEED TO BE REPLACED WITH A LARGER DIAMETER OR A DIFFERENT MEASURE.
5. THE SOCK NEEDS TO BE REINSTALLED IF UNDERMINED OR DISLODGED.
6. THE COMPOST SOCK SHALL BE INSPECTED UNTIL LAND DISTURBANCE IS COMPLETE AND THE AREA ABOVE THE MEASURE HAS BEEN PERMANENTLY STABILIZED.

TEMPORARY COMPOST SOCK CHECK DAM N.T.S.

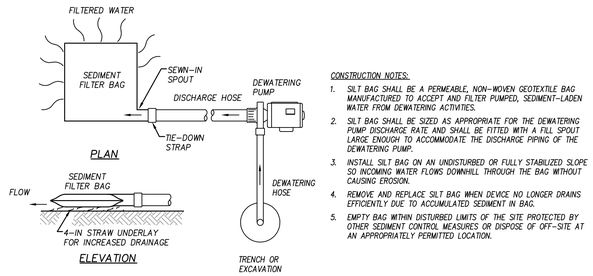


ELEVATION

NOTES:

1. INSTALL TREE PROTECTION FENCING PRIOR TO PERFORMING ANY CLEARING OF THE SITE.
2. WARNING SIGNS TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.
3. LETTERS TO BE 3" TALL AND CLEARLY LEGIBLE.
4. SIGNS SHALL BE PLACED AT 100' MAXIMUM INTERVALS. PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 100' ON CENTER THEREAFTER.
5. FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA.
6. ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
7. MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.

TREE PROTECTION FENCE N.T.S.



PLAN

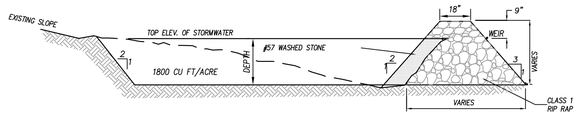
ELEVATION

CONSTRUCTION NOTES:

1. SILT BAG SHALL BE A PERMEABLE, NON-WOVEN GEOTEXTILE BAG MANUFACTURED TO ACCEPT AND FILTER PUMPED, SEDIMENT-LADEN WATER FROM DEWATERING ACTIVITIES.
2. SILT BAG SHALL BE SIZED AS APPROPRIATE FOR THE DEWATERING PUMP DISCHARGE RATE AND SHALL BE FITTED WITH A FILL SPOUT LARGE ENOUGH TO ACCOMMODATE THE DISCHARGE PIPING OF THE DEWATERING PUMP.
3. INSTALL SILT BAG ON AN UNDISTURBED OR FULLY STABILIZED SLOPE SO INCOMING WATER FLOWS DOWNHILL THROUGH THE BAG WITHOUT CAUSING EROSION.
4. REMOVE AND REPLACE SILT BAG WHEN DEVICE NO LONGER DRAINS EFFICIENTLY DUE TO ACCUMULATED SEDIMENT IN BAG.
5. EMPTY BAG WITHIN DISTURBED LIMITS OF THE SITE PROTECTED BY OTHER SEDIMENT CONTROL MEASURES OR DISPOSE OF OFF-SITE AT AN APPROPRIATELY PERMITTED LOCATION.

DEWATERING SEDIMENT FILTER BAG N.T.S.

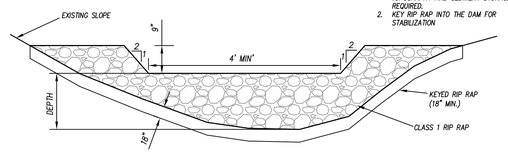
CHECK DAM NUMBER	DISTURBED AREA (AC)	DESIGN VOLUME (CF)	WEIR LENGTH (FT)	BOTTOM LENGTH (FT)	BOTTOM WIDTH (FT)	DEPTH (FT)
1	0.63	240	4	20	10	1.5



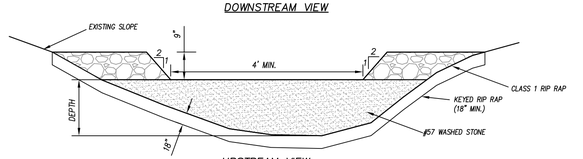
SIDE VIEW

NOTES:

1. HEIGHT AND WIDTH DETERMINED BY EXISTING TOPOGRAPHY AND SEDIMENT STORAGE REQUIRED.
2. KEY RIP RAP INTO THE DAM FOR STABILIZATION



DOWNSTREAM VIEW



UPSTREAM VIEW

NOTES:

1. HEIGHT AND WIDTH DETERMINED BY EXISTING TOPOGRAPHY AND SEDIMENT STORAGE REQUIRED.
2. KEY RIP RAP INTO SLOPES FOR STABILITY.

MAINTENANCE NOTES:

1. INSPECT CHECK PROTECTION WEEKLY AND AFTER ½" RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE SEDIMENT STRAW, LIMBS, OR OTHER DEBRIS THAT COULD CLOG THE CHANNEL WHEN NEEDED.
2. IMMEDIATELY CORRECT ANY DAMAGE CAUSED BY SUBMERGED AND DEPOSITION ABOVE THE CHECK DAM AND FROM HIGH FLOWS AROUND THE EDGES.
3. REMOVE SEDIMENT ACCUMULATED BEHIND THE DAMS AS NEEDED TO PREVENT DAMAGE TO CHANNEL VEGETATION. ALLOW THE CHANNEL TO DRAIN THROUGH THE STONE CHECK DAM, AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE DAM. ADD STONES TO DAMS AS NEEDED TO MAINTAIN DESIGN HEIGHT AND CROSS SECTION.

CHECK DAM WITH WEIR N.T.S.

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8550 Stephenson Road
Apex, NC 27539

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11 Corning Road, Suite 190
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SEAL | 03/26/2021

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RATIO

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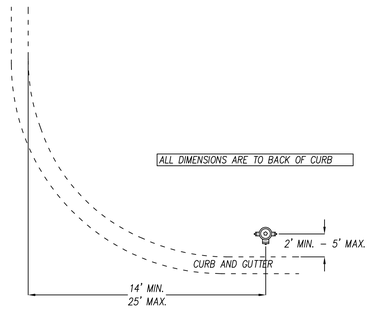
PROJECT NO. 02000.000

SHEET TITLE
EROSION CONTROL DETAILS

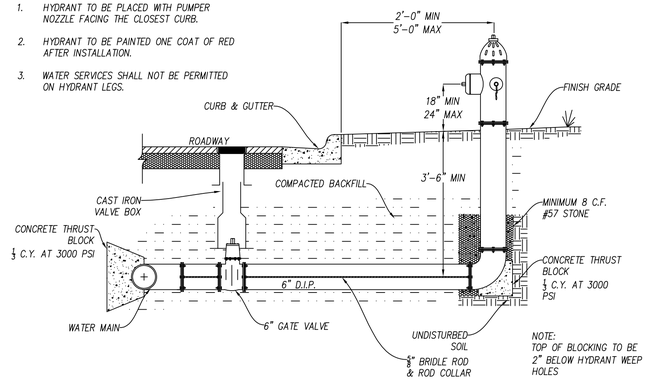
SHEET NUMBER
C-07.05



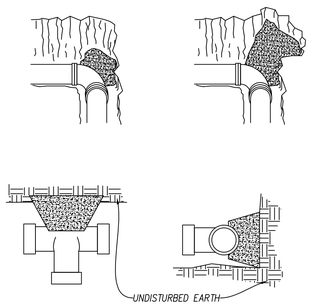
TOWN OF APEX STANDARDS	HYDRANT LOCATION	STD. NO. 600.06
EFFECTIVE: DECEMBER 3, 2002		SHEET 1 OF 1

NOTES:

1. HYDRANT TO BE PLACED WITH PUMPER NOZZLE FACING THE CLOSEST CURB.
2. HYDRANT TO BE PAINTED ONE COAT OF RED AFTER INSTALLATION.
3. WATER SERVICES SHALL NOT BE PERMITTED ON HYDRANT LEGS.



TOWN OF APEX STANDARDS	HYDRANT INSTALLATION	STD. NO. 600.05
EFFECTIVE: NOVEMBER 20, 2007		SHEET 1 OF 1

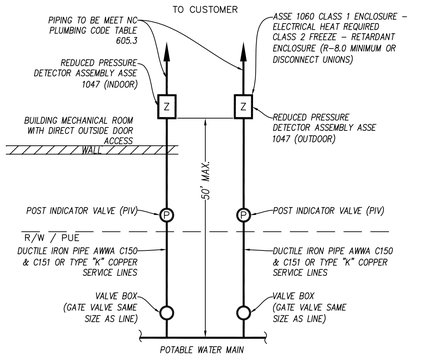


MINIMUM CONCRETE BLOCKING (C.Y.)*					
NOM. PIPE DIA. (INCHES)	TEES & DEAD ENDS	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
4	0.1	0.1	0.1	0.1	0.1
6	0.2	0.2	0.1	0.1	0.1
8	0.2	0.3	0.2	0.1	0.1
10	0.3	0.5	0.3	0.2	0.2
12	0.4	0.6	0.5	0.3	0.3
14	0.7	0.9	0.6	0.5	0.5
16	0.7	0.9	0.6	0.5	0.5
18	0.9	1.2	0.7	0.6	0.6
20	1.1	1.6	1.1	0.7	0.7
24	1.7	2.3	1.6	0.9	0.9

* CONCRETE SHALL BE 3000 PSI

NOTE: WRAP FITTINGS IN 6 MIL PLASTIC BEFORE POURING CONCRETE

TOWN OF APEX STANDARDS	REACTION BLOCKING	STD. NO. 600.13
EFFECTIVE: DECEMBER 3, 2002		SHEET 1 OF 1

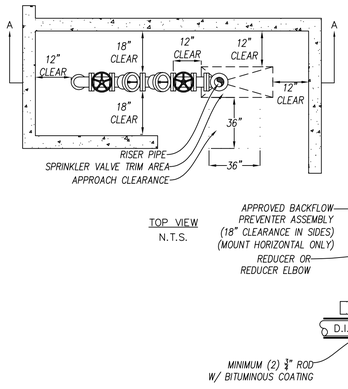


FIRE

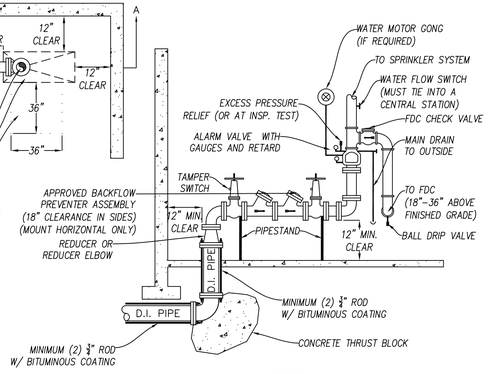
NOT TO SCALE

NOTE:
1. REDUCED PRESSURE DETECTOR ASSEMBLY ASSE 1047 SHALL MEET CURRENT TOWN OF APEX CROSS CONNECTION ORDINANCE AND USC CODE.
2. INLET PIPE TO WATER METER SHALL BE SAME SIZE AS OUTLET PIPE BEHIND BACKFLOW PREVENTER.
3. THERE SHALL BE NO TAPS, BYPASS PIPING, HYDRANTS, FIRE DEPT. CONNECTION POINTS OR OTHER WATER-USING APPURTENANCES CONNECTED TO THE SUPPLY LINE BETWEEN ANY WATER METER AND ITS REQUIRED BACKFLOW PREVENTER.
4. EACH BACKFLOW PREVENTER CONNECTED TO TOWN OF APEX WATER SUPPLY (CONTAINMENT) SHALL BE TESTED BY AN APPROVED TESTER BEFORE PLACING THE WATER SYSTEM IN SERVICE AND SHALL BE TESTED ANNUALLY OR AS REQUESTED BY THE TOWN OF APEX.
5. ENCLOSURE SHALL HAVE THE FOLLOWING INFORMATION MARKED:
   A. NAME OF MANUFACTURER OR TRADE MARK
   B. MODEL NUMBER
   C. DATE CODE OR SERIAL NUMBER
   D. CLASS DESIGNATION AND LOWEST TEMPERATURE RANGE
   E. ASSE STANDARD #1060
   F. PHYSICAL ADDRESS
   G. MARKINGS SHALL BE 6 MM (¼") SIZE LETTER HEIGHT AND CAST, ETCHED, STAMPED OR ENGRAVED ON THE ENCLOSURE, OR ON A CORROSION RESISTANT PLATE SECURELY ATTACHED TO THE ENCLOSURE.
   H. 2" SIZE NUMBERS TO BE PLACED ON THE BACK OF THE COVER FOR EACH BACKFLOW LOCATION (COMMERCIAL ONLY).
6. ALL BACKFLOW PREVENTERS SHALL BE "LEAD FREE".

TOWN OF APEX STANDARDS	TYPICAL FIRE CONNECTIONS – COMMERCIAL	STD. NO. 620.02
EFFECTIVE: MARCH 6, 2018		SHEET 1 OF 2



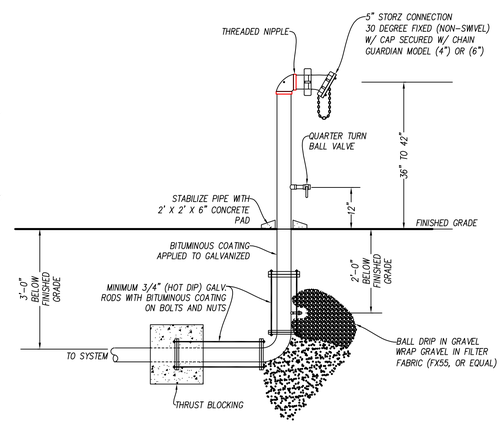
TOP VIEW
N.T.S.



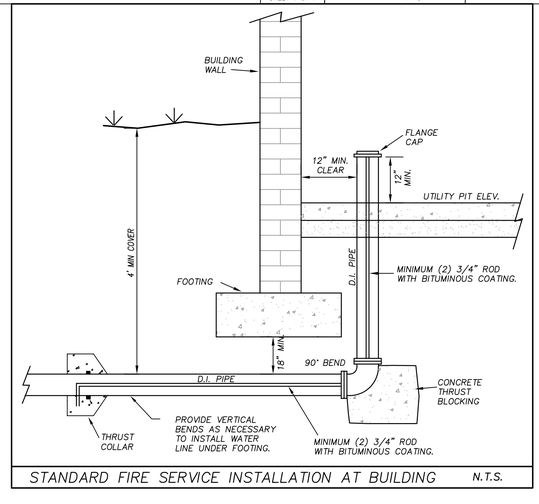
SECTION A–A
N.T.S.

TOWN OF APEX STANDARDS	SPRINKLER RISER & FIRE DEPARTMENT CONNECTION	STD. NO. 600.19
EFFECTIVE: NOVEMBER 20, 2007		SHEET 1 OF 1

NOTES:
1. ALL EXPOSED PIPING AND FITTINGS SHALL BE GALVANIZED WITH EXCEPTION OF STORZ CONNECTION
2. PIPE MATERIAL SHALL BE CLASS 350 DIP AWWA C150 AND C151 APPROVED BY THE TOWN. PIPE MATERIAL BEHIND THE BACKFLOW PREVENTER SHALL MEET NC PLUMBING CODE TABLE 605.4
3. PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF FDC AND ACCESSORIES
4. 50' MAX DISTANCE FROM FDC TO APPARATUS – FIRE HYDRANT
5. FOR NFPA 13R SYSTEMS (2 ½" RISER AND SMALLER) SINGLE FDC WITH NATIONAL STANDARD THREADS SHALL BE USED
6. AN APPROVED CONNECTION (TAPPING IS NOT APPROVED)



TOWN OF APEX STANDARDS	YARD FDC	STD. NO. 620.08
EFFECTIVE: MARCH 6, 2018		SHEET 1 OF 1



STANDARD FIRE SERVICE INSTALLATION AT BUILDING N.T.S.

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SHEET ISSUE

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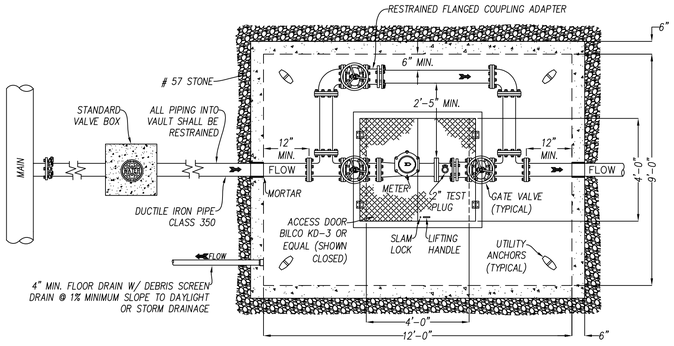
PROJECT NO. 02000.000

SHEET TITLE
UTILITY & STORM DETAILS

SHEET NUMBER
C-08.00

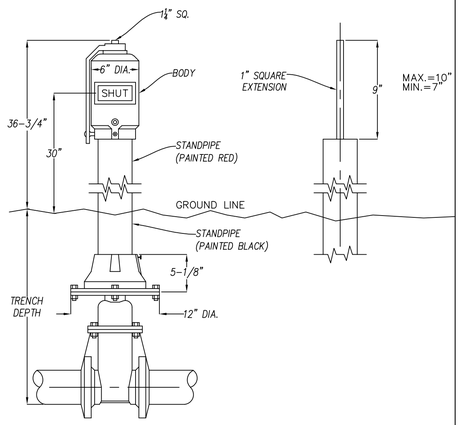


PLAN VIEW

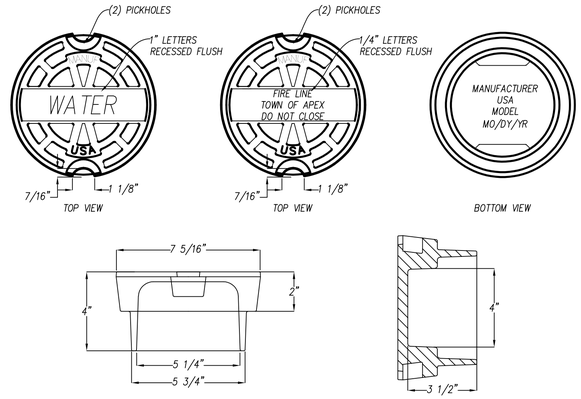
TOWN OF APEX STANDARDS	3" & LARGER METER INSTALLATION & VAULT	STD. NO. 600.03
EFFECTIVE: JANUARY 22, 2014		SHEET 2 OF 2

FIELD ADJUSTMENT INSTRUCTIONS:

1. REMOVE THE BODY FROM THE TOP OF THE INDICATOR POST ASSEMBLY.
2. CUT THE REQUIRED LENGTH OF THE BOTTOM OF THE STANDPIPE FOR THE GROUND LINE TO MATCH UP WITH THE STANDPIPE GROUND LINE MARK.
3. CUT THE 1" SQ. EXTENSION AT A DISTANCE OF 9" ABOVE THE TOP OF THE STANDPIPE.
4. SET THE "OPEN" AND "SHUT" TARGETS FOR THE APPROPRIATE VALVE SIZE.
5. REATTACH THE BODY TO THE TOP OF THE INDICATOR POST ASSEMBLY.
6. LOCATION OF VALVE PER NFPA.

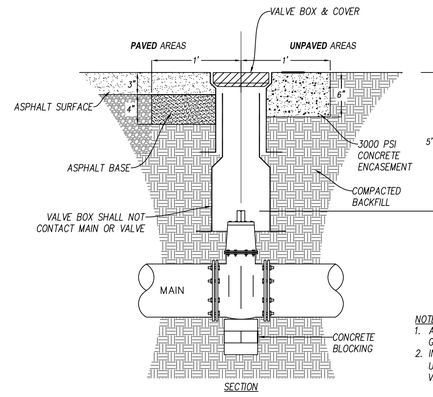


TOWN OF APEX STANDARDS	TAPPING SLEEVE & POST INDICATOR VALVE	STD. NO. 600.16
EFFECTIVE: DECEMBER 21, 2010		SHEET 1 OF 1



COVER WEIGHT: 16 LBS

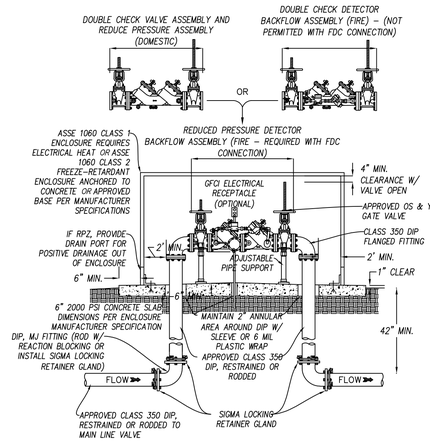
TOWN OF APEX STANDARDS	VALVE COVER	STD. NO. 600.09
EFFECTIVE: NOVEMBER 20, 2007		



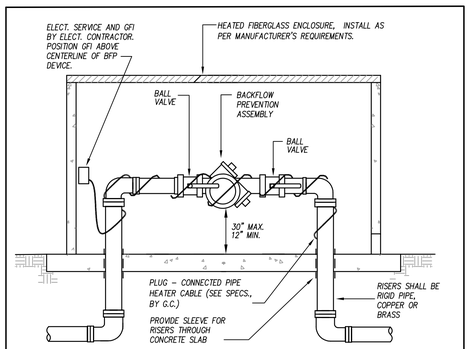
NOTES:
1. ALL VALVE BOXES AND COVERS SHALL MEET ASTM A48, GRADE 35B IRON REQUIREMENTS.
2. IN CASES WHERE MAX. VALVE BOX HEIGHT IS EXCEEDED, USE 6" DIP AS A PROTECTIVE SLEEVE AND INCLUDE A VALVE NUT EXTENSION.

TOWN OF APEX STANDARDS	VALVE BOX INSTALLATION	STD. NO. 600.08
EFFECTIVE: JUNE 18, 2019		SHEET 1 OF 1

NOTES:
1. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1013 & AWWA C511.
2. REDUCED PRESSURE DETECTOR BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1047. UNIT SHALL BE USED FOR ALL FIRE PREVENTION SYSTEMS WITH FDC, CHEMICAL, PROCESSED OR BOOSTERED.
3. DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1015 & AWWA C510.
4. DOUBLE CHECK DETECTOR BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1048.
5. BACKFLOW ASSEMBLY SHALL BE CENTERED ON CONCRETE PAD AND CENTERED WITHIN ENCLOSURE OR BASED ON MANUFACTURER SPECIFICATION.
6. ASSE 1060 CLASS 2 FREEZE-RETARDANT ENCLOSURE REQUIRED.
7. STANDARD 120V GFCI ELECTRICAL RECEPTACLE TO BE INSTALLED IN ACCORDANCE WITH THE NC ELECTRICAL CODE FOR OUTDOOR OPERATION.
8. PIPE MATERIAL SHALL BE CLASS 350 DIP AWWA C150 AND C151 APPROVED BY THE TOWN.
9. INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE TOWN ORDINANCES, SPECIFICATIONS, UNIVERSITY OF SOUTHERN CALIFORNIA FOUNDATION FOR CROSS – CONNECTION CONTROL AND HYDRAULIC RESEARCH AND THE NC PLUMBING CODE.
10. PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW PREVENTION ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.
11. ALL BACKLOW PREVENTERS SHALL BE "LEAD FREE".



TOWN OF APEX STANDARDS	COMMERCIAL OUTDOOR DOMESTIC/FIRE BACKFLOW ASSEMBLY (3" DIAMETER & LARGER)	STD. NO. 620.06
EFFECTIVE: MARCH 6, 2018		SHEET 1 OF 1



NOTES:
1. REDUCED PRESSURE ASSEMBLY SHALL BE ZURN–WILKINS MODEL. SEE UTILITY PLAN FOR MODEL INFORMATION.
2. ALL BACKFLOW PREVENTERS SHALL BE AS APPROVED BY TOWN OF RUTHERFORDTON.
3. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS OF BACKFLOW PREVENTER, VALVES, ENCLOSURE, ETC.
4. HEATER AND POWER CORD BY G.C., SEE SPECIFICATIONS INSTALL PER MANUFACTURES INSTRUCTIONS.

REDUCED PRESSURE ASSEMBLY NTS

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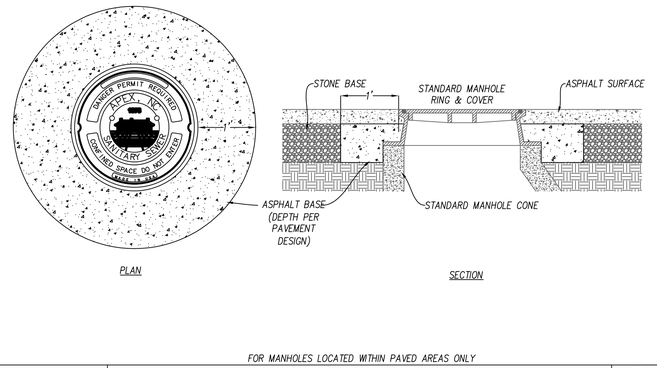
PROJECT NO. 02000.000

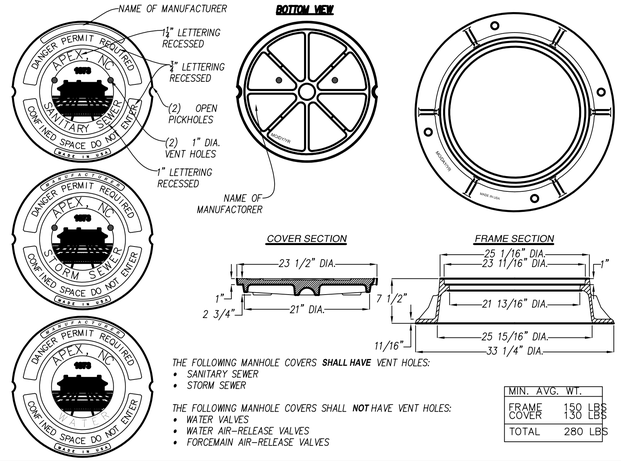
SHEET TITLE
UTILITY & STORM DETAILS

SHEET NUMBER
C-08.01



FOR MANHOLES LOCATED WITHIN PAVED AREAS ONLY

TOWN OF APEX STANDARDS	MANHOLE RING & COVER ENCASEMENT	STD. NO. 700.06
EFFECTIVE: JANUARY 22, 2014		SHEET 1 OF 2



THE FOLLOWING MANHOLE COVERS **SHALL HAVE** VENT HOLES:
- SANITARY SEWER
- STORM SEWER

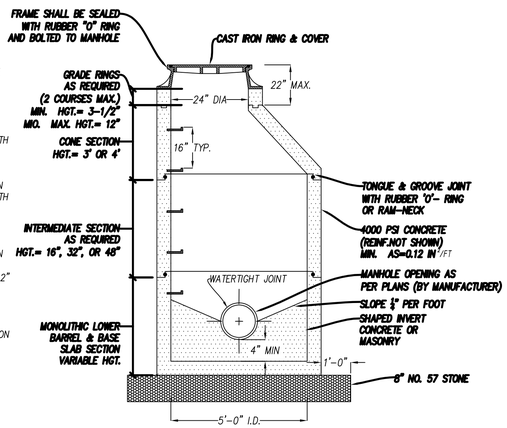
THE FOLLOWING MANHOLE COVERS SHALL **NOT** HAVE VENT HOLES:
- WATER VALVES
- WATER AIR-RELEASE VALVES
- FORCEMAIN AIR-RELEASE VALVES

MIN. AVG. WT.	
FRAME	150 LBS
COVER	130 LBS
TOTAL	280 LBS

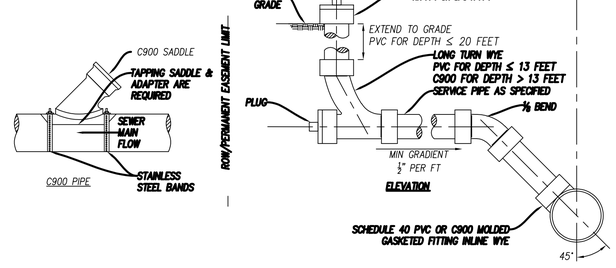
TOWN OF APEX STANDARDS	MANHOLE RING & COVER (PAVED AREAS)	STD. NO. 700.05
EFFECTIVE: DECEMBER 18, 2012		SHEET 1 OF 2

NOTES:

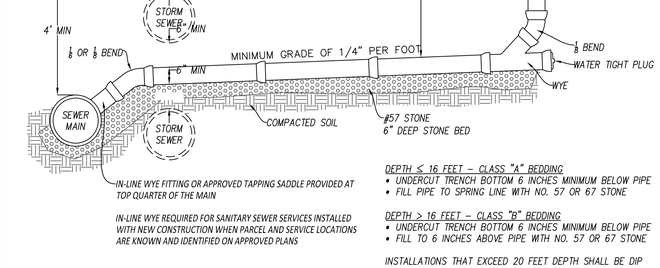
1. FOR DEAD-END MANHOLES, THE INVERT SHALL BE EXTENDED THROUGH THE MANHOLE.
2. ON THE INTERIOR OF THE MANHOLE, ALL JOINTS BETWEEN SECTIONS SHALL BE PARGED WITH NON-SHRINK GROUT.
3. ON THE INTERIOR OF ALL MANHOLES, ALL JOINTS BETWEEN SECTIONS SHALL BE PARGED WITH PRECO-PLUG QUICK SETTING GROUT.
4. ON THE EXTERIOR OF ALL MANHOLES, ALL JOINTS BETWEEN SECTIONS SHALL BE CONTINUOUSLY WRAPPED WITH 12" WIDE WATERPROOF BITUMINOUS TAPE.
5. SEWER MANHOLES WITHIN 1200 FEET OF FORCE MAIN CONNECTION SHALL HAVE INTERIOR EPOXY COATED.



TOWN OF APEX STANDARDS	PRECAST MANHOLE	STD. NO. 700.04
EFFECTIVE: JULY 21, 2015		SHEET 1 OF 3



TOWN OF APEX STANDARDS	SANITARY SEWER SERVICE CONNECTIONS	STD. NO. 700.03
EFFECTIVE: JULY 21, 2015		SHEET 1 OF 1



IN-LINE WYE FITTING OR APPROVED TAPPING SADDLE PROVIDED AT TOP QUARTER OF THE MAIN

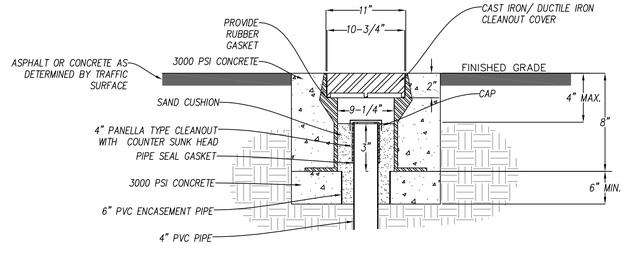
IN-LINE WYE REQUIRED FOR SANITARY SEWER SERVICES INSTALLED WITH NEW CONSTRUCTION WHEN PARCEL AND SERVICE LOCATIONS ARE KNOWN AND IDENTIFIED ON APPROVED PLANS

DEPTH ≤ 16 FEET – CLASS "A" BEDDING
- UNDERCUT TRENCH BOTTOM 6 INCHES MINIMUM BELOW PIPE
- FILL PIPE TO SPRING LINE WITH NO. 57 OR 67 STONE

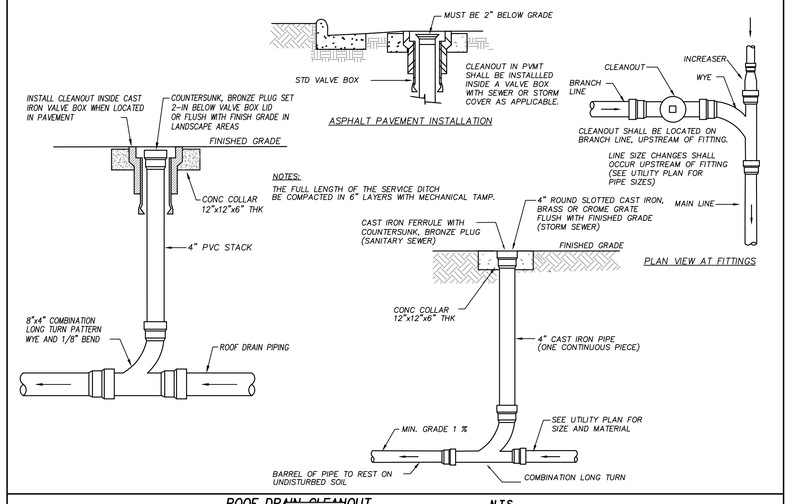
DEPTH > 16 FEET – CLASS "B" BEDDING
- UNDERCUT TRENCH BOTTOM 6 INCHES MINIMUM BELOW PIPE
- FILL TO 6 INCHES ABOVE PIPE WITH NO. 57 OR 67 STONE

INSTALLATIONS THAT EXCEED 20 FEET DEPTH SHALL BE DIP

TOWN OF APEX STANDARDS	SANITARY SEWER TAP & SERVICE	STD. NO. 700.02
EFFECTIVE: JULY 17, 2018		SHEET 1 OF 1



TOWN OF APEX STANDARDS	CLEANOUT COVER FOR VEHICLE TRAFFIC AREAS	STD. NO. 700.14
EFFECTIVE: DECEMBER 3, 2002		SHEET 1 OF 1



ROOF DRAIN CLEANOUT N.T.S.

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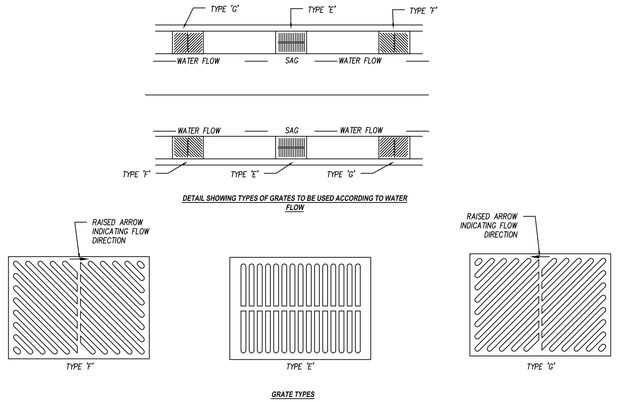
SHEET TITLE

UTILITY &_STORM DETAILS

SHEET NUMBER

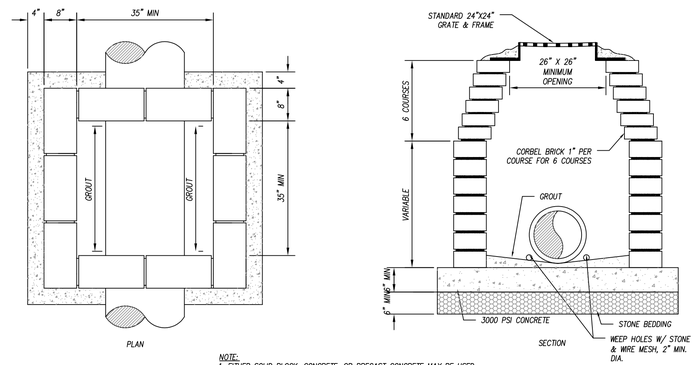
C-08.02



DETAIL SHOWING TYPES OF GRATES TO BE USED ACCORDING TO WATER FLOW

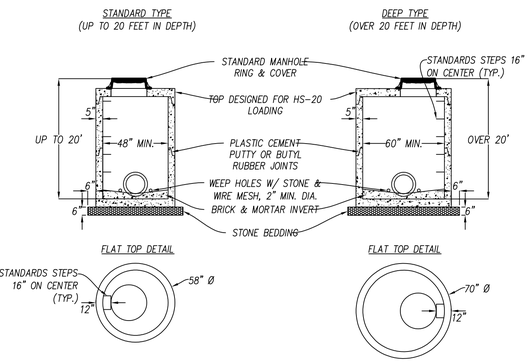
GRATE TYPES

TOWN OF APEX STANDARDS	GRATE PLACEMENT DETAIL FOR CATCH BASIN	STD. NO. 500.03
EFFECTIVE: DECEMBER 3, 2002		SHEET 1 OF 1

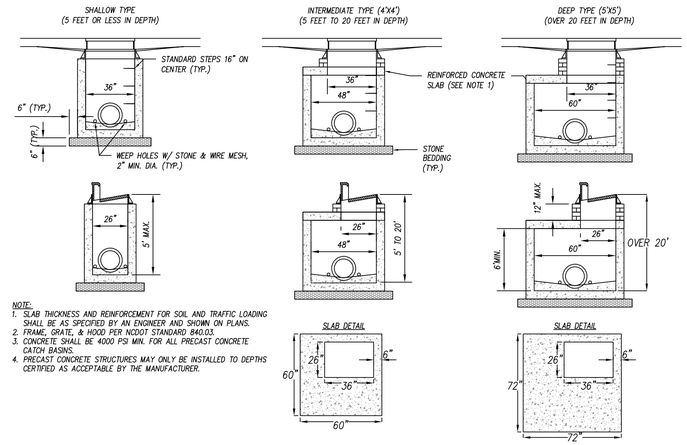


NOTE:
1. EITHER SOLID BLOCK, CONCRETE, OR PRECAST CONCRETE MAY BE USED.
2. FOR 24" R.C.P. AND LARGER--USE PIPE DIA PLUS 12" FOR MINIMUM INSIDE DIMENSION.
3. CAST IN PLACE DESIGNS TO BE SUBMITTED.

TOWN OF APEX STANDARDS	YARD INLET W/ GRATE & FRAME	STD. NO. 500.02
EFFECTIVE: DECEMBER 18, 2012		SHEET 1 OF 1

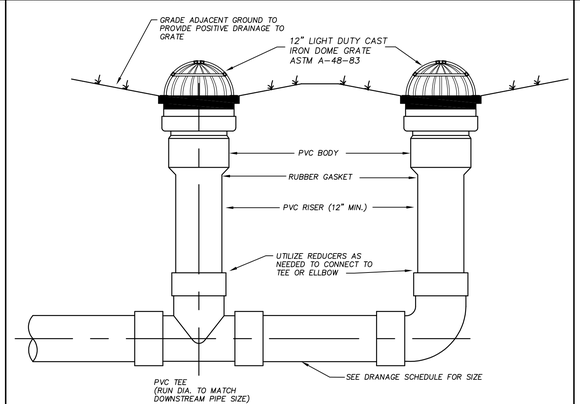


TOWN OF APEX STANDARDS	PRECAST MANHOLE JUNCTION BOX	STD. NO. 500.06
		SHEET 1 OF 1



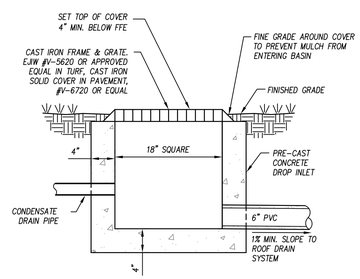
NOTE:
1. SLAB THICKNESS AND REINFORCEMENT FOR SOIL AND TRAFFIC LOADING SHALL BE AS SPECIFIED BY AN ENGINEER AND SHOWN ON PLANS.
2. FRAME, GRATE, & HOOD PER NCDOT STANDARD 840.03.
3. CONCRETE SHALL BE 4000 PSI MIN. FOR ALL PRECAST CONCRETE CATCH BASINS.
4. PRECAST CONCRETE STRUCTURES MAY ONLY BE INSTALLED TO DEPTHS CERTIFIED AS ACCEPTABLE BY THE MANUFACTURER.

TOWN OF APEX STANDARDS	PRECAST CATCH BASIN DETAIL	STD. NO. 500.05
EFFECTIVE: MARCH 6, 2018		SHEET 1 OF 1



NOTES:
1. GRATES SHALL BE 12" DIAMETER, SLOTTED, CAST IRON, HINGED AT BASE.
2. PIPE AND FITTINGS SHALL BE PVC, SMOOTH INTERIOR AND EXTERIOR.
3. INLINE DRAINS SHALL BE AS MANUFACTURED BY ADS, INC. OR APPROVED EQUAL.

INLINE DRAIN N.T.S.



CONDENSATE RELIEF BASIN N.T.S.

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

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Wake County Public Schools
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Cary, North Carolina 27518
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RATIO
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(919) 463-9995

Parking Consultant
Walker Consultants
13860 Ballantyne Corporate Pl, Suite 140
Charlotte, North Carolina 28277
(704) 247-6230

SEAL | 03/26/2021

PRELIMINARY NOT FOR CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

RATIO

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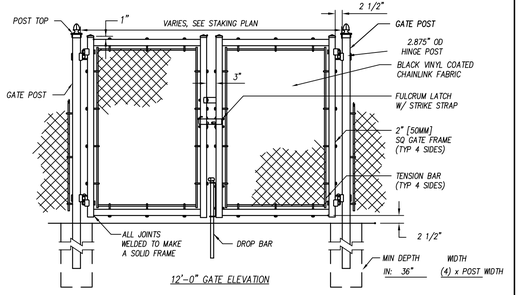
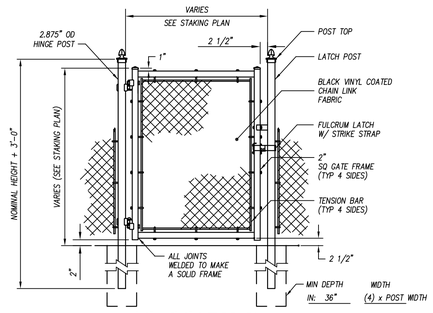
PROJECT NO. 02000.000

SHEET TITLE
UTILITY &_STORM DETAILS

SHEET NUMBER
C-08.03

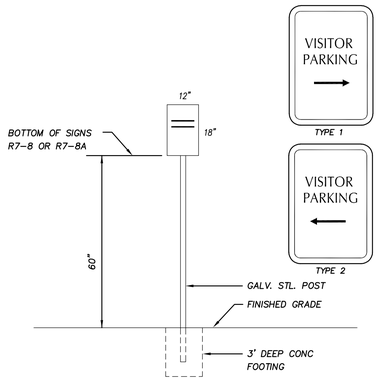


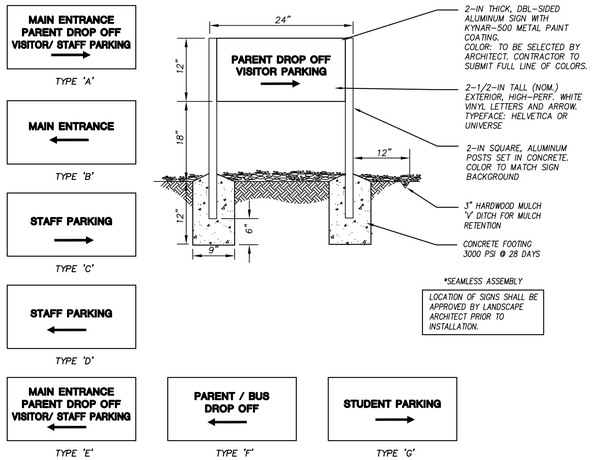
12'-0" GATE ELEVATION



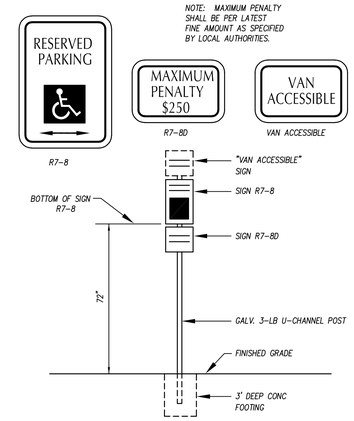
4'-0" & 5'-0" GATE ELEVATION

VISITOR PARKING SIGNAGE N.T.S.

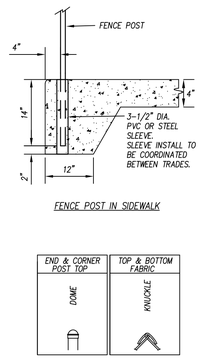




SCHOOL DIRECTIONAL SIGNAGE N.T.S.



ACCESSIBLE PARKING SIGNAGE N.T.S.



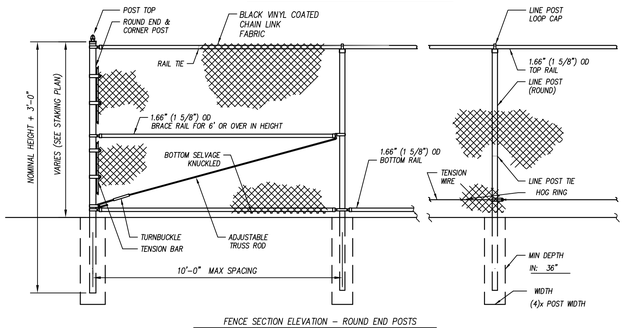
FENCE POST IN SIDEWALK

BOLTS ON ALL FENCE SHALL BE CUT FLUSH WITH NUT. NO SHARP PROTRUDING EDGES BE ALLOWED IN DIRECTION OF CHILD PLAY AREA.

SEE SPECS FOR ADDITIONAL INFORMATION.

PROVIDE BOTTOM TENSION WIRE FOR ALL PERIMETER AND BMP FENCING.

SLEEVE TO BE FILLED WITH NON-SHRINK GROUT AND BE FLUSH TO FINISH GRADE



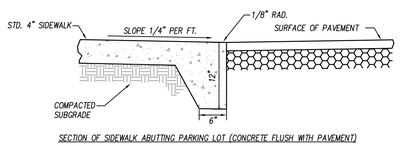
FENCE SECTION ELEVATION – ROUND END POSTS

BLACK VINYL COATED CHAIN LINK FENCE N.T.S.

SECTION VIEW

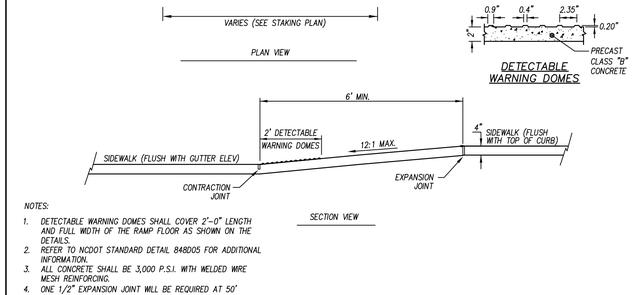
TRANSVERSE EXPANSION JOINT

GENERAL NOTES:
1. A GROOVE JOINT 1" DEEP, WITH 1/8" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS UNLESS INDICATED OTHERWISE. SEE SPECS FOR ADDITIONAL JOINT SPACING REQUIREMENTS.
2. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 50' INTERVALS.
3. A 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
4. ALL CONCRETE SHALL BE 3,000 P.S.I.



SECTION OF SIDEWALK ABUTTING PARKING LOT (CONCRETE FLUSH WITH PAVEMENT)

CONCRETE SIDEWALK N.T.S.



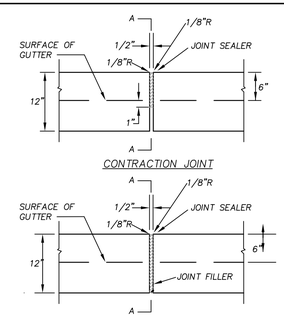
PLAN VIEW

DETECTABLE WARNING DOMES

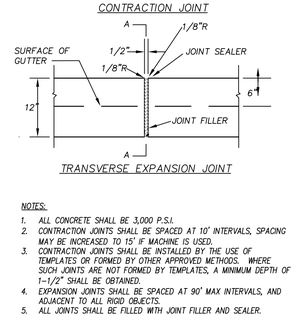
SECTION VIEW

NOTES:
1. DETECTABLE WARNING DOMES SHALL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. REFER TO NCDOT STANDARD DETAIL 848D05 FOR ADDITIONAL INFORMATION.
3. ALL CONCRETE SHALL BE 3,000 P.S.I. WITH WELDED WIRE MESH REINFORCING.
4. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 50' INTERVALS.

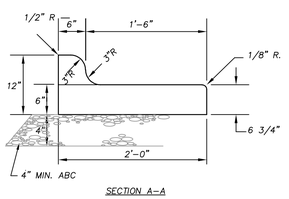
ACCESSIBLE PARKING CURB RAMPS N.T.S.



CONTRACTION JOINT

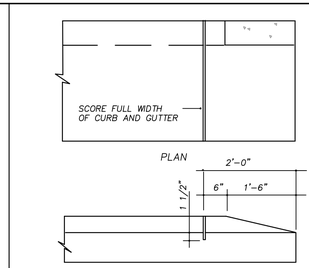


TRANSVERSE EXPANSION JOINT



SECTION A-A

24" CURB & GUTTER



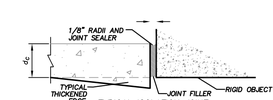
PLAN

FRONT

STANDARD METHOD OF ENDING CURB AND GUTTER

NOTES:
1. ALL CONCRETE SHALL BE 3,000 P.S.I.
2. CONTRACTION JOINTS SHALL BE SPACED AT 10' INTERVALS, SPACING MAY BE INCREASED TO 15' IF MACHINE IS USED.
3. CONTRACTION JOINTS SHALL BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1-1/2" SHALL BE OBTAINED.
4. EXPANSION JOINTS SHALL BE SPACED AT 90' MAX INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS.
5. ALL JOINTS SHALL BE FILLED WITH JOINT FILLER AND SEALER.

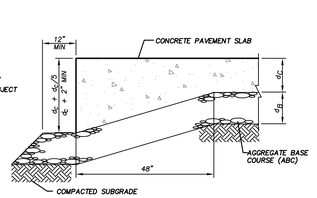
STANDARD 24" CONCRETE CURB AND GUTTER N.T.S.



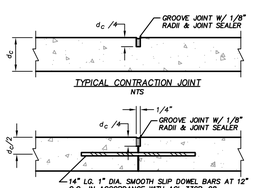
TYPICAL ISOLATION JOINT
NTS

CONCRETE PAVEMENT DIMENSIONS

CONC SLAB THICKNESS, d_c =	6"
ABC THICKNESS, d_B =	4"



TYPICAL THICKENED EDGE
NTS



NOTES:
1. ALL CONCRETE SHALL BE OF NCDOT TYPE AA PORTLAND CEMENT CONCRETE WITH A 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI (ASTM C39).
2. CONTRACTION JOINTS SHALL BE SPACED AT 12 FT O.C.E.W. MAX.
3. ISOLATION JOINTS SHALL BE PLACED WHERE CONCRETE PAVEMENT ABUTS ANY RIGID OBJECT.
4. JOINTING PLAN IN ACCORDANCE WITH ACI-330R-08 SHALL BE APPROVED BY SITE' DESIGN ENGINEER PRIOR TO POURING SLAB.
5. THICKENED EDGE SHALL ALSO OCCUR AT INTERFACE BETWEEN PAVEMENTS OF DIFFERENT THICKNESS. NO DOWELING REQUIRED AT INTERFACE BETWEEN PAVEMENTS OF DIFFERENT THICKNESS.

CONCRETE PAVEMENT N.T.S.

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919-821-0805

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LHC Structural Engineers
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SEAL | 03/26/2021

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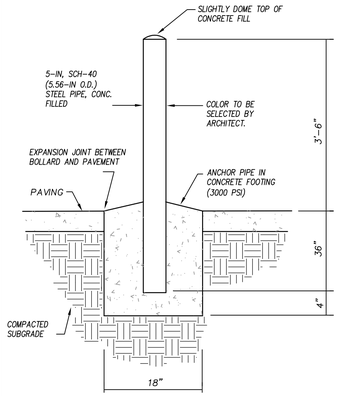
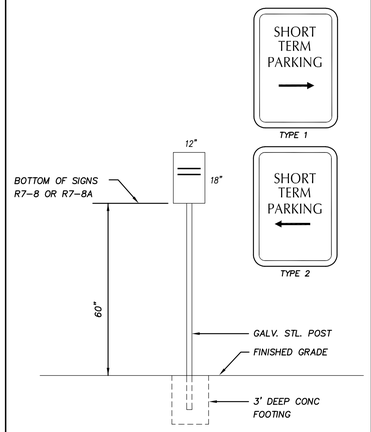
PROJECT NO. 02000.000

SHEET TITLE
PAVING & HARDSCAPE DETAILS

SHEET NUMBER
C-09.00



STEEL BOLLARD N.T.S.



SHORT TERM PARKING SIGNAGE N.T.S.

NOTES

CONCRETE SHALL BE 3,000-PSI @ 28 DAYS.

PROVIDE NO-SLIP BROOM FINISH PERPENDICULAR TO DIRECTION OF TRAVEL.

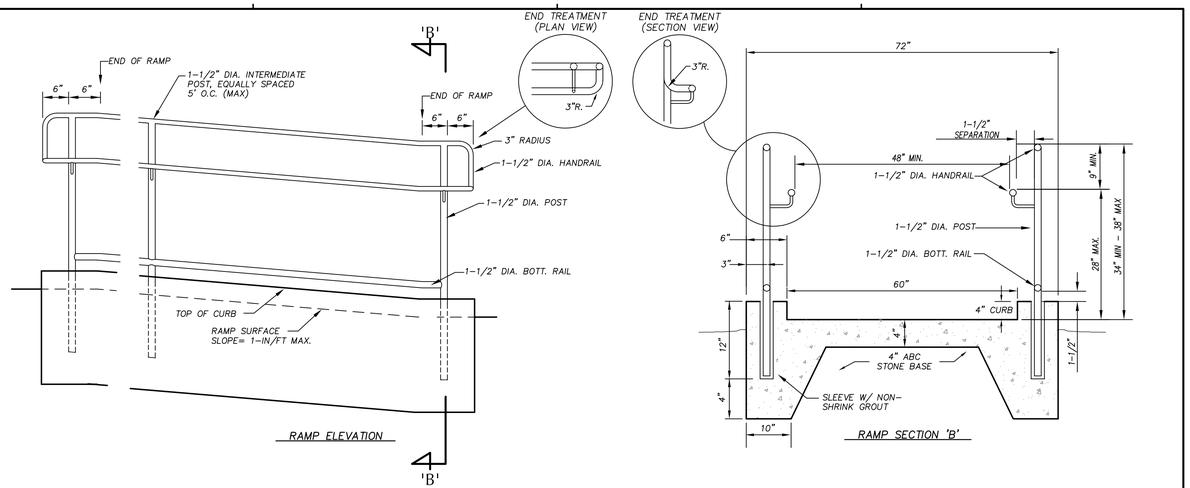
RAMP AND HANDRAIL SHALL BE CONSTRUCTED IN ACCORDANCE WITH 2012 NCSBC SECTION 1010 AND 1012 AND ICC/ANSI A117.1- 2009 SECTION 405.

PROVIDE 1-1/2" MINIMUM CLEAR SPACE BETWEEN WALL AND AND HANDRAIL.

12 IN. SLEEVES SHALL BE HOT-DIP GALVANIZED STEEL PIPE (ASTM A53) NOT LESS THAN 1/2 IN. MORE THAN OUTSIDE DIMENSION OF POST AND FLAT STEEL PLATE FORMING BOTTOM CLOSURE. FILL VOIDS BETWEEN POST AND SLEEVE WITH NONSHRINK ANCHORING CEMENT MIXED AND PLACED TO COMPLY WITH ANCHORING MATERIAL MANUFACTURER'S RECOMMENDATIONS. FINISHED SLOPE TO DRAIN AWAY FROM POST.

PLAN VIEW LEGEND:

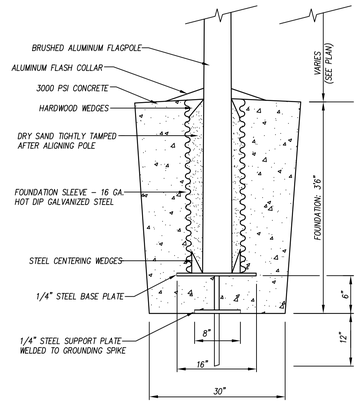
HR	HANDRAIL ONLY
GR	GUARDRAIL ONLY
HR/GR	HANDRAIL AND GUARDRAIL



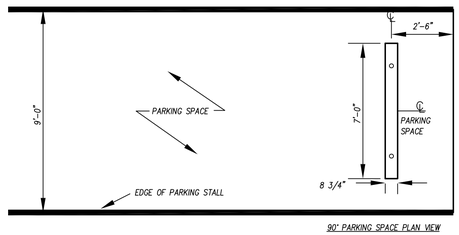
ON-GRADE RAMP WITH HANDRAIL N.T.S.

NOTES:

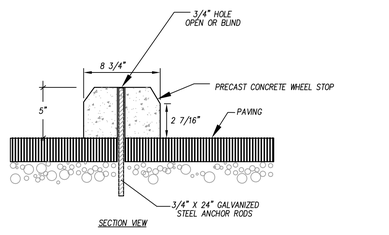
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.



FLAG POLE N.T.S.

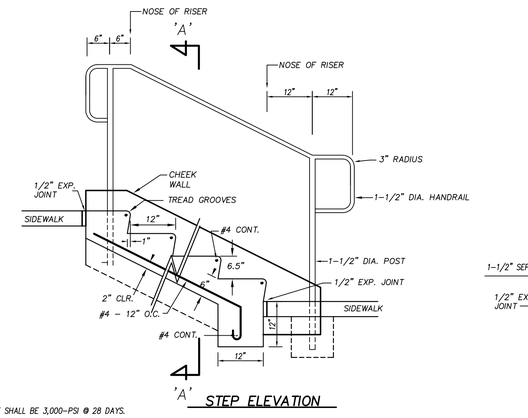


90° PARKING SPACE PLAN VIEW

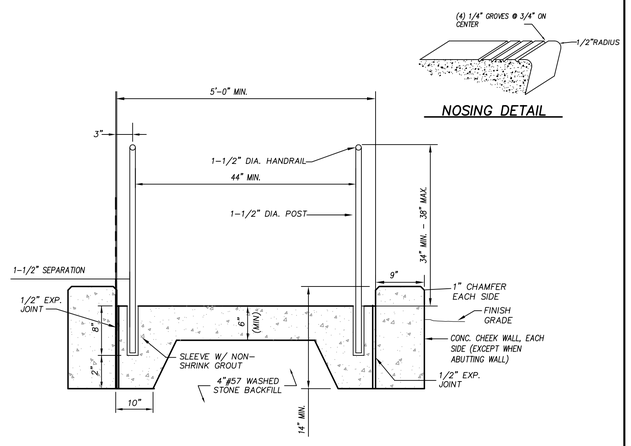


SECTION VIEW

WHEEL STOP N.T.S.



STEP ELEVATION

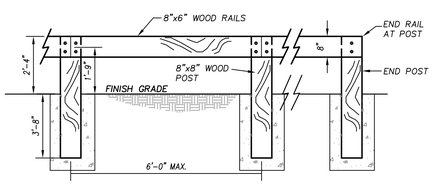


STEP SECTION A-A

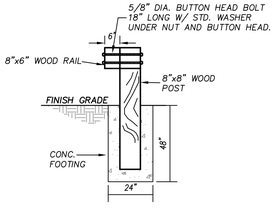
NOTES:

1. CONCRETE SHALL BE 3,000-PSI @ 28 DAYS.
2. PROVIDE NO-SLIP BROOM FINISH PERPENDICULAR TO DIRECTION OF TRAVEL.
3. HANDRAILS SHALL BE CONSTRUCTED IN ACCORDANCE WITH NC BUILDING CODE VOLUME 1-C, CHAPTER 5.4.2. HANDRAILS SHALL BE PAINTED GALVANIZED STEEL. REFER TO ARCHITECTURAL DRAWINGS FOR HANDRAIL DETAILS.
4. 12 IN. SLEEVES SHALL BE HOT-DIP GALVANIZED STEEL PIPE (ASTM A53) NOT LESS THAN 1/2 IN. MORE THAN OUTSIDE DIMENSION OF POST AND FLAT STEEL PLATE FORMING BOTTOM CLOSURE. FILL VOIDS BETWEEN POST AND SLEEVE WITH NONSHRINK ANCHORING CEMENT MIXED AND PLACED TO COMPLY WITH ANCHORING MATERIAL MANUFACTURER'S RECOMMENDATIONS. FINISHED SLOPE TO DRAIN AWAY FROM POST.
5. HANDRAILS TO BE PAINTED, SEE SPECS. COLOR TO BE SELECTED BY ARCHITECT.

CONCRETE STEPS WITH HANDRAILS N.T.S.



FRONT ELEVATION

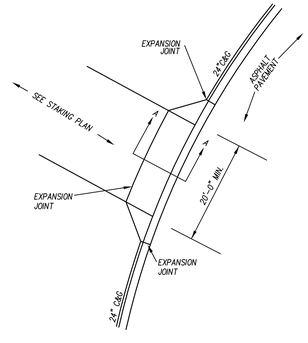


NOTES:

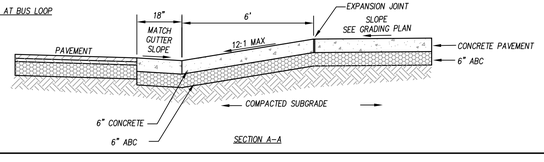
1. ALL WOOD SHALL BE NO.2 CCA PRESSURE TREATED YELLOW PINE.
2. ALL HARDWARE SHALL BE GALVANIZED, PER ASTM A153.

SIDE ELEVATION

TRAFFIC GUARDRAIL N.T.S.



PLAN - FIRELANE ACCESS AT BUS LOOP



SECTION A-A

NOTES:

1. ALL CONCRETE SHALL BE 3,000 P.S.I.
2. CONTRACTION JOINTS SHALL BE SPACED AT 10' INTERVALS, SPACING MAY BE INCREASED TO 15' IF MACHINE IS USED.
3. CONTRACTION JOINTS SHALL BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1-1/2" SHALL BE OBTAINED.
4. EXPANSION JOINTS SHALL BE SPACED AT 90' MAX INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS.
5. ALL JOINTS SHALL BE FILLED WITH JOINT FILLER AND SEALER.

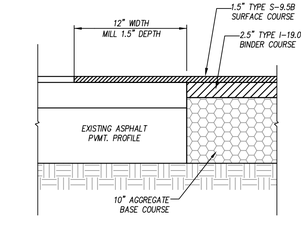
CONCRETE DRIVE APRON N.T.S.

	LIGHT DUTY	MEDIUM DUTY	HEAVY DUTY
TYPE S-9.5B SURFACE COURSE	3.0 IN (TWO 1.5 IN LIFTS)	1.0 IN	1.0 IN
TYPE I-19.0C BINDER COURSE	–	2.5 IN	3.0 IN
AGGREGATE BASE COURSE	6.0 IN	6.0 IN	6.0 IN

COMPACTED SUBGRADE TO 98%

NOTES:

1. SEE SPECIFICATIONS FOR PROOFROLLING, COMPACTION & TESTING REQUIREMENTS. DETAIL IS FOR ON-SITE PAVING OPERATIONS ONLY.
2. SEE GEOTECHNICAL REPORT AND PAVEMENT THICKNESS RECOMMENDATIONS LETTER.
3. NO HIGH PLASTICITY SOILS WITHIN 12 INCHES OF SUBGRADE
4. THE CONTRACTOR MAY CHOOSE TO INSTALL INTERMEDIATE COURSES OF PAVEMENT TO STABILIZE THE SITE DURING CONSTRUCTION AT NO ADDITIONAL COST.
5. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ADEQUATE THICKNESS REQUIRED FOR INTERMEDIATE PAVING. INCREASES IN THE DESIGN PAVEMENT SECTION TO FACILITATE INTERMEDIATE PAVING SHALL BE PROVIDED AT NO ADDITIONAL COST.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGES TO SUBGRADE, INSTALLED BASE COURSE AND/OR INTERMEDIATE PAVING PRIOR TO PLACING SUBSEQUENT PAVEMENT LIFTS AT NO ADDITIONAL COST.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING PAVEMENT DURING ALL PHASES OF WORK. THE FINAL SURFACE OF PAVEMENT SHALL BE FREE OF ALL DEFECTS OR DAMAGE.



HEAVY DUTY ASPHALT TIE TO EXISTING ASPHALT

ASPHALT PAVEMENT N.T.S.

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SHEET ISSUE

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2	TOA Major Site Plan Submittal #1	12/1/20
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5	60% Construction Documents	3/26/21

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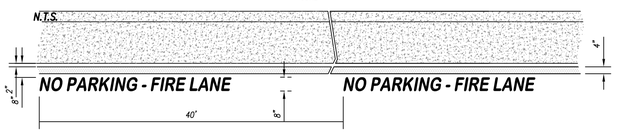
PROJECT NO. 02000.000

SHEET TITLE
PAVING_& HARDSCAPE DETAILS

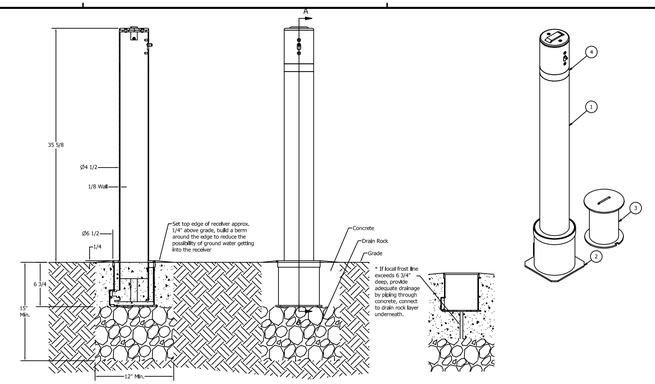
SHEET NUMBER
C-09.01



NOTES:

1. "NO PARKING–FIRE LANE" LETTER MARKINGS SHALL BE YELLOW.
2. LETTERS SHALL BE A MINIMUM OF 8" HIGH AND SPACED 8" FROM THE EDGE OF PAVEMENT.
3. LETTER MARKING SHALL BE PLACED EVERY 40' AND AT EVERY FIRE HYDRANT.
4. SOLID 4" WIDE YELLOW LINE SHALL BE PLACED 2" FROM THE EDGE OF PAVEMENT.

TOWN OF APEX STANDARDS	FIRE LANE PAVEMENT MARKING	STD. NO. 300.24
EFFECTIVE: DECEMBER 21, 2010		SHEET 1 OF 1

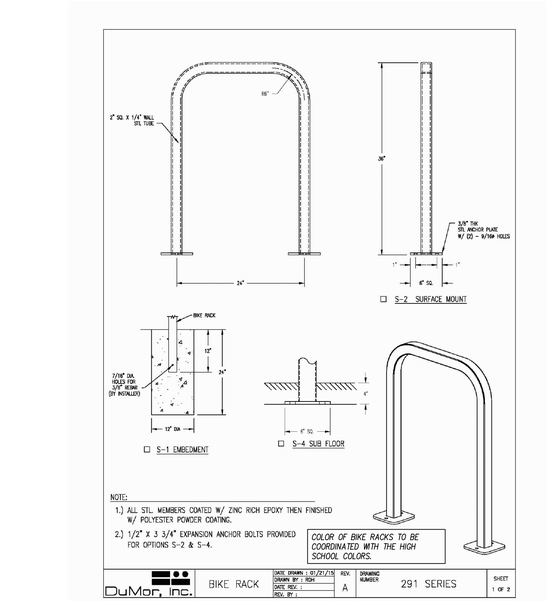


Notes:

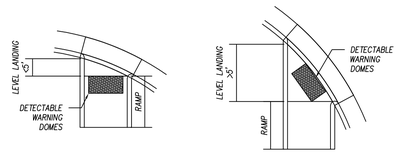
- Embedment details are for reference illustration only. Minimum foundation sizes depend on local soil conditions, weather conditions, and engineering requirements.
- Bollard is provided as shown, with parts listed below. Concrete foundation and/or installation not provided by Reliance Foundry.
- This drawing is not drawn to scale. Dimensions provided herein is for reference only. Please consult Reliance Foundry sales professionals if any dimension is critical to your particular installation.
- Reliance Foundry reserves the right to amend design and specifications without prior notice for product improvement.

PARTS LIST					
ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL	WEIGHT
1	1	R8464	R8464 Removable Bollard Assembly	Stainless Steel 316	25 lbs
2	1	R8464R	R8464R Removable Bollard Receiver	Steel Hot Dip Galvanized	2 3/4 lbs
3	1	R8464RC	R8464RC Removable Bollard Receiver Cover	Steel Hot Dip Galvanized	5 3/8 lbs
4	1	Reflective Tape (Optional)	Optional Reflective Tape, Max. 1-1/8" Width	Plastic	

STAINLESS STEEL REMOVABLE BOLLARD N.T.S.



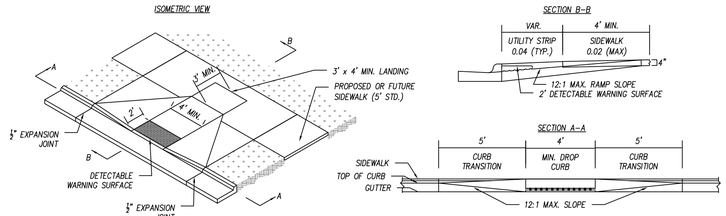
BIKE RACK N.T.S.

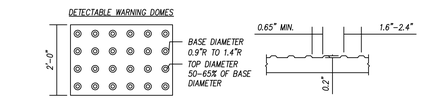


NOTES:

1. FOR RAMPS WITH RETURNED CURB, PLACE DETECTABLE WARNING DOMES ON RAMP IF LEVEL LANDING IS LESS THAN 5 FEET DEEP. PLACE DETECTABLE WARNING DOMES ON LEVEL LANDING IF LANDING IS MORE THAN 5 FEET DEEP.
2. CROSSWALK WIDTHS AND CONFIGURATION VARY BUT MUST CONFORM TO TRAFFIC DESIGN STANDARDS.
3. USE CLASS "B" CONCRETE WITH A SIDEWALK FINISH IN ORDER TO OBTAIN A ROUGH NON–SKID TYPE SURFACE.
4. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
5. THE CURB CUT AND THE PEDESTRIAN CROSSWALK LINES SHALL BE COORDINATED SO THAT A 4'X4' CLEAR SPACE AT THE BASE OF THE CURB RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES.
6. STOP LINES, NORMALLY PERPENDICULAR TO THE LANE LINES, SHALL BE USED WHERE IT IS IMPORTANT TO INDICATE THE POINT BEHIND WHICH VEHICLES ARE REQUIRED TO STOP IN COMPLIANCE WITH A TRAFFIC SIGNAL, STOP SIGN, OR OTHER LEGAL REQUIREMENT. AN UNUSUAL APPROACH SKEW MAY REQUIRE THE PLACEMENT OF THE STOP LINE TO BE PARALLEL TO THE INTERSECTING ROADWAY. REFER TO THE PAVEMENT MARKING PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS. IF A PAVEMENT MARKING PLAN IS NOT PROVIDED, LOCATE AS DIRECTED BY THE ENGINEER.
7. TERMINATE PARKING A MINIMUM OF 20' BACK OF A PEDESTRIAN CROSSWALK.
8. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION AND THE NORTH CAROLINA SUPPLEMENT TO THE MUTCD.

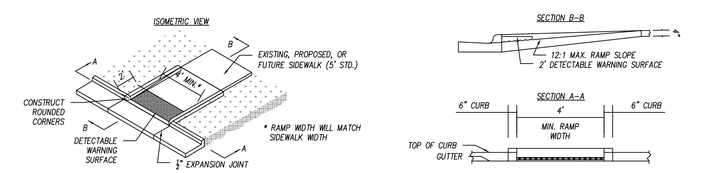
TOWN OF APEX STANDARDS	CURB RAMP	STD. NO. 300.09
EFFECTIVE: DECEMBER 18, 2012		SHEET 3 OF 3



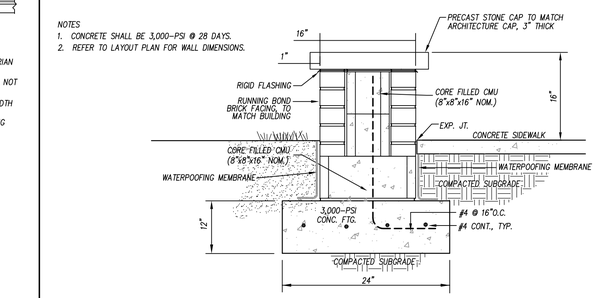


NOTES:

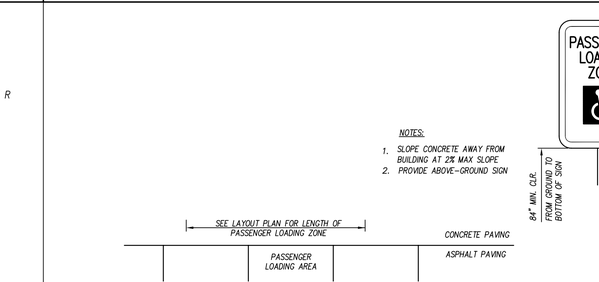
1. RAMPS WITH FLARED SIDES WILL BE USED WHEN NEEDED FOR PEDESTRIAN CIRCULATION (SEE DETAIL ABOVE).
2. RAMPS WITH RETURNED CURB WILL BE USED WHEN FLARED SIDES ARE NOT NEEDED FOR PEDESTRIAN CIRCULATION (SEE DETAIL BELOW).
3. DETECTABLE WARNING DOMES WILL COVER 2'–0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR.
4. DETECTABLE WARNING DOMES WILL CONTRAST VISIBILITY WITH ADJOINING SURFACE, EITHER LIGHT–ON–DARK OR DARK–ON–LIGHT SEQUENCE



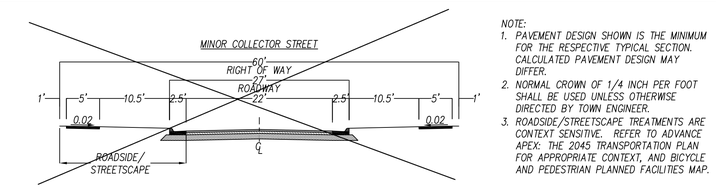
TOWN OF APEX STANDARDS	CURB RAMP	STD. NO. 300.09
EFFECTIVE: DECEMBER 18, 2012		SHEET 1 OF 3



SEAT WALL N.T.S.



PASSENGER LOADING ZONE N.T.S.



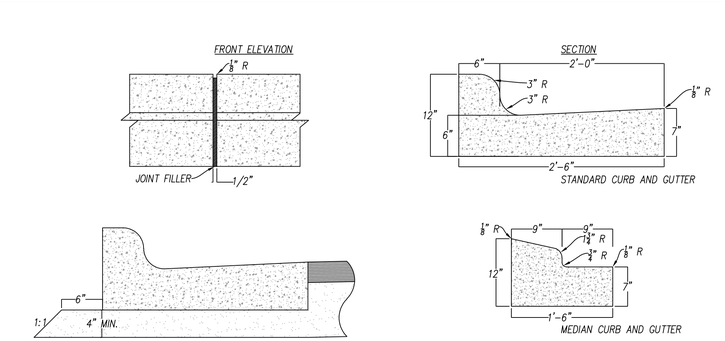
NOTE:

1. PAVEMENT DESIGN SHOWN IS THE MINIMUM FOR THE RESPECTIVE TYPICAL SECTION. CALCULATED PAVEMENT DESIGN MAY DIFFER.
2. NORMAL CROWN OF 1/4 INCH PER FOOT SHALL BE USED UNLESS OTHERWISE DIRECTED BY TOWN ENGINEER.
3. ROADSIDE/STREETSCAPE TREATMENTS ARE CONTEXT SENSITIVE. REFER TO ADVANCE APEX: THE 2045 TRANSPORTATION PLAN FOR APPROPRIATE CONTEXT, AND BICYCLE AND PEDESTRIAN PLANNED FACILITIES MAP.

PAVEMENT DESIGN:

3" ASPHALT CONCRETE SURFACE COURSE
4" ASPHALT CONCRETE INTERMEDIATE COURSE
10" AGGREGATE BASE COURSE

TOWN OF APEX STANDARDS	STREET TYPICAL SECTIONS COLLECTOR/2-LANE THOROUGHFARE	STD. NO. 300.01
EFFECTIVE: NOVEMBER 19, 2019		SHEET 2 OF 4



NOTES:

1. CONCRETE SHALL BE 3000 PSI.
2. CONTRACTION JOINTS SHALL BE SPACED AT 10' INTERVALS OR 15' INTERVALS WHEN A MACHINE IS USED.
3. EXPANSION JOINTS SHALL BE SPACED AT 50' INTERVALS.
4. FINISH ALL CONCRETE WITH CURING COMPOUND.
5. FOLLOW ALL APPLICABLE ACI REQUIRMENTS.
6. VALLEY CURB SHALL ONLY BE USED FOR APPROVED APPLICATIONS.

TOWN OF APEX STANDARDS	CONCRETE CURB AND GUTTER	STD. NO. 300.03
EFFECTIVE: NOVEMBER 19, 2019		SHEET 1 OF 1

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5	60% Construction Documents	3/26/21

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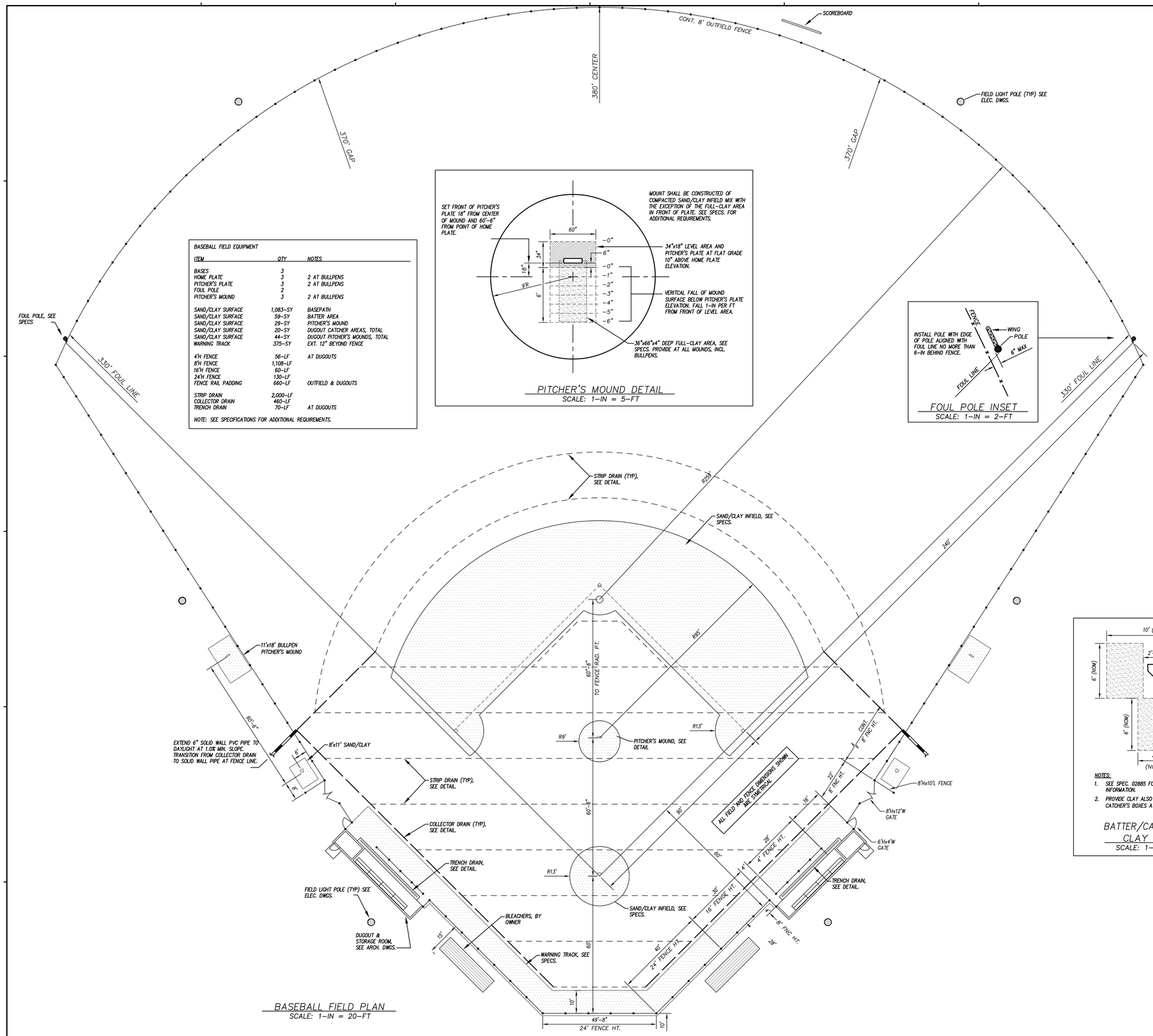
PROJECT NO. 02000.000

SHEET TITLE
PAVING & HARDSCAPE DETAILS

SHEET NUMBER
C-09.02



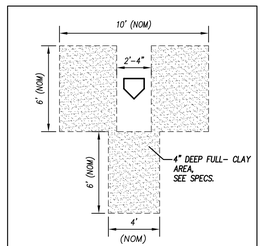
BASEBALL FIELD EQUIPMENT

ITEM	QTY	NOTES
BASES	3	
HOME PLATE	3	2 AT BULLPENS
PITCHER'S PLATE	3	2 AT BULLPENS
FOUL POLE	2	
PITCHER'S MOUND	3	2 AT BULLPENS
SAND/CLAY SURFACE	1,083-SY	BASEPATH
SAND/CLAY SURFACE	59-SY	BATTER AREA
SAND/CLAY SURFACE	29-SY	PITCHER'S MOUND
SAND/CLAY SURFACE	20-SY	DUGOUT CATCHER AREAS, TOTAL
SAND/CLAY SURFACE	44-SY	DUGOUT PITCHER'S MOUNDS, TOTAL
WARNING TRACK	375-SY	EXT. 12" BEYOND FENCE
4'H FENCE	56-LF	AT DUGOUTS
8'H FENCE	1,108-LF	
16'H FENCE	60-LF	
24'H FENCE	130-LF	
FENCE RAIL PADDING	660-LF	OUTFIELD & DUGOUTS
STRIP DRAIN	2,000-LF	
COLLECTOR DRAIN	460-LF	
TRENCH DRAIN	70-LF	AT DUGOUTS

NOTE: SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

PITCHER'S MOUND DETAIL
SCALE: 1-IN = 5-FT

FOUL POLE INSET
SCALE: 1-IN = 2-FT



NOTES:
1. SEE SPEC. 02885 FOR ADDITIONAL INFORMATION.
2. PROVIDE CLAY ALSO AT PITCHER'S PLATES AND CATCHER'S BOXES AT BULLPENS.

BATTER/CATCHER BOX CLAY DETAIL
SCALE: 1-IN = 5-FT

BASEBALL FIELD PLAN
SCALE: 1-IN = 20-FT

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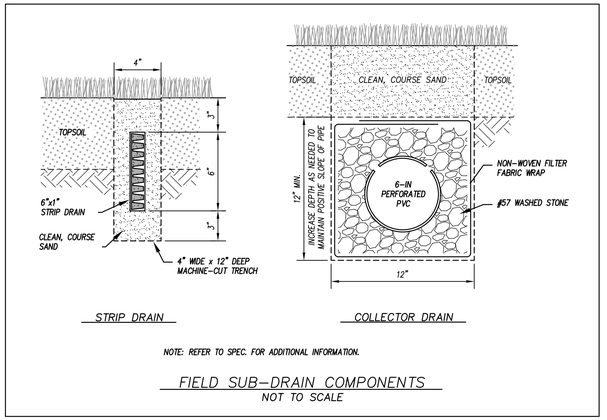
PAVING_& HARDSCAPE DETAILS

SHEET NUMBER
C-09.03

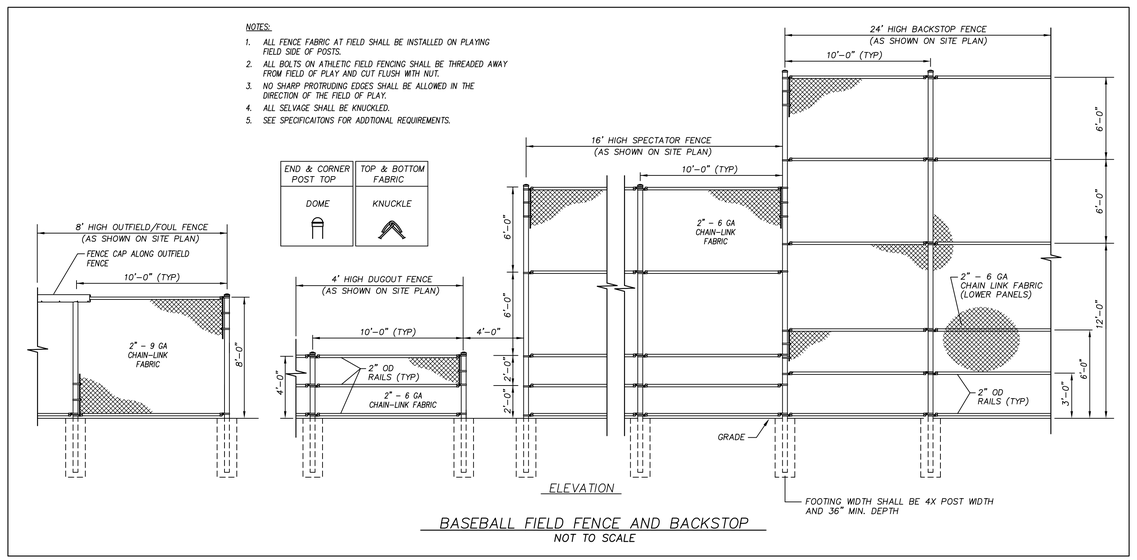


STRIP DRAIN

COLLECTOR DRAIN

NOTE: REFER TO SPEC. FOR ADDITIONAL INFORMATION.

FIELD SUB-DRAIN COMPONENTS
NOT TO SCALE



ELEVATION

BASEBALL FIELD FENCE AND BACKSTOP
NOT TO SCALE

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5	60% Construction Documents	3/26/21

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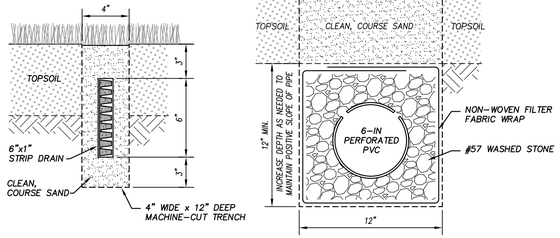
PROJECT NO. 02000.000

SHEET TITLE
PAVING_& HARDSCAPE DETAILS

SHEET NUMBER
C-09.04



STRIP DRAIN COLLECTOR DRAIN

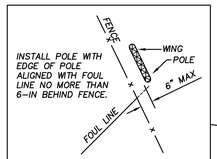
NOTE: REFER TO SPEC. 02720 FOR ADDITIONAL INFORMATION.

FIELD SUB-DRAIN COMPONENTS
NOT TO SCALE

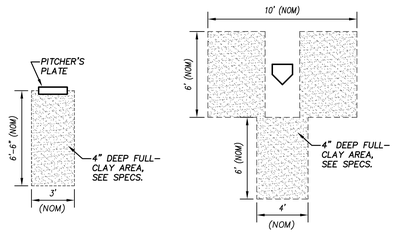
SOFTBALL FIELD EQUIPMENT

ITEM	QTY	NOTES
BASES	3	
HOME PLATE	3	2 AT BULLPENS
PITCHER'S PLATE	3	2 AT BULLPENS
FOUL POLE	2	
SAND/CLAY SURFACE	934-SY	INFILED
SAND/CLAY SURFACE	20-SY	DUGOUT CATCHER AREAS, TOTAL
SAND/CLAY SURFACE	20-SY	DUGOUT PITCHER'S MOUNDS, TOTAL
8'H FENCE	674-LF	
12'H FENCE	80-LF	
18'H BACKSTOP	40-LF	
FENCE RAIL PADDING	400-LF	OUTFIELD
STRIP DRAIN	680-LF	
COLLECTOR DRAIN	240-LF	
TRENCH DRAIN	70-LF	AT DUGOUTS

NOTE: SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.



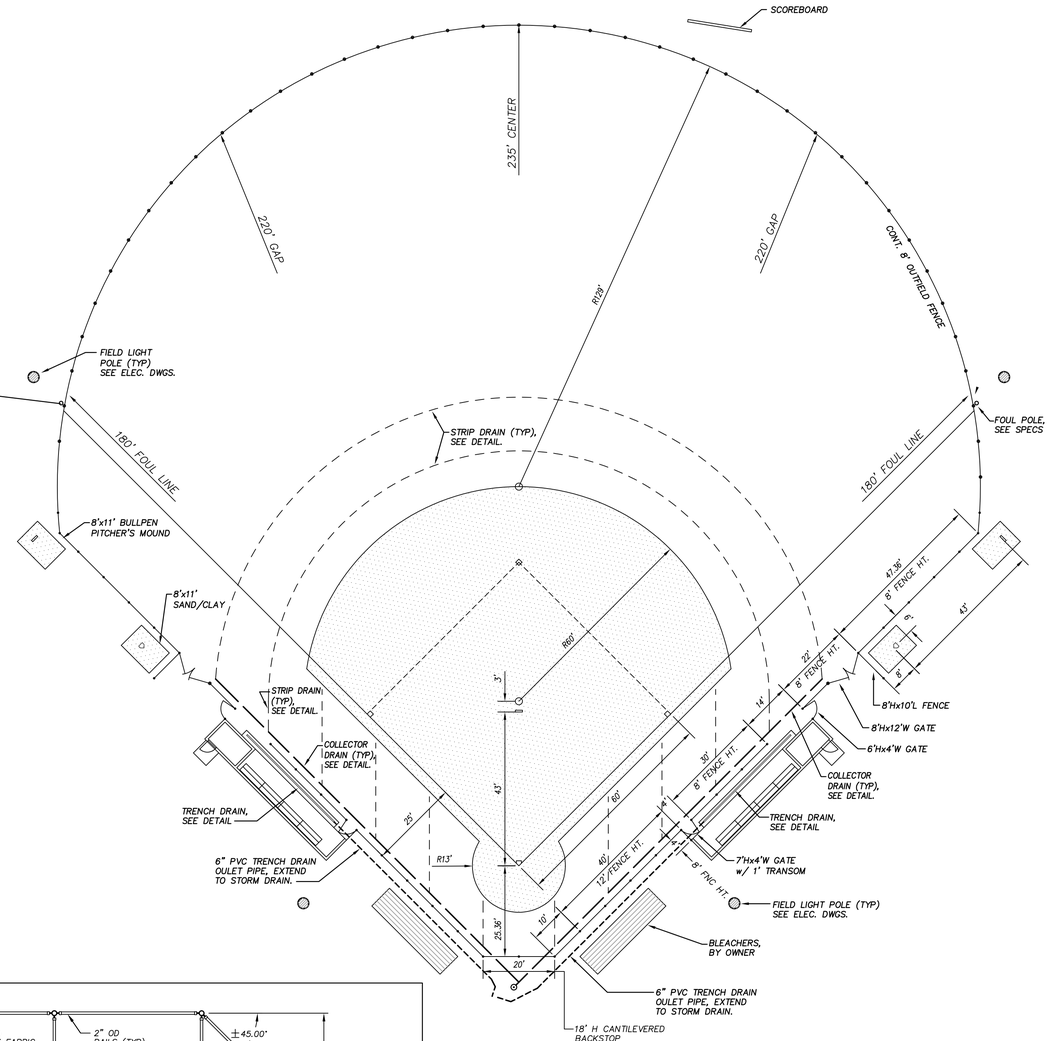
FOUL POLE INSET
SCALE: 1-IN = 2-FT



PITCHER'S CLAY BATTER'S/CATCHER'S BOX CLAY

NOTES:
1. SEE SPEC. 02885 FOR ADDITIONAL INFORMATION.
2. PROVIDE CLAY ALSO AT EACH PITCHER'S PLATE AND CATCHER'S BOX AT BULLPENS.

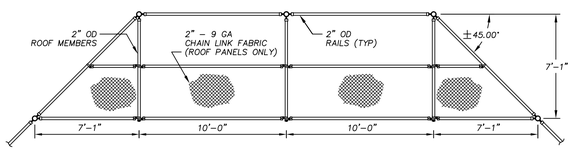
PITCHER'S AND BATTER'S BOX CLAY DETAILS
SCALE: 1-IN = 5-FT



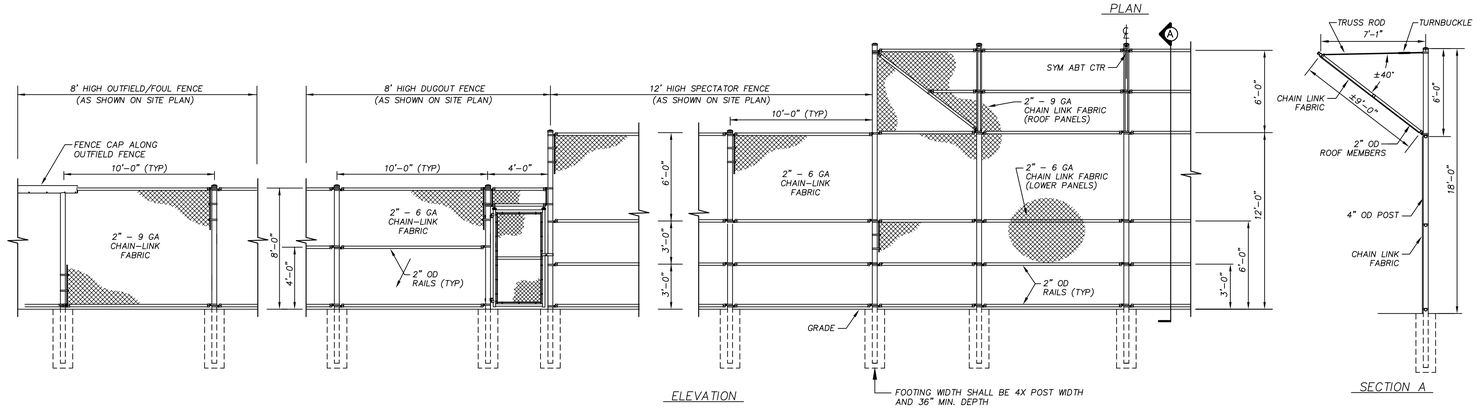
SOFTBALL FIELD PLAN
SCALE: 1-IN = 20-FT

NOTES:
1. ALL FENCE FABRIC AT FIELD SHALL BE INSTALLED ON THE PLAYING SURFACE SIDE OF POSTS.
2. ALL BOLTS ON ATHLETIC FIELD FENCING SHALL BE THREADED AWAY FROM FIELD OF PLAY AND CUT FLUSH WITH NUT.
3. NO SHARP PROTRUDING EDGES SHALL BE ALLOWED IN THE DIRECTION OF THE FIELD OF PLAY.
4. ALL SELVAGE SHALL BE KNUCKLED.
5. SEE SPECIFICAITONS FOR ADDTIONAL REQUIREMENTS.

END & CORNER POST TOP	TOP & BOTTOM FABRIC
DOME	KNUCKLE



PLAN



ELEVATION SECTION A

SOFTBALL FIELD FENCE AND BACKSTOP
NOT TO SCALE

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LHC Structural Engineers
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SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
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3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

RATIO

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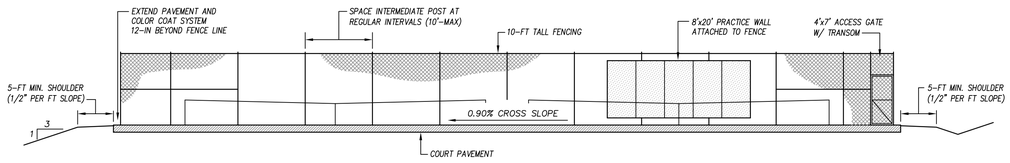
PROJECT NO. 02000.000

SHEET TITLE
PAVING_& HARDSCAPE DETAILS

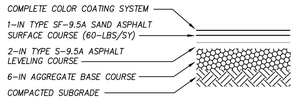
SHEET NUMBER
C-09.05



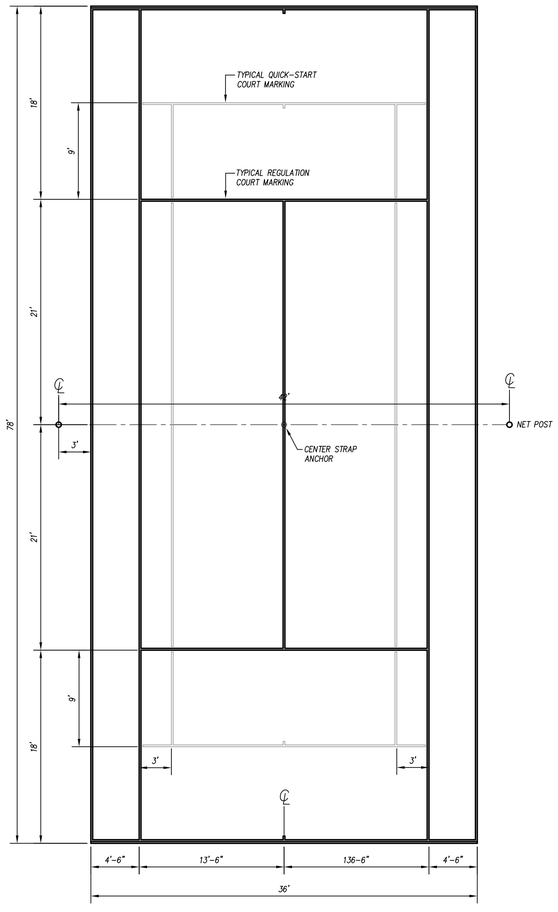
COURT ELEVATION
NTS

NOTES:

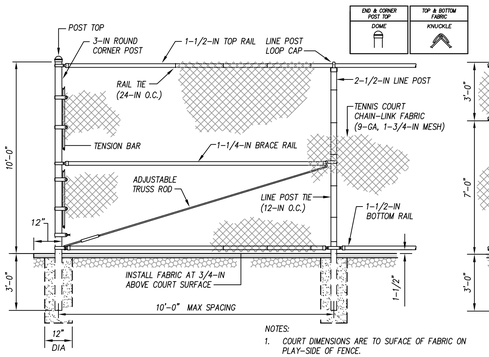
1. ALL DIMENSIONS ARE TO THE OUTSIDE EDGE OF LINES.
2. ALL REGULATION PLAYING LINES SHALL BE "WHITE" AND 2-IN IN WIDTH EXCEPT FOR REGULATION BASE LINES, WHICH SHALL BE 4-IN IN WIDTH.
3. ALL 60-FT "QUICK START" COURT LINES WHICH SHALL BE A DARKER SHADE OF THE INNER-COURT COLOR.
4. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.



COURT PAVEMENT SECTION
NTS



COURT LAYOUT PLAN
NTS

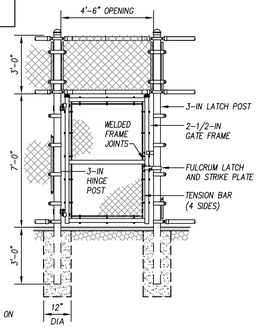


TYPICAL ELEVATION
NTS

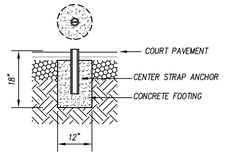
NOTES:

1. COURT DIMENSIONS ARE TO SUFACE OF FABRIC ON PLAY-SIDE OF FENCE.
2. FABRIC SHALL BE INSTALLED ON PLAY-SIDE OF FENCE.
3. PIPE DIMENSIONS SHOWN ARE NOMINAL PIPE SIZE.
4. BOLTS ON ALL FENCE SHALL BE CUT FLUSH WITH NUT. NO SHARP PROTRUDING EDGES ALLOWED ON PLAY-SIDE OF FENCE.
5. CAUTION: CONSULT MANUFACTURER'S RECOMENDATIONS BEFORE INSTALLING A WIND SCREEN ON THIS FENCE AS STRONG WINDS CAN CAUSE DAMAGE TO THE FENCE.
6. SEE SPECS FOR ADDITIONAL INFORMATION.

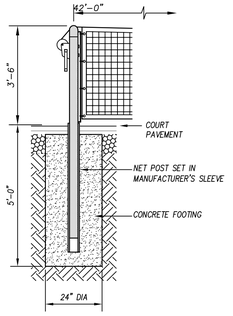
TENNIS COURT FENCING
NTS



ACCESS GATE
NTS



CENTER STRAP ANCHOR
NTS



NET POST ANCHOR
NTS

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

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Cary, North Carolina 27518
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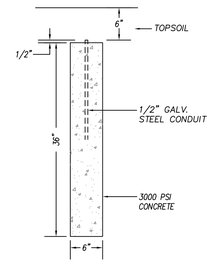
PROJECT NO. 02000.000

SHEET TITLE
PAVING_& HARDSCAPE DETAILS

SHEET NUMBER
C-09.06



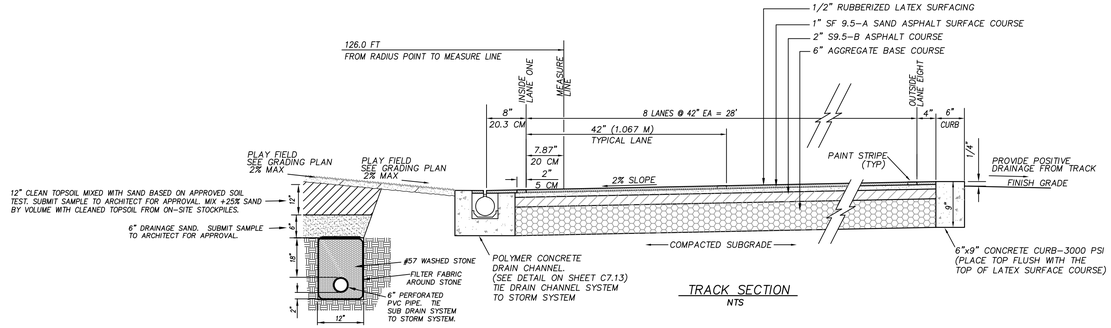
PERMANENT RADIUS MONUMENT

GENERAL NOTES:

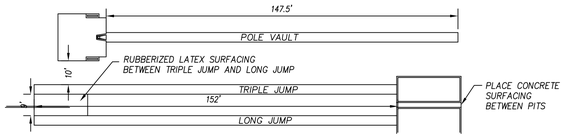
1. ALL CONSTRUCTION SHALL MEET CURRENT NATIONAL FEDERATION OF STATE HIGH SCHOOL ASSOCIATIONS (NFSHSA) AND U.S. TENNIS COURT AND TRACK BUILDERS ASSOCIATION STANDARDS.
2. ALL TRACK LANE LINES TO BE 2" WIDE, WHITE LINES.
3. SLOPE REQUIREMENTS: LATERAL – 2:100 (SLOPED TO THE INSIDE OF TRACK) RUNNING DIRECTION – 1:1000
4. REFER TO SPECIFICATION SECTIONS 321800 AND 325000 FOR ADDITIONAL REQUIREMENTS.

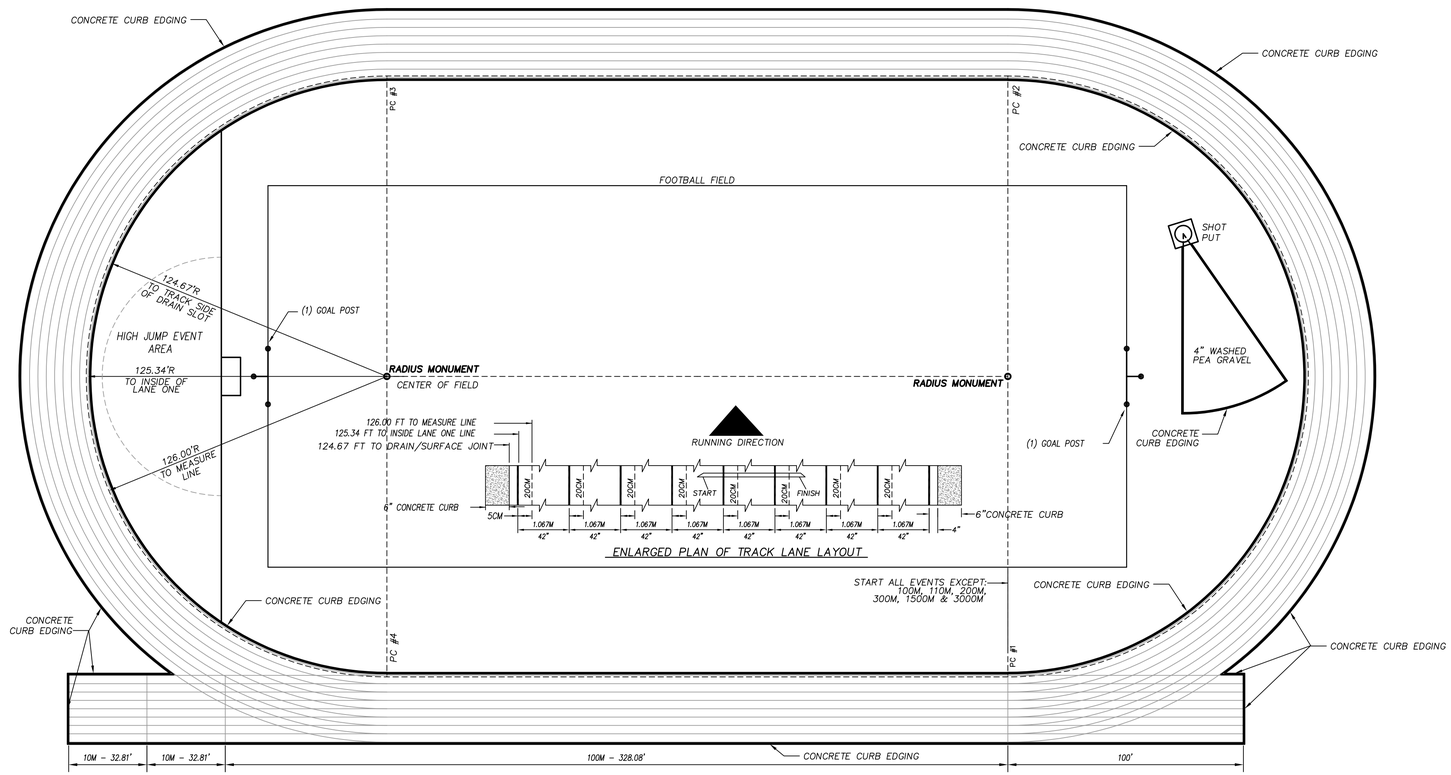
TRACK MARKING REQUIREMENTS:

1. APPLICATION OF MARKINGS SHALL BE PERFORMED BY AN EXPERIENCED TRACK PAINTER WITH SUITABLE EQUIPMENT AND KNOWLEDGE OF THE RELATIVE POSITIONS OF THE DESIGNATED POINTS TO THE PAINTED MARKINGS.
2. ALL 400 METER LANE LINES, START AND FINISH LINES, AND EVENT MARKINGS SHALL BE ACCURATELY POSITIONED AND MARKED IN ACCORDANCE WITH THE CURRENT SPECIFICATIONS OF THE NATIONAL FEDERATION OF STATE HIGH SCHOOL ASSOCIATIONS (NFSHSA), 816-464-5400.
3. A DRAWING SHOWING THE PROPOSED MARKING LAYOUT SHALL BE SUBMITTED BY THE CONTRACTOR FOR APPROVAL PRIOR TO APPLICATION OF ANY LINES ON THE TRACK SURFACE.
4. MARKING PAINT SHALL BE AS APPROVED BY THE MANUFACTURER FOR APPLICATION ON THE SURFACE COURSE FINISH MATERIAL. PAINTING SHALL BE PERFORMED BY SKILLED PERSONS IN A WORKMANLIKE MANNER IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
5. UPON COMPLETION OF THE MARKINGS THE CONTRACTOR SHALL FURNISH THE OWNER WITH FIVE COPIES OF A DRAWING SHOWING ALL LINES AND MARKINGS THAT HAVE BEEN APPLIED. THE DRAWING SHALL CONTAIN A STATEMENT SIGNED AND SEALED BY A PROFESSIONAL LAND SURVEYOR, CERTIFYING THAT MONUMENTATION AND THE LINES AS THUS MARKED ARE IN ACCORDANCE WITH THE RULES OF THE NFSHSA. NO MINUS TOLERANCE IS ALLOWED FOR THE LENGTH OF ANY EVENT.
6. REFER TO SPECIFICATION SECTION 325000 FOR ADDITIONAL SURFACING AND MARKING REQUIREMENTS.



TRACK SECTION
NTS





400 METER EVENT MARKING LAYOUT
1"=30'

TRACK AND FIELD EVENTS DETAILS

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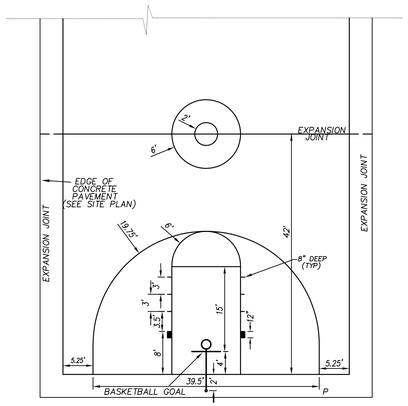
SHEET TITLE
PAVING_& HARDSCAPE DETAILS

SHEET NUMBER
C-09.07

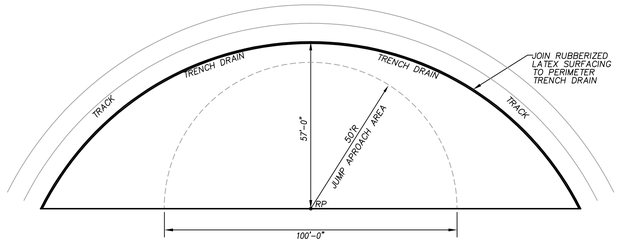


PAVEMENT SECTION

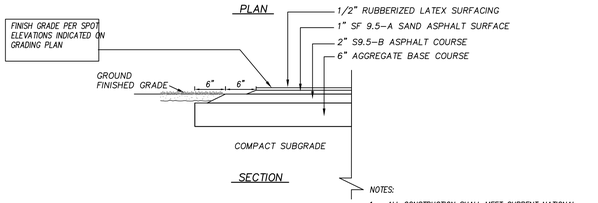
CONCRETE BASE:
4–IN THICK
3,000–PSI ABC
6x6–W1.4xW1.4 WWF
FINISH PER SPECIFICATIONS

NOTES:
1. REFER TO SPECIFICATION SECTION 321800 FOR SURFACING AND MARKING REQUIREMENTS.
2. REFER TO SPECIFICATION SECTION 325000 FOR GOAL REQUIREMENTS.
3. MARK COURT PER NFSHSA STANDARDS.
4. INSTALL EXPANSION JOINTS AT MID COURT LINE AND BETWEEN ADJACENT COURTS.

BASKETBALL COURT LAYOUT N.T.S.



PLAN



SECTION

NOTES:
1. ALL CONSTRUCTION SHALL MEET CURRENT NATIONAL FEDERATION OF STATE HIGH SCHOOL ASSOCIATIONS (NFSHSA) AND U.S. TENNIS COURT AND TRACK BUILDERS ASSOCIATION STANDARDS.
2. REFER TO SPECIFICATION SECTIONS 321800 AND 325000.

HIGH JUMP DETAIL N.T.S.

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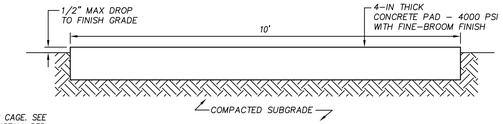
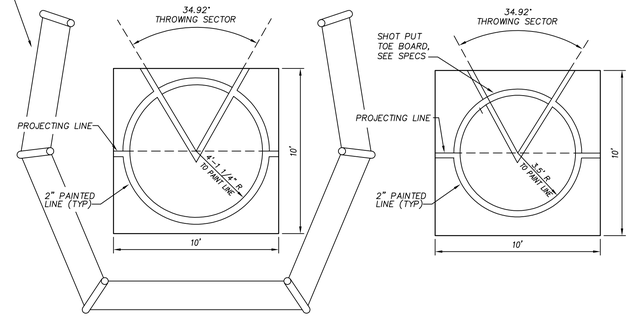


REMOVABLE DISCUS CAGE. SEE SPECIFICATIONS. INSTALL PER MANUFACTURER'S INSTRUCTIONS.

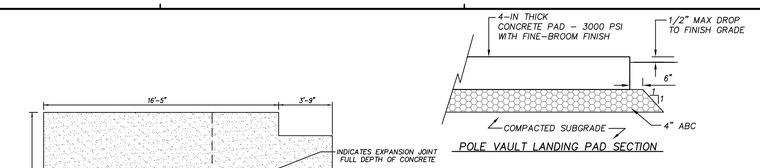
DISCUS & SHOT PUT CIRCLE PAD SECTIONS



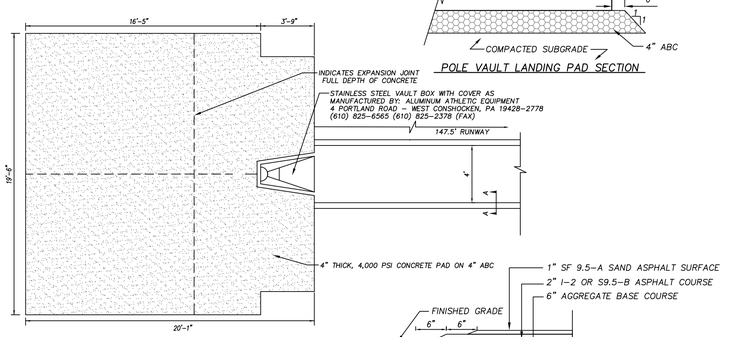
DISCUS CIRCLE PLAN

SHOT PUT CIRCLE PLAN

DISCUS AND SHOTPUT DETAILS N.T.S.



POLE VAULT LANDING PAD SECTION



SECTION A–A

NOTES:
1. ALL CONSTRUCTION SHALL MEET CURRENT NATIONAL FEDERATION OF STATE HIGH SCHOOL ASSOCIATIONS (NFSHSA) AND U.S. TENNIS COURT AND TRACK BUILDERS ASSOCIATION STANDARDS.
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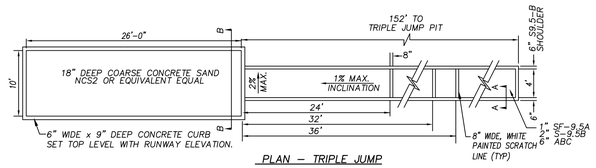
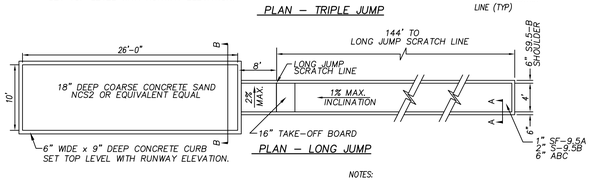
POLE VAULT LANDING N.T.S.

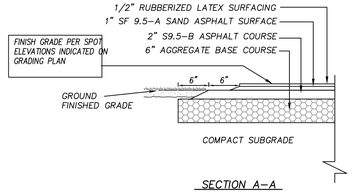


PLAN – TRIPLE JUMP

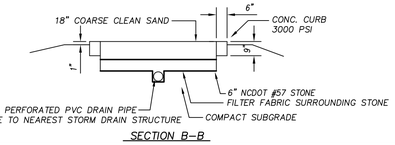


PLAN – LONG JUMP

NOTES:
1. ALL CONSTRUCTION SHALL MEET CURRENT NATIONAL FEDERATION OF STATE HIGH SCHOOL ASSOCIATIONS (NFSHSA) AND U.S. TENNIS COURT AND TRACK BUILDERS ASSOCIATION STANDARDS.
2. REFER TO SPECIFICATION SECTIONS 321800 AND 325000.
3. COORDINATE WITH SCHOOL ATHLETIC DIRECTOR PRIOR TO STRIPING.



SECTION A–A



SECTION B–B

LONG/TRIPLE JUMP DETAIL N.T.S.

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
11 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
RATIO
227 Fayetteville Street, Suite 301
Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
A Division of Bennett & Pless
5430 Wade Park Blvd #400
Raleigh, North Carolina 27607
(919) 832-5587

Mechanical / Electrical / Plumbing Engineer
The Wooten Company
120 North Boylan Avenue
Raleigh, North Carolina 27603
(919) 828-0531

Civil Engineer and Landscape Architect
CLH Design, PA
400 Regency Forest Drive, Suite 120
Cary, North Carolina 27518
(919) 319-6716

Envelope Consultant
Rick Nuhn Engineering
1913 Thayer Circle
Greensboro, North Carolina 27407
(336) 855-1182

Food Service
KRM
4230 Folkston Drive
Charlotte, North Carolina 28205
(704) 724-1045

Theatrical & Acoustic Consultant
Thorburn Associates
2500 Gateway Centre Blvd, Suite 800
Morrisville, North Carolina 27560
(919) 463-9995

Parking Consultant
Walker Consultants
13860 Ballantyne Corporate Pl, Suite 140
Charlotte, North Carolina 28277
(704) 247-6230

SEAL | 03/26/2021

PRELIMINARY
NOT FOR
CONSTRUCTION

SHEET ISSUE

1	Design Development	11/20/20
2	TOA Major Site Plan Submittal #1	12/1/20
3	TOA Major Site Plan Submittal #2	2/12/21
4	TOA Major Site Plan Submittal #3	3/05/21
5	60% Construction Documents	3/26/21

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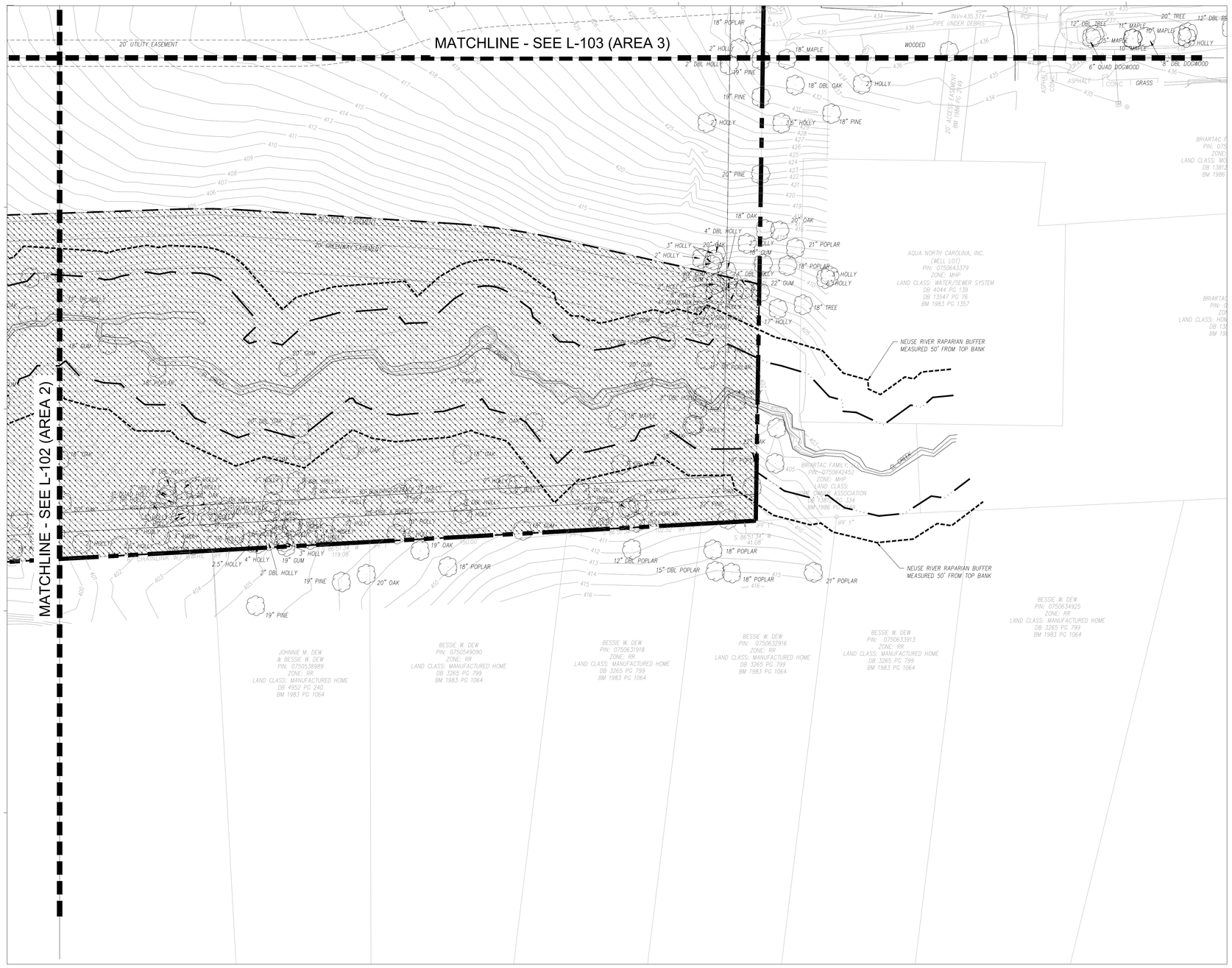
PROJECT NO. 02000.000

SHEET TITLE
PAVING_& HARDSCAPE DETAILS

SHEET NUMBER
C-09.08



1 L-01.01

RESOURCE CONSERVATION AREA 1

1"=40'-0" (0, 20', 40', 80')

RESOURCE CONSERVATION AREA 581,337 sf
Preserve undisturbed forested areas, floodplains, riparian streams and riparian buffers.
-

RESOURCE CONSERVATION AREAS	
DESCRIPTION	AREA
GROSS SITE AREA	2,895,867 SF (66.48 acres)
REQUIRED RESOURCE CONSERVATION AREA (20% GROSS SITE AREA)	579,173 SF (13.30 acres)
RESOURCE CONSERVATION AREA PROVIDED	581,337 SF (13.35 acres)

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed to the cover sheet of these construction plans.

PW - Transportation	Date	WR - Stormwater	Date
Building Inspections	Date	Planning	Date
WR - Utility Engineering	Date	Planning - Transportation	Date
Electric	Date	Fire	Date
WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

NOT FOR CONSTRUCTION

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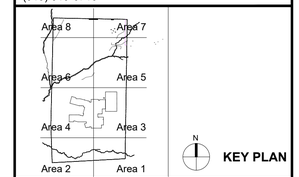

KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

01	DESIGN DEVELOPMENT	11/20/20
02	TOA MAJOR SITE PLAN SUBMITTAL	12/01/20
03	TOA MAJOR SITE PLAN RESUBMITTAL	02/12/21
04	TOA MAJOR SITE PLAN SUBMITTAL #3	03/05/21
05	60% CONSTRUCTION DOCUMENTS	03/26/21
06	TOA MAJOR SITE PLAN SUBMITTAL #4	03/26/21

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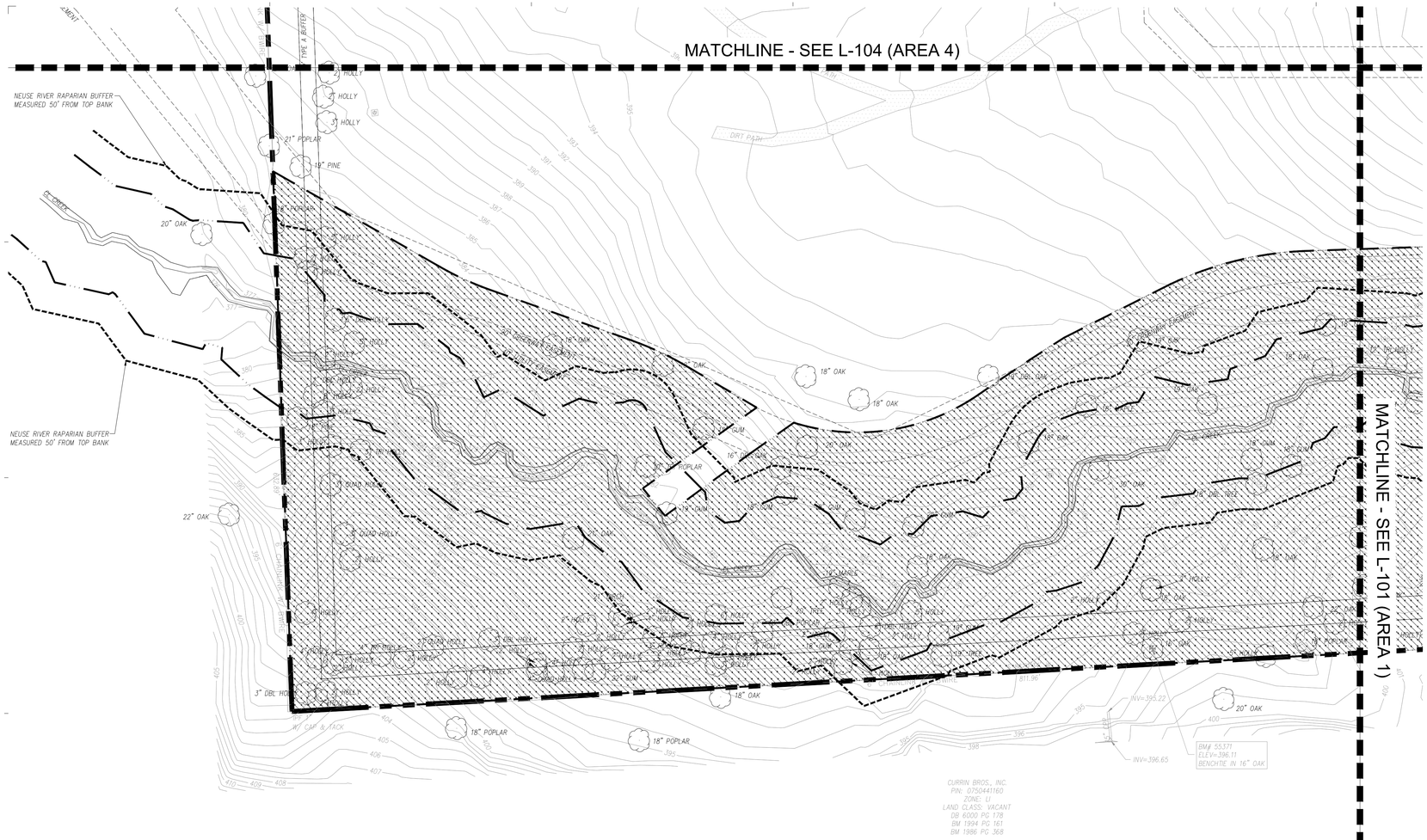
PROJECT NO. 19150.000

SHEET TITLE
RESOURCE CONSERVATION AREA 1

SHEET NUMBER
L-01.01



1 L-01.02

RESOURCE CONSERVATION AREA 2

1"=40'-0"

0 20' 40' 80'

RESOURCE CONSERVATION AREA 581,337 sf
Preserve undisturbed forested areas, floodplains, riparian streams and riparian buffers.
-

RESOURCE CONSERVATION AREAS	
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NOT FOR CONSTRUCTION

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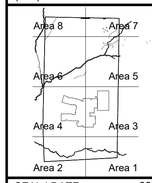

KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

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05	60% CONSTRUCTION DOCUMENTS	03/26/21
06	TOA MAJOR SITE PLAN SUBMITTAL #4	03/26/21

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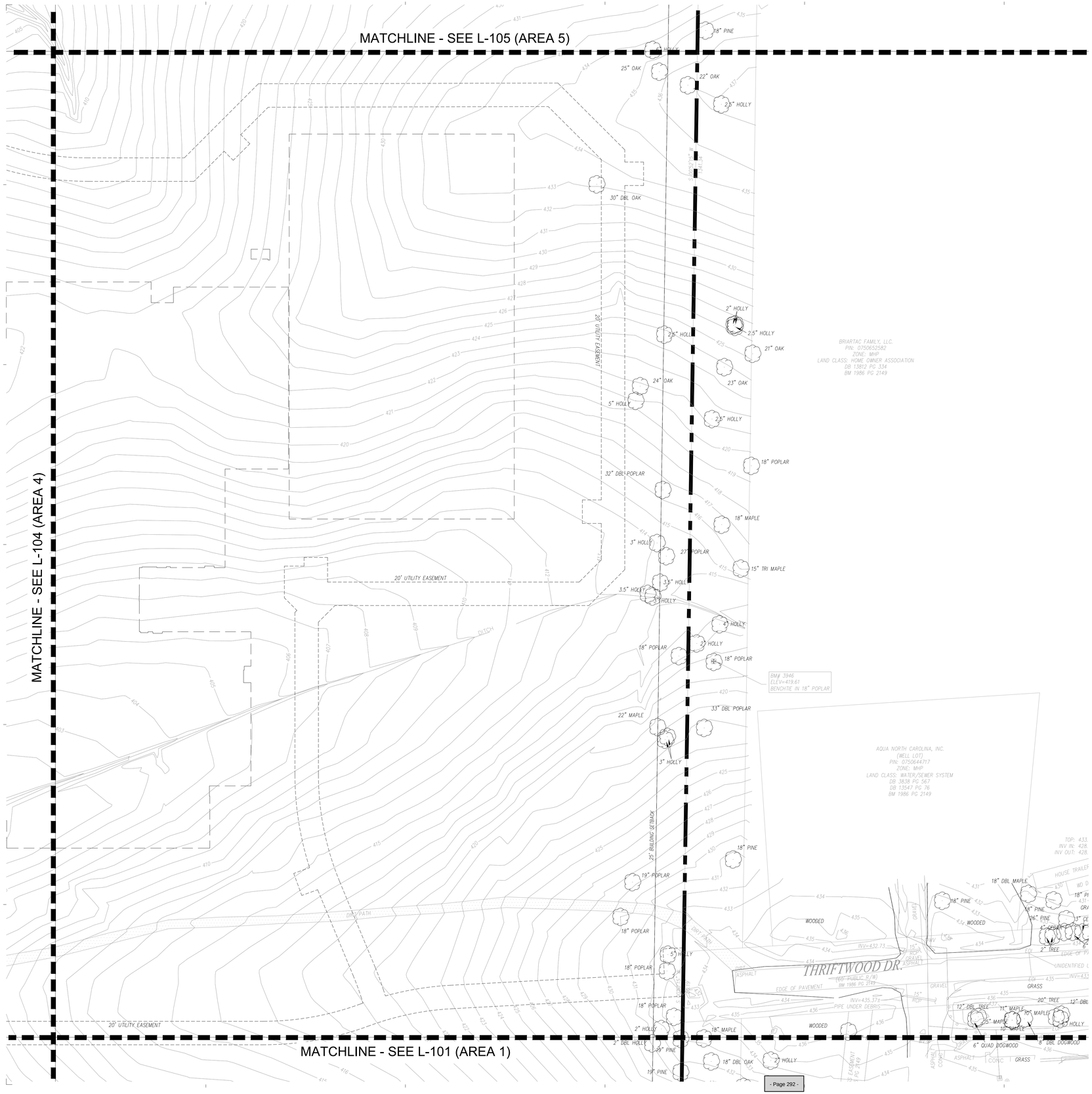
PROJECT NO. 19150.000

SHEET TITLE
RESOURCE CONSERVATION AREA 2

SHEET NUMBER
L-01.02



RESOURCE CONSERVATION AREA 581,337 sf
Preserve undisturbed forested areas, floodplains, riparian streams and riparian buffers.
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WR - Utility Engineering	Date	Planning - Transportation	Date
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WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

1 L-01.03

RESOURCE CONSERVATION AREA 3

1"=40'-0" 0 20' 40' 80'

NOT FOR CONSTRUCTION

H12/Felton Grove High School

8550 Stephenson Road Apex, NC 27539

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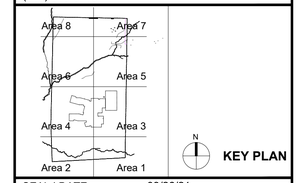

KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

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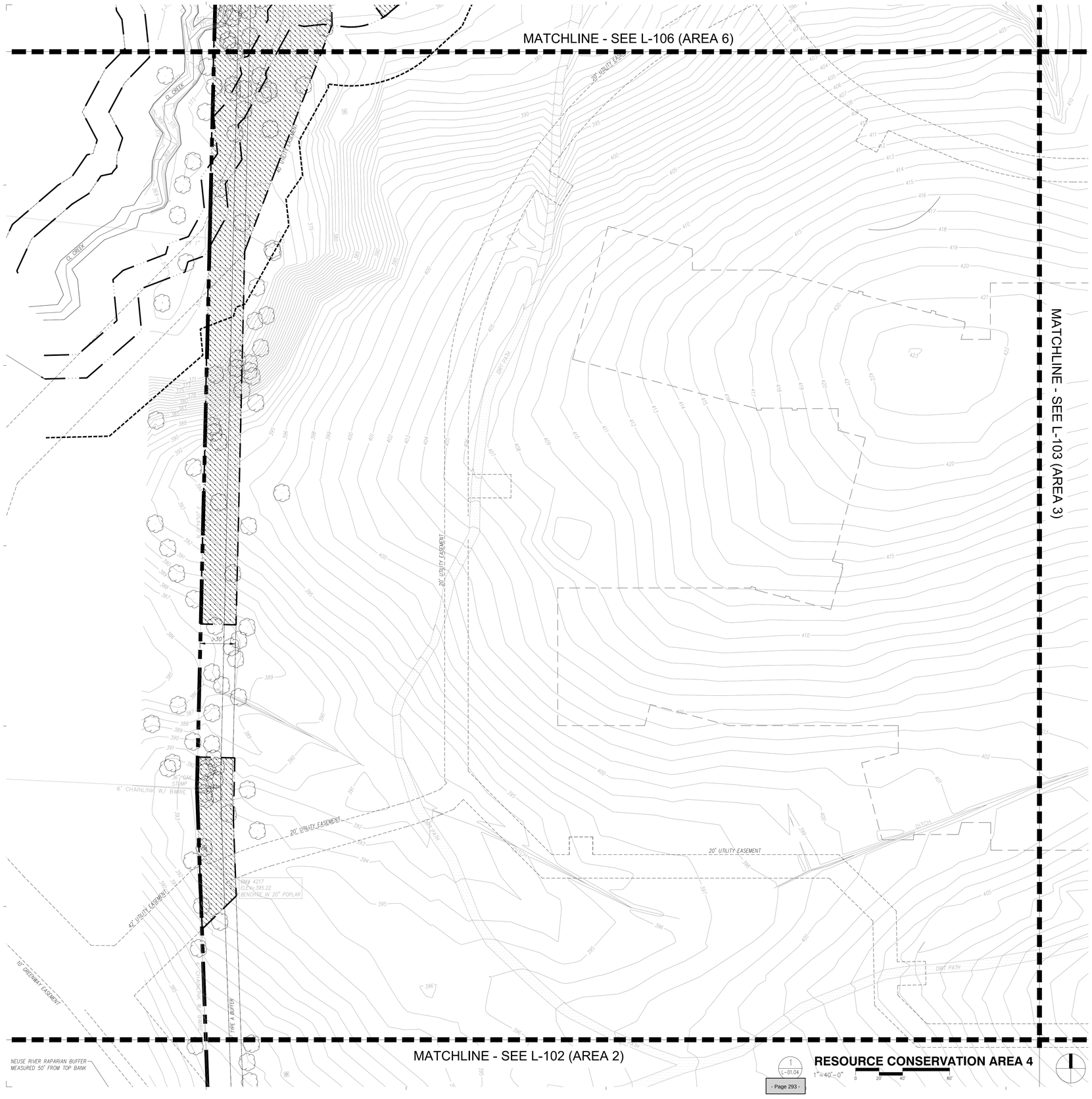
PROJECT NO. 19150.000

SHEET TITLE
RESOURCE CONSERVATION AREA 3

SHEET NUMBER
L-01.03



1 L-01.04

RESOURCE CONSERVATION AREA 4

1"=40'-0" 0 20' 40' 80'

RESOURCE CONSERVATION AREA — 581,337 sf
Preserve undisturbed forested areas, floodplains, riparian streams and riparian buffers.

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WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

NOT FOR CONSTRUCTION

H12/Felton Grove High School

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Apex, NC 27539

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(919)588-3602

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Raleigh, North Carolina 27601
919-821-0805

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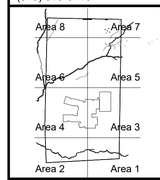
Cary, North Carolina 27518
(919) 319-6716



KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

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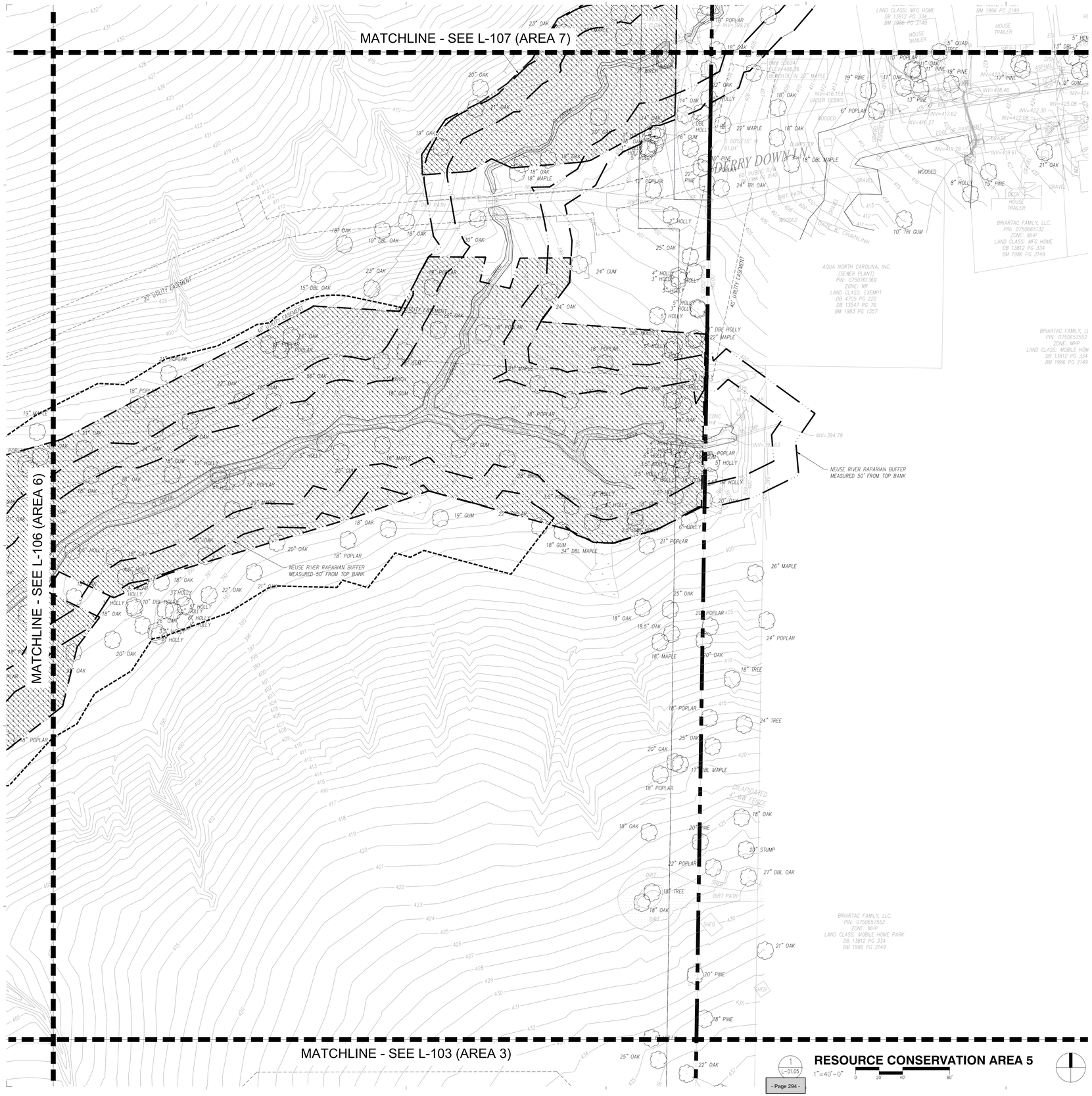
PROJECT NO. 19150.000

SHEET TITLE
RESOURCE CONSERVATION AREA 4

SHEET NUMBER
L-01.04



1 L-01.05

RESOURCE CONSERVATION AREA 5

1"=40'-0" 0 20' 40' 80'

- Page 294 -

RESOURCE CONSERVATION AREA 581,337 sf
Preserve undisturbed forested areas, floodplains, riparian streams and riparian buffers.
-

RESOURCE CONSERVATION AREAS	
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NOT FOR CONSTRUCTION

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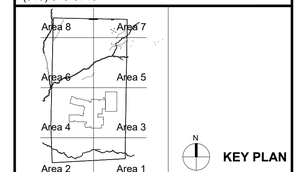

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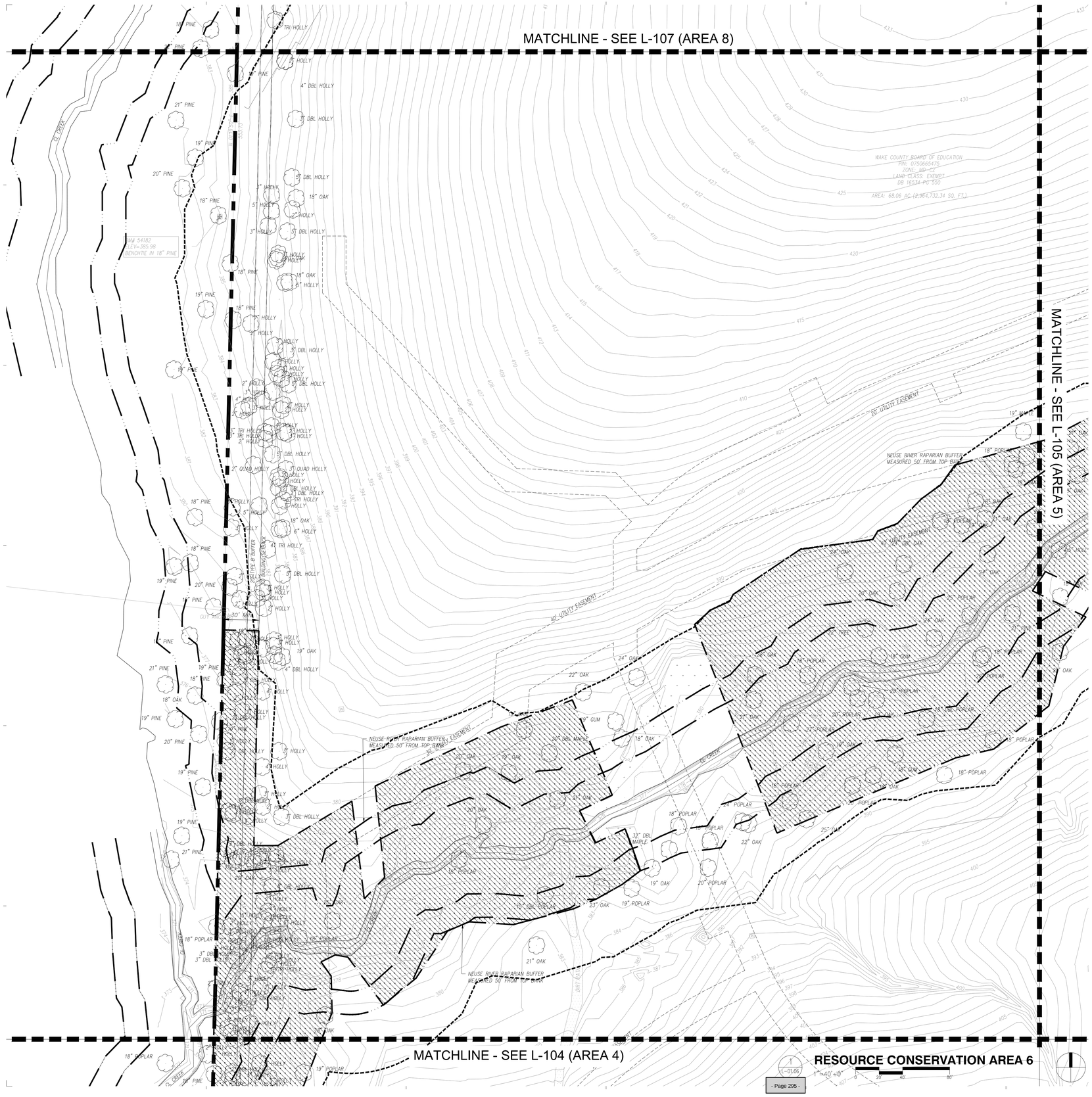
PROJECT NO. 19150.000

SHEET TITLE
RESOURCE CONSERVATION AREA 5

SHEET NUMBER
L-01.05



RESOURCE CONSERVATION AREA 581,337 sf
Preserve undisturbed forested areas, floodplains, riparian streams and riparian buffers.
-

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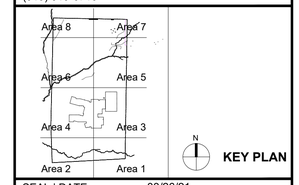

SEAL | DATE 03/26/21

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PROJECT NO. 19150.000

SHEET TITLE
RESOURCE CONSERVATION AREA 6

SHEET NUMBER
L-01.06

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PW - Transportation	Date	WR - Stormwater	Date
Building Inspections	Date	Planning	Date
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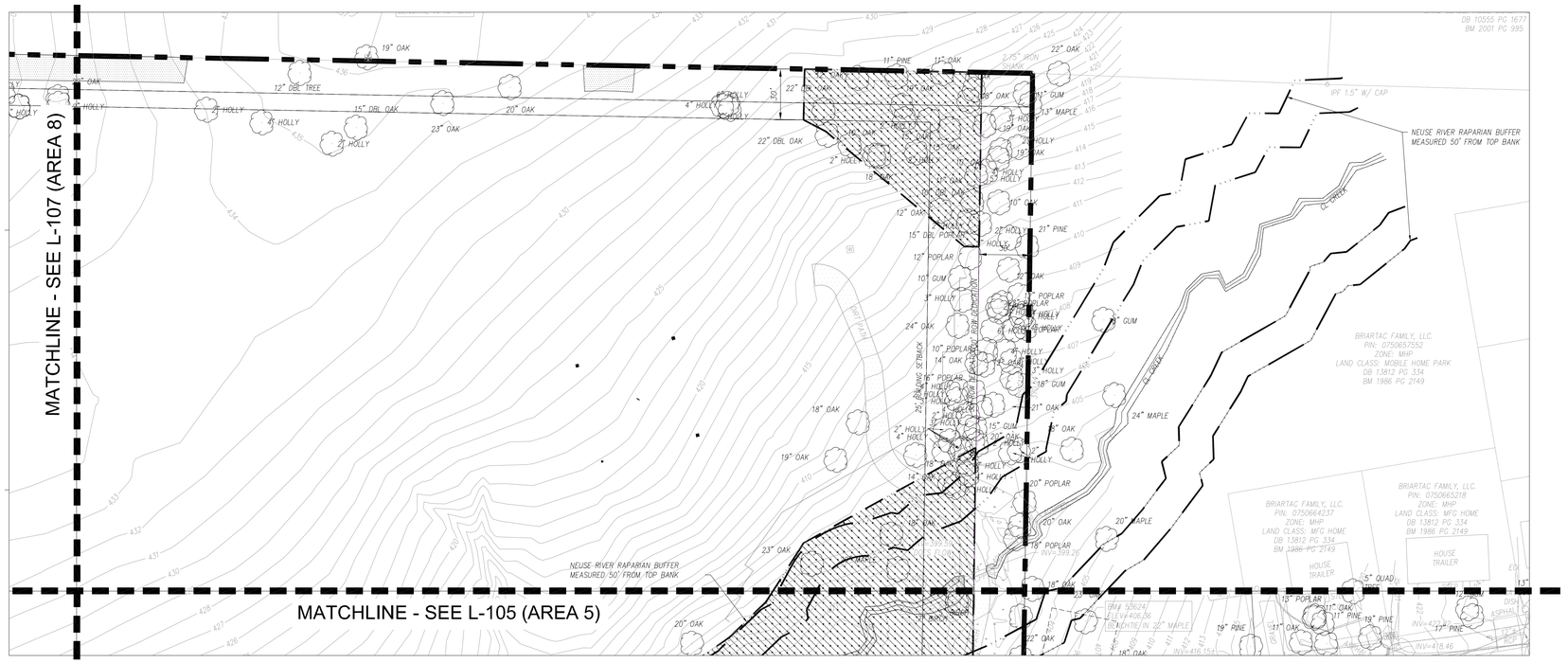
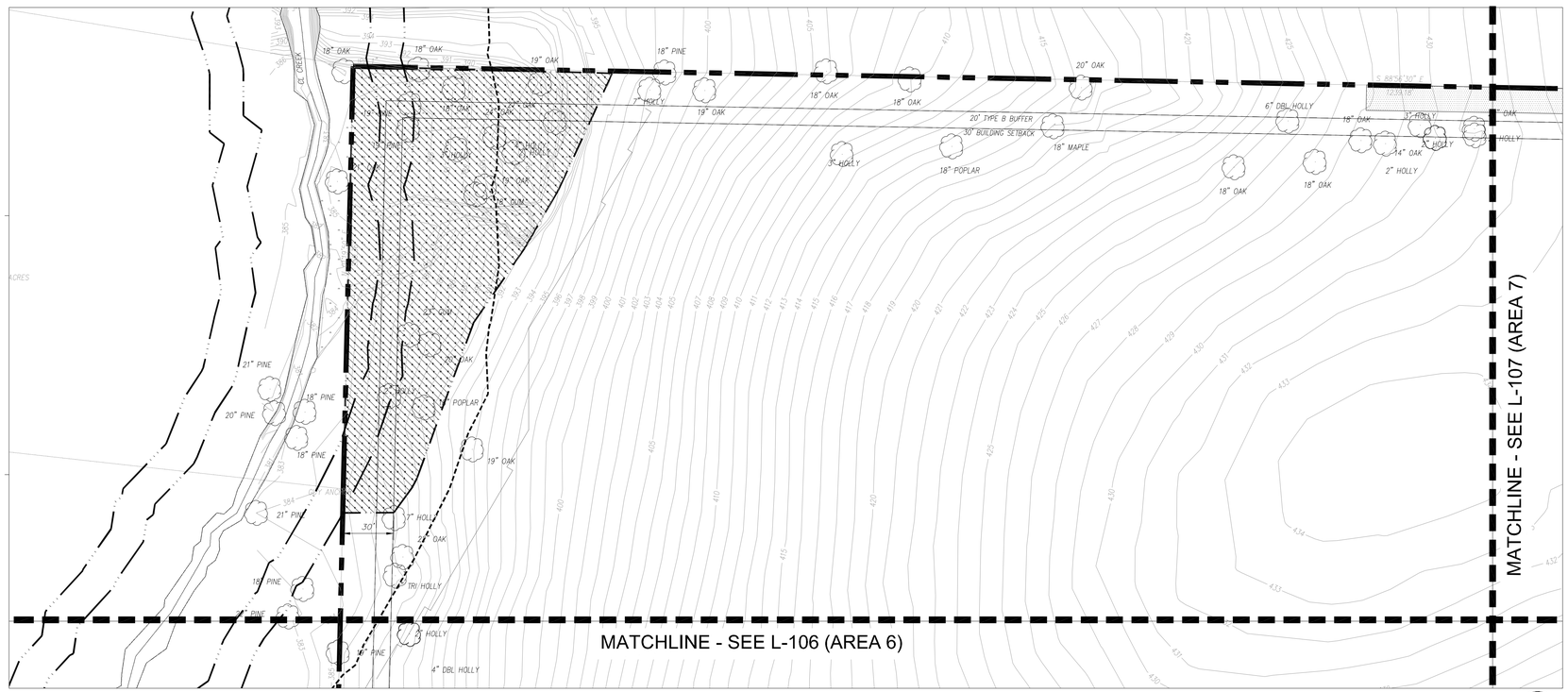
Electric	Date	Fire	Date
WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

NOT FOR CONSTRUCTION





RESOURCE CONSERVATION AREA — 581,337 sf
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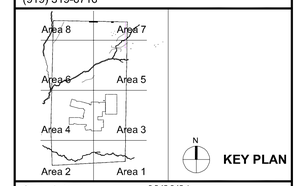

SEAL | DATE 03/26/21

SHEET ISSUE		
01	DESIGN DEVELOPMENT	11/20/20
02	TOA MAJOR SITE PLAN SUBMITTAL	12/01/20
03	TOA MAJOR SITE PLAN RESUBMITTAL	02/12/21
04	TOA MAJOR SITE PLAN SUBMITTAL #3	03/05/21
05	60% CONSTRUCTION DOCUMENTS	03/26/21
06	TOA MAJOR SITE PLAN SUBMITTAL #4	03/26/21

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PROJECT NO. 19150.000

SHEET TITLE
RESOURCE CONSERVATION AREAS 7 & 8

SHEET NUMBER
L-01.07

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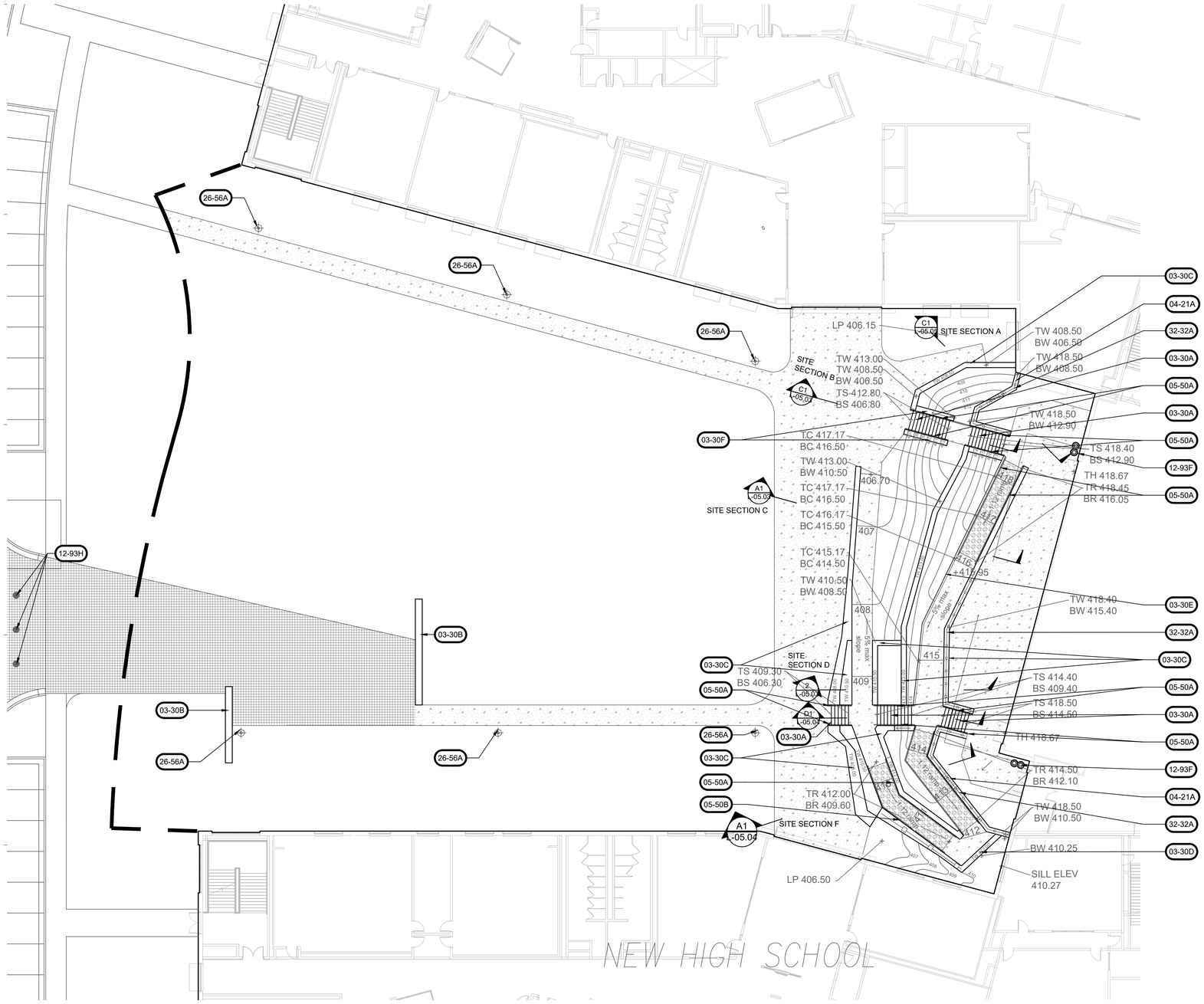
PW - Transportation	Date	WR - Stormwater	Date
Building Inspections	Date	Planning	Date
WR - Utility Engineering	Date	Planning - Transportation	Date
Electric	Date	Fire	Date
WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

NOT FOR CONSTRUCTION



1 L-02.01 **PLAN ENLARGEMENT - COURTYARD BASE BID**

1"=16'-0" 0 8' 16' 32'

SITE FEATURES NOTES

1. SITE UTILITIES SHOWN FOR REFERENCE ONLY. SEE OTHER DISCIPLINE SHEETS FOR PLANS AND DETAILS.
2. AUTOCAD .DWG FILES WILL BE PROVIDED FOR CONSTRUCTION LAYOUT.
3. DO NOT SCALE DRAWINGS FOR FIELD LAYOUT. REFER TO SITE LAYOUT PLAN(S) FOR DIMENSIONS.
4. ALL PAVEMENT MARKINGS INTERRUPTED BY DEMOLITION AND PROPOSED IMPROVEMENTS SHALL BE REPLACED WITH MATCHING COLOR AND WIDTH.
5. REFER TO / FOR CONCRETE PAVING JOINT DETAILS.
   5.1. ALL CONCRETE PAVING JOINTS SHALL BE CONTRACTION JOINT 'A' UNLESS INDICATED OTHERWISE.
6. CURB RAMPS SHALL COMPLY WITH CURB RAMP DRAWING INDEX & GENERAL NOTES, REFER TO /
7. DAMAGE TO EXISTING PAVMENT SHALL BE REPLACED WITH MATCHING COLOR AND FINISH BY CONTRACTOR.

SITE FEATURES LEGEND

- CONSTRUCTION FENCE
- TEMPORARY WORK LIMIT
- TREE PROTECTION FENCING
- IJ / B — ISOLATION JOINT, JOINT TYPE B PER
- ALIGN

REFERENCE NOTES SCHEDULE		
	Cast-In-Place Concrete	
CODE	DESCRIPTION	DETAIL
03-30A	CIP CONC STAIRS	E1/L-05.01
03-30B	CIP CONCRETE. SEATWALL	A5/L-05.01
03-30C	CIP CONCRETE TERRACED WALLS W/ DECORATIVE FORMLINER FINISH	
03-30D	CIP CONCRETE RETAINING WALL	A3/L-05.01
03-30E	CIP CONCRETE PLANTER CURB	
03-30F	CIP CHEEKWALL	
	Unit Masonry	
CODE	DESCRIPTION	DETAIL
04-21A	STRUCTURAL CIP RETAINING WALL W/ DECORATIVE FORMLINER FINISH	
04-21B	MONUMENT SIGN, To be permitted separately	A1/L-05.06
CODE	DESCRIPTION	DETAIL
05-50A	GALVANIZED STEEL HANDRAILS	B1/L-05.01
05-50B	42" PEDESTRIAN GUARDRAIL W/ ADA HANDRAIL GRAB BAR	
	Site Furnishings	
CODE	DESCRIPTION	DETAIL
12-93D	DECORATIVE BOLLARD	D5/L-05.01
12-93E	PLAZA BENCH	C1/L-05.02
12-93F	DUAL TRASH/RECYCLE RECEPTACLE	F5/L-05.01
12-93G	PLAZA BIKE RACK	E1/L-05.02
12-93H	KNOCKDOWN BOLLARD, SEE CIVIL DWGS	
12-93I	FLAGPOLE	
	LIGHTING	
CODE	DESCRIPTION	DETAIL
26-56A	12' HT. PEDESTRIAN LIGHT	A1/L-05.02
	CURBS AND GUTTERS	
CODE	DESCRIPTION	DETAIL
32-17A	CAST IRON DETECTABLE WARNING PLATES	
	FENCES AND GATES	
CODE	DESCRIPTION	DETAIL
32-31A	6' HT. ECS TERRACE FENCE	
32-31B	6' HT. ECS TERRACE DOUBLE GATE	
32-32A	42" PEDESTRIAN GUARDRAIL	C4/L-05.05
	CONCRETE PAVING	
SYMBOL	DESCRIPTION	DETAIL
	CONCRETE PAVEMENT *LIGHT DUTY*	
	CONCRETE PAVEMENT *ADA RAMP*	A1/L-05.01
	CONCRETE PAVEMENT *HEAVY DUTY*	

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NOT FOR CONSTRUCTION

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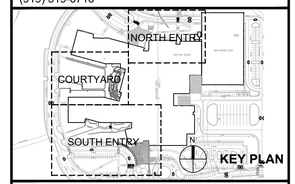

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PROJECT NO. 19150.000

SHEET TITLE
COURTYARD PLAN ENLARGEMENT BASE BID

SHEET NUMBER
L-02.01

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SITE FEATURES LEGEND

CONSTRUCTION FENCE
TEMPORARY WORK LIMIT
TREE PROTECTION FENCING
IJ B — ISOLATION JOINT JOINT TYPE B PER ALIGN

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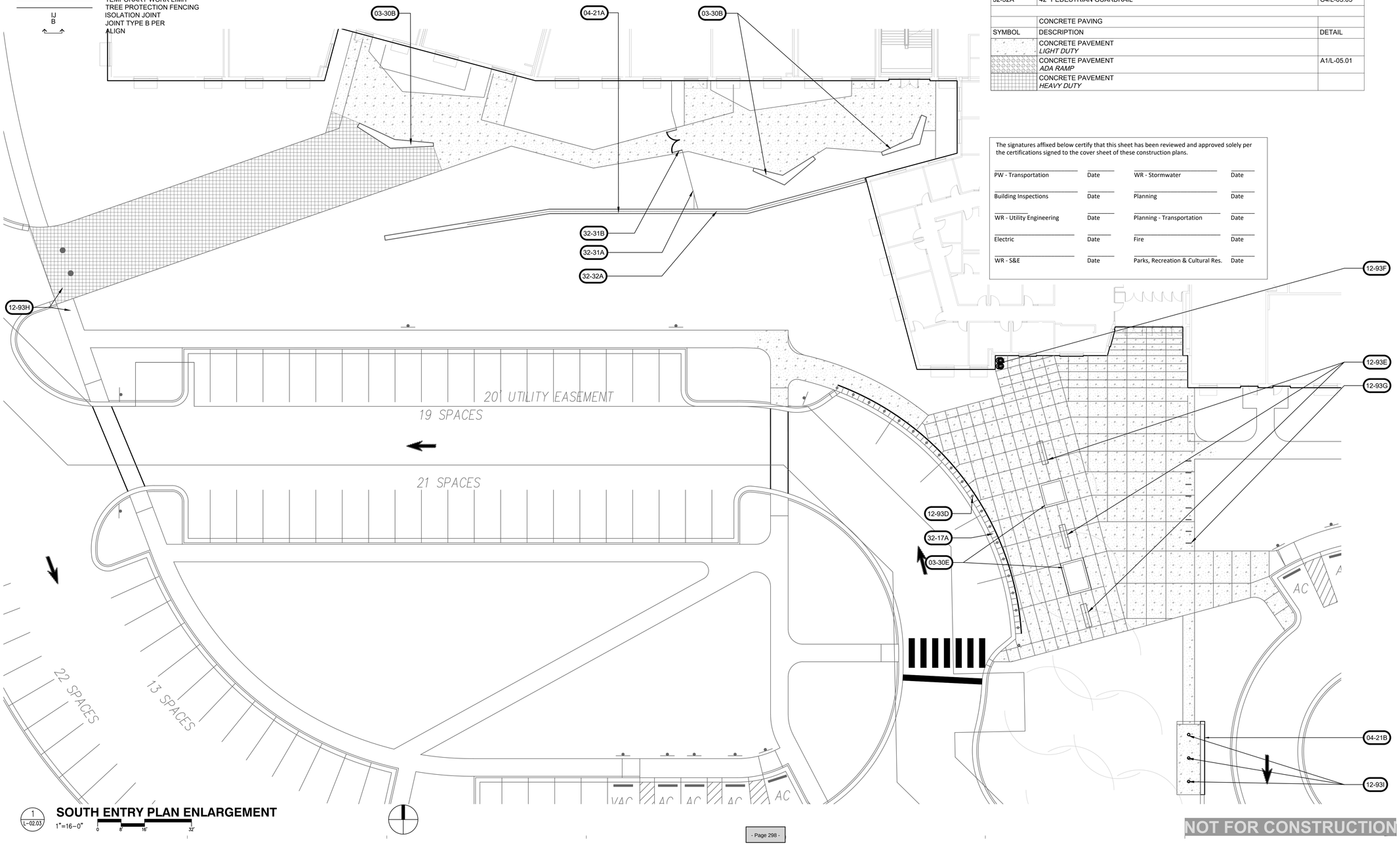

1 / L-02.03 **SOUTH ENTRY PLAN ENLARGEMENT**
1"=16'-0" (0, 8', 16', 32')

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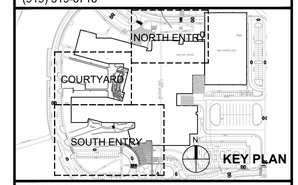

SEAL | DATE 03/26/21

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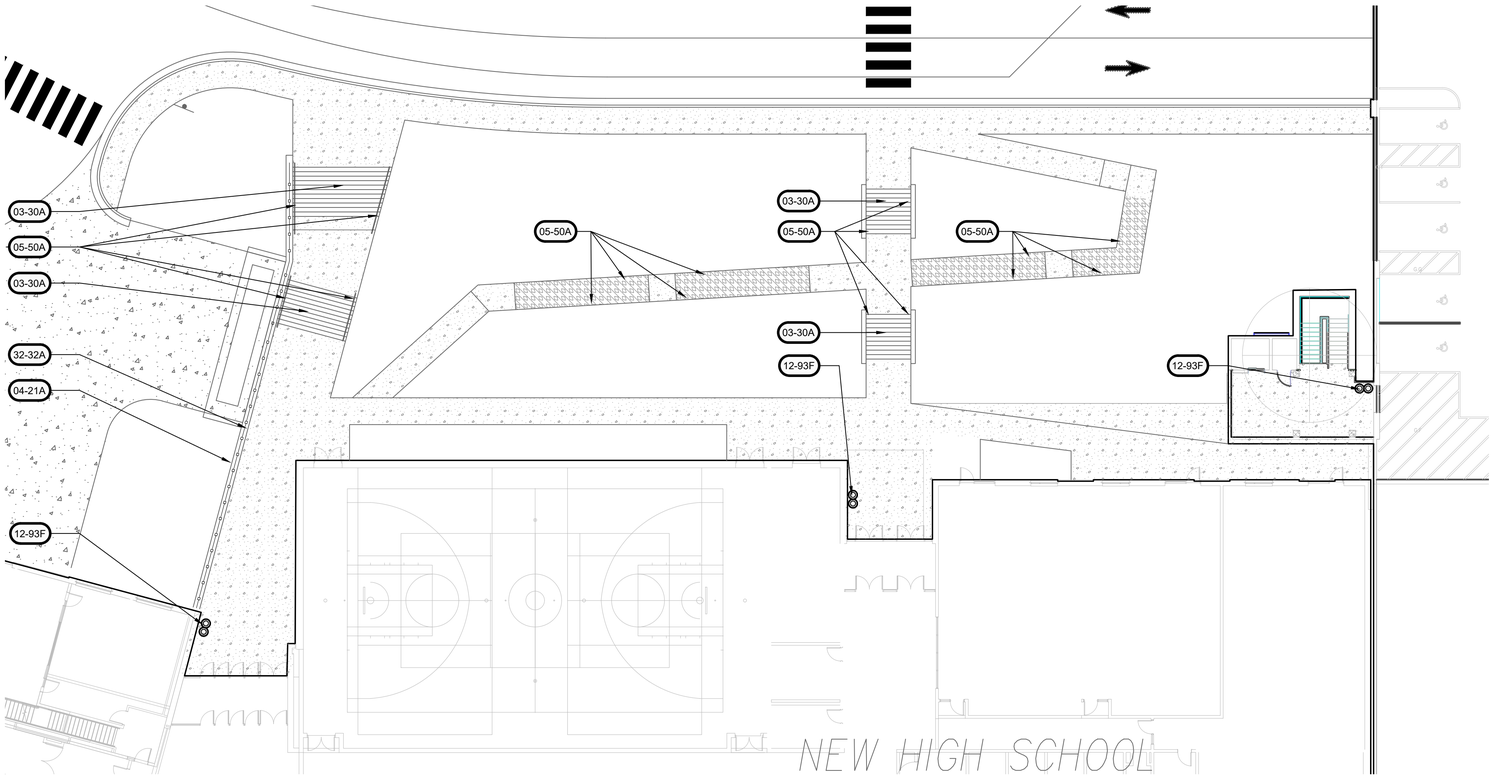
PROJECT NO. 19150.000

SHEET TITLE
SOUTH ENTRY PLAN ENLARGEMENT

SHEET NUMBER
L-02.03

NOT FOR CONSTRUCTION



1 L-02.04 **NORTH ENTRY PLAN ENLARGEMENT**
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TEMPORARY WORK LIMIT
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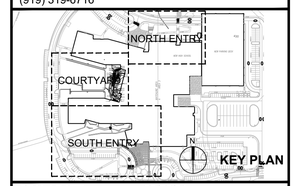

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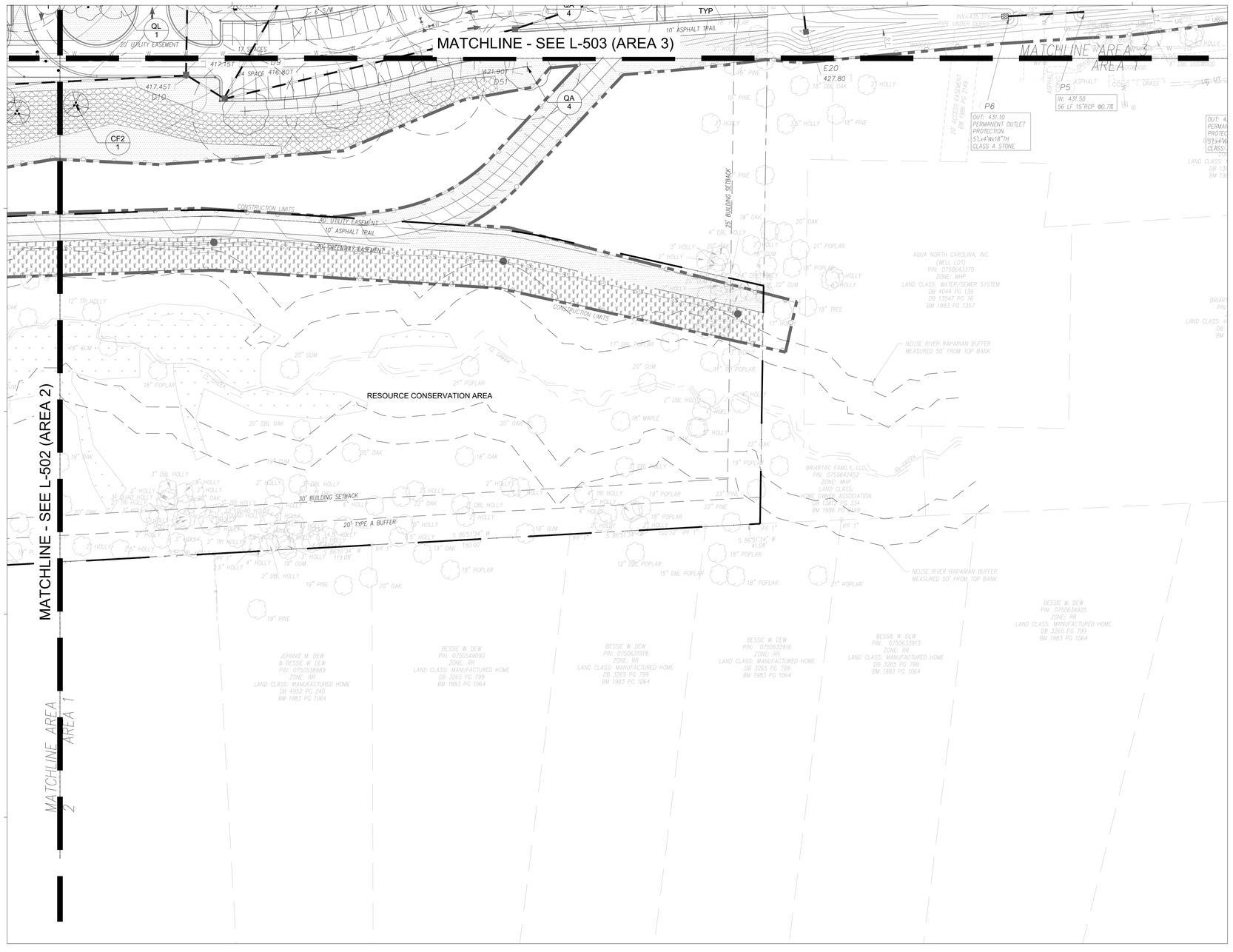
PROJECT NO. 19150.000

SHEET TITLE
NORTH ENTRY PLAN ENLARGEMENT

SHEET NUMBER
L-02.04



PLANTING NOTES

1. REFER TO GENERAL LANDSCAPE ARCHITECTURAL NOTES PRIOR TO COMMENCING THE PLANTING SCOPE OF WORK.
2. PARTICIPATE IN THE PRE-INSTALLATION CONFERENCE FOR THE PLANTING SCOPE OF WORK, ACCORDING TO THE PROJECT SPECIFICATIONS, PRIOR TO COMMENCEMENT.
3. EXISTING AND PROPOSED UTILITIES THAT ARE SHOWN ARE FOR REFERENCE ONLY. REFER TO THE SITE SURVEY FOR EXISTING UTILITIES AND VERIFY IN THE FIELD. REFER TO THE MEP AND CIVIL PLANS FOR PROPOSED UTILITIES.
4. MATCH GRAPHIC REPRESENTATION SHOWN UNLESS NOTED / DIMENSIONED OTHERWISE. REFER TO PROJECT DETAILS FOR PLACEMENT OF HATCHED AREAS.
5. OBTAIN APPROVAL OF PLANTING LAYOUT BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
6. COMMENCEMENT OF PLANTING SCOPE CONSTITUTES ACCEPTANCE OF SITE CONDITIONS, SUBGRADE, AND SUBSOIL CONDITONS. ENSURE THAT NECESSARY AND SPECIFIED PLANTING CONDITIONS HAVE BEEN ACHIEVED PRIOR TO LANDSCAPE INSTALLATION.
6. INSTALL SPECIFIED TURFGRASS SOD AT DISTURBED AREAS NOT OTHERWISE IDENTIFIED FOR PLANT MATERIAL.
7. PROVIDE 2" BROWN DYED MULCH AT ALL PLANTING AREAS.
8. REFER TO SPECIFICATIONS FOR PLANT STAGING, HANDLING, PLANTING, AND STAKING REQUIREMENTS.
9. FAILURE TO FOLLOW PLANTING PLAN DESIGN WILL RESULT IN REMOVAL OF NON-CONFORMING PLANTS AND PURCHASE OF NEW PLANTS AT COST OF CONTRACTOR.
10. FINISH GRADE AND PLANTING TO BE COORDINATED WITH LANDSCAPE ARCHITECT WITHIN TREE PROTECTION ZONE PRIOR TO COMMENCEMENT OF PLANTING INSTALLATION.
11. REFER TO SPECIFICATIONS FOR IRRIGATION DESIGN AND INSTALLATION REQUIREMENTS.
12. SOIL DEPTHS:
    - 1.1. SODDED GRASS - FOUR INCHES
    - 1.2. GROUND COVER AND ANNUAL BEDS - EIGHT INCHES
    - 1.3. NATIVE PLUG AREAS - EIGHT INCHES
    - 1.4. SHRUB AND PERENNIAL BEDS - FOURTEEN INCHES
13. ALL BUFFERS MUST BE PLANTED IN ORDER TO RECEIVE A CERTIFICATE OF OCCUPANCY.

1 / L-04.01 PLANTING PLAN - AREA 1

1"=40'-0" (0, 20', 40', 80')

PLANT SCHEDULE				
EVERGREEN TREES	BOTANICAL / COMMON NAME	SIZE		QTY
IS	Ilex opaca `Satyr Hill` / Satyr Hill American Holly	8` ht, 1.5" cal. min.		33
INS	Ilex x `Nellie R. Stevens` / Nellie R. Stevens Holly	8` ht, 1.5" cal. min.		17
MG	Magnolia grandiflora / Southern Magnolia	12` ht, 2.5" cal. min.		9
MLG	Magnolia grandiflora `Little Gem` / Dwarf Southern Magnolia	8` ht, 1.5" cal. min.		6
PT	Pinus taeda / Loblolly Pine	8` ht, 1.5" cal. min.		5
COLUMINAR TREES	BOTANICAL / COMMON NAME	SIZE		QTY
QI	Quercus palustris `Green Pillar` / Columnar Pin Oak	12` ht, 2.5" cal. min.		11
DECIDUOUS SHADE TREE	BOTANICAL / COMMON NAME	SIZE		QTY
AF	Acer floridanum / Southern Sugar Maple	12` ht, 2.5" cal. min.		11
CK	Cladrastis kentukea / American Yellowwood	12` ht, 2.5" cal. min.		5
MM	Magnolia virginiana `Moon Glow` / Sweet Bay	12` ht, 2.5" cal. min.		7
NW	Nyssa sylvatica `Wildfire` / Black Gum	12` ht, 2.5" cal. min.		12
PC	Pistacia chinensis / Chinese Pistache	12` ht, 2.5" cal. min.		16
QA	Quercus alba / White Oak	12` ht, 2.5" cal. min.		28
QB	Quercus bicolor / Swamp White Oak	12` ht, 2.5" cal. min.		45
QL	Quercus lyrata / Overcup Oak	12` ht, 2.5" cal. min.		21
QS	Quercus shumardii / Shumard Red Oak	12` ht, 2.5" cal. min.		24
QT	Quercus texana / Nuttall Oak	12` ht, 2.5" cal. min.		32
UJ	Ulmus americana `Jefferson` / American Elm	12` ht, 2.5" cal. min.		30
UNDERSTORY TREES	BOTANICAL / COMMON NAME	SIZE		QTY
AC	Amelanchier canadensis `Autumn Brilliance` / Autumn Brilliance Serviceberry	10` ht, multi-stem		7
CF2	Cercis canadensis `Forest Pansy` / Forest Pansy Eastern Redbud	1.5" Cal.		5
CD	Chionanthus virginicus `Dirr` / Dirr White Fringetree	10` ht, multi-stem		6
CF	Cornus florida `Cherokee Chief` / Cherokee Chief Dogwood	1.5" Cal.		4
HC	Halesia carolina / Silverbell	8` ht.		5
PA	Prunus subhirtella `Autumnalis` / Autumn Flowering Cherry	1.5" Cal.		6
SJ	Styrax japonicus / Japanese Snowbell	8` ht.		6
SHRUBS	BOTANICAL / COMMON NAME	SIZE		QTY
AGG	Abelia x grandiflora `Edward Goucher` / Glossy Abelia	18" ht, 3 gal. min.		21
AP	Aesculus parviflora / Bottlebrush Buckeye	30" ht, 4 gal. min.		52
AEP	Aesculus pavia / Red Buckeye	30" ht, 4 gal. min.		1
CAA	Callicarpa americana / American Beautyberry	30" ht, 4 gal. min.		6
CB	Camellia sasanqua `Apple Blossom` / Apple Blossom Camellia	30" ht, 4 gal. min.		103
CCL	Caryopteris x clandonensis / Bluebeard	18" ht, 3 gal. min.		57
DBC	Distylium x `Blue Cascade` / Blue Cascade Distylium	18" ht, 3 gal. min.		72
FAJ	Fatsia japonica / Japanese Fatsia	18" ht, 3 gal. min.		16
FS	Forsythia suspensa `Sieboldii` / Weeping Forsythia	30" ht, 4 gal. min.		19
FMA	Fothergilla major `Mount Airy` / Mount Airy Fothergilla	30" ht, 4 gal. min.		57
HVH	Hamamelis virginiana `Harvest Moon` / Harvest Moon Witch Hazel	30" ht, 4 gal. min.		10
HAA	Hydrangea arborescens `Abetwo` / Incrediball Hydrangea	30" ht, 4 gal. min.		77
HPW	Hydrangea quercifolia `Pee Wee` / Oakleaf Hydrangea	18" ht, 3 gal. min.		47
HF	Hypericum frondosum `Sunburst` / Sunburst Hypericum	18" ht, 3 gal. min.		96
ICR	Ilex comuta `Rotunda` / Dwarf Chinese Holly	18" ht, 3 gal. min.		17
IVJ	Ilex verticillata `Jim Dandy` / Jim Dandy Winterberry	30" ht, 4 gal. min.		3
IVR	Ilex verticillata `Red Sprite` / Red Sprite Winterberry	30" ht, 4 gal. min.		77
IVT	Ilex vomitoria / Yaupon Holly	30" ht, 4 gal. min.		85
IVN	Ilex vomitoria `Nana` / Dwarf Yaupon	18" ht, 3 gal. min.		29
IU	Illicium floridanum `Miss Scarlet` / Miss Scarlet Anise	30" ht, 4 gal. min.		61
ILH	Itea virginica `Little Henry` TM / Virginia Sweetspire	18" ht, 3 gal. min.		42
OHG	Osmanthus heterophyllus `Goshiki` / Goshiki Holly Olive	30" ht, 4 gal. min.		10
PTW	Pittosporum tobira `Wheeler's Dwarf` / Wheeler's Dwarf Pittosporum	18" ht, 3 gal. min.		88
PLO	Prunus laurocerasus `Otto Luyken` / Otto Luyken Laurel	30" ht, 4 gal. min.		72
VAL	Vitex agnus-castus `Lecompte` / Chaste Tree	30" ht, 4 gal. min.		17
GROUND COVERS	BOTANICAL / COMMON NAME	SIZE	SPACING	QTY
AHU	Amsonia hubrichtii / Arkansas Blue-star	Quart	18" o.c.	1,236
CKF	Calamagrostis x acutiflora `Karl Foerster` / Feather Reed Grass	1 Gal.	24" o.c.	138
COE	Carex oshimensis `Everillo` TM / EverColor Everillo Japanese Sedge	1 Gal.	12" o.c.	808
DC	Deschampsia cespitosa `Northern Lights` / Northern Lights Hair Grass	Quart	24" o.c.	539
EPU	Echinacea purpurea / Purple Coneflower	Quart	18" o.c.	50
JHZ	Juniperus horizontalis / Creeping Juniper	1 Gal.	44" o.c.	377
MCA	Muhlenbergia capillaris / Pink Muhly Grass	1 Gal.	30" o.c.	128
OJG	Ophiopogon japonicus `Gyoku Ryu` / Mondo Grass	Quart	12" o.c.	335
RAG	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac	1 Gal.	36" o.c.	697
SSP	Sedum spectabile `Purple Emporer` / Stonecrop	1 Gal.	16" o.c.	342
SAL	Sisyrinchium angustifolium `Lucerne` / Lucerne Blue Eyed Grass	Pint	12" o.c.	2,863
TURF	BOTANICAL / COMMON NAME	SIZE	SPACING	QTY
T1	Cynodon dactylon `Tif 419` / Bermuda Grass	Sod		327,965 sf
T2	Cynodon dactylon `TifTuf` / TifTuf BermudaGrass	Sod		347,718 sf

GENERAL SOD LAWN TifTuf Bermuda -		58,663 sf
LOWLAND SCM PLANTINGS Native grass and perennial plantings within stormwater control zone expected to periodically hold water. Plugs and 1 gal. size. -		86,020 sf
UPLAND SCM PLANTINGS Variety of wetland species shrubs, 18" min. ht, 48"-60" spacing typical, within stormwater control zone expected to receive periodic inundation. -		76,688 sf
SLOPE STABILIZATION MIX Seed mix & geotextile to be installed on slopes 3:1 or less, to support re-establishment of forest. SEE L-05.02 FOR SEED MIXES		320,567 sf
REFORESTATION SEED MIX To be installed on disturbed areas with slopes 3:1 or less adjacent to existing woodland to support re-establishment of forest. SEE L-05.02 FOR SEED MIXES		92,905 sf
NO-MOW SEED MIX BLEND OF NATIVE GRASSES AND FORBS SUITABLE FOR MOST SOIL TYPES AND FULL SUN. SEE L-05.02 FOR SEED MIXES		88,552 sf

H12/Felton Grove High School

8550 Stephenson Road Apex, NC 27539

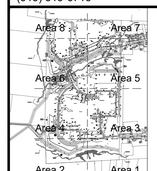
Owner
Wake County Public Schools
111 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
RATIO
227 Fayetteville Street, Suite 301
Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
5430 Wade Park Blvd #400
Raleigh, North Carolina 27607
(919) 832-5587

Mechanical / Electrical / Plumbing Engineer
The Wooten Company
120 North Boylan Avenue
Raleigh, North Carolina 27603
(919) 828-0531

Civil Engineer and Landscape Architect
CLH Design PA
400 Regency Forest Drive, Suite 120
Cary, North Carolina 27518
(919) 319-6716



KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

01	DESIGN DEVELOPMENT	11/20/20
02	TOA TOA MAJOR SITE PLAN SUBMITTAL	12/01/20
03	TOA MAJOR SITE PLAN RESUBMITTAL	02/12/21
04	TOA MAJOR SITE PLAN SUBMITTAL #3	03/05/21
05	60% CONSTRUCTION DOCUMENTS	03/26/21
06	TOA MAJOR SITE PLAN SUBMITTAL #4	03/26/21

RATIO

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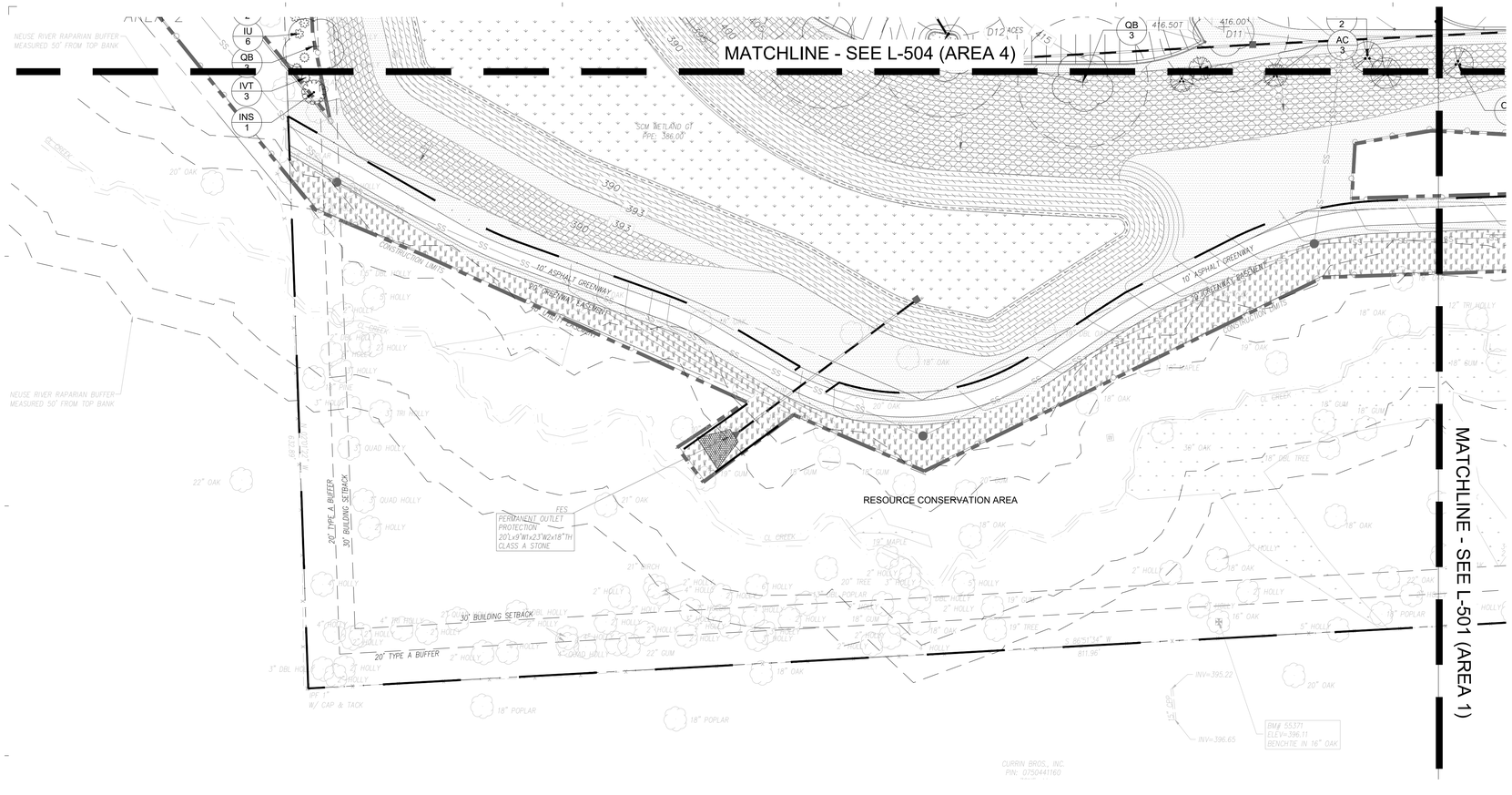
PROJECT NO. 19150.000

SHEET TITLE
PLANTING PLAN - AREA 1

SHEET NUMBER
L-04.01

NOT FOR CONSTRUCTION



1 L-04.02 PLANTING PLAN - AREA 2

1"=40'-0" (0, 20', 40', 80')

PLANT SCHEDULE				
EVERGREEN TREES	BOTANICAL / COMMON NAME	SIZE		QTY
IS	Ilex opaca `Satyr Hill` / Satyr Hill American Holly	8' Ht, 1.5" cal. min.		33
INS	Ilex x `Nellie R. Stevens` / Nellie R. Stevens Holly	8' Ht, 1.5" cal. min.		17
MG	Magnolia grandiflora / Southern Magnolia	12' Ht, 2.5" cal. min.		9
MLG	Magnolia grandiflora `Little Gem` / Dwarf Southern Magnolia	8' Ht, 1.5" cal. min.		6
PT	Pinus taeda / Loblolly Pine	8' Ht, 1.5" cal. min.		5
COLUMNAR TREES	BOTANICAL / COMMON NAME	SIZE		QTY
QI	Quercus palustris `Green Pillar` / Columnar Pin Oak	12' Ht, 2.5" cal. min.		11
DECIDUOUS SHADE TREE	BOTANICAL / COMMON NAME	SIZE		QTY
AF	Acer floridanum / Southern Sugar Maple	12' Ht, 2.5" cal. min.		11
CK	Cladrastis kentukea / American Yellowwood	12' Ht, 2.5" cal. min.		5
MM	Magnolia virginiana `Moon Glow` / Sweet Bay	12' Ht, 2.5" cal. min.		7
NW	Nyssa sylvatica `Wildfire` / Black Gum	12' Ht, 2.5" cal. min.		12
PC	Pistacia chinensis / Chinese Pistache	12' Ht, 2.5" cal. min.		16
QA	Quercus alba / White Oak	12' Ht, 2.5" cal. min.		28
QB	Quercus bicolor / Swamp White Oak	12' Ht, 2.5" cal. min.		45
QL	Quercus lyrata / Overcup Oak	12' Ht, 2.5" cal. min.		21
QS	Quercus shumardii / Shumard Red Oak	12' Ht, 2.5" cal. min.		24
QT	Quercus texana / Nuttall Oak	12' Ht, 2.5" cal. min.		32
UJ	Ulmus americana `Jefferson` / American Elm	12' Ht, 2.5" cal. min.		30
UNDERSTORY TREES	BOTANICAL / COMMON NAME	SIZE		QTY
AC	Amelanchier canadensis `Autumn Brilliance` / Autumn Brilliance Serviceberry	10' Ht, multi-stem		7
CF2	Cercis canadensis `Forest Pansy` / Forest Pansy Eastern Redbud	1.5" Cal.		5
CD	Chionanthus virginicus `Dirr` / Dirr White Fringetree	10' Ht, multi-stem		6
CF	Cornus florida `Cherokee Chief` / Cherokee Chief Dogwood	1.5" Cal.		4
HC	Halesia carolina / Silverbell	8' Ht.		5
PA	Prunus subhirtella `Autumnalis` / Autumn Flowering Cherry	1.5" Cal.		6
SJ	Styrax japonicus / Japanese Snowbell	8' Ht.		6
SHRUBS	BOTANICAL / COMMON NAME	SIZE		QTY
AGG	Abelia x grandiflora `Edward Goucher` / Glossy Abelia	18" Ht, 3 gal. min.		21
AP	Aesculus parviflora / Bottlebrush Buckeye	30" Ht, 4 gal. min.		52
AEP	Aesculus pavia / Red Buckeye	30" Ht, 4 gal. min.		1
CAA	Callicarpa americana / American Beautyberry	30" Ht, 4 gal. min.		6
CB	Camellia sasanqua `Apple Blossom` / Apple Blossom Camellia	30" Ht, 4 gal. min.		103
CCL	Caryopteris x clandonensis / Bluebeard	18" Ht, 3 gal. min.		57
DBC	Distylium x `Blue Cascade` / Blue Cascade Distylium	18" Ht, 3 gal. min.		72
FAJ	Fatsia japonica / Japanese Fatsia	18" Ht, 3 gal. min.		16
FS	Forsythia suspensa `Sieboldii` / Weeping Forsythia	30" Ht, 4 gal. min.		19
FMA	Fothergilla major `Mount Airy` / Mount Airy Fothergilla	30" Ht, 4 gal. min.		57
HVH	Hamamelis virginiana `Harvest Moon` / Harvest Moon Witch Hazel	30" Ht, 4 gal. min.		10
HAA	Hydrangea arborescens `Abetwo` / Incrediball Hydrangea	30" Ht, 4 gal. min.		77
HPW	Hydrangea quercifolia `Pee Wee` / Oakleaf Hydrangea	18" Ht, 3 gal. min.		47
HF	Hypericum frondosum `Sunburst` / Sunburst Hypericum	18" Ht, 3 gal. min.		96
ICR	Ilex cornuta `Rotunda` / Dwarf Chinese Holly	18" Ht, 3 gal. min.		17
IVJ	Ilex verticillata `Jim Dandy` / Jim Dandy Winterberry	30" Ht, 4 gal. min.		3
IVR	Ilex verticillata `Red Sprite` / Red Sprite Winterberry	30" Ht, 4 gal. min.		77
IVT	Ilex vomitoria / Yaupon Holly	30" Ht, 4 gal. min.		85
IVN	Ilex vomitoria `Nana` / Dwarf Yaupon	18" Ht, 3 gal. min.		29
IU	Illicum floridanum `Mss Scarlet` / Miss Scarlet Anise	30" Ht, 4 gal. min.		61
ILH	Itea virginica `Little Henry` TM / Virginia Sweetspire	18" Ht, 3 gal. min.		42
OHG	Osmanthus heterophyllus `Goshiki` / Goshiki Holly Olive	30" Ht, 4 gal. min.		10
PTW	Pittosporum tobira `Wheeler`s Dwarf` / Wheeler`s Dwarf Pittosporum	18" Ht, 3 gal. min.		88
PLO	Prunus laurocerasus `Otto Luyken` / Otto Luyken Laurel	30" Ht, 4 gal. min.		72
VAL	Vitex agnus-castus `Lecompte` / Chaste Tree	30" Ht, 4 gal. min.		17
GROUND COVERS	BOTANICAL / COMMON NAME	SIZE	SPACING	QTY
AHU	Amsonia hubrichtii / Arkansas Blue-star	Quart	18" o.c.	1,236
CKF	Calamagrostis x acutiflora `Karl Foerster` / Feather Reed Grass	1 Gal.	24" o.c.	138
COE	Carex oshimensis `Everillo` TM / EverColor Everillo Japanese Sedge	1 Gal.	12" o.c.	808
DC	Deschampsia cespitosa `Northern Lights` / Northern Lights Hair Grass	Quart	24" o.c.	539
EPU	Echinacea purpurea / Purple Coneflower	Quart	18" o.c.	50
JHZ	Juniperus horizontalis / Creeping Juniper	1 Gal.	44" o.c.	377
MCA	Muhlenbergia capillaris / Pink Muhly Grass	1 Gal.	30" o.c.	128
OJG	Ophiopogon japonicus `Gyoku Ryu` / Mondo Grass	Quart	12" o.c.	335
RAG	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac	1 Gal.	36" o.c.	697
SSP	Sedum spectabile `Purple Emporer` / Stonecrop	1 Gal.	16" o.c.	342
SAL	Sisyrinchium angustifolium `Lucerne` / Lucerne Blue Eyed Grass	Pint	12" o.c.	2,863
TURF	BOTANICAL / COMMON NAME	SIZE	SPACING	QTY
T1	Cynodon dactylon `TiFit 419` / Bermuda Grass	Sod		327,965 sf
T2	Cynodon dactylon `TiFtuf` / TiFtuf BermudaGrass	Sod		347,718 sf

GENERAL SOD LAWN TiFtuf Bermuda -	58,663 sf
LOWLAND SCM PLANTINGS Native grass and perennial plantings within stormwater control zone expected to periodically hold water. Plugs and 1 gal. size. -	86,020 sf
UPLAND SCM PLANTINGS Variety of wetland species shrubs, 18" min. ht, 48"-60" spacing typical, within stormwater control zone expected to receive periodic inundation. -	76,688 sf
SLOPE STABILIZATION MIX Seed mix & geotextile to be installed on slopes 3:1 or less, to support re-establishment of forest. SEE L-05.02 FOR SEED MIXES	320,567 sf
REFORESTATION SEED MIX To be installed on disturbed areas with slopes 3:1 or less adjacent to existing woodland to support re-establishment of forest. SEE L-05.02 FOR SEED MIXES	92,905 sf
NO-MOW SEED MIX BLEND OF NATIVE GRASSES AND FORBS SUITABLE FOR MOST SOIL TYPES AND FULL SUN. SEE L-05.02 FOR SEED MIXES	88,552 sf

PLANTING NOTES

1. REFER TO GENERAL LANDSCAPE ARCHITECTURAL NOTES PRIOR TO COMMENCING THE PLANTING SCOPE OF WORK.
2. PARTICIPATE IN THE PRE-INSTALLATION CONFERENCE FOR THE PLANTING SCOPE OF WORK, ACCORDING TO THE PROJECT SPECIFICATIONS, PRIOR TO COMMENCEMENT.
3. EXISTING AND PROPOSED UTILITIES THAT ARE SHOWN ARE FOR REFERENCE ONLY. REFER TO THE SITE SURVEY FOR EXISTING UTILITIES AND VERIFY IN THE FIELD. REFER TO THE MEP AND CIVIL PLANS FOR PROPOSED UTILITIES.
4. MATCH GRAPHIC REPRESENTATION SHOWN UNLESS NOTED / DIMENSIONED OTHERWISE. REFER TO PROJECT DETAILS FOR PLACEMENT OF HATCHED AREAS.
5. OBTAIN APPROVAL OF PLANTING LAYOUT BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
6. COMMENCEMENT OF PLANTING SCOPE CONSTITUTES ACCEPTANCE OF SITE CONDITIONS, SUBGRADE, AND SUBSOIL CONDITONS. ENSURE THAT NECESSARY AND SPECIFIED PLANTING CONDITIONS HAVE BEEN ACHIEVED PRIOR TO LANDSCAPE INSTALLATION.
6. INSTALL SPECIFIED TURFGRASS SOD AT DISTURBED AREAS NOT OTHERWISE IDENTIFIED FOR PLANT MATERIAL.
7. PROVIDE 2" BROWN DYED MULCH AT ALL PLANTING AREAS.
8. REFER TO SPECIFICATIONS FOR PLANT STAGING, HANDLING, PLANTING, AND STAKING REQUIREMENTS.
9. FAILURE TO FOLLOW PLANTING PLAN DESIGN WILL RESULT IN REMOVAL OF NON-CONFORMING PLANTS AND PURCHASE OF NEW PLANTS AT COST OF CONTRACTOR.
10. FINISH GRADE AND PLANTING TO BE COORDINATED WITH LANDSCAPE ARCHITECT WITHIN TREE PROTECTION ZONE PRIOR TO COMMENCEMENT OF PLANTING INSTALLATION.
11. REFER TO SPECIFICATIONS FOR IRRIGATION DESIGN AND INSTALLATION REQUIREMENTS.
12. SOIL DEPTHS:
    - 1.1. SODDED GRASS - FOUR INCHES
    - 1.2. GROUND COVER AND ANNUAL BEDS - EIGHT INCHES
    - 1.3. NATIVE PLUG AREAS - EIGHT INCHES
    - 1.4. SHRUB AND PERENNIAL BEDS - FOURTEEN INCHES
13. ALL BUFFERS MUST BE PLANTED IN ORDER TO RECEIVE A CERTIFICATE OF OCCUPANCY.

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed to the cover sheet of these construction plans.

PW - Transportation	Date	WR - Stormwater	Date
Building Inspections	Date	Planning	Date
WR - Utility Engineering	Date	Planning - Transportation	Date
Electric	Date	Fire	Date
WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

NOT FOR CONSTRUCTION

H12/Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

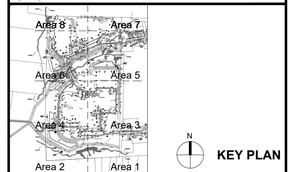
Owner
Wake County Public Schools
111 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
RATIO
227 Fayetteville Street, Suite 301
Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
5430 Wade Park Blvd #400
Raleigh, North Carolina 27607
(919) 832-5587

Mechanical / Electrical / Plumbing Engineer
The Wooten Company
120 North Boylan Avenue
Raleigh, North Carolina 27603
(919) 828-0531

Civil Engineer and Landscape Architect
CLH Design PA
400 Regency Forest Drive, Suite 120
Cary, North Carolina 27518
(919) 319-6716



KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

01	DESIGN DEVELOPMENT	11/20/20
02	TOA MAJOR SITE PLAN SUBMITTAL	12/01/20
03	TOA MAJOR SITE PLAN RESUBMITTAL	02/12/21
04	TOA MAJOR SITE PLAN SUBMITTAL #3	03/05/21
05	60% CONSTRUCTION DOCUMENTS	03/26/21
06	TOA MAJOR SITE PLAN SUBMITTAL #4	03/26/21

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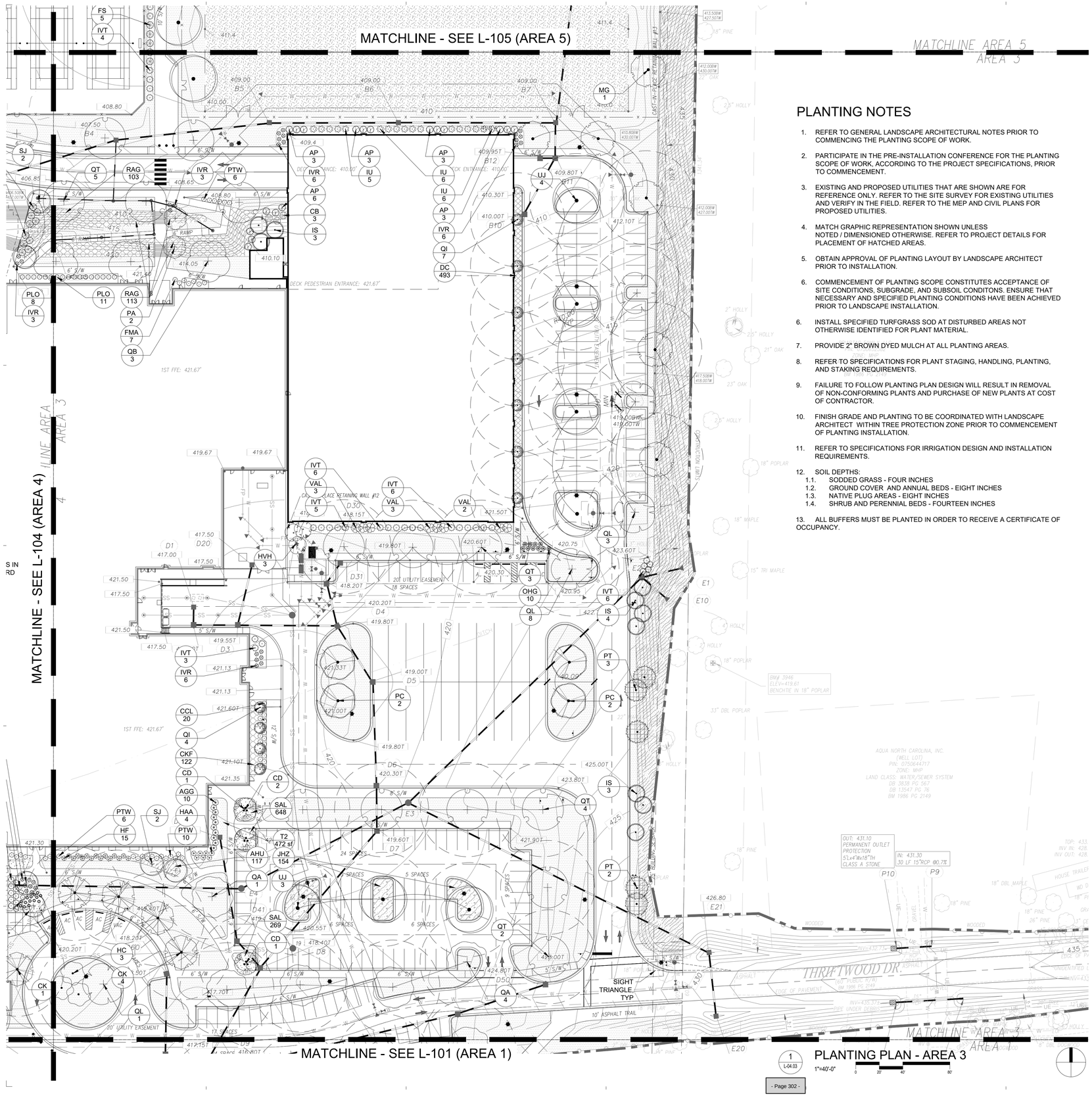
PROJECT NO. 19150.000

SHEET TITLE
PLANTING PLAN - AREA 2

SHEET NUMBER
L-04.02



PLANTING NOTES

1. REFER TO GENERAL LANDSCAPE ARCHITECTURAL NOTES PRIOR TO COMMENCING THE PLANTING SCOPE OF WORK.
2. PARTICIPATE IN THE PRE-INSTALLATION CONFERENCE FOR THE PLANTING SCOPE OF WORK, ACCORDING TO THE PROJECT SPECIFICATIONS, PRIOR TO COMMENCEMENT.
3. EXISTING AND PROPOSED UTILITIES THAT ARE SHOWN ARE FOR REFERENCE ONLY. REFER TO THE SITE SURVEY FOR EXISTING UTILITIES AND VERIFY IN THE FIELD. REFER TO THE MEP AND CIVIL PLANS FOR PROPOSED UTILITIES.
4. MATCH GRAPHIC REPRESENTATION SHOWN UNLESS NOTED / DIMENSIONED OTHERWISE. REFER TO PROJECT DETAILS FOR PLACEMENT OF HATCHED AREAS.
5. OBTAIN APPROVAL OF PLANTING LAYOUT BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
6. COMMENCEMENT OF PLANTING SCOPE CONSTITUTES ACCEPTANCE OF SITE CONDITIONS, SUBGRADE, AND SUBSOIL CONDITONS. ENSURE THAT NECESSARY AND SPECIFIED PLANTING CONDITIONS HAVE BEEN ACHIEVED PRIOR TO LANDSCAPE INSTALLATION.
6. INSTALL SPECIFIED TURFGRASS SOD AT DISTURBED AREAS NOT OTHERWISE IDENTIFIED FOR PLANT MATERIAL.
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10. FINISH GRADE AND PLANTING TO BE COORDINATED WITH LANDSCAPE ARCHITECT WITHIN TREE PROTECTION ZONE PRIOR TO COMMENCEMENT OF PLANTING INSTALLATION.
11. REFER TO SPECIFICATIONS FOR IRRIGATION DESIGN AND INSTALLATION REQUIREMENTS.
12. SOIL DEPTHS:
    - 1.1. SODDED GRASS - FOUR INCHES
    - 1.2. GROUND COVER AND ANNUAL BEDS - EIGHT INCHES
    - 1.3. NATIVE PLUG AREAS - EIGHT INCHES
    - 1.4. SHRUB AND PERENNIAL BEDS - FOURTEEN INCHES
13. ALL BUFFERS MUST BE PLANTED IN ORDER TO RECEIVE A CERTIFICATE OF OCCUPANCY.

PLANT SCHEDULE				
EVERGREEN TREES	BOTANICAL / COMMON NAME	SIZE		QTY
IS	Ilex opaca `Satyr Hill` / Satyr Hill American Holly	8' Ht, 1.5" cal. min.		33
INS	Ilex x `Nellie R. Stevens` / Nellie R. Stevens Holly	8' Ht, 1.5" cal. min.		17
MG	Magnolia grandiflora / Southern Magnolia	12' Ht, 2.5" cal. min.		9
MLG	Magnolia grandiflora `Little Gem` / Dwarf Southern Magnolia	8' Ht, 1.5" cal. min.		6
PT	Pinus taeda / Loblolly Pine	8' Ht, 1.5" cal. min.		5
COLUMNAR TREES	BOTANICAL / COMMON NAME	SIZE		QTY
QI	Quercus palustris `Green Pillar` / Columnar Pin Oak	12' Ht, 2.5" cal. min.		11
DECIDUOUS SHADE TREE	BOTANICAL / COMMON NAME	SIZE		QTY
AF	Acer floridanum / Southern Sugar Maple	12' Ht, 2.5" cal. min.		11
CK	Cladrastis kentukea / American Yellowwood	12' Ht, 2.5" cal. min.		5
MM	Magnolia virginiana `Moon Glow` / Sweet Bay	12' Ht, 2.5" cal. min.		7
NW	Nyssa sylvatica `Wildfire` / Black Gum	12' Ht, 2.5" cal. min.		12
PC	Pistacia chinensis / Chinese Pistache	12' Ht, 2.5" cal. min.		16
QA	Quercus alba / White Oak	12' Ht, 2.5" cal. min.		28
QB	Quercus bicolor / Swamp White Oak	12' Ht, 2.5" cal. min.		45
QL	Quercus lyrata / Overcup Oak	12' Ht, 2.5" cal. min.		21
QS	Quercus shumardii / Shumard Red Oak	12' Ht, 2.5" cal. min.		24
QT	Quercus texana / Nuttall Oak	12' Ht, 2.5" cal. min.		32
UJ	Ulmus americana `Jefferson` / American Elm	12' Ht, 2.5" cal. min.		30
UNDERSTORY TREES	BOTANICAL / COMMON NAME	SIZE		QTY
AC	Amelanchier canadensis `Autumn Brilliance` / Autumn Brilliance Serviceberry	10` ht, multi-stem		7
CF2	Cercis canadensis `Forest Pansy` / Forest Pansy Eastern Redbud	1.5" Cal.		5
CD	Chionanthus virginicus `Dirr` / Dirr White Fringetree	10` ht, multi-stem		6
CF	Cornus florida `Cherokee Chief` / Cherokee Chief Dogwood	1.5" Cal.		4
HC	Halesia carolina / Silverbell	8' ht.		5
PA	Prunus subhirtella `Autumnalis` / Autumn Flowering Cherry	1.5" Cal.		6
SJ	Styrax japonicus / Japanese Snowbell	8` ht.		6
SHRUBS	BOTANICAL / COMMON NAME	SIZE		QTY
AGG	Abelia x grandiflora `Edward Goucher` / Glossy Abelia	18" Ht, 3 gal. min.		21
AP	Aesculus parviflora / Bottlebrush Buckeye	30" Ht, 4 gal. min.		52
AEP	Aesculus pavia / Red Buckeye	30" Ht, 4 gal. min.		1
CAA	Callicarpa americana / American Beautyberry	30" Ht, 4 gal. min.		6
CB	Camellia sasanqua `Apple Blossom` / Apple Blossom Camellia	30" Ht, 4 gal. min.		103
CCL	Caryopteris x clandonensis / Bluebeard	18" Ht, 3 gal. min.		57
DBC	Distylium x `Blue Cascade` / Blue Cascade Distylium	18" Ht, 3 gal. min.		72
FAJ	Fatsia japonica / Japanese Fatsia	18" Ht, 3 gal. min.		16
FS	Forsythia suspensa `Siebolidi` / Weeping Forsythia	30" Ht, 4 gal. min.		19
FMA	Fothergilla major `Mount Airy` / Mount Airy Fothergilla	30" Ht, 4 gal. min.		57
HVH	Hamamelis virginiana `Harvest Moon` / Harvest Moon Witch Hazel	30" Ht, 4 gal. min.		10
HAA	Hydrangea arborescens `Abetwo` / Incrediball Hydrangea	30" Ht, 4 gal. min.		77
HPW	Hydrangea quercifolia `Pee Wee` / Oakleaf Hydrangea	18" Ht, 3 gal. min.		47
HF	Hypericum frondosum `Sunburst` / Sunburst Hypericum	18" Ht, 3 gal. min.		96
ICR	Ilex cornuta `Rotunda` / Dwarf Chinese Holly	18" Ht, 3 gal. min.		17
IVJ	Ilex verticillata `Jim Dandy` / Jim Dandy Winterberry	30" Ht, 4 gal. min.		3
IVR	Ilex verticillata `Red Sprite` / Red Sprite Winterberry	30" Ht, 4 gal. min.		77
IVT	Ilex vomitoria / Yaupon Holly	30" Ht, 4 gal. min.		85
IVN	Ilex vomitoria `Nana` / Dwarf Yaupon	18" Ht, 3 gal. min.		29
IU	Illicum floridanum `Miss Scarlet` / Miss Scarlet Anise	30" Ht, 4 gal. min.		61
ILH	Itea virginica `Little Henry` TM / Virginia Sweetspire	18" Ht, 3 gal. min.		42
OHG	Osmanthus heterophyllus `Goshiki` / Goshiki Holly Olive	30" Ht, 4 gal. min.		10
PTW	Pittosporum tobira `Wheeler`s Dwarf` / Wheeler`s Dwarf Pittosporum	18" Ht, 3 gal. min.		88
PLO	Prunus laurocerasus `Otto Luyken` / Otto Luyken Laurel	30" Ht, 4 gal. min.		72
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GROUND COVERS	BOTANICAL / COMMON NAME	SIZE	SPACING	QTY
AHU	Amsonia hubrichtii / Arkansas Blue-star	Quart	18" o.c.	1,236
CKF	Calamagrostis x acutiflora `Karl Foerster` / Feather Reed Grass	1 Gal.	24" o.c.	138
COE	Carex oshimensis `Everillo` TM / EverColor Everillo Japanese Sedge	1 Gal.	12" o.c.	808
DC	Deschampsia cespitosa `Northern Lights` / Northern Lights Hair Grass	Quart	24" o.c.	539
EPU	Echinacea purpurea / Purple Coneflower	Quart	18" o.c.	50
JHZ	Juniperus horizontalis / Creeping Juniper	1 Gal.	44" o.c.	377
MCA	Muhlenbergia capillaris / Pink Muhly Grass	1 Gal.	30" o.c.	128
OJG	Ophiopogon japonicus `Gyoko Ryu` / Mondo Grass	Quart	12" o.c.	335
RAG	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac	1 Gal.	36" o.c.	697
SSP	Sedum spectabile `Purple Emporer` / Stonecrop	1 Gal.	16" o.c.	342
SAL	Sisyrinchium angustifolium `Lucerne` / Lucerne Blue Eyed Grass	Pint	12" o.c.	2,863
TURF	BOTANICAL / COMMON NAME	SIZE	SPACING	QTY
T1	Cynodon dactylon `TiF419` / Bermuda Grass	Sod		327,965 sf
T2	Cynodon dactylon `TifTuf` / TifTuf BermudaGrass	Sod		347,716 sf

GENERAL SOD LAWN — 58,663 sf
TifTuf Bermuda
-

LOWLAND SCM PLANTINGS — 86,020 sf
Native grass and perennial plantings within stormwater control zone expected to periodically hold water. Plugs and 1 gal. size.
-

UPLAND SCM PLANTINGS — 76,688 sf
Variety of wetland species shrubs, 18" min. ht. 48"-60" spacing typical, within stormwater control zone expected to receive periodic inundation.
-

SLOPE STABILZATION MIX — 320,567 sf
Seed mix & geotextile to be installed on slopes 3:1 or less, to support re-establishment of forest.
SEE L-05.02 FOR SEED MIXES

REFORESTATION SEED MIX — 92,905 sf
To be installed on disturbed areas with slopes 3:1 or less adjacent to existing woodland to support re-establishment of forest.
SEE L-05.02 FOR SEED MIXES

NO-MOW SEED MIX — 88,552 sf
BLEND OF NATIVE GRASSES AND FORBS SUITABLE FOR MOST SOIL TYPES AND FULL SUN.
SEE L-05.02 FOR SEED MIXES

1 L-04.03 PLANTING PLAN - AREA 3
1"=40'-0"
0 20' 40' 80'

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed to the cover sheet of these construction plans.

PW - Transportation	Date	WR - Stormwater	Date
Building Inspections	Date	Planning	Date
WR - Utility Engineering	Date	Planning - Transportation	Date
Electric	Date	Fire	Date
WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

NOT FOR CONSTRUCTION

H12/Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
111 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
RATIO
227 Fayetteville Street, Suite 301
Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
5430 Wade Park Blvd #400
Raleigh, North Carolina 27607
(919) 832-5587

Mechanical / Electrical / Plumbing Engineer
The Wooten Company
120 North Boylan Avenue
Raleigh, North Carolina 27603
(919) 828-0531

Civil Engineer and Landscape Architect
CLH Design PA
400 Regency Forest Drive, Suite 120
Cary, North Carolina 27518
(919) 319-6716

KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

01	DESIGN DEVELOPMENT	11/20/20
02	TOA MAJOR SITE PLAN SUBMITTAL	12/01/20
03	TOA MAJOR SITE PLAN RESUBMITTAL	02/12/21
04	TOA MAJOR SITE PLAN SUBMITTAL #3	03/05/21
05	60% CONSTRUCTION DOCUMENTS	03/26/21
06	TOA MAJOR SITE PLAN SUBMITTAL #4	03/26/21

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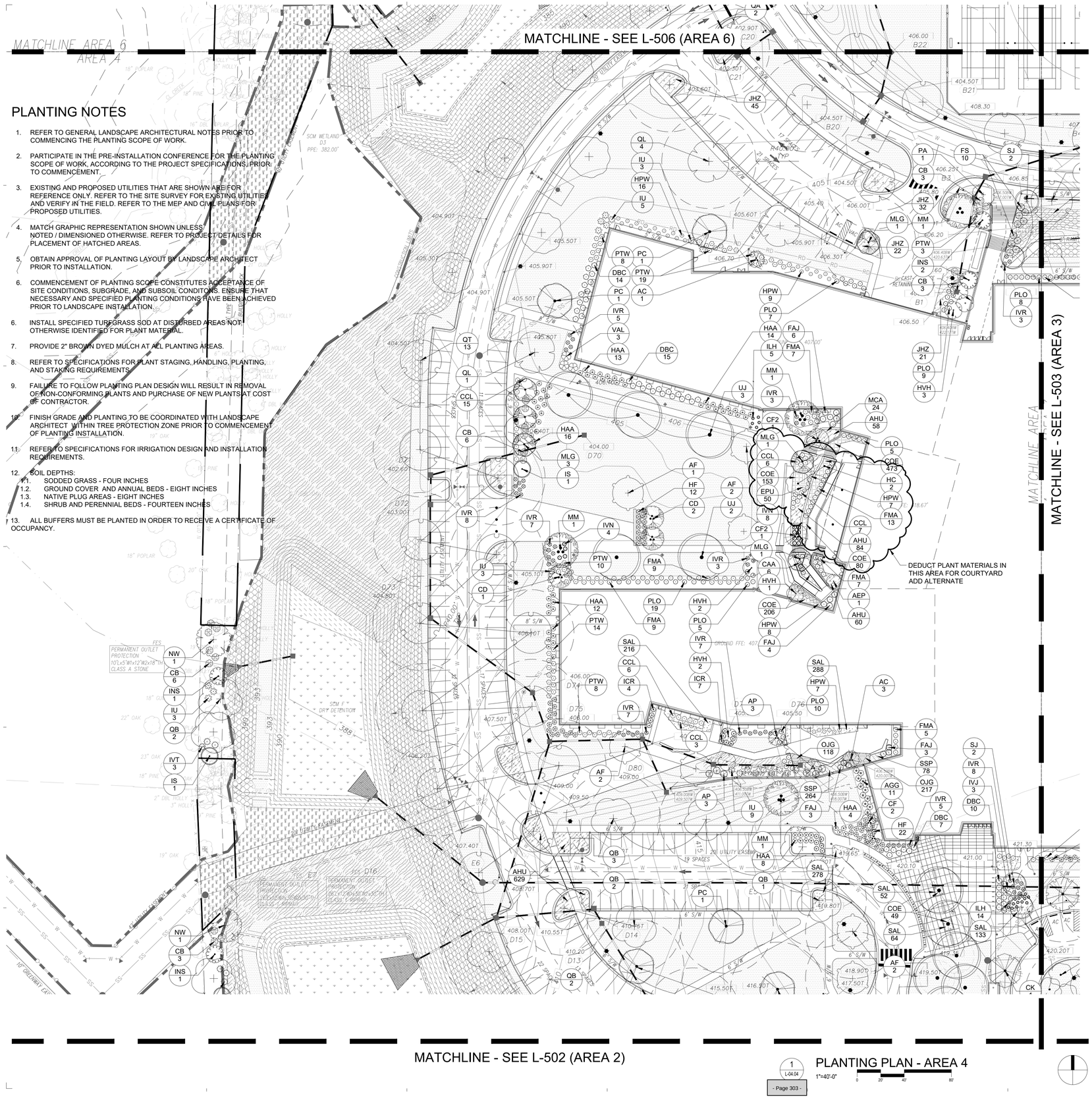
PROJECT NO. 19150.000

SHEET TITLE
PLANTING PLAN - AREA 3

SHEET NUMBER
L-04.03



PLANTING NOTES

1. REFER TO GENERAL LANDSCAPE ARCHITECTURAL NOTES PRIOR TO COMMENCING THE PLANTING SCOPE OF WORK.
2. PARTICIPATE IN THE PRE-INSTALLATION CONFERENCE FOR THE PLANTING SCOPE OF WORK, ACCORDING TO THE PROJECT SPECIFICATIONS, PRIOR TO COMMENCEMENT.
3. EXISTING AND PROPOSED UTILITIES THAT ARE SHOWN ARE FOR REFERENCE ONLY. REFER TO THE SITE SURVEY FOR EXISTING UTILITIES AND VERIFY IN THE FIELD. REFER TO THE MEP AND CIVIL PLANS FOR PROPOSED UTILITIES.
4. MATCH GRAPHIC REPRESENTATION SHOWN UNLESS NOTED / DIMENSIONED OTHERWISE. REFER TO PROJECT DETAILS FOR PLACEMENT OF HATCHED AREAS.
5. OBTAIN APPROVAL OF PLANTING LAYOUT BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
6. COMMENCEMENT OF PLANTING SCOPE CONSTITUTES ACCEPTANCE OF SITE CONDITIONS, SUBGRADE, AND SUBSOIL CONDITONS. ENSURE THAT NECESSARY AND SPECIFIED PLANTING CONDITIONS HAVE BEEN ACHIEVED PRIOR TO LANDSCAPE INSTALLATION.
6. INSTALL SPECIFIED TURFGRASS SOD AT DISTURBED AREAS NOT OTHERWISE IDENTIFIED FOR PLANT MATERIAL.
7. PROVIDE 2" BROWN DYED MULCH AT ALL PLANTING AREAS.
8. REFER TO SPECIFICATIONS FOR PLANT STAGING, HANDLING, PLANTING, AND STAKING REQUIREMENTS.
9. FAILURE TO FOLLOW PLANTING PLAN DESIGN WILL RESULT IN REMOVAL OF NON-CONFORMING PLANTS AND PURCHASE OF NEW PLANTS AT COST OF CONTRACTOR.
10. FINISH GRADE AND PLANTING TO BE COORDINATED WITH LANDSCAPE ARCHITECT WITHIN TREE PROTECTION ZONE PRIOR TO COMMENCEMENT OF PLANTING INSTALLATION.
11. REFER TO SPECIFICATIONS FOR IRRIGATION DESIGN AND INSTALLATION REQUIREMENTS.
12. SOIL DEPTHS:
    - 12.1. SODDED GRASS - FOUR INCHES
    - 12.2. GROUND COVER AND ANNUAL BEDS - EIGHT INCHES
    - 12.3. NATIVE PLUG AREAS - EIGHT INCHES
    - 12.4. SHRUB AND PERENNIAL BEDS - FOURTEEN INCHES
13. ALL BUFFERS MUST BE PLANTED IN ORDER TO RECEIVE A CERTIFICATE OF OCCUPANCY.

PLANT SCHEDULE				
EVERGREEN TREES	BOTANICAL / COMMON NAME	SIZE		QTY
IS	Ilex opaca `Satyr Hill` / Satyr Hill American Holly	8' Ht, 1.5" cal. min.		33
INS	Ilex x `Nellie R. Stevens` / Nellie R. Stevens Holly	6' Ht, 1.5" cal. min.		17
MG	Magnolia grandiflora / Southern Magnolia	12' Ht, 2.5" cal. min.		9
MLG	Magnolia grandiflora `Little Gem` / Dwarf Southern Magnolia	8' Ht, 1.5" cal. min.		6
PT	Pinus taeda / Loblolly Pine	8' Ht, 1.5" cal. min.		5
COLUMNAR TREES	BOTANICAL / COMMON NAME	SIZE		QTY
QI	Quercus palustris `Green Pillar` / Columnar Pin Oak	12' Ht, 2.5" cal. min.		11
DECIDUOUS SHADE TREE	BOTANICAL / COMMON NAME	SIZE		QTY
AF	Acer floridanum / Southern Sugar Maple	12' Ht, 2.5" cal. min.		11
CK	Cladrastis kentukea / American Yellowwood	12' Ht, 2.5" cal. min.		5
MM	Magnolia virginiana `Moon Glow` / Sweet Bay	12' Ht, 2.5" cal. min.		7
NW	Nyssa sylvatica `Wildfire` / Black Gum	12' Ht, 2.5" cal. min.		12
PC	Pistacia chinensis / Chinese Pistache	12' Ht, 2.5" cal. min.		16
QA	Quercus alba / White Oak	12' Ht, 2.5" cal. min.		28
QB	Quercus bicolor / Swamp White Oak	12' Ht, 2.5" cal. min.		45
QL	Quercus lyrata / Overcup Oak	12' Ht, 2.5" cal. min.		21
QS	Quercus shumardii / Shumard Red Oak	12' Ht, 2.5" cal. min.		24
QT	Quercus texana / Nuttall Oak	12' Ht, 2.5" cal. min.		32
UJ	Ulmus americana `Jefferson` / American Elm	12' Ht, 2.5" cal. min.		30
UNDERSTORY TREES	BOTANICAL / COMMON NAME	SIZE		QTY
AC	Amelanchier canadensis `Autumn Brilliance` / Autumn Brilliance Serviceberry	10' Ht, multi-stem		7
CF2	Cercis canadensis `Forest Pansy` / Forest Pansy Eastern Redbud	1.5" Cal.		5
CD	Chionanthus virginicus `Dirr` / Dirr White Fringetree	10' Ht, multi-stem		6
CF	Cornus florida `Cherokee Chief` / Cherokee Chief Dogwood	1.5" Cal.		4
HC	Halesia carolina / Silverbell	8' Ht.		5
PA	Prunus subhirtella `Autumnalis` / Autumn Flowering Cherry	1.5" Cal.		6
SJ	Styrax japonicus / Japanese Snowbell	8' ht.		6
SHRUBS	BOTANICAL / COMMON NAME	SIZE		QTY
AGG	Abelia x grandiflora `Edward Goucher` / Glossy Abelia	18" Ht, 3 gal. min.		21
AP	Aesculus parviflora / Bottlebrush Buckeye	30" Ht, 4 gal. min.		52
AEP	Aesculus pavia / Red Buckeye	30" Ht, 4 gal. min.		1
CAA	Callicarpa americana / American Beautyberry	30" Ht, 4 gal. min.		6
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CCL	Caryopteris x clandonensis / Bluebeard	18" Ht, 3 gal. min.		57
DBC	Distylium x `Blue Cascade` / Blue Cascade Distylium	18" Ht, 3 gal. min.		72
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HVH	Hamamelis virginiana `Harvest Moon` / Harvest Moon Witch Hazel	30" Ht, 4 gal. min.		10
HAA	Hydrangea arborescens `Abetwo` / Incrediball Hydrangea	30" Ht, 4 gal. min.		77
HPW	Hydrangea quercifolia `Pee Wee` / Oakleaf Hydrangea	18" Ht, 3 gal. min.		47
HF	Hypericum frondosum `Sunburst` / Sunburst Hypericum	18" Ht, 3 gal. min.		96
ICR	Ilex cornuta `Rotunda` / Dwarf Chinese Holly	18" Ht, 3 gal. min.		17
IVJ	Ilex verticillata `Jim Dandy` / Jim Dandy Winterberry	30" Ht, 4 gal. min.		3
IVR	Ilex verticillata `Red Sprite` / Red Sprite Winterberry	30" Ht, 4 gal. min.		77
IVT	Ilex vomitoria / Yaupon Holly	30" Ht, 4 gal. min.		85
IVN	Ilex vomitoria `Nana` / Dwarf Yaupon	18" Ht, 3 gal. min.		29
IJ	Illicum floridanum `Mss Scarlet` / Mss Scarlet Anise	30" Ht, 4 gal. min.		61
ILH	Itea virginica `Little Henry` TM / Virginia Sweetspire	18" Ht, 3 gal. min.		42
OHG	Osmanthus heterophyllus `Goshiki` / Goshiki Holly Olive	30" Ht, 4 gal. min.		10
PTW	Pittosporum tobira `Wheeler's Dwarf` / Wheeler's Dwarf Pittosporum	18" Ht, 3 gal. min.		88
PLO	Prunus laurocerasus `Otto Luyken` / Otto Luyken Laurel	30" Ht, 4 gal. min.		72
VAL	Vitex agnus-castus `Lecompte` / Chaste Tree	30" Ht, 4 gal. min.		17
GROUND COVERS	BOTANICAL / COMMON NAME	SIZE	SPACING	QTY
AHU	Amsonia hubrichtii / Arkansas Blue-star	Quart	18" o.c.	1,236
CKF	Calamagrostis x acutiflora `Karl Foerster` / Feather Reed Grass	1 Gal.	24" o.c.	138
COE	Carex oshimensis `Everillo` TM / EverColor Everillo Japanese Sedge	1 Gal.	12" o.c.	808
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EPU	Echinacea purpurea / Purple Coneflower	Quart	18" o.c.	50
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SAL	Sisyrinchium angustifolium `Lucerne` / Lucerne Blue Eyed Grass	Pint	12" o.c.	2,863
TURF	BOTANICAL / COMMON NAME	SIZE	SPACING	QTY
T1	Cynodon dactylon `TiF419` / Bermuda Grass	Sod		327,965 sf
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	GENERAL SOD LAWN TifTuf Bermuda -	58,663 sf
	LOWLAND SCM PLANTINGS Native grass and perennial plantings within stormwater control zone expected to periodically hold water. Plugs and 1 gal. size. -	86,020 sf
	UPLAND SCM PLANTINGS Variety of wetland species shrubs, 18" min. ht, 48"-60" spacing typical. within stormwater control zone expected to receive periodic inundation. -	76,688 sf
	SLOPE STABILIZATION MIX Seed mix & geotextile to be installed on slopes 3:1 or less, to support re-establishment of forest. SEE L-05.02 FOR SEED MIXES	320,567 sf
	REFORESTATION SEED MIX To be installed on disturbed areas with slopes 3:1 or less adjacent to existing woodland to support re-establishment of forest. SEE L-05.02 FOR SEED MIXES	92,905 sf
	NO-MOW SEED MIX BLEND OF NATIVE GRASSES AND FORBS SUITABLE FOR MOST SOIL TYPES AND FULL SUN. SEE L-05.02 FOR SEED MIXES	88,552 sf

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Building Inspections	Date	Planning	Date
WR - Utility Engineering	Date	Planning - Transportation	Date
Electric	Date	Fire	Date
WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

NOT FOR CONSTRUCTION

1 / L-04.04 PLANTING PLAN - AREA 4

1"=40'-0" (0, 20', 40', 80')

H12/Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
111 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
RATIO
227 Fayetteville Street, Suite 301
Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
5430 Wade Park Blvd #400
Raleigh, North Carolina 27607
(919) 832-5587

Mechanical / Electrical / Plumbing Engineer
The Wooten Company
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Raleigh, North Carolina 27603
(919) 828-0531

Civil Engineer and Landscape Architect
CLH Design PA
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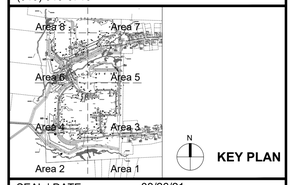
Cary, North Carolina 27518
(919) 319-6716



KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

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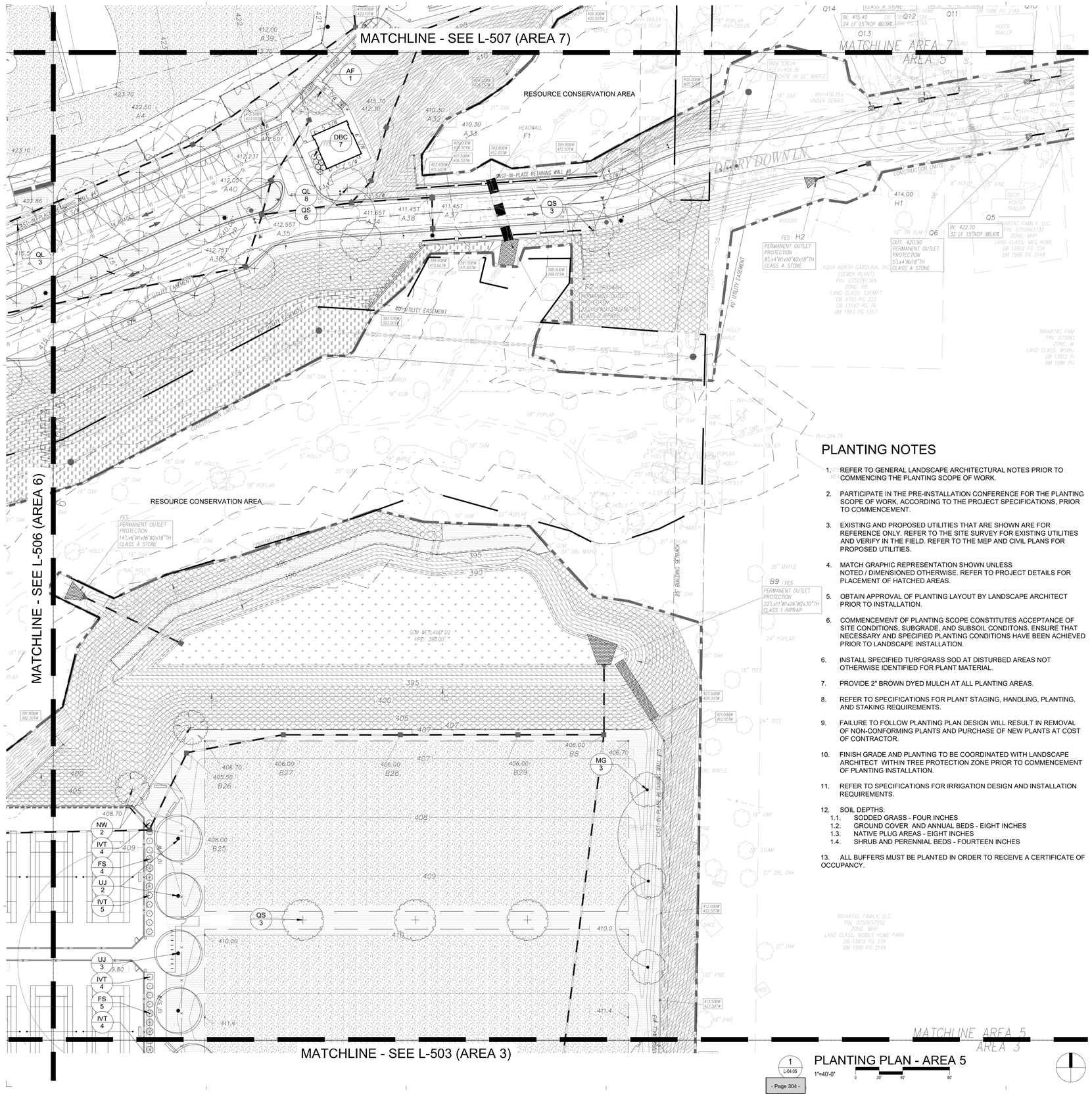
PROJECT NO. 19150.000

SHEET TITLE
PLANTING PLAN - AREA 4

SHEET NUMBER
L-04.04


MATCHLINE - SEE L-507 (AREA 7)
MATCHLINE - SEE L-506 (AREA 6)
MATCHLINE - SEE L-503 (AREA 3)
MATCHLINE AREA 5 AREA 3
RESOURCE CONSERVATION AREA
RESOURCE CONSERVATION AREA
EAST-WEST PLACE
EAST-WEST PLACE
EAST-WEST PLACE
EAST-WEST PLACE
CONSTRUCTION LIMITS
40' UTILITY EASEMENT
40' UTILITY EASEMENT
30' WATER EASEMENT
25' BUILDING SETBACK
AF 1
DBC 7
QL 8
QS 6
QS 3
QL 3
MG 3
NW 2
IVT 4
FS 4
UJ 2
IVT 5
UJ 3
IVT 4
FS 5
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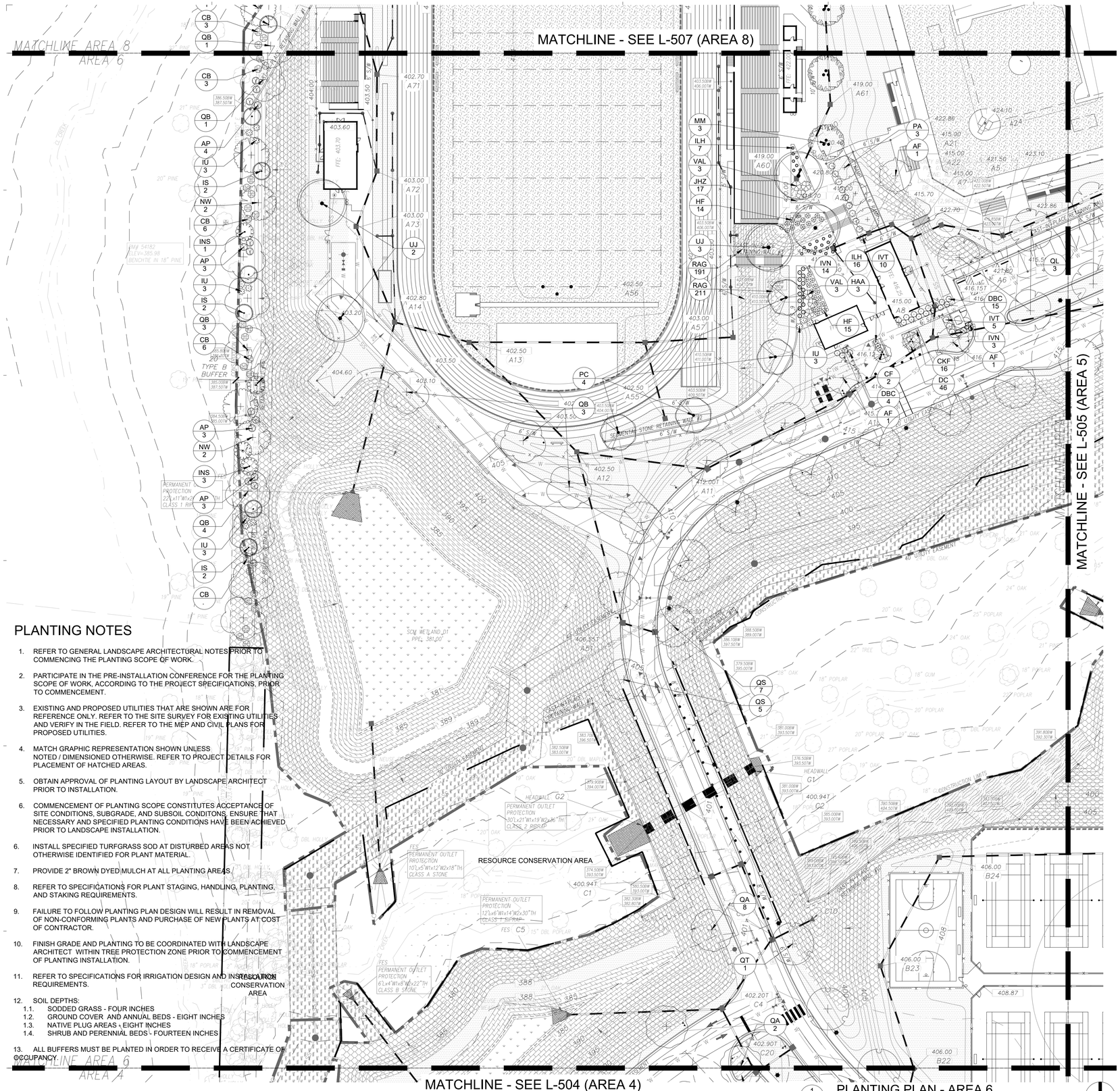

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7. PROVIDE 2" BROWN DYED MULCH AT ALL PLANTING AREAS.
8. REFER TO SPECIFICATIONS FOR PLANT STAGING, HANDLING, PLANTING, AND STAKING REQUIREMENTS.
9. FAILURE TO FOLLOW PLANTING PLAN DESIGN WILL RESULT IN REMOVAL OF NON-CONFORMING PLANTS AND PURCHASE OF NEW PLANTS AT COST OF CONTRACTOR.
10. FINISH GRADE AND PLANTING TO BE COORDINATED WITH LANDSCAPE ARCHITECT WITHIN TREE PROTECTION ZONE PRIOR TO COMMENCEMENT OF PLANTING INSTALLATION.
11. REFER TO SPECIFICATIONS FOR IRRIGATION DESIGN AND INSTALLATION REQUIREMENTS.
12. SOIL DEPTHS:
    - 1.1. SODDED GRASS - FOUR INCHES
    - 1.2. GROUND COVER AND ANNUAL BEDS - EIGHT INCHES
    - 1.3. NATIVE PLUG AREAS - EIGHT INCHES
    - 1.4. SHRUB AND PERENNIAL BEDS - FOURTEEN INCHES
13. ALL BUFFERS MUST BE PLANTED IN ORDER TO RECEIVE A CERTIFICATE OF OCCUPANCY.

1 L-04.06 PLANTING PLAN - AREA 6
1"=40'-0"
0 20' 40' 80'

PLANT SCHEDULE				
EVERGREEN TREES	BOTANICAL / COMMON NAME	SIZE		QTY
IS	Ilex opaca `Satyr Hill` / Satyr Hill American Holly	8' Ht, 1.5" cal. min.		33
INS	Ilex x `Nellie R. Stevens` / Nellie R. Stevens Holly	8' Ht, 1.5" cal. min.		17
MG	Magnolia grandiflora / Southern Magnolia	12' Ht, 2.5" cal. min.		9
MLG	Magnolia grandiflora `Little Gem` / Dwarf Southern Magnolia	8' Ht, 1.5" cal. min.		6
PT	Pinus taeda / Loblolly Pine	8' Ht, 1.5" cal. min.		5
COLUMNAR TREES	BOTANICAL / COMMON NAME	SIZE		QTY
QI	Quercus palustris `Green Pillar` / Columnar Pin Oak	12' Ht, 2.5" cal. min.		11
DECIDUOUS SHADE TREE	BOTANICAL / COMMON NAME	SIZE		QTY
AF	Acer floridanum / Southern Sugar Maple	12' Ht, 2.5" cal. min.		11
CK	Cladrastis kentukea / American Yellowwood	12' Ht, 2.5" cal. min.		5
MM	Magnolia virginiana `Moon Glow` / Sweet Bay	12' Ht, 2.5" cal. min.		7
NW	Nyssa sylvatica `Wildfire` / Black Gum	12' Ht, 2.5" cal. min.		12
PC	Pistacia chinensis / Chinese Pistache	12' Ht, 2.5" cal. min.		16
QA	Quercus alba / White Oak	12' Ht, 2.5" cal. min.		28
QB	Quercus bicolor / Swamp White Oak	12' Ht, 2.5" cal. min.		45
QL	Quercus lyrata / Overcup Oak	12' Ht, 2.5" cal. min.		21
QS	Quercus shumardii / Shumard Red Oak	12' Ht, 2.5" cal. min.		24
QT	Quercus texana / Nuttall Oak	12' Ht, 2.5" cal. min.		32
UJ	Ulmus americana `Jefferson` / American Elm	12' Ht, 2.5" cal. min.		30
UNDERSTORY TREES	BOTANICAL / COMMON NAME	SIZE		QTY
AC	Amelanchier canadensis `Autumn Brilliance` / Autumn Brilliance Serviceberry	10' Ht, multi-stem		7
CF2	Cercis canadensis `Forest Pansy` / Forest Pansy Eastern Redbud	1.5" Cal.		5
CD	Chionanthus virginicus `Dirr` / Dirr White Fringetree	10' Ht, multi-stem		6
CF	Cornus florida `Cherokee Chief` / Cherokee Chief Dogwood	1.5" Cal.		4
HC	Halesia carolina / Silverbell	8' Ht.		5
PA	Prunus subhirtella `Autumnalis` / Autumn Flowering Cherry	1.5" Cal.		6
SJ	Styrax japonicus / Japanese Snowbell	8' Ht.		6
SHRUBS	BOTANICAL / COMMON NAME	SIZE		QTY
AGG	Abelia x grandiflora `Edward Goucher` / Glossy Abelia	18" Ht, 3 gal. min.		21
AP	Aesculus parviflora / Bottlebrush Buckeye	30" Ht, 4 gal. min.		52
AEP	Aesculus pavia / Red Buckeye	30" Ht, 4 gal. min.		1
CAA	Callicarpa americana / American Beautyberry	30" Ht, 4 gal. min.		6
CB	Camellia sasanqua `Apple Blossom` / Apple Blossom Camellia	30" Ht, 4 gal. min.		103
CCL	Caryopteris x clandonensis / Bluebeard	18" Ht, 3 gal. min.		57
DBC	Distylium x `Blue Cascade` / Blue Cascade Distylium	18" Ht, 3 gal. min.		72
FAJ	Fatsia japonica / Japanese Fatsia	18" Ht, 3 gal. min.		16
FS	Forsythia suspensa `Sieboldii` / Weeping Forsythia	30" Ht, 4 gal. min.		19
FMA	Fothergilla major `Mount Airy` / Mount Airy Fothergilla	30" Ht, 4 gal. min.		57
HVH	Hamamelis virginiana `Harvest Moon` / Harvest Moon Witch Hazel	30" Ht, 4 gal. min.		10
HAA	Hydrangea arborescens `Abetwo` / IncrediBall Hydrangea	30" Ht, 4 gal. min.		77
HPW	Hydrangea quercifolia `Pee Wee` / Oakleaf Hydrangea	18" Ht, 3 gal. min.		47
HF	Hypericum frondosum `Sunburst` / Sunburst Hypericum	18" Ht, 3 gal. min.		96
IOR	Ilex cornuta `Rotunda` / Dwarf Chinese Holly	18" Ht, 3 gal. min.		17
IVJ	Ilex verticillata `Jim Dandy` / Jim Dandy Winterberry	30" Ht, 4 gal. min.		3
IVR	Ilex verticillata `Red Sprite` / Red Sprite Winterberry	30" Ht, 4 gal. min.		77
IVT	Ilex vomitoria / Yaupon Holly	30" Ht, 4 gal. min.		85
IVN	Ilex vomitoria `Nana` / Dwarf Yaupon	18" Ht, 3 gal. min.		29
IU	Illicum floridanum `Mis Scarlet` / Miss Scarlet Anise	30" Ht, 4 gal. min.		61
ILH	Ilea virginica `Little Henry` TM / Virginia Sweetspire	18" Ht, 3 gal. min.		42
OHG	Osmanthus heterophyllus `Goshiki` / Goshiki Holly Olive	30" Ht, 4 gal. min.		10
PTW	Pittosporum tobira `Wheeler`s Dwarf` / Wheeler`s Dwarf Pittosporum	18" Ht, 3 gal. min.		88
PLO	Prunus laurocerasus `Otto Luyken` / Otto Luyken Laurel	30" Ht, 4 gal. min.		72
VAL	Vitex agnus-castus `Lecompte` / Chaste Tree	30" Ht, 4 gal. min.		17
GROUND COVERS	BOTANICAL / COMMON NAME	SIZE	SPACING	QTY
AHU	Amsonia hubrichtii / Arkansas Blue-star	Quart	18" o.c.	1,236
CKF	Calamagrostis x acutiflora `Karl Foerster` / Feather Reed Grass	1 Gal.	24" o.c.	138
COE	Carex oshimensis `Evergilo` TM / EverColor Everillo Japanese Sedge	1 Gal.	12" o.c.	808
DC	Deschampsia cespitosa `Northern Lights` / Northern Lights Hair Grass	Quart	24" o.c.	539
EPU	Echinacea purpurea / Purple Coneflower	Quart	18" o.c.	50
JHZ	Juniperus horizontalis / Creeping Juniper	1 Gal.	44" o.c.	377
MCA	Muhlenbergia capillaris / Pink Muhly Grass	1 Gal.	30" o.c.	128
OJG	Ophiopogon japonicus `Gyoku Ryu` / Mondo Grass	Quart	12" o.c.	335
RAG	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac	1 Gal.	36" o.c.	697
SSP	Sedum spectabile `Purple Emporer` / Stonecrop	1 Gal.	16" o.c.	342
SAL	Sisyrinchium angustifolium `Lucerne` / Lucerne Blue Eyed Grass	Pint	12" o.c.	2,863
TURF	BOTANICAL / COMMON NAME	SIZE	SPACING	QTY
T1	Cynodon dactylon `TiF419` / Bermuda Grass	Sod		327,965 sf
T2	Cynodon dactylon `TiFTuf` / TiTuf BermudaGrass	Sod		347,718 sf

GENERAL SOD LAWN TiTuf Bermuda -		58,663 sf
LOWLAND SCM PLANTINGS Native grass and perennial plantings within stormwater control zone expected to periodically hold water. Plugs and gal. size. -		86,020 sf
UPLAND SCM PLANTINGS Variety of wetland species shrubs, 18" min. ht, 48"-60" spacing typical, within stormwater control zone expected to receive periodic inundation. -		76,688 sf
SLOPE STABILIZATION MIX Seed mix & geotextile to be installed on slopes 3:1 or less, to support re-establishment of forest. SEE L-05.02 FOR SEED MIXES		320,567 sf
REFORESTATION SEED MIX To be installed on disturbed areas with slopes 3:1 or less adjacent to existing woodland to support re-establishment of forest. SEE L-05.02 FOR SEED MIXES		92,905 sf
NO-MOW SEED MIX BLEND OF NATIVE GRASSES AND FORBS SUITABLE FOR MOST SOIL TYPES AND FULL SUN. SEE L-05.02 FOR SEED MIXES		88,552 sf

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed to the cover sheet of these construction plans.

PW - Transportation	Date	WR - Stormwater	Date
Building Inspections	Date	Planning	Date
WR - Utility Engineering	Date	Planning - Transportation	Date
Electric	Date	Fire	Date
WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

NOT FOR CONSTRUCTION

H12/Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

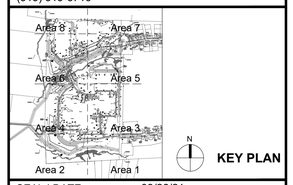
Owner
Wake County Public Schools
111 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
RATIO
227 Fayetteville Street, Suite 301
Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
5430 Wade Park Blvd #400
Raleigh, North Carolina 27607
(919) 832-5587

Mechanical / Electrical / Plumbing Engineer
The Wooten Company
120 North Boylan Avenue
Raleigh, North Carolina 27603
(919) 828-0531

Civil Engineer and Landscape Architect
CLH Design PA
400 Regency Forest Drive, Suite 120
Cary, North Carolina 27518
(919) 319-6716



KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

01	DESIGN DEVELOPMENT	11/20/20
02	TOA MAJOR SITE PLAN SUBMITTAL	12/01/20
03	TOA MAJOR SITE PLAN RESUBMITTAL	02/12/21
04	TOA MAJOR SITE PLAN SUBMITTAL #3	03/05/21
05	60% CONSTRUCTION DOCUMENTS	03/26/21
06	TOA MAJOR SITE PLAN SUBMITTAL #4	03/26/21

RATIO

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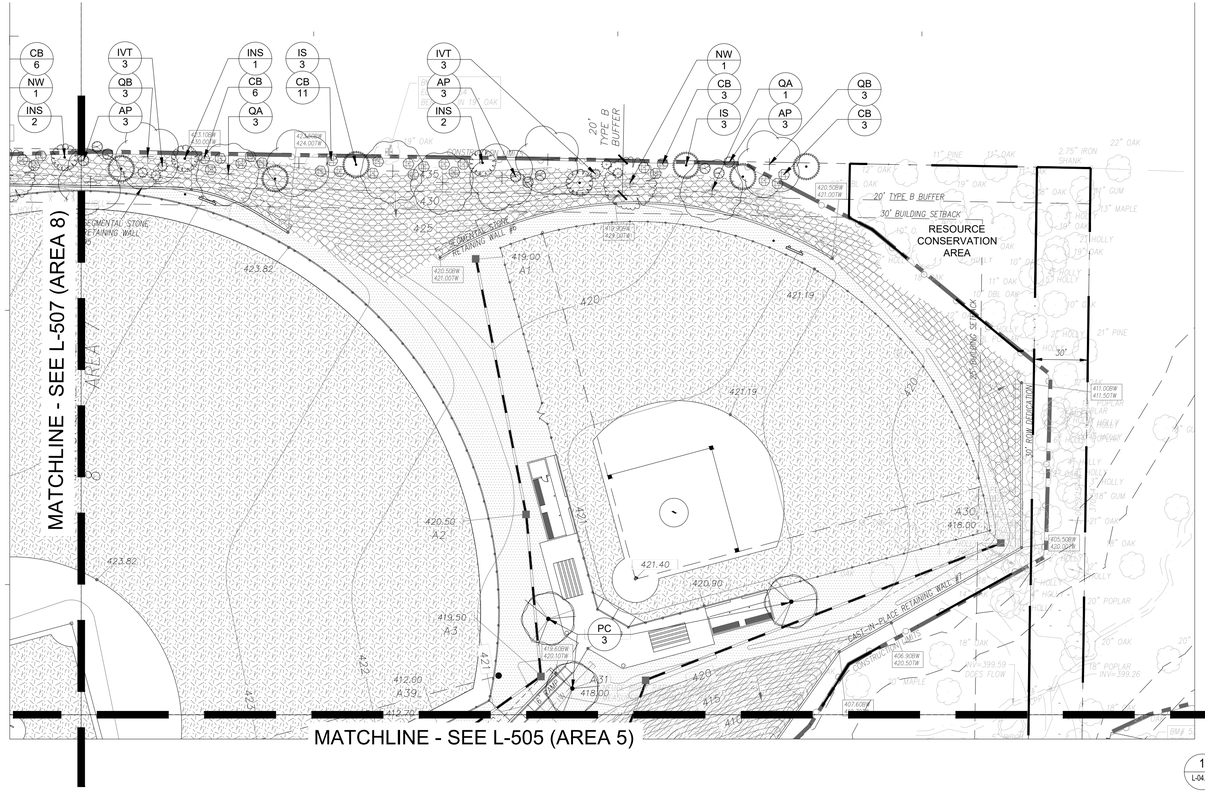
PROJECT NO. 19150.000

SHEET TITLE
PLANTING PLAN - AREA 6

SHEET NUMBER
L-04.06



1 L-04.07

PLANTING PLAN AREA 7

1"=40'-0"

0 20' 40' 80'

PLANTING NOTES

1. REFER TO GENERAL LANDSCAPE ARCHITECTURAL NOTES PRIOR TO COMMENCING THE PLANTING SCOPE OF WORK.
2. PARTICIPATE IN THE PRE-INSTALLATION CONFERENCE FOR THE PLANTING SCOPE OF WORK, ACCORDING TO THE PROJECT SPECIFICATIONS, PRIOR TO COMMENCEMENT.
3. EXISTING AND PROPOSED UTILITIES THAT ARE SHOWN ARE FOR REFERENCE ONLY. REFER TO THE SITE SURVEY FOR EXISTING UTILITIES AND VERIFY IN THE FIELD. REFER TO THE MEP AND CIVIL PLANS FOR PROPOSED UTILITIES.
4. MATCH GRAPHIC REPRESENTATION SHOWN UNLESS NOTED / DIMENSIONED OTHERWISE. REFER TO PROJECT DETAILS FOR PLACEMENT OF HATCHED AREAS.
5. OBTAIN APPROVAL OF PLANTING LAYOUT BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
6. COMMENCEMENT OF PLANTING SCOPE CONSTITUTES ACCEPTANCE OF SITE CONDITIONS, SUBGRADE, AND SUBSOIL CONDITONS. ENSURE THAT NECESSARY AND SPECIFIED PLANTING CONDITIONS HAVE BEEN ACHIEVED PRIOR TO LANDSCAPE INSTALLATION.
6. INSTALL SPECIFIED TURFGRASS SOD AT DISTURBED AREAS NOT OTHERWISE IDENTIFIED FOR PLANT MATERIAL.
7. PROVIDE 2" BROWN DYED MULCH AT ALL PLANTING AREAS.
8. REFER TO SPECIFICATIONS FOR PLANT STAGING, HANDLING, PLANTING, AND STAKING REQUIREMENTS.
9. FAILURE TO FOLLOW PLANTING PLAN DESIGN WILL RESULT IN REMOVAL OF NON-CONFORMING PLANTS AND PURCHASE OF NEW PLANTS AT COST OF CONTRACTOR.
10. FINISH GRADE AND PLANTING TO BE COORDINATED WITH LANDSCAPE ARCHITECT WITHIN TREE PROTECTION ZONE PRIOR TO COMMENCEMENT OF PLANTING INSTALLATION.
11. REFER TO SPECIFICATIONS FOR IRRIGATION DESIGN AND INSTALLATION REQUIREMENTS.
12. SOIL DEPTHS:
    - 1.1. SODDED GRASS - FOUR INCHES
    - 1.2. GROUND COVER AND ANNUAL BEDS - EIGHT INCHES
    - 1.3. NATIVE PLUG AREAS - EIGHT INCHES
    - 1.4. SHRUB AND PERENNIAL BEDS - FOURTEEN INCHES
13. ALL BUFFERS MUST BE PLANTED IN ORDER TO RECEIVE A CERTIFICATE OF OCCUPANCY.

PLANT SCHEDULE				
EVERGREEN TREES	BOTANICAL / COMMON NAME	SIZE		QTY
IS	Ilex opaca `Satyr Hill` / Satyr Hill American Holly	8` ht, 1.5" cal. min.		33
INS	Ilex x `Nellie R. Stevens` / Nellie R. Stevens Holly	8` ht, 1.5" cal. min.		17
MG	Magnolia grandiflora / Southern Magnolia	12` ht, 2.5" cal. min.		9
MLG	Magnolia grandiflora `Little Gem` / Dwarf Southern Magnolia	8` ht, 1.5" cal. min.		6
PT	Pinus taeda / Loblolly Pine	8` ht, 1.5" cal. min.		5
COLUMNAR TREES	BOTANICAL / COMMON NAME	SIZE		QTY
QI	Quercus palustris `Green Pillar` / Columnar Pin Oak	12` ht, 2.5" cal. min.		11
DECIDUOUS SHADE TREE	BOTANICAL / COMMON NAME	SIZE		QTY
AF	Acer floridanum / Southern Sugar Maple	12` ht, 2.5" cal. min.		11
CK	Cladrastis kentukea / American Yellowwood	12` ht, 2.5" cal. min.		5
MM	Magnolia virginiana `Moon Glow` / Sweet Bay	12` ht, 2.5" cal. min.		7
NW	Nyssa sylvatica `Wildfire` / Black Gum	12` ht, 2.5" cal. min.		12
PC	Pistacia chinensis / Chinese Pistache	12` ht, 2.5" cal. min.		16
QA	Quercus alba / White Oak	12` ht, 2.5" cal. min.		28
QB	Quercus bicolor / Swamp White Oak	12` ht, 2.5" cal. min.		45
QL	Quercus lyrata / Overcup Oak	12` ht, 2.5" cal. min.		21
QS	Quercus shumardii / Shumard Red Oak	12` ht, 2.5" cal. min.		24
QT	Quercus texana / Nuttall Oak	12` ht, 2.5" cal. min.		32
UJ	Ulmus americana `Jefferson` / American Elm	12` ht, 2.5" cal. min.		30
UNDERSTORY TREES	BOTANICAL / COMMON NAME	SIZE		QTY
AC	Amelanchier canadensis `Autumn Brilliance` / Autumn Brilliance Serviceberry	10` ht, multi-stem		7
CF2	Cercis canadensis `Forest Pansy` / Forest Pansy Eastern Redbud	1.5" Cal.		5
CD	Chionanthus virginicus `Dirr` / Dirr White Fringetree	10` ht, multi-stem		6
CF	Cornus florida `Cherokee Chief` / Cherokee Chief Dogwood	1.5" Cal.		4
HC	Halesia carolina / Silverbell	8` ht.		5
PA	Prunus subhirtella `Autumnalis` / Autumn Flowering Cherry	1.5" Cal.		6
SJ	Styrax japonicus / Japanese Snowbell	8` ht.		6
SHRUBS	BOTANICAL / COMMON NAME	SIZE		QTY
AGG	Abelia x grandiflora `Edward Goucher` / Glossy Abelia	18" ht, 3 gal. min.		21
AP	Aesculus parviflora / Bottlebrush Buckeye	30" ht, 4 gal. min.		52
AEP	Aesculus pavia / Red Buckeye	30" ht, 4 gal. min.		1
CAA	Callicarpa americana / American Beautyberry	30" ht, 4 gal. min.		6
CB	Camellia sasanqua `Apple Blossom` / Apple Blossom Camellia	30" ht, 4 gal. min.		103
CCL	Caryopteris x clandonensis / Bluebeard	18" ht, 3 gal. min.		57
DBC	Distylium x `Blue Cascade` / Blue Cascade Distylium	18" ht, 3 gal. min.		72
FAJ	Fatsia japonica / Japanese Fatsia	18" ht, 3 gal. min.		16
FS	Forsythia suspensa `Sieboldii` / Weeping Forsythia	30" ht, 4 gal. min.		19
FMA	Fothergilla major `Mount Airy` / Mount Airy Fothergilla	30" ht, 4 gal. min.		57
HVH	Hamamelis virginiana `Harvest Moon` / Harvest Moon Witch Hazel	30" ht, 4 gal. min.		10
HAA	Hydrangea arborescens `Abetwo` / Incredibal® Hydrangea	30" ht, 4 gal. min.		77
HPW	Hydrangea quercifolia `Pee Wee` / Oakleaf Hydrangea	18" ht, 3 gal. min.		47
HF	Hypericum frondosum `Sunburst` / Sunburst Hypericum	18" ht, 3 gal. min.		96
ICR	Ilex cornuta `Rotunda` / Dwarf Chinese Holly	18" ht, 3 gal. min.		17
IVJ	Ilex verticillata `Jim Dandy` / Jim Dandy Winterberry	30" ht, 4 gal. min.		3
IVR	Ilex verticillata `Red Sprite` / Red Sprite Winterberry	30" ht, 4 gal. min.		77
IVT	Ilex vomitoria / Yaupon Holly	30" ht, 4 gal. min.		85
IVN	Ilex vomitoria `Nana` / Dwarf Yaupon	18" ht, 3 gal. min.		29
IU	Illicium floridanum `Miss Scarlet` / Miss Scarlet Anise	30" ht, 4 gal. min.		61
ILH	Itea virginica `Little Henry` TM / Virginia Sweetspire	18" ht, 3 gal. min.		42
OHG	Osmanthus heterophyllus `Goshiki` / Goshiki Holly Olive	30" ht, 4 gal. min.		10
PTW	Pittosporum tobira `Wheeler's Dwarf` / Wheeler`s Dwarf Pittosporum	18" ht, 3 gal. min.		88
PLO	Prunus laurocerasus `Otto Luyken` / Otto Luyken Laurel	30" ht, 4 gal. min.		72
VAL	Vitex agnus-castus `Lecompte` / Chaste Tree	30" ht, 4 gal. min.		17
GROUND COVERS	BOTANICAL / COMMON NAME	SIZE	SPACING	QTY
AHU	Amsonia hubrichtii / Arkansas Blue-star	Quart	18" o.c.	1,236
CKF	Calamagrostis x acutiflora `Karl Foerster` / Feather Reed Grass	1 Gal.	24" o.c.	138
COE	Carex oshimensis `Everillo` TM / EverColor Everillo Japanese Sedge	1 Gal.	12" o.c.	808
DC	Deschampsia cespitosa `Northern Lights` / Northern Lights Hair Grass	Quart	24" o.c.	539
EPU	Echinacea purpurea / Purple Coneflower	Quart	18" o.c.	50
JHZ	Juniperus horizontalis / Creeping Juniper	1 Gal.	44" o.c.	377
MCA	Muhlenbergia capillaris / Pink Muhly Grass	1 Gal.	30" o.c.	128
OJG	Ophiopogon japonicus `Gyoko Ryu` / Mondo Grass	Quart	12" o.c.	335
RAG	Rhus aromatica `Gro-Low` / Gro-Low Fragrant Sumac	1 Gal.	36" o.c.	697
SSP	Sedum spectabile `Purple Emperor` / Stonecrop	1 Gal.	18" o.c.	342
SAL	Sisyrinchium angustifolium `Lucerne` / Lucerne Blue Eyed Grass	Pint	12" o.c.	2,863
TURF	BOTANICAL / COMMON NAME	SIZE	SPACING	QTY
T1	Cynodon dactylon `TF 419` / Bermuda Grass	Sod		327,965 sf
T2	Cynodon dactylon `TifTuf` / TifTuf BermudaGrass	Sod		347,718 sf

GENERAL SOD LAWN — 58,663 sf
TifTuf Bermuda
-

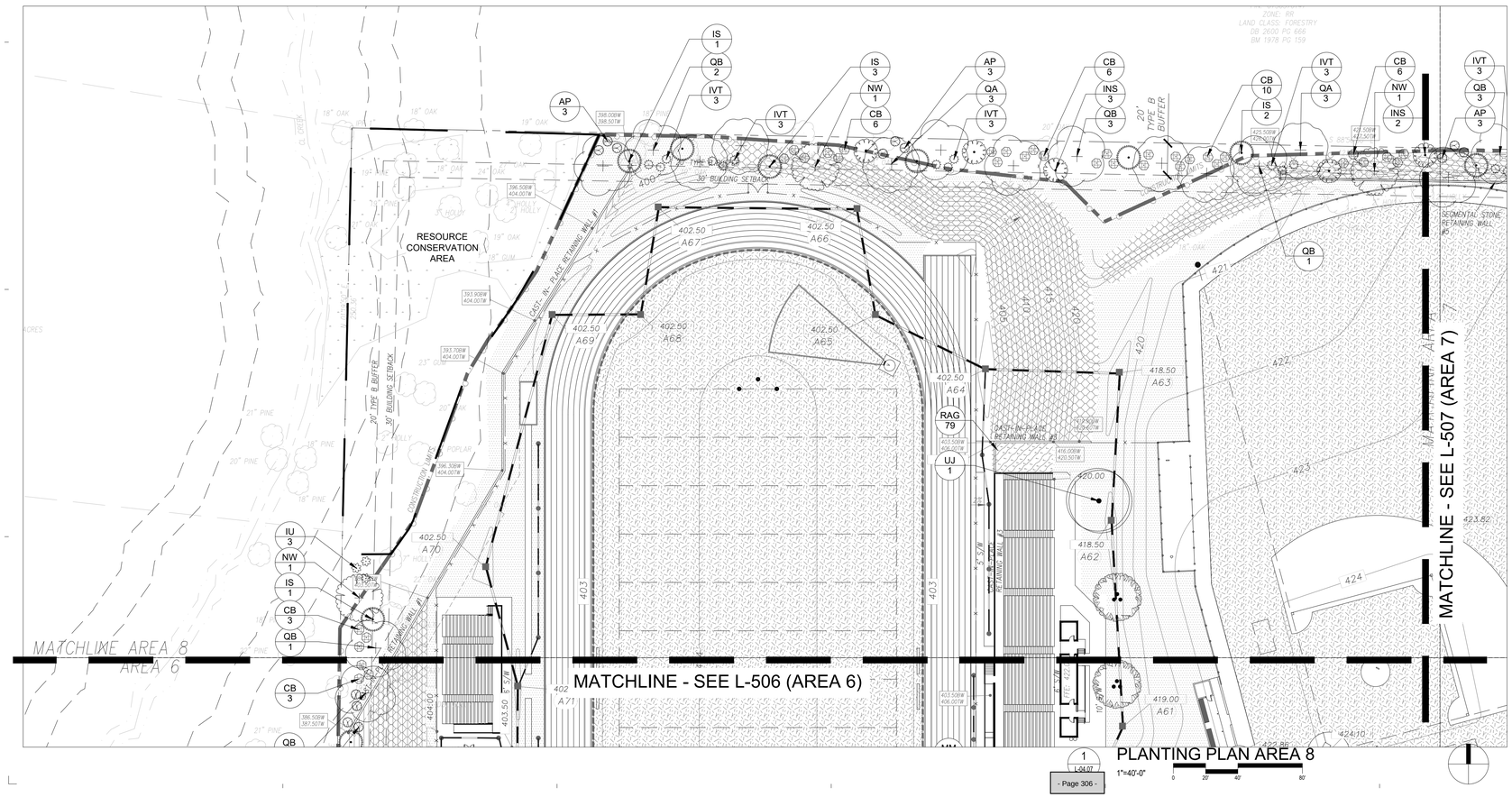
LOWLAND SCM PLANTINGS — 86,020 sf
Native grass and perennial plantings within stormwater control zone expected to periodically hold water. Plugs and 1 gal. size.
-

UPLAND SCM PLANTINGS — 76,688 sf
Variety of wetland species shrubs, 18" min. ht, 48"-60" spacing typical, within stormwater control zone expected to receive periodic inundation.
-

SLOPE STABILIZATION MIX — 320,567 sf
Seed mix & geotextile to be installed on slopes 3:1 or less, to support re-establishment of forest.
SEE L-05.02 FOR SEED MIXES

REFORESTATION SEED MIX — 92,905 sf
To be installed on disturbed areas with slopes 3:1 or less adjacent to existing woodland to support re-establishment of forest.
SEE L-05.02 FOR SEED MIXES

NO-MOW SEED MIX — 88,552 sf
BLEND OF NATIVE GRASSES AND FORBS SUITABLE FOR MOST SOIL TYPES AND FULL SUN.
SEE L-05.02 FOR SEED MIXES



1 L-04.07

PLANTING PLAN AREA 8

1"=40'-0"

0 20' 40' 80'

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed to the cover sheet of these construction plans.

PW - Transportation	Date	WR - Stormwater	Date
Building Inspections	Date	Planning	Date
WR - Utility Engineering	Date	Planning - Transportation	Date
Electric	Date	Fire	Date
WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

NOT FOR CONSTRUCTION

H12/Felton Grove High School

8550 Stephenson Road Apex, NC 27539

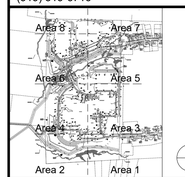
Owner
Wake County Public Schools
111 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
RATIO
227 Fayetteville Street, Suite 301
Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
5430 Wade Park Blvd #400
Raleigh, North Carolina 27607
(919) 832-5587

Mechanical / Electrical / Plumbing Engineer
The Wooten Company
120 North Boylan Avenue
Raleigh, North Carolina 27603
(919) 828-0531

Civil Engineer and Landscape Architect
CLH Design PA
400 Regency Forest Drive, Suite 120
Cary, North Carolina 27518
(919) 319-6716



KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

01	DESIGN DEVELOPMENT	11/20/20
02	TOA MAJOR SITE PLAN SUBMITTAL	12/01/20
03	TOA MAJOR SITE PLAN RESUBMITTAL	02/12/21
04	TOA MAJOR SITE PLAN SUBMITTAL #3	03/05/21
05	60% CONSTRUCTION DOCUMENTS	03/26/21
06	TOA MAJOR SITE PLAN SUBMITTAL #4	03/26/21

RATIO

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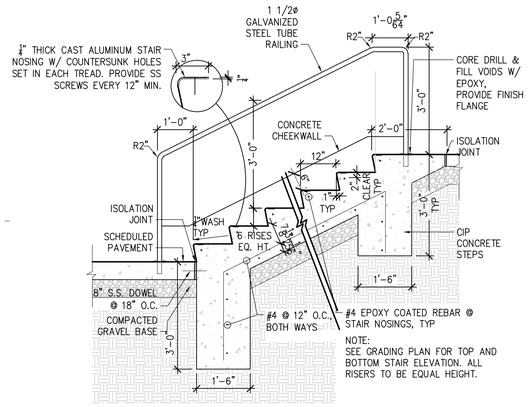
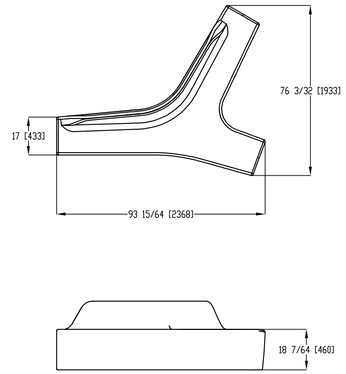
PROJECT NO. 19150.000

SHEET TITLE
PLANTING PLAN - AREAS 7 & 8

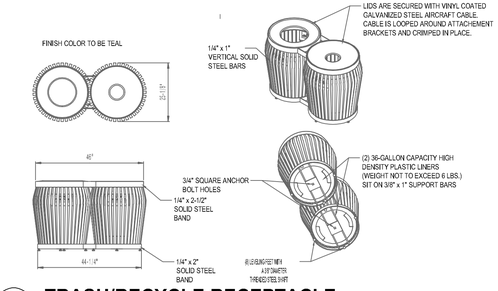
SHEET NUMBER
L-04.07



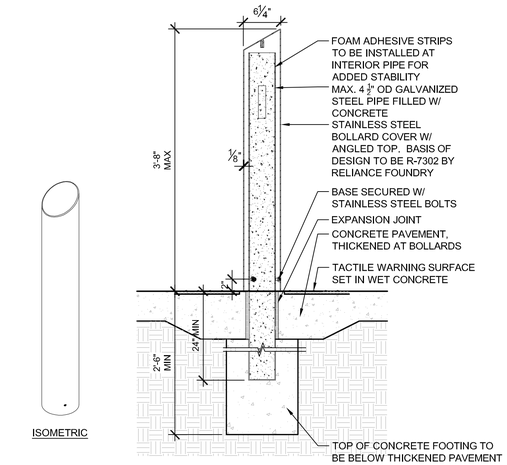
E1 L-05.01 **CIP CONCRETE STAIRS**
1/2" = 1'-0" P-H12-05



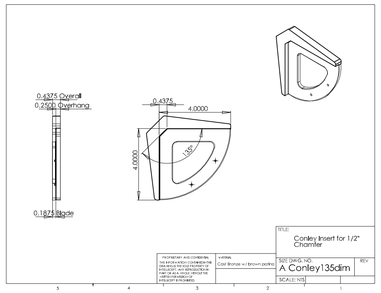
D2 L-05.01 **'TWIG' BENCH W/ BACK**
3/8" = 1'-0" P-H12-11

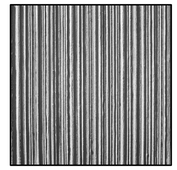


F5 L-05.01 **TRASH/RECYCLE RECEPTACLE**
3/8" = 1'-0" P-H12-21



D5 L-05.01 **DECORATIVE BOLLARD**
1" = 1'-0" P-H12-08





2/42 NAAB

An abstract pattern with a linear texture. Varyingly wide grooves in an even arrangement only unobtrusively break the concrete.

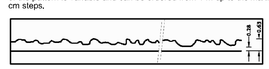
BASIS OF DESIGN FORMLINER FOR CAST-IN-PLACE CONCRETE TO BE:
2/42 NAAB BY US FORMLINER POWERED BY RECKLI
380 COMMERCE BLVD
ATHENS, GA 30606
P. (706) 549-6787

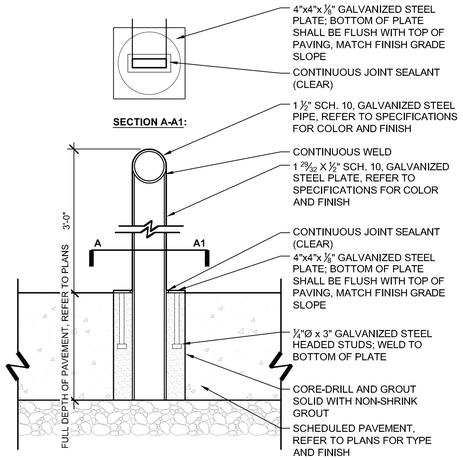
DIMENSIONS

Uses	Dimensions (in)	Order Number
100	L 291.34 × L 149.61	C 2042
10	L 291.34 × L 49.21	E 2042

100-timer formliners are supplied in an individual dimension within the maximum indicated dimensions.

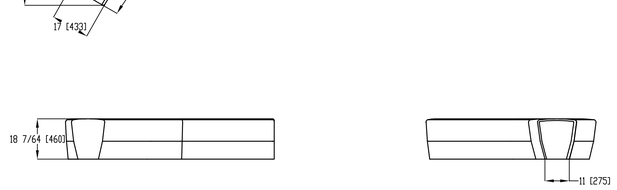
The specified widths of the 10-timer and 50-timer formliners are a fixed dimension and ensure the continuity of the structure in the case of linear patterns. The longitudinal direction of the pattern is variable and can be ordered from 1 m up to the maximum dimension in 50 cm steps.



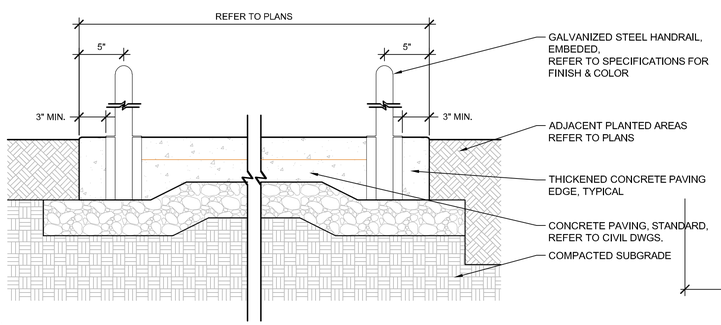


NOTES:
1. SEE DIVISIONS 05 & 09 OF THE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. ENSURE HOLE DRILLED FOR POST EMBEDMENT IS NOT LARGER THAN ESCUTCHEON PLATE.
3. ALL HANDRAILS ARE TO FOLLOW ACCESSIBILITY REQUIREMENTS AS FOUND IN CURRENT LOCAL, STATE, OR FEDERAL LAW. WHERE CONFLICT OCCURS, THE MORE RESTRICTIVE REQUIREMENTS ARE TO BE FOLLOWED.

B1 L-05.01 **GALVANIZED STEEL HANDRAIL**
3" = 1'-0" P-H12-04

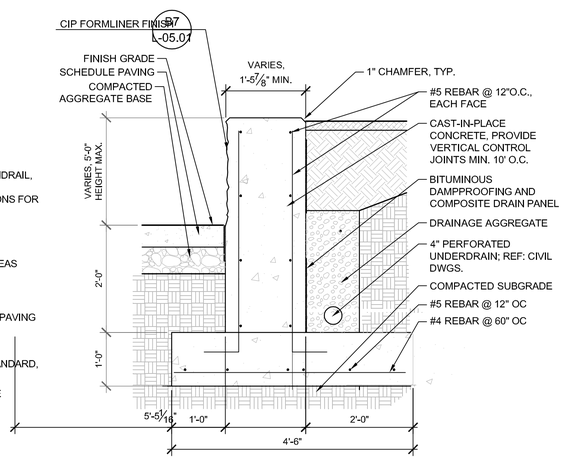


B2 L-05.01 **BACKLESS 'TWIG' BENCH**
3/8" = 1'-0" P-H12-10

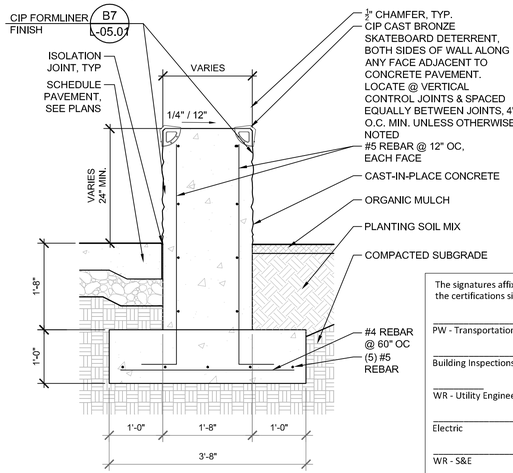


NOTES:

A1 L-05.01 **CONCRETE PAVEMENT| ADA RAMP**
1 1/2" = 1'-0" P-H12-03



A3 L-05.01 **CIP CONCRETE RETAINING WALL**
3/4" = 1'-0" P-H12-06



A5 L-05.01 **CIP CONCRETE SEATWALL**
3/4" = 1'-0" P-H12-07

B7 L-05.01 **CIP FORMLINER FINISH**
3/4" = 1'-0"

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PW - Transportation	Date	WR - Stormwater	Date
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Electric	Date	Fire	Date
WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

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Apex, NC 27539

Owner
Wake County Public Schools
111 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

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Civil Engineer and Landscape Architect
CLH Design PA
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Cary, North Carolina 27518
(919) 319-6716

KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

01	DESIGN DEVELOPMENT	11/20/20
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05	60% CONSTRUCTION DOCUMENTS	03/26/21
06	TOA MAJOR SITE PLAN SUBMITTAL #4	03/26/21

P-H12-24

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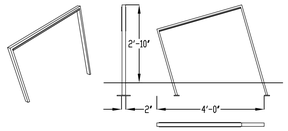
PROJECT NO. 19150.000

SHEET TITLE
SITE DETAILS

SHEET NUMBER
L-05.01



Color: To be coordinated with the High School colors
Material: Galvanized steel structure w/ Powdercoat finish

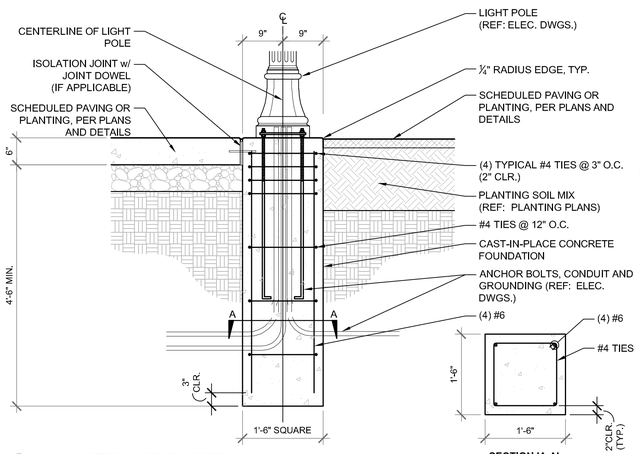
E1 PLAZA BIKE RACK
L-05.02 — 3/8" = 1'-0"

P-H12-19

Color: Textured Fern (Spring Green)
Finish: Fade-resistant, powder coated steel and aluminum components
Material: 10-gauge steel contour seat with unique perforated Stix tree line pattern and cast aluminum legs.

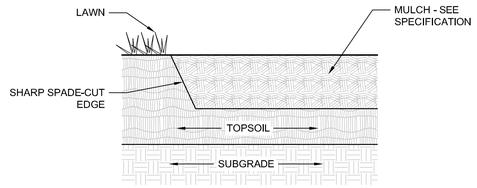
C1 PLAZA BENCH
L-05.02 — 3/8" = 1'-0"

P-H12-18



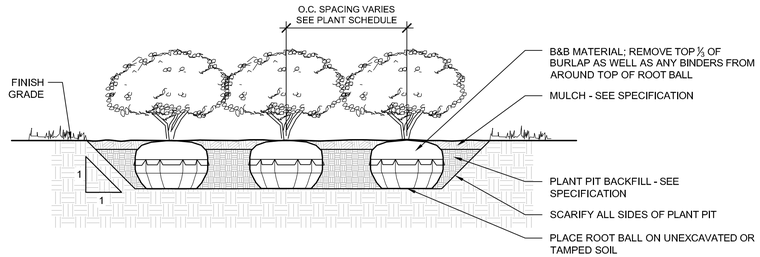
A1 LIGHTPOST FOOTING
L-05.02 — 3/4" = 1'-0"

P-H12-17



D3 SPADE EDGE
L-05.02 — 3" = 1'-0"

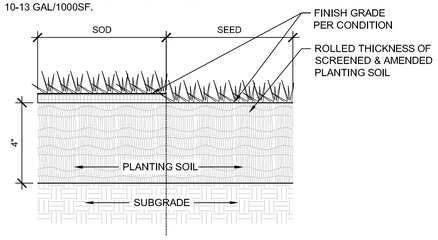
P-H12-16



D4 SHRUB PLANTING
L-05.02 — 1/2" = 1'-0"

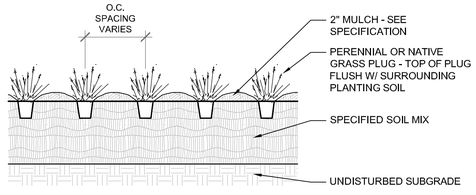
P-H12-13

NOTES:
1. SEE SEEDING SCHEDULE FOR CALENDAR YEAR REQUIREMENTS FOR TEMPORARY & PERMANENT SEED MIX TYPES, FERTILIZER AND APPLICATION RATES.
2. IN ALL LAWN AREAS, TILL SUBGRADE TO MIN. 4" DEPTH, REMOVE & DISPOSE OF STONES LARGER THAN 2 INCHES AND ANY STICKS, ROOTS, RUBBISH AND OTHER EXTRANEOUS MATTER.
3. pH TO BE BETWEEN 6.0 AND 7.5. CONTRACTOR TO AMEND SOILS PER RECOMMENDED RATES AS RESULT OF REQUIRED SOIL TESTING. LIME TO MEET ASTMC602, CLASS T FOR RAISING pH OR SULFUR FOR LOWERING pH, ACCORDING TO THE ACIDITY OR ALKALINITY IN WEIGHT PER 1000 SF FOR 6-INCH DEPTH OF SOIL.
4. APPLY ANY SOIL AMENDMENTS, THOROUGHLY MIX, AND APPLY BACK TO SUBGRADE IN LIFTS (8 INCHES MAX. BY COMPACTION EQUIPMENT, 4 INCHES MAX BY HAND -TAMPING) WHICH ARE EACH COMPACTED TO 75-82 % OF MAXIMUM STANDARD PROCTOR DENSITY.
5. DO NOT APPLY MATERIALS OR TILL IF SOIL IS FROZEN, MUDDY OR EXCESSIVELY WET.
6. SOW SEED AT A TOTAL RATE OF 3-4 LBS/1000 SF IF NOT OTHERWISE SPECIFIED ON PLANS.
7. PROTECT SEEDED AREA W/ EROSION-CONTROL MULCH OR MATS AS FOLLOWS:
- SLOPES EXCEEDING 1:4: EROSION CONTROL BLANKETS (Biodegradable wood excelsior, straw or coconut-fiber mat enclosed in a photodegradable plastic mesh)
- SLOPES EXCEEDING 1:6: EROSION CONTROL FIBER MESH W/ STAPLES (Biodegradable burlap or spun-coir mesh, w/ 50-65 percent open area, w/ steel wire staples)
- SLOPES NOT EXCEEDING 1:6: STRAW MULCH SPREAD AT RATE OF 2 TONS/ACRE, 1 ½" DEPTH. STRAW MULCH TO BE BONDED W/ TACKING ASPHALT EMULSION AT A RATE OF 10-13 GAL/1000SF.



B4 SEED/SOD LAWN
L-05.02 — 3" = 1'-0"

P-H12-15



A4 PLUG PLANTING
L-05.02 — 3/4" = 1'-0"

P-H12-14

Slope Stabilization Seed Mix

Botanical Name	Common Name
Permanent Grasses:	
Andropogon gerardii	Big Bluestem
Bouteloua curtipendula	Side-Oats Grama
Carex spp.	Prairie Sedge Species
Elymus canadensis	Canada Wild Rye
Elymus virginicus	Virginia Wild Rye
Panicum virgatum	Switch Grass
Schizachyrium scoparium	Little Bluestem
Sorghastrum nutans	Indian Grass
Temporary Cover:	
Avena sativa	Common Oat
Lolium multiflorum	Annual Rye

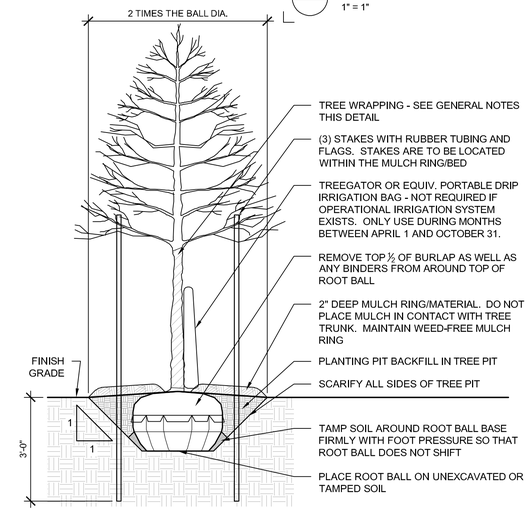
No-Mow Seed Mix

Botanical Name	Common Name
Permanent Grasses:	
Andropogon gerardii	Big Bluestem
Bouteloua curtipendula	Side-Oats Grama
Carex spp.	Prairie Sedge Species
Elymus canadensis	Canada Wild Rye
Panicum virgatum	Switch Grass
Schizachyrium scoparium	Little Bluestem
Sorghastrum nutans	Indian Grass
Temporary Cover:	
Avena sativa	Common Oat
Lolium multiflorum	Annual Rye
Forbs:	
Asclepias syriaca	Common Milkweed
Asclepias tuberosa	Butterfly Weed
Chamaecrista fasciculata	Partridge Pea
Coreopsis lanceolata	Sand Coreopsis
Echinacea purpurea	Broad-Leaved Purple Coneflower
Heliopsis helianthoides	False Sunflower
Monarda fistulosa	Wild Bergamot
Penstemon digitalis	Foxglove Beard Tongue
Ratibida pinnata	Yellow Coneflower
Rudbeckia hirta	Black-Eyed Susan
Solidago speciosa	Showy Goldenrod
Symphyotrichum laeve	Smooth Blue Aster
Symphyotrichum novae-angliae	New England Aster

Reforestation Mix
Mesic-to-Dry TallGrass Prairie Seed Mix

Botanical Name	Common Name
Bareroot Sapling plugs, planted 25' O.C.	
Amelanchier laevis	Smooth Serviceberry
Cercis Canadensis	Redbud
Liquidambar styraciflua	Sweet Gum
Quercus alba	White Oak
Quercus rubra	Red Oak
Quercus shumardii	Shumard Oak
Permanent Grasses:	
Andropogon gerardii	Big Bluestem
Bouteloua curtipendula	Side-Oats Grama
Carex spp.	Prairie Sedge Species
Elymus canadensis	Canada Wild Rye
Panicum virgatum	Switch Grass
Schizachyrium scoparium	Little Bluestem
Sorghastrum nutans	Indian Grass
Temporary Cover:	
Avena sativa	Common Oat
Lolium multiflorum	Annual Rye
Forbs:	
Asclepias syriaca	Common Milkweed
Asclepias tuberosa	Butterfly Weed
Baptisia alba	White Wild Indigo
Baptisia bracteata	Cream Wild Indigo
Chamaecrista fasciculata	Partridge Pea
Coreopsis lanceolata	Sand Coreopsis
Coreopsis palmata	Prairie Coreopsis
Desmanthus illinoensis	Illinois Sensitive Plant
Desmodium illinoense	Illinois Tick Trefoil
Echinacea purpurea	Broad-Leaved Purple Coneflower
Eryngium yuccifolium	Rattlesnake Master
Lespedeza capitata	Round-Headed Bush Clover
Liatris aspera	Rough Blazing Star
Liatris pycnostachya	Prairie Blazing Star
Lupinus perennis v. occidentalis	Wild Lupine
Monarda fistulosa	Wild Bergamot
Oligoneuron rigidum	Stiff Goldenrod
Parthenium integrifolium	Wild Quinine
Drymocallis arguta	Prairie Cinquefoil
Pycnanthemum virginianum	Common Mountain Mint
Ratibida pinnata	Yellow Coneflower
Rudbeckia hirta	Black-Eyed Susan
Silphium integrifolium	Rosin Weed
Silphium laciniatum	Compass Plant
Silphium terebinthinaceum	Prairie Dock
Solidago nemoralis	Old-Field Goldenrod
Solidago speciosa	Showy Goldenrod
Symphyotrichum laeve	Smooth Blue Aster
Symphyotrichum novae-angliae	New England Aster
Symphyotrichum oolentangiense	Sky-Blue Aster
Tradescantia ohiensis	Common Spiderwort
Veronicastrum virginicum	Culver's Root

SEED MIXES
1" = 1"



A3 TREE PLANTING
L-05.02 — 1/2" = 1'-0"

P-H12-12

GENERAL NOTES:

1. TREE WRAPPING SHALL BE IN PLACE ONLY IN MONTHS BETWEEN OCTOBER 31 AND APRIL 1.
2. TREE WRAPPING TO BE PLACED ONLY ON TREES WITH THIN BARK.
3. DO NOT HEAVILY PRUNE THE TREE AT PLANTING. PRUNE ONLY CROSSOVER LIMBS, CO-DOMINANT LEADERS, AND BROKEN OR DEAD BRANCHES. SOME INTERIOR TWIGS AND LATERAL BRANCHES MAY BE PRUNED; HOWEVER, DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN.
4. EACH TREE MUST BE PLANTED SUCH THAT THE TRUNK FLARE IS VISIBLE AT THE TOP OF THE ROOT BALL. DO NOT COVER THE TOP OF THE ROOT BALL WITH SOIL.

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PW - Transportation	Date	WR - Stormwater	Date
Building Inspections	Date	Planning	Date
WR - Utility Engineering	Date	Planning - Transportation	Date
Electric	Date	Fire	Date
WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

NOT FOR CONSTRUCTION

H12/Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
111 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
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CLH Design PA
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N
KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

01	DESIGN DEVELOPMENT	11/20/20
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03	TOA MAJOR SITE PLAN RESUBMITTAL	02/12/21
04	TOA MAJOR SITE PLAN SUBMITTAL #3	03/05/21
05	60% CONSTRUCTION DOCUMENTS	03/26/21
06	TOA MAJOR SITE PLAN SUBMITTAL #4	03/26/21

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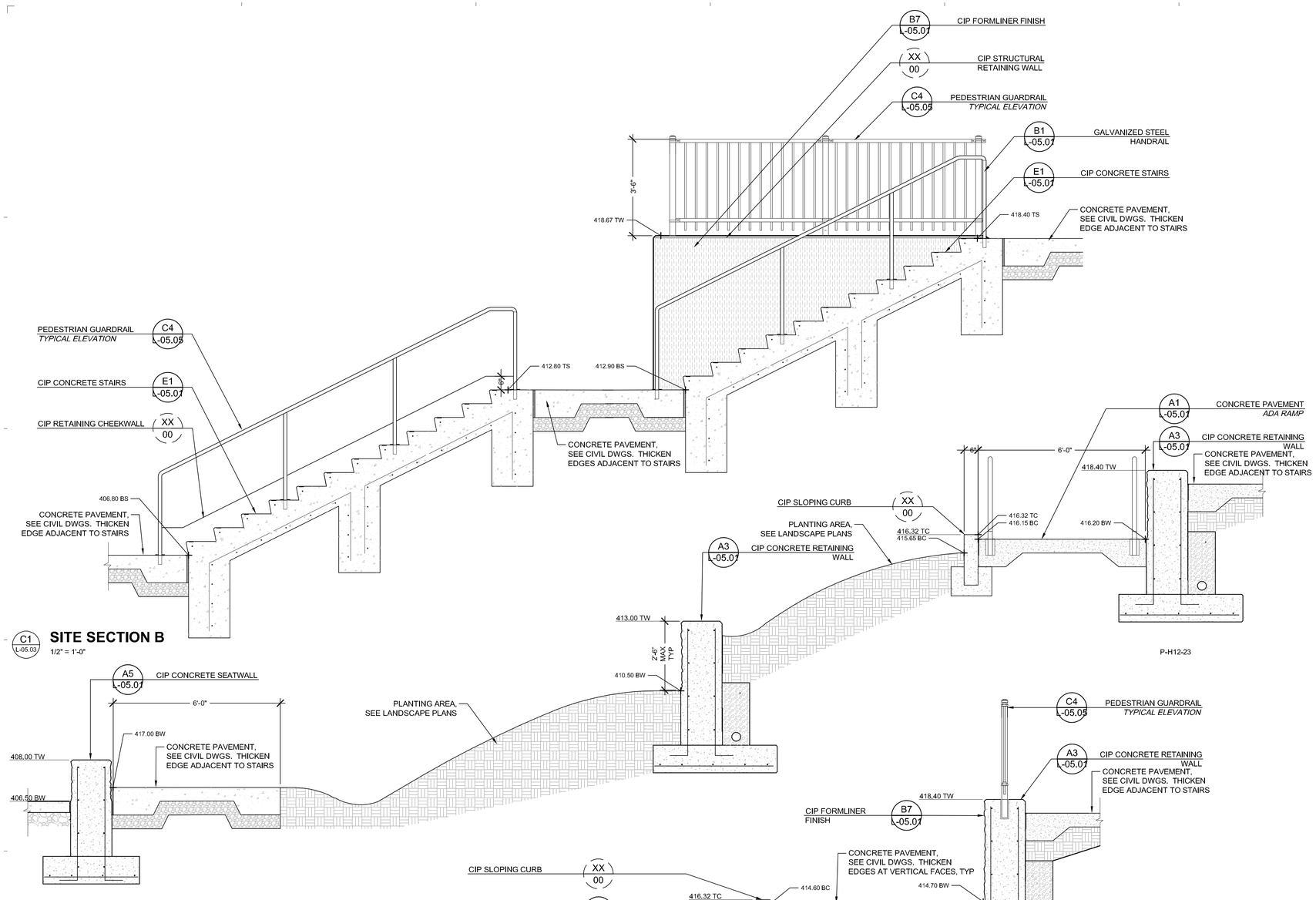
PROJECT NO. 19150.000

SHEET TITLE
SITE DETAILS

SHEET NUMBER
L-05.02



C1 L-05.03 **SITE SECTION B**
1/2" = 1'-0"

A1 L-05.03 **SITE SECTION C**
1/2" = 1'-0"

2 L-05.03 **SITE SECTION D**
1/2" = 1'-0"

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N **KEY PLAN**

SEAL | DATE 03/26/21

SHEET ISSUE

01	60% CONSTRUCTION DOCUMENTS	03/26/21
02	TOA MAJOR SITE PLAN SUBMITTAL #4	03/26/21

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PROJECT NO. 19150.000

SHEET TITLE
SITE DETAILS

SHEET NUMBER
L-05.03

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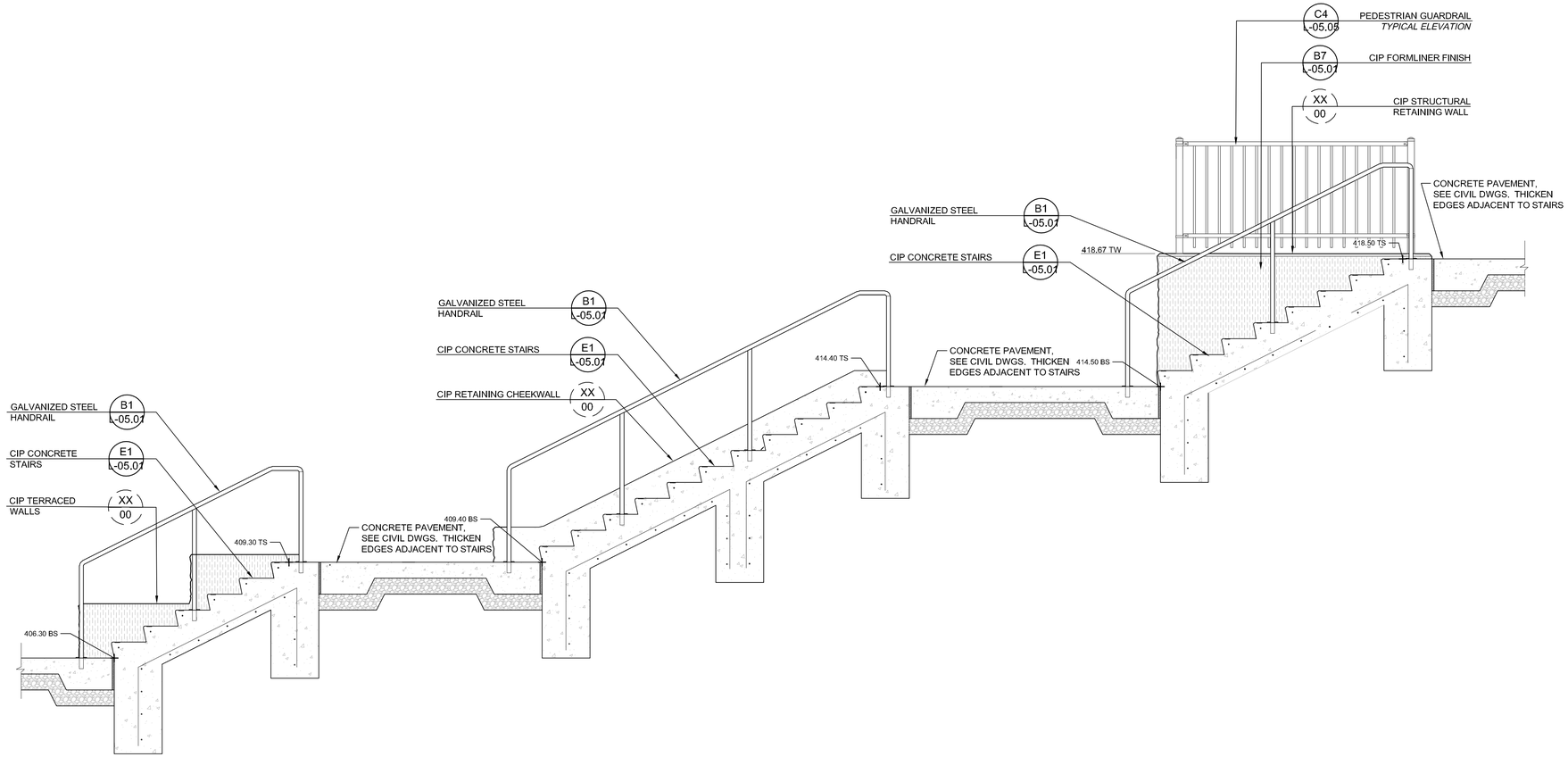
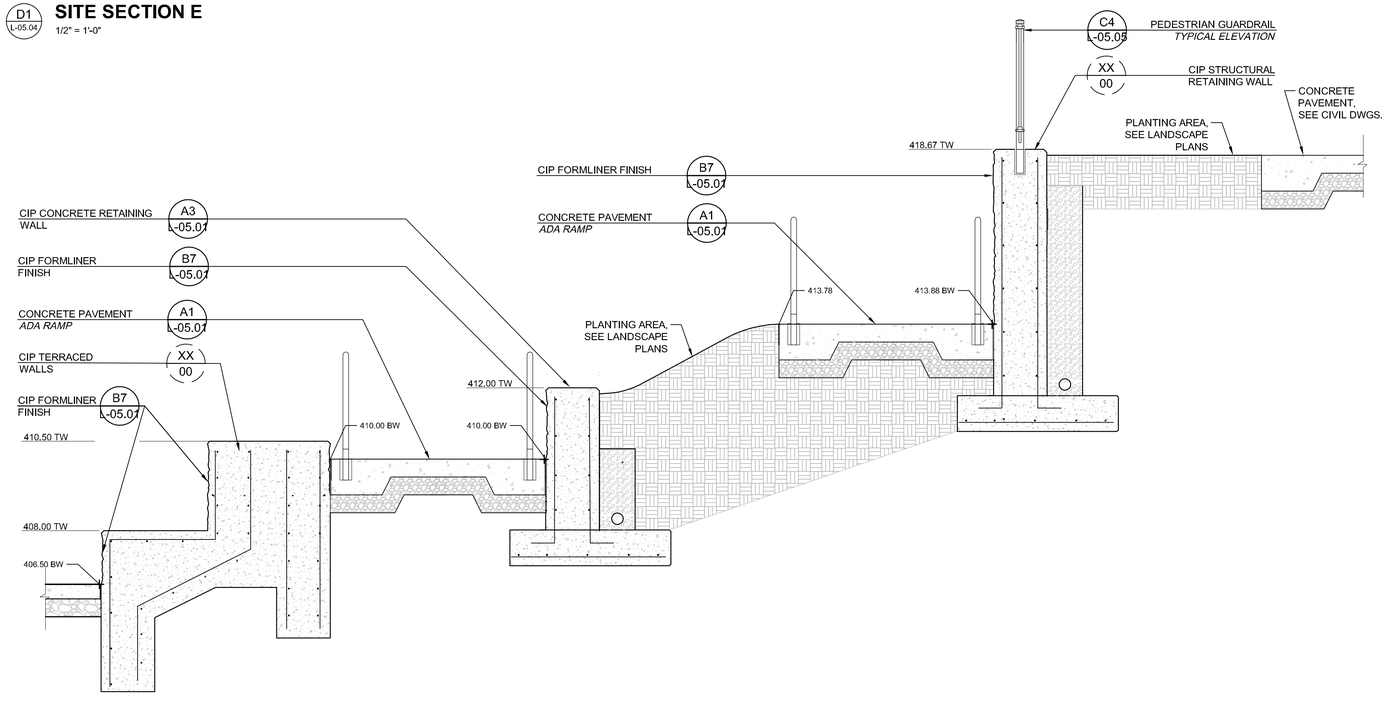
NOT FOR CONSTRUCTION



D1 L-05.04 **SITE SECTION E**
1/2" = 1'-0"



A1 L-05.04 **SITE SECTION F**
1/2" = 1'-0"

The signatures affixed below certify that this sheet has been reviewed and approved solely per the certifications signed to the cover sheet of these construction plans.

PW - Transportation	Date	WR - Stormwater	Date
Building Inspections	Date	Planning	Date
WR - Utility Engineering	Date	Planning - Transportation	Date
Electric	Date	Fire	Date
WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

NOT FOR CONSTRUCTION

H12/Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
111 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

Architect and Landscape Architect
RATIO
227 Fayetteville Street, Suite 301
Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
5430 Wade Park Blvd #400
Raleigh, North Carolina 27607
(919) 832-5587

Mechanical / Electrical / Plumbing Engineer
The Wooten Company
120 North Boylan Avenue
Raleigh, North Carolina 27603
(919) 828-0531

Civil Engineer and Landscape Architect
CLH Design PA
400 Regency Forest Drive, Suite 120
Cary, North Carolina 27518
(919) 319-6716

N **KEY PLAN**

SEAL | DATE 03/26/21

SHEET ISSUE

01	60% CONSTRUCTION DOCUMENTS	03/26/21
02	TOA MAJOR SITE PLAN SUBMITTAL #4	03/26/21

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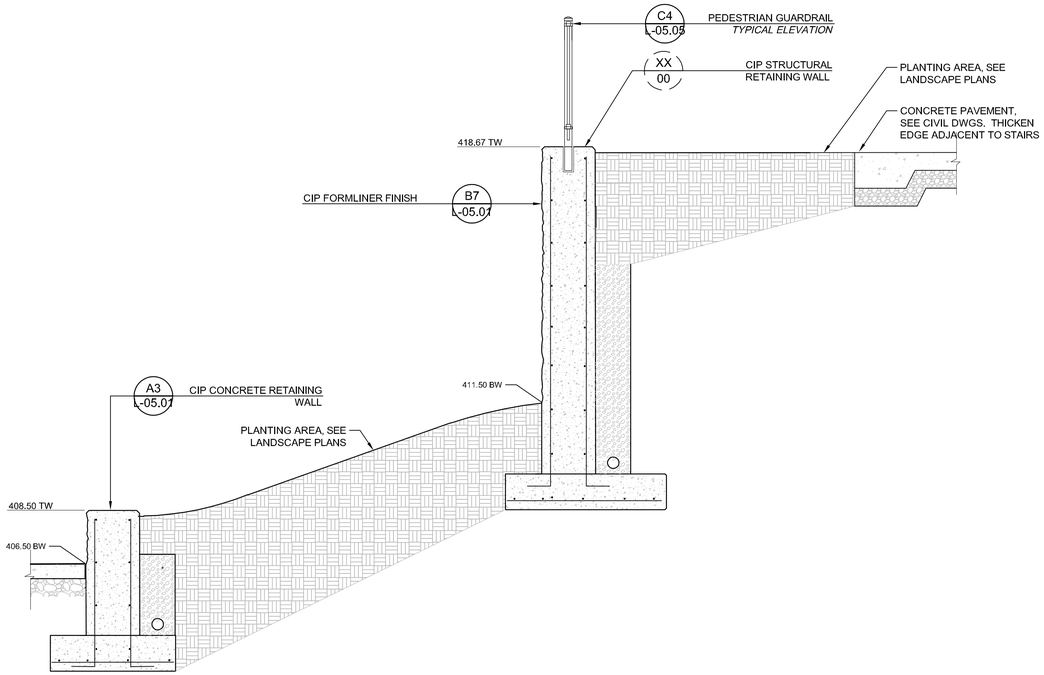
PROJECT NO. 19150.000

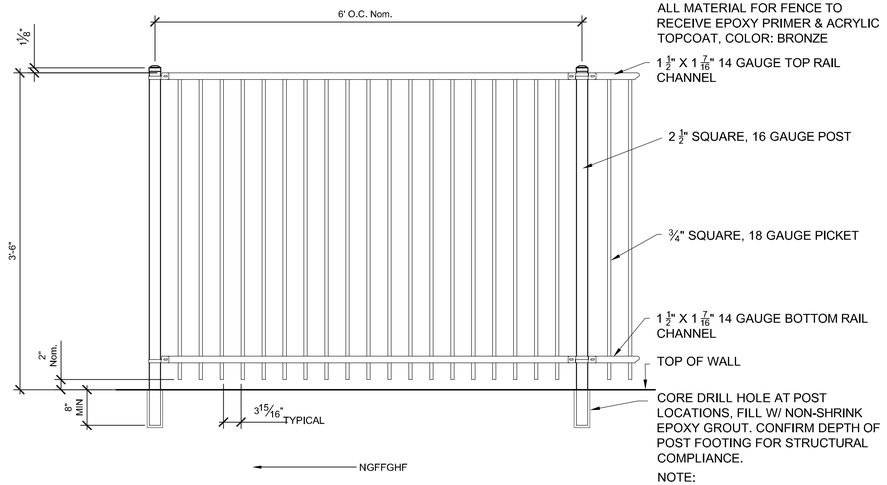
SHEET TITLE
SITE DETAILS

SHEET NUMBER
L-05.04



C1 L-05.05 **SITE SECTION A**

1/2" = 1'-0"



NOTE:
ALL MATERIAL FOR FENCE TO RECEIVE EPOXY PRIMER & ACRYLIC TOPCOAT, COLOR: BRONZE

1 ½" X 1 7/16" 14 GAUGE TOP RAIL CHANNEL

2 ½" SQUARE, 16 GAUGE POST

¾" SQUARE, 18 GAUGE PICKET

1 ½" X 1 7/16" 14 GAUGE BOTTOM RAIL CHANNEL

TOP OF WALL

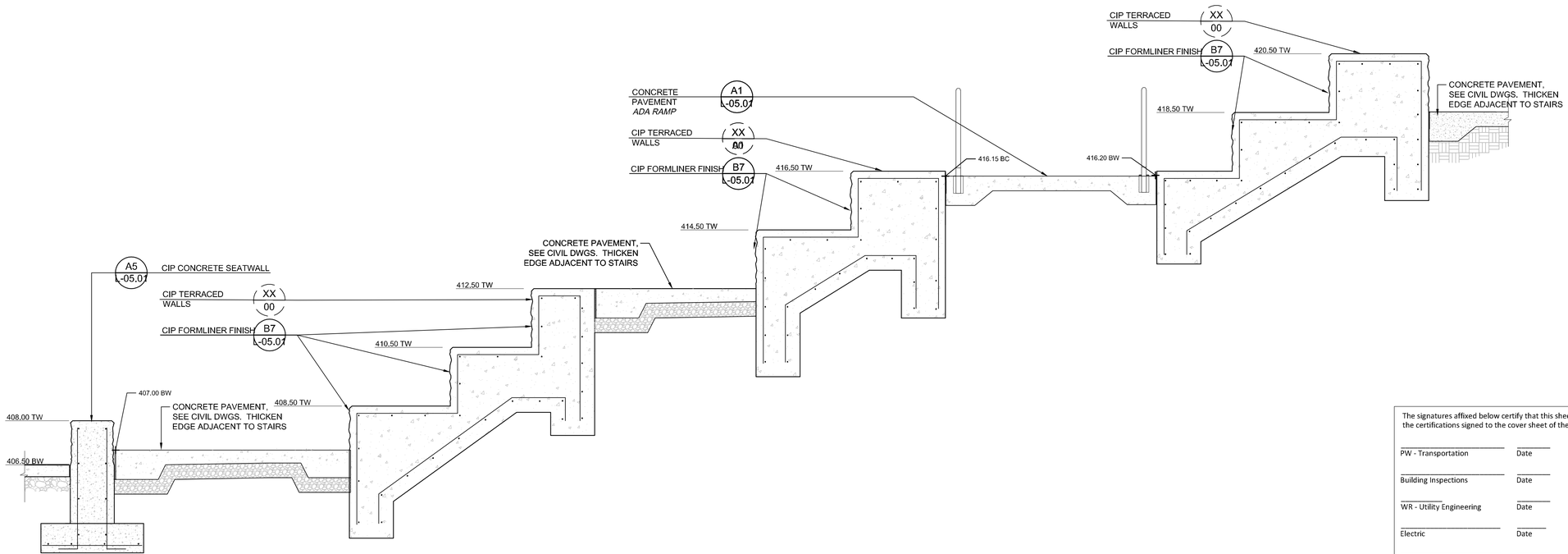
CORE DRILL HOLE AT POST LOCATIONS, FILL W/ NON-SHRINK EPOXY GROUT. CONFIRM DEPTH OF POST FOOTING FOR STRUCTURAL COMPLIANCE.

NOTE:
BASIS OF DESIGN TO BE 6' HEIGHT 'ECHELON PLUS' STEEL PICKET FENCE - "MAJESTIC" MODEL AS MANUFACTURED BY AMERISTAR FENCE PRODUCTS, 872 INDUSTRIAL DR. ELMHURST, IL 60126, 888.333.3422. CONTRACTOR HAS OPTION OF PROVIDING COMPARABLE PRODUCT.

C4 L-05.05 **PEDESTRIAN GUARDRAIL | TYPICAL ELEVATION**

3/4" = 1'-0"

P-H12-22



A1 L-05.05 **SITE SECTION C - ADD ALTERNATE**

1/2" = 1'-0"

P-H12-29

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N **KEY PLAN**

SEAL | DATE 03/26/21

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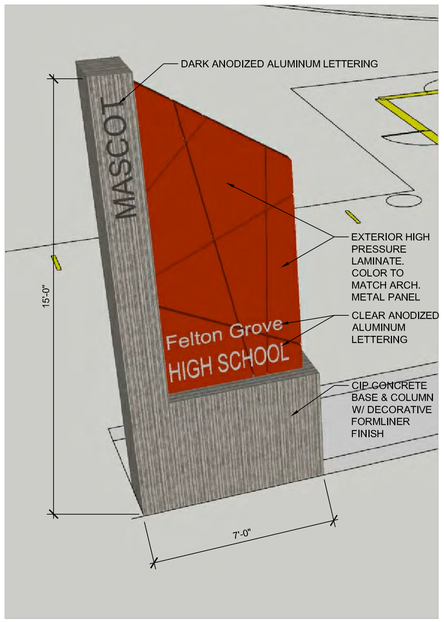
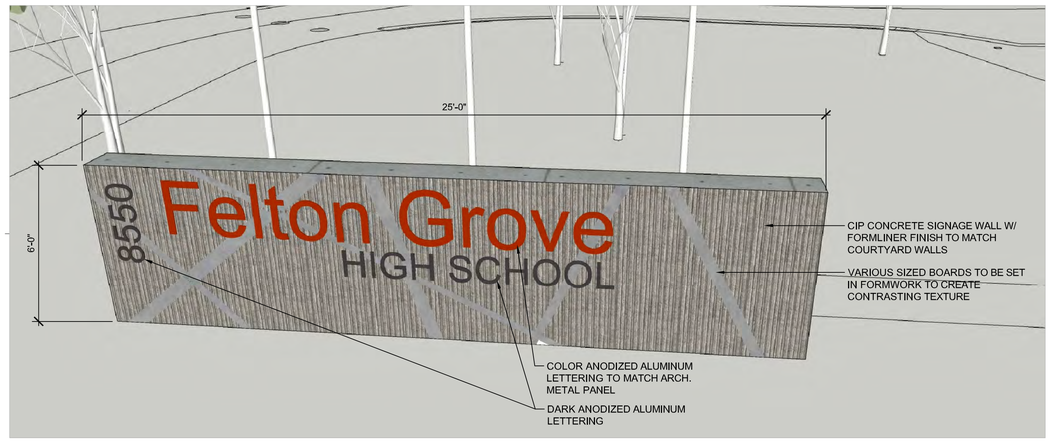
PROJECT NO. 19150.000

SHEET TITLE
SITE DETAILS

SHEET NUMBER
L-05.05



C1 L-05.06 **STADIUM SIGNAGE COLUMN | ADD ALTERNATE**
3/8" = 1'-0" * TO BE PERMITTED SEPARATELY P-H12-33



A1 L-05.06 **MONUMENT SIGN** * TO BE PERMITTED SEPARATELY
3/8" = 1'-0" P-H12-31

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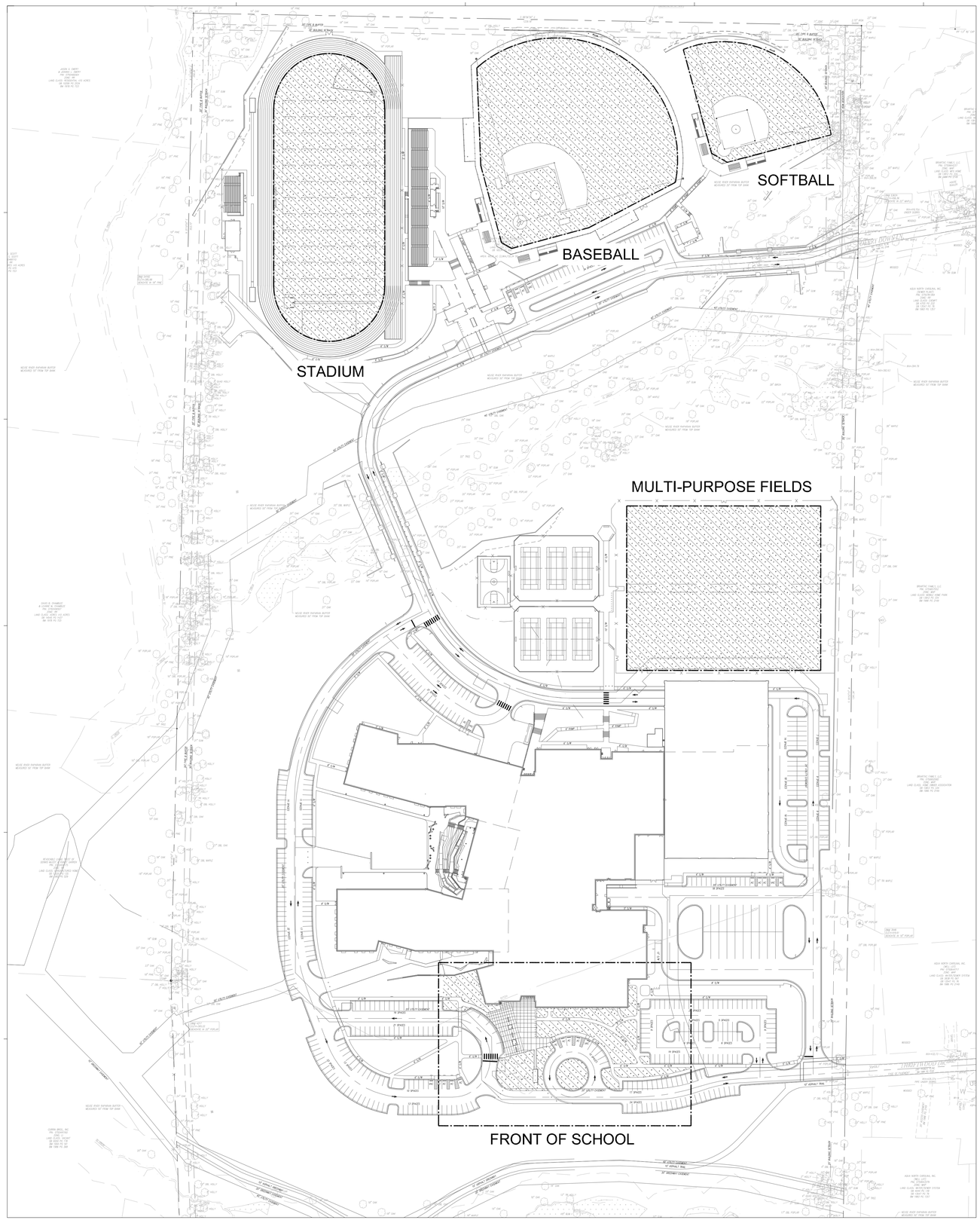
SITE DETAILS

SHEET NUMBER
L-05.06



IRRIGATION LEGEND

CONCEPT PLANT SCHEDULE

IRRIGATION AREAS
AREAS TO RECEIVE FULLY AUTOMATED IRRIGATION SYSTEM. SEE SECTION 328400 - PLANTING IRRIGATION FOR DELEGATED DESIGN AND SYSTEM REQUIREMENTS

-

1 L-06.01 IRRIGATION PLAN DIAGRAM

1"=100'-0" 0 50' 100' 200'

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Building Inspections	Date	Planning	Date
WR - Utility Engineering	Date	Planning - Transportation	Date
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WR - S&E	Date	Parks, Recreation & Cultural Res.	Date

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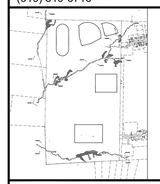

N

KEY PLAN

SEAL | DATE 03/26/21

SHEET ISSUE

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PROJECT NO. 19150.000

SHEET TITLE
IRRIGATION PLAN DIAGRAM

SHEET NUMBER
L-06.01

DUKE ENERGY. PROGRESS

Outdoor Lighting

Roadway LED

light distribution pattern

Light source: LED *(white)*
Lumens: 4,807 – 25,050 *(fixture dependent)*

Wattage	Light Pattern	IESNA Backlight-Uplight – Glare (BUG) Rating
LED 50	IESNA Type III *(medium oval)*	B1-U0-G1
LED 75	IESNA Type II *(long oval)*	B1-U0-G2
LED 105	IESNA Type II *(long oval)*	B2-U0-G3
LED 150	IESNA Type III *(medium oval)*	B2-U0-G2
LED 215	IESNA Type III *(medium oval)*	B3-U0-G3
LED 280	IESNA Type III *(medium oval)*	B3-U0-G4

Color temperature: 4,000K
Warm-up and restrike time: Instant on *(no warm-up or restrike time)*

Poles available:

Name	*Mounting height*	*Color*
Fiberglass	25', 30', 35'	Gray
Fiberglass	25', 30', 35'	Black *(additional cost)*
Wood	25', 30', 35'	Standard
Metal *(special conditions)**	25', 30', 35'	Gray

Features	Benefits
Little or no installation cost	Frees up capital for other projects
Design services by lighting professionals included	Meets industry standards and lighting ordinances
Maintenance included	Eliminates high and unexpected repair bills
Electricity included	Less expensive than metered service
Warranty included	Worry-free
One low monthly cost on your electric bill	Convenience and savings for you
Turnkey operation	Provides hassle-free installation and service
Backed by over 40 years of experience	A name you can trust today ... and tomorrow

**2' raised foundation available when required.*

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DUKE ENERGY. PROGRESS

Outdoor Lighting

Roadway LED

The Roadway LED is a green solution and great fit for streets, roads, long, narrow areas and parking lots. This energy-efficient luminaire delivers the light where it is needed while increasing visibility and reducing spill light to adjoining properties. Choose low to medium light output on wood or fiberglass poles (or mount on an existing pole). Available with one to four fixtures per pole, depending on the fixture/pole combination selected.

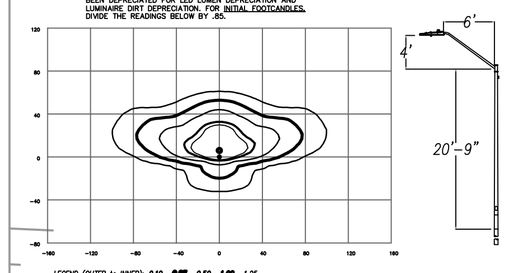
LED *(Light Emitting Diode)*	50 | 75 | 105 | 150 | 215 | 280 watts
Mounting heights	25', 30', 35'
Color	Gray, Black
Poles	Fiberglass Metal *(special conditions)* Wood

For additional information, visit us at duke-energy.com/OutdoorLighting or call us toll free at 866.769.6417.

ISOFOOTCANDLE CURVES

FIXTURE: LED 70w Roadway
MOUNTING HEIGHT: 25 FT
LIGHT SOURCE: 20 LED'S, 4000K, 70 CRI
LUMENS = 8506
PATTERN: TYPE II, B2-U0-G2(zero light clt or above 90 degrees)
NOTE: THE FOOTCANDLE READINGS BELOW ARE MAINTAINED AND HAVE BEEN DEPRECIATED FOR LED LUMEN DEPRECIATION AND LUMINAIRE DIRT DEPRECIATION FOR INITIAL FOOTCANDLES.
DIVIDE THE READINGS BELOW BY .85.

ASSY# LFIX-RW-LED-70-BLK-II-MULTIV-____-P
POLE ASSY# LPOLE-DB-FG-25FT-BLK-____-P (BLACK)

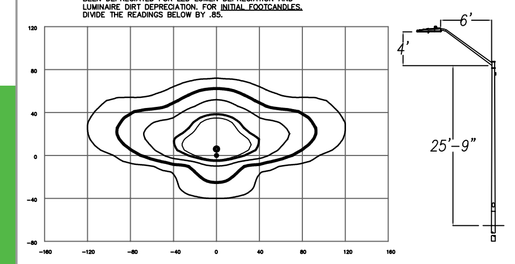


LEGEND (OUTER to INNER): 0.10 , 0.50 , 1.00 , 1.25

ISOFOOTCANDLE CURVES

FIXTURE: LED 110w Roadway
MOUNTING HEIGHT: 30 FT
LIGHT SOURCE: 30 LED'S, 4000K, 70 CRI
LUMENS = 12414
PATTERN: TYPE II, B2-U0-G3(zero light clt or above 90 degrees)
NOTE: THE FOOTCANDLE READINGS BELOW ARE MAINTAINED AND HAVE BEEN DEPRECIATED FOR LED LUMEN DEPRECIATION AND LUMINAIRE DIRT DEPRECIATION FOR INITIAL FOOTCANDLES.
DIVIDE THE READINGS BELOW BY .85.

ASSY# LFIX-RW-LED-105-BLK-II-MULTIV-____-P
POLE ASSY# LPOLE-DB-FG-30FT-BLK-____-P (BLACK)

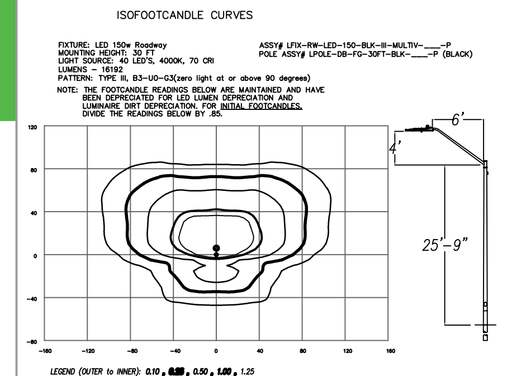


LEGEND (OUTER to INNER): 0.10 , 0.50 , 1.00 , 1.25

ISOFOOTCANDLE CURVES

FIXTURE: LED 150w Roadway
MOUNTING HEIGHT: 30 FT
LIGHT SOURCE: 40 LED'S, 4000K, 70 CRI
LUMENS = 16192
PATTERN: TYPE III, B3-U0-G3(zero light clt or above 90 degrees)
NOTE: THE FOOTCANDLE READINGS BELOW ARE MAINTAINED AND HAVE BEEN DEPRECIATED FOR LED LUMEN DEPRECIATION AND LUMINAIRE DIRT DEPRECIATION FOR INITIAL FOOTCANDLES.
DIVIDE THE READINGS BELOW BY .85.

ASSY# LFIX-RW-LED-150-BLK-III-MULTIV-____-P
POLE ASSY# LPOLE-DB-FG-30FT-BLK-____-P (BLACK)

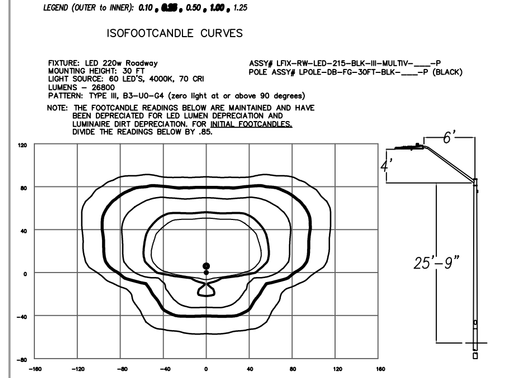


LEGEND (OUTER to INNER): 0.10 , 0.50 , 1.00 , 1.25

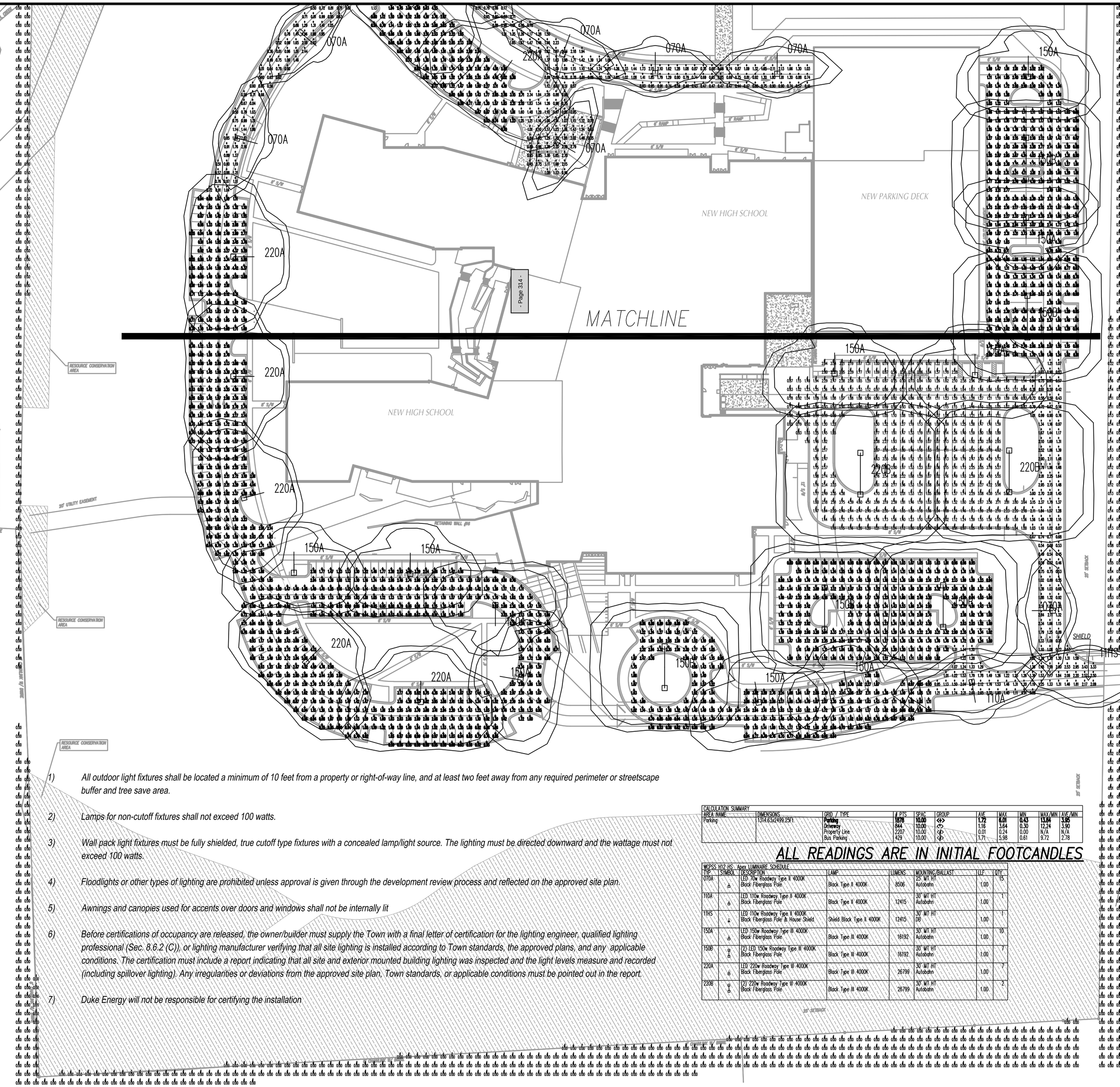
ISOFOOTCANDLE CURVES

FIXTURE: LED 220w Roadway
MOUNTING HEIGHT: 30 FT
LIGHT SOURCE: 60 LED'S, 4000K, 70 CRI
LUMENS = 26800
PATTERN: TYPE III, B3-U0-G4 (zero light clt or above 90 degrees)
NOTE: THE FOOTCANDLE READINGS BELOW ARE MAINTAINED AND HAVE BEEN DEPRECIATED FOR LED LUMEN DEPRECIATION AND LUMINAIRE DIRT DEPRECIATION FOR INITIAL FOOTCANDLES.
DIVIDE THE READINGS BELOW BY .85.

ASSY# LFIX-RW-LED-215-BLK-III-MULTIV-____-P
POLE ASSY# LPOLE-DB-FG-30FT-BLK-____-P (BLACK)



LEGEND (OUTER to INNER): 0.10 , 0.50 , 1.00 , 1.25



1) *All outdoor light fixtures shall be located a minimum of 10 feet from a property or right-of-way line, and at least two feet away from any required perimeter or streetscape buffer and tree save area.*

2) *Lamps for non-cutoff fixtures shall not exceed 100 watts.*

3) *Wall pack light fixtures must be fully shielded, true cutoff type fixtures with a concealed lamp/light source. The lighting must be directed downward and the wattage must not exceed 100 watts.*

4) *Floodlights or other types of lighting are prohibited unless approval is given through the development review process and reflected on the approved site plan.*

5) *Awnings and canopies used for accents over doors and windows shall not be internally lit*

6) *Before certifications of occupancy are released, the owner/builder must supply the Town with a final letter of certification for the lighting engineer, qualified lighting professional (Sec. 8.6.2 (C)), or lighting manufacturer verifying that all site lighting is installed according to Town standards, the approved plans, and any applicable conditions. The certification must include a report indicating that all site and exterior mounted building lighting was inspected and the light levels measure and recorded (including spillover lighting). Any irregularities or deviations from the approved site plan, Town standards, or applicable conditions must be pointed out in the report.*

7) *Duke Energy will not be responsible for certifying the installation*

CALCULATION SUMMARY

AREA NAME	DIMENSIONS	PRIV / TYPE	# PTS	SPACE	GROUP	AVE	MAX	MIN	MAX/MIN	AVE/MIN
Parking	1314.6SQ.FPR.25FT	Parking	1078	10.00	<>	1.72	6.09	0.45	13.54	3.82
		Driveway	944	10.00	<>	1.16	3.64	0.30	12.24	3.90
		Property Line	2207	10.00	<>	0.01	0.24	0.00	N/A	N/A
		Bus Parking	429	10.00	<>	1.71	5.98	0.61	9.72	2.78

ALL READINGS ARE IN INITIAL FOOTCANDLES

MCPSS H12 HS Apex LUMINAIRE SCHEDULE

TYP	SYMBOL	DESCRIPTION	LAMP	LUMENS	MOUNTING/BALLAST	LLF	QTY.
070A	a	LED 70w Roadway Type II 4000K Black Fiberglass Pole	Black Type II 4000K	8506	25' MT HT Autobahn	1.00	15
110A	a	LED 110w Roadway Type II 4000K Black Fiberglass Pole	Black Type II 4000K	12415	30' MT HT Autobahn	1.00	1
110S	L	LED 110w Roadway Type II 4000K Black Fiberglass Pole & House Shield	Shield Black Type II 4000K	12415	30' MT HT DB	1.00	1
150A	a	LED 150w Roadway Type III 4000K Black Fiberglass Pole	Black Type III 4000K	16192	30' MT HT Autobahn	1.00	10
150B	a b	(2) LED 150w Roadway Type III 4000K Black Fiberglass Pole	Black Type III 4000K	16192	30' MT HT Autobahn	1.00	7
220A	a	LED 220w Roadway Type III 4000K Black Fiberglass Pole	Black Type III 4000K	26799	30' MT HT Autobahn	1.00	7
220B	a b	(2) 220w Roadway Type III 4000K Black Fiberglass Pole	Black Type III 4000K	26799	30' MT HT Autobahn	1.00	2

LIGHTING DESIGN TOLERANCE

The calculated footcandle light levels in this lighting design are predicted values and are based on specific information that has been supplied to Duke Energy Progress. Any inaccuracies in the supplied information, differences in luminaire installation, lighted area geometry including elevation differences, reflective properties of surrounding surfaces, obstructions (foliage or otherwise) in the lighted area, or lighting from sources other than listed in this design may produce different results from the predicted values. Normal tolerances of voltage, lamp output, and ballast and luminaire manufacture will also affect results.

Customer approval_____ Date_____

DISTANCE CALIBRATION (INCHES)

0 0.5 1.0 2.0 3.0 4.0

DUKE ENERGY® PROGRESS

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H12 High School
Apex, NC
SITE LIGHTING PLAN

Designed by DEP LIGHTING SOLUTIONS
Reviewed by G. Sterken Scale 1" = 60'
Date 03/04/2021 Size "Arch D"
Description LED 70w, 110w, 150w & 220w Roadway
Drawing No. 20-0390C Sht. 2 OF 2

DUKE ENERGY. PROGRESS

Outdoor Lighting

Roadway LED

light distribution pattern

Light source: LED *(white)*
Lumens: 4,807 – 25,050 *(fixture dependent)*

Wattage	Light Pattern	IESNA Backlight-Uplight – Glare (BUG) Rating
LED 50	IESNA Type III *(medium oval)*	B1-U0-G1
LED 75	IESNA Type II *(long oval)*	B1-U0-G2
LED 105	IESNA Type II *(long oval)*	B2-U0-G3
LED 150	IESNA Type III *(medium oval)*	B2-U0-G2
LED 215	IESNA Type III *(medium oval)*	B3-U0-G3
LED 280	IESNA Type III *(medium oval)*	B3-U0-G4

Color temperature: 4,000K
Warm-up and restrike time: Instant on *(no warm-up or restrike time)*

Poles available:

Name	*Mounting height*	*Color*
Fiberglass	25', 30', 35'	Gray
Fiberglass	25', 30', 35'	Black *(additional cost)*
Wood	25', 30', 35'	Standard
Metal *(special conditions)**	25', 30', 35'	Gray

Features	Benefits
Little or no installation cost	Frees up capital for other projects
Design services by lighting professionals included	Meets industry standards and lighting ordinances
Maintenance included	Eliminates high and unexpected repair bills
Electricity included	Less expensive than metered service
Warranty included	Worry-free
One low monthly cost on your electric bill	Convenience and savings for you
Turnkey operation	Provides hassle-free installation and service
Backed by over 40 years of experience	A name you can trust today ... and tomorrow

**2' raised foundation available when required.*

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Outdoor Lighting

Roadway LED

The Roadway LED is a green solution and great fit for streets, roads, long, narrow areas and parking lots. This energy-efficient luminaire delivers the light where it is needed while increasing visibility and reducing spill light to adjoining properties. Choose low to medium light output on wood or fiberglass poles (or mount on an existing pole). Available with one to four fixtures per pole, depending on the fixture/pole combination selected.

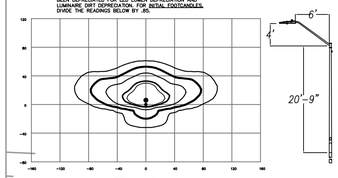
LED *(Light Emitting Diode)*	50 | 75 | 105 | 150 | 215 | 280 watts
Mounting heights	25', 30', 35'
Color	Gray, Black
Poles	Fiberglass Metal *(special conditions)* Wood

For additional information, visit us at **duke-energy.com/OutdoorLighting** or call us toll free at **866.769.6417**.

ISOFOOTCANDLE CURVES

FIXTURE: LED 70w Roadway
MOUNTING HEIGHT: 25 FT
LIGHT SOURCE: 20 LED'S, 4000K, 70 CRI
LUMENS = 8506
PATTERN: TYPE II, B2-U0-G2(zero light clt or above 90 degrees)
NOTE: THE FOOTCANDLE READINGS BELOW ARE MAINTAINED AND HAVE BEEN DEPRECIATED FOR LED LUMEN DEPRECIATION AND LUMINAIRE DIRT DEPRECIATION. FOR INITIAL FOOTCANDLES, DIVIDE THE READINGS BELOW BY .85.

ASSY# LFIX-RW-LED-70-BLK-II-MULTIV-____-P
POLE ASSY# LPOLE-DB-FG-25FT-BLK-____-P (BLACK)

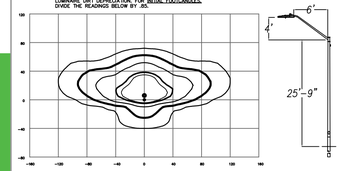


LEGEND (OUTER to INNER): 0.10 , 0.25 , 0.50 , 1.00 , 1.25

ISOFOOTCANDLE CURVES

FIXTURE: LED 110w Roadway
MOUNTING HEIGHT: 30 FT
LIGHT SOURCE: 30 LED'S, 4000K, 70 CRI
LUMENS = 12414
PATTERN: TYPE II, B2-U0-G3(zero light clt or above 90 degrees)
NOTE: THE FOOTCANDLE READINGS BELOW ARE MAINTAINED AND HAVE BEEN DEPRECIATED FOR LED LUMEN DEPRECIATION AND LUMINAIRE DIRT DEPRECIATION. FOR INITIAL FOOTCANDLES, DIVIDE THE READINGS BELOW BY .85.

ASSY# LFIX-RW-LED-105-BLK-II-MULTIV-____-P
POLE ASSY# LPOLE-DB-FG-30FT-BLK-____-P (BLACK)

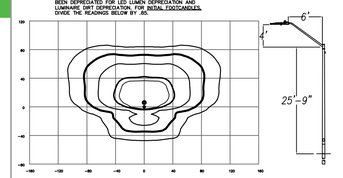


LEGEND (OUTER to INNER): 0.10 , 0.25 , 0.50 , 1.00 , 1.25

ISOFOOTCANDLE CURVES

FIXTURE: LED 150w Roadway
MOUNTING HEIGHT: 30 FT
LIGHT SOURCE: 40 LED'S, 4000K, 70 CRI
LUMENS = 18192
PATTERN: TYPE III, B2-U0-G2(zero light clt or above 90 degrees)
NOTE: THE FOOTCANDLE READINGS BELOW ARE MAINTAINED AND HAVE BEEN DEPRECIATED FOR LED LUMEN DEPRECIATION AND LUMINAIRE DIRT DEPRECIATION. FOR INITIAL FOOTCANDLES, DIVIDE THE READINGS BELOW BY .85.

ASSY# LFIX-RW-LED-150-BLK-III-MULTIV-____-P
POLE ASSY# LPOLE-DB-FG-30FT-BLK-____-P (BLACK)

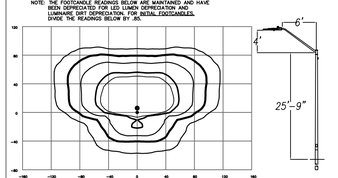


LEGEND (OUTER to INNER): 0.10 , 0.25 , 0.50 , 1.00 , 1.25

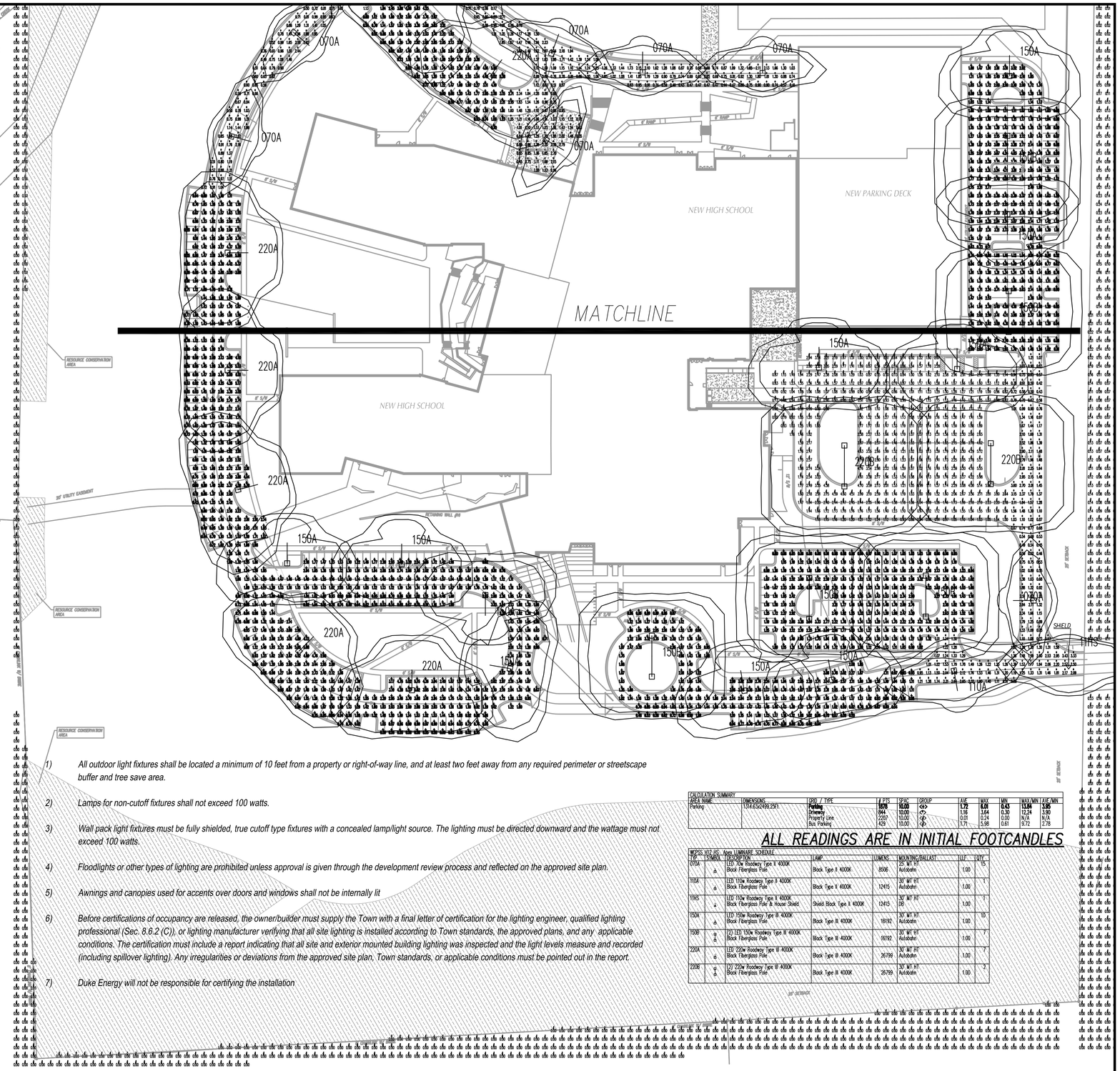
ISOFOOTCANDLE CURVES

FIXTURE: LED 220w Roadway
MOUNTING HEIGHT: 30 FT
LIGHT SOURCE: 60 LED'S, 4000K, 70 CRI
LUMENS = 26809
PATTERN: TYPE III, B3-U0-G4 (zero light clt or above 90 degrees)
NOTE: THE FOOTCANDLE READINGS BELOW ARE MAINTAINED AND HAVE BEEN DEPRECIATED FOR LED LUMEN DEPRECIATION AND LUMINAIRE DIRT DEPRECIATION. FOR INITIAL FOOTCANDLES, DIVIDE THE READINGS BELOW BY .85.

ASSY# LFIX-RW-LED-215-BLK-III-MULTIV-____-P
POLE ASSY# LPOLE-DB-FG-30FT-BLK-____-P (BLACK)



LEGEND (OUTER to INNER): 0.10 , 0.25 , 0.50 , 1.00 , 1.25



1) *All outdoor light fixtures shall be located a minimum of 10 feet from a property or right-of-way line, and at least two feet away from any required perimeter or streetscape buffer and tree save area.*

2) *Lamps for non-cutoff fixtures shall not exceed 100 watts.*

3) *Wall pack light fixtures must be fully shielded, true cutoff type fixtures with a concealed lamp/light source. The lighting must be directed downward and the wattage must not exceed 100 watts.*

4) *Floodlights or other types of lighting are prohibited unless approval is given through the development review process and reflected on the approved site plan.*

5) *Awnings and canopies used for accents over doors and windows shall not be internally lit*

6) *Before certifications of occupancy are released, the owner/builder must supply the Town with a final letter of certification for the lighting engineer, qualified lighting professional (Sec. 8.6.2 (C)), or lighting manufacturer verifying that all site lighting is installed according to Town standards, the approved plans, and any applicable conditions. The certification must include a report indicating that all site and exterior mounted building lighting was inspected and the light levels measure and recorded (including spillover lighting). Any irregularities or deviations from the approved site plan, Town standards, or applicable conditions must be pointed out in the report.*

7) *Duke Energy will not be responsible for certifying the installation*

CALCULATION SUMMARY

AREA NAME	DIMENSIONS	PRIV / TYPE	# PTS	SPACING	GROUP	AVE	MAX	MIN	MAX/MIN	AVE/MIN
Parking	1314.6SQ.FEET	Parking	1078	10.00	<>	1.72	6.09	0.43	13.84	3.95
		Driveway	944	10.00	<>	1.16	3.64	0.30	12.24	3.90
		Property Line	2207	10.00	<>	0.01	0.24	0.00	N/A	N/A
		Bus Parking	429	10.00	<>	1.71	5.98	0.61	9.72	2.78

ALL READINGS ARE IN INITIAL FOOTCANDLES

MCPSS H12 HS Apex LUMINAIRE SCHEDULE

TYP	SYMBOL	DESCRIPTION	LAMP	LUMENS	MOUNTING/BALLAST	LLF	QTY.
070A		LED 70w Roadway Type II 4000K Black Fiberglass Pole	Black Type II 4000K	8506	25' MT HT Autobahn	1.00	15
110A		LED 110w Roadway Type II 4000K Black Fiberglass Pole	Black Type II 4000K	12415	30' MT HT Autobahn	1.00	1
110HS		LED 110w Roadway Type II 4000K Black Fiberglass Pole & House Shield	Shield Black Type II 4000K	12415	30' MT HT DB	1.00	1
150A		LED 150w Roadway Type III 4000K Black Fiberglass Pole	Black Type III 4000K	18192	30' MT HT Autobahn	1.00	10
150B		(2) LED 150w Roadway Type III 4000K Black Fiberglass Pole	Black Type III 4000K	18192	30' MT HT Autobahn	1.00	7
220A		LED 220w Roadway Type III 4000K Black Fiberglass Pole	Black Type III 4000K	26799	30' MT HT Autobahn	1.00	7
220B		(2) 220w Roadway Type III 4000K Black Fiberglass Pole	Black Type III 4000K	26799	30' MT HT Autobahn	1.00	2

LIGHTING DESIGN TOLERANCE

The calculated footcandle light levels in this lighting design are predicted values and are based on specific information that has been supplied to Duke Energy Progress. Any inaccuracies in the supplied information, differences in luminaire installation, lighted area geometry including elevation differences, reflective properties of surrounding surfaces, obstructions (foliage or otherwise) in the lighted area, or lighting from sources other than listed in this design may produce different results from the predicted values. Normal tolerances of voltage, lamp output, and ballast and luminaire manufacture will also affect results.

*Customer approval*_____ *Date*_____

DISTANCE CALIBRATION (INCHES)

0 0.5 1.0 2.0 3.0 4.0

DUKE ENERGY. PROGRESS

PROPRIETARY & CONFIDENTIAL

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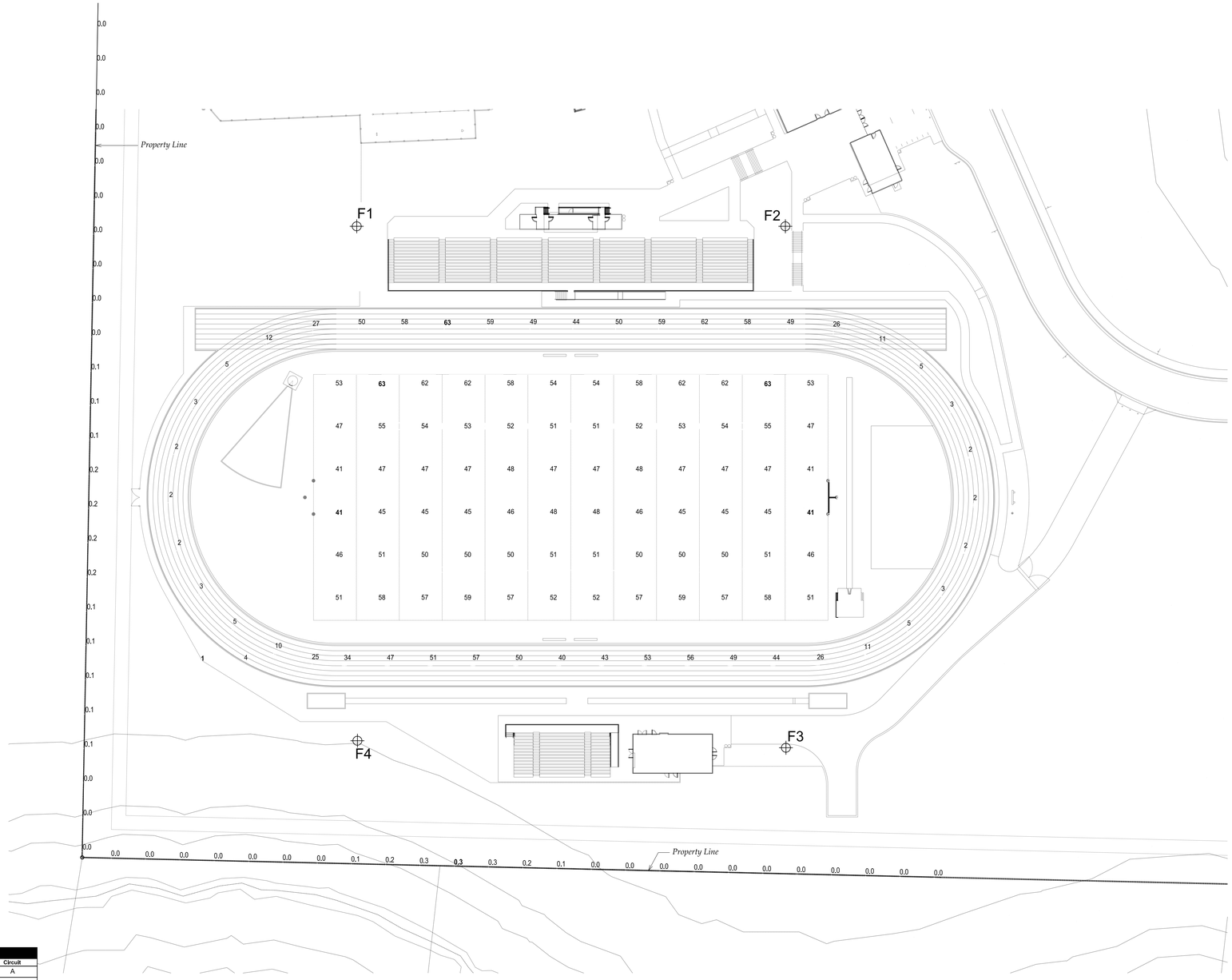
	H12 High School
	Apex, NC
	SITE LIGHTING PLAN
Designed by	DEP LIGHTING SOLUTIONS
Reviewed by	G. Sterken Scale 1" = 60'
Date	03/04/2021 Size "Arch D"
Description	LED 70w, 110w, 150w & 220w Roadway
Drawing No.	20-0390C Sht. 2 OF 2

NOTE:
CODE REQUIRED EXTERIOR EGRESS LIGHTING WILL BE PROVIDED USING FULL CUTOFF WALL PACK MOUNTED AT 9'-0" AFF AT EACH EXIT. FIXTURES SHALL BE DARK BRONZE, WITH 3000K COLOR TEMPERATURE.

DUE TO SCALE. WALL PACKS ARE NOT INCLUDED IN SITE PHOTOMETRIC PLANS. LIGHTING CONTRIBUTION:
18 FC MAX,
1.0 FC @ 17'
0.1 FC @ 30'

3 SL-01.01 BUILDING MOUNTED WALL PACK
NO SCALE

2 SL-01.01 SPORTS FIELD LIGHTS
NO SCALE



1 SL-01.01 STADIUM LIGHTING PLAN
SCALE: 1"= 40'

Lighting System

Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
F1-F2	70'	70'	11	TLC-LED-1500	15.73 kW	A
		16'	2	TLC-BT-575	1.15 kW	A
F3-F4	80'	80'	10	TLC-LED-1500	14.30 kW	A
		16'	2	TLC-BT-575	1.15 kW	A
4			***50***		***64.66 kW***	

Circuit	Description	Load	Fixture Qty
A	Football	64.66 kW	50

Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-1500	LED 5700K - 75 CRI	1430W	160,000	>120,000	>120,000	>120,000	42
TLC-BT-575	LED 5700K - 75 CRI	575W	52,000	>120,000	>120,000	>120,000	8

Light Level Summary

Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Football	Horizontal Illuminance	51,2	41	63	1,54	1,25	A	50
Track	Horizontal Illuminance	32,23	2,0	62	28,6	14,8	A	50
Property Line	Horizontal Illuminance	0,0635	0,000	0,28	-	-	A	50

H12/Felton Grove High School

8550 Stephenson Road Apex, NC 27539

Owner
Wake County Public Schools
111 Corning Road, Suite 190
Cary, North Carolina 27518
(919)588-3602

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Raleigh, North Carolina 27601
919-821-0805

Structural Engineer
LHC Structural Engineers
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Raleigh, North Carolina 27603
(919) 828-0531
License # F-0115

Civil Engineer and Landscape Architect
CLH Design PA
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(919) 319-6716

KEY PLAN

SEAL | DATE

SHEET ISSUE

1	Town of Apex Major Site Plan Submittal	12/01/20
2	Town of Apex Major Site Plan Submittal #2	2/12/21
3	Town of Apex Major Site Plan Submittal #3	3/05/21
4	Town of Apex Major Site Plan Submittal #4	3/26/21

RATIO

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PROJECT NO. 3153-W

SHEET TITLE

STADIUM LIGHTING PLAN

SHEET NUMBER

SL-01.01

FOR REFERENCE ONLY NOT FOR CONSTRUCTION

GROSS BUILDING AREA

SECOND FLOOR	94,079 SF
FIRST FLOOR	197,390 SF
GROUND FLOOR	71,603 SF
SUB TOTAL	**363,072 SF**
MECHANICAL PENTHOUSE	10,294 SF
SECOND FLOOR MECHANICAL MEZZANINE	20,582 SF
SUB TOTAL	**30,876 SF**
AUXILIARY ATHLETICS BUILDINGS	5,723 SF
GRAND TOTAL	**399,671 SF**

GENERAL PROJECT NOTES

1. THE SCREENING OF LOADING DOCKS, ROLL-OUT TRASH CONTAINERS, DUMPSTERS, OUTDOOR STORAGE, MECHANICAL AND HVAC EQUIPMENT, AND SIMILAR FACILITIES ON THE ROOF, GROUND, OR BUILDING SHALL MEET THE REQUIREMENTS OF UDO SEC. 8.2.8. SPECIFICALLY, SCREENING MUST BE DONE SO THATI
   A. IT IS INCORPORATED INTO THE OVERALL DESIGN THEME OF THE BUILDING AND LANDSCAPE.
   B, SCREENING MATERIALS ARE NOT DIFFERENT FROM OR INFERIOR TO THE PRINCIPAL MATERIALS OF THE BUILDING OR LANDSCAPE, AND ARE SIMILAR IN MATERIALS AND COLOR,
   C. SCREENED ITEMS ARE OUT OF VIEW FROM ADJACENT PROPERTIES AND PUBLIC STREETS, AND A TOTALLY OPAQUE SCREEN IS ACHIEVED.
   D. ANY GROUND-MOUNTED HVAC OR OTHER MECHANICAL OR UTILITY EQUIPMENT SIX (6) FEET TALL OR HIGHER MUST BE FENCED AND LANDSCAPED.
   E. DUMPSTER ENCLOSURES MUST MEET THE ABOVE REQUIREMENTS PLUS BE EIGHT (8) FEET TALL OR THE HEIGHT OF THE DUMPSTER, WHICHEVER IS GREATER, AND BE BUILT OF MASONRY MATERIAL WITH OPAQUE GATES. WHERE PRACTICABLE, SHRUBS OR OTHER PLANTS MUST BE PLANTED OUTSIDE THE ENCLOSURE TO VISUALLY SOFTEN THE APPEARANCE.

2. ALL OUTDOOR LIGHT FIXTURES SHALL BE LOCATED A MINIMUM OF 10 FEET FROM A PROPERTY OR RIGHT-OF-WAY LINE, AND AT LEAST TWO FEET AWAY FROM ANY REQUIRED PERIMETER OR STREETSCAPE BUFFER AND TREE SAVE AREA.

3. LAMPS FOR NON-CUTOFF LIGHT FIXTURES SHALL NOT EXCEED 100 WATTS.

4. WALL PACK LIGHT FIXTURES MUST BE FULLY SHIELDED, TRUE CUTOFF TYPE FIXTURES WITH A CONCEALED LAMP/LIGHT SOURCE. THE LIGHTING MUST BE DIRECTED DOWNWARD AND THE WATTAGE MUST NOT EXCEED 100 WATTS.

5. FLOODLIGHTS OR OTHER TYPES OF LIGHTING ARE PROHIBITED UNLESS APPROVAL IS GIVEN THROUGH THE DEVELOPMENT REVIEW PROCESS AND REFLECTED ON THE APPROVED SITE PLAN.

6. AWNINGS AND CANOPIES USED FOR ACCENTS OVER DOORS AND WINDOWS SHALL NOT BE INTERNALLY LIT.

7. BEFORE CERTIFICATES OF OCCUPANCY ARE RELEASED, THE OWNER/BUILDER MUST SUPPLY THE TOWN WITH A FINAL LETTER OF CERTIFICATION FROM THE LIGHTING ENGINEER AND/OR LIGHTING MANUFACTURER VERIFYING THAT ALL SITE LIGHTING IS INSTALLED ACCORDING TO TOWN STANDARDS, THE APPROVED PLANS, AND ANY APPLICABLE CONDITIONS.

8. ARCHITECTURAL CONSTRUCTION PLANS MUST ADHERE TO THE APPROVED SITE PLANS. ANY PROPOSED CHANGES MUST BE SUBMITED TO THE PLANNING DEPARTMENT FOR APPROVAL.

Felton Grove High School (H12)

8550 Stephenson Road
Apex, NC 27539

Owner
Wake County Public Schools
111 Corning Road, Ste 190
Cary, NC 27518
919-588-3602

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SEAL | DATE 3/5/21

SHEET ISSUE

1	Town of Apex Major Site Plan Submittal #1	12/1/20
2	Town of Apex Major Site Plan Submittal #2	2/12/21
3	Town of Apex Major Site Plan Submittal #3	3/5/21

RATIO

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PROJECT NO. 19150.000

SHEET TITLE
GENERAL PROJECT INFORMATION

SHEET NUMBER
A-01.00.

NOT FOR CONSTRUCTION

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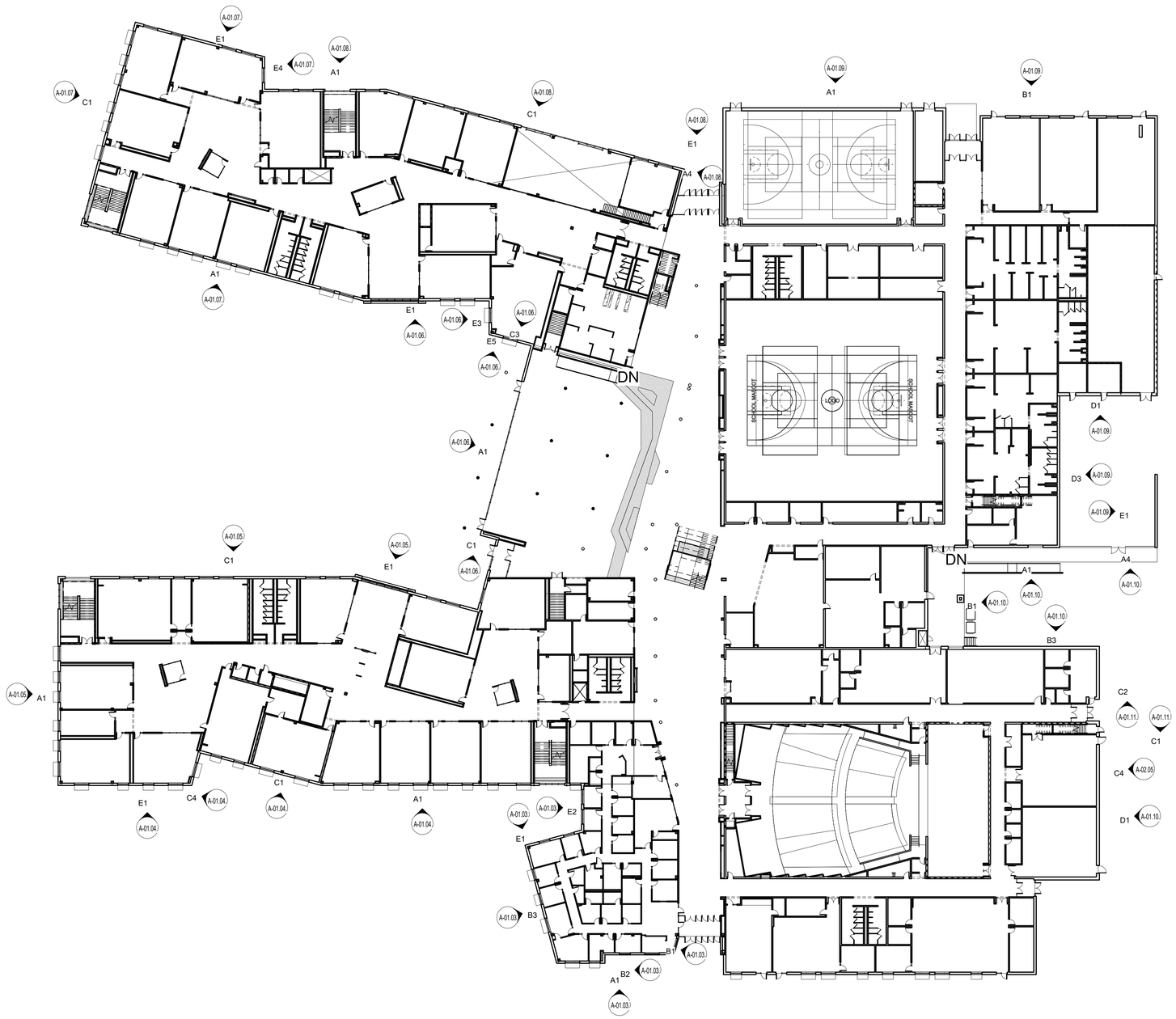

A1 / A-01.01 **OVERALL FIRST FLOOR PLAN**
1/32" = 1'-0"

0' 16' 32' 64' 128'

NOT FOR CONSTRUCTION

Felton Grove High School (H12)

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Apex, NC 27539

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SEAL | DATE 3/5/21

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PROJECT NO. 19150.000

SHEET TITLE
FLOOR PLAN

SHEET NUMBER
A-01.01.

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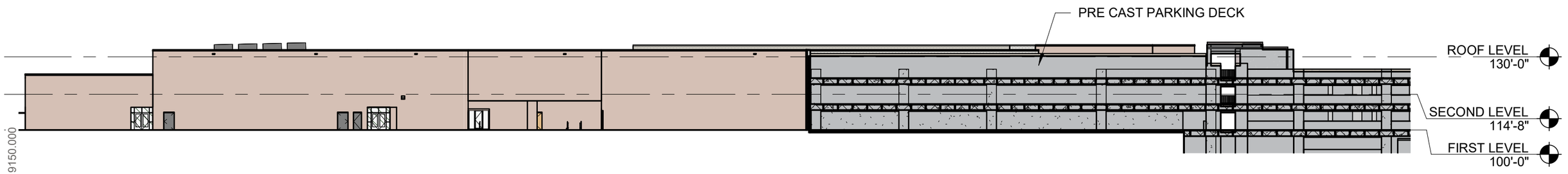
NORTH



EAST

19150.000

[4/1/2021 2:52:47 PM

RATIO

2021-04-01

1" = 40'-0"

TERIOR ELEVATIONS **Felton Grove High School**

WEST

SOUTH

19150.000

4/1/2021 2:52:50 PM

RATIO

2021-04-01

1" = 40'-0"

TERIOR ELEVATIONS **Felton Grove High School**

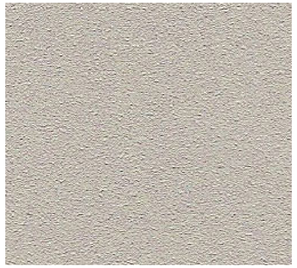
H12 - FELTON GROVE HIGH SCHOOL - MAIN BUILDING

FACE BRICK

FACE BRICK A
TAYLOR CLAY PRODUCTS #323 GRAY MODULAR WIRECUT

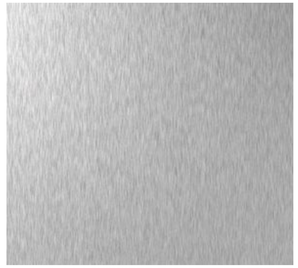
FACE BRICK B
BLEND- TAYLOR CLAY PRODUCTS #369 & #371 AUTUMN BLEND WIRECUT

MECHANICAL PENTHOUSE ENCLOSURE



DRIVIT LIMESTONE FINISH 131 GULL GRAY

ALUMINUM CURTAIN WALL & STOREFRONT



KAWNEER CLEAR ANODIZED ALUMINUM
CURTAIN WALL & STOREFRONT FINISH

METAL COPING

TO MATCH FACE BRICK A

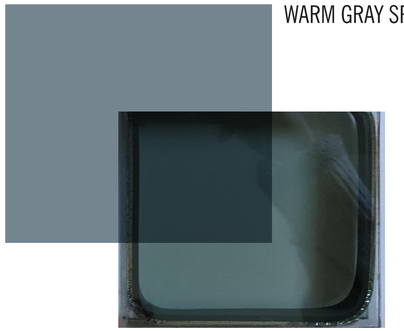
METAL PANEL

LIGHT GRAY

ORANGE

**COLOR TO BE DETERIMINED BY MANUFACTURER CHOSEN AVAILABILITY.
COLOR TO BE LIGHT GRAY OR ORANGE.

EXTERIOR GLAZING

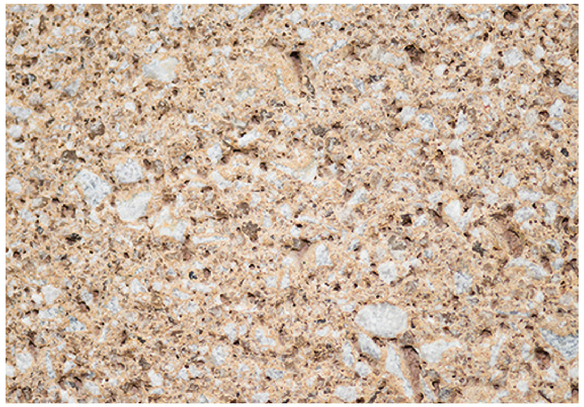


WARM GRAY SPANDREL

EXTERIOR GLAZING: GUARDIAN GLASS
SNX 62/27(#2) ON CLEAR 6MM

H12 - FELTON GROVE HIGH SCHOOL - AUXILIARY ATHLETICS

GROUND FACE BLOCK

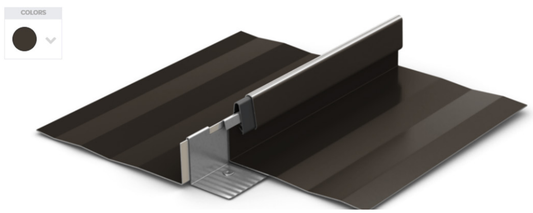


GROUND FACE BLOCK
JOHNSON CONCRETE PRODUCTS JCL-3063 SHORELINE SAND

CEMENTITIOUS SIDING

HARDIEPANEL HZ10 TEXTURE AND
VERTICAL SEAMS: SMOOTH, BOARD AND
BATTEN, RICH EXPRESSO

STANDING SEAM METAL ROOF

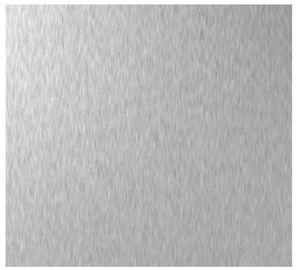


BERRIDGE HIGH SEAM TEE PANEL
DARK BRONZE

DOWNSPOUT & GUTTER

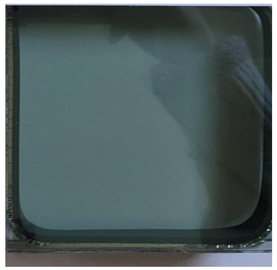
TO MATCH STANDING SEAM METAL ROOF

ALUMINUM CANOPIES & STOREFRONT



KAWNEER CLEAR ANODIZED ALUMINUM

EXTERIOR GLAZING



EXTERIOR GLAZING: GUARDIAN GLASS
SNX 62/27(#2) ON CLEAR 6MM

NOTE: ALL MATERIALS ARE BASIS OF DESIGN

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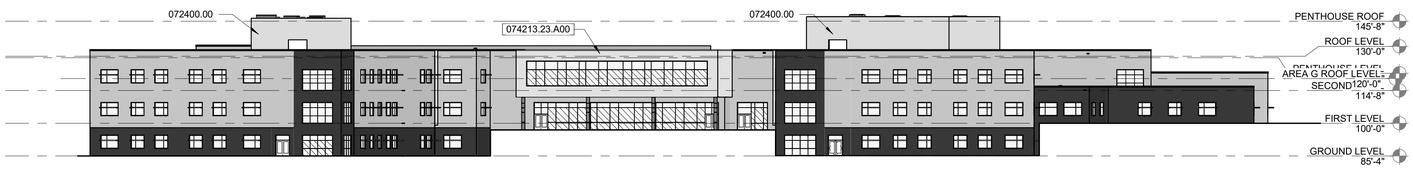
[4/1/2021 2:52:50 PM 19150.000

RATIO

2021-04-01

INTERIOR RENDERING **Felton Grove High School**



D1 A-01.02

EXTERIOR ELEVATION - WEST OVERALL

1/32" = 1'-0"

C1 A-01.02

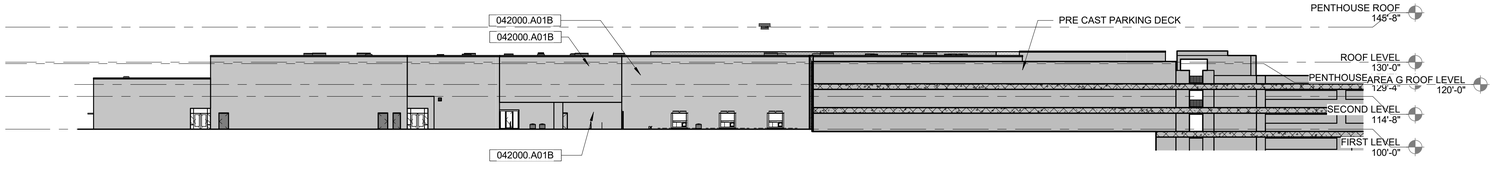
EXTERIOR ELEVATION - SOUTH OVERALL

1/32" = 1'-0"

B1 A-01.02

EXTERIOR ELEVATION - NORTH OVERALL

1/32" = 1'-0"



A1 A-01.02

EXTERIOR ELEVATION - EAST OVERALL

1/32" = 1'-0"

SUBMITTAL INFORMATION

1. PRIMARY OCCUPANCIES = E, A1, A2, A4
2. ACCESSORY OCCUPANCIES = S-1, B
3. TYPE 1B CONSTRUCTION
4. GROUND FLOOR SF = 71,603 SF
5. FIRST FLOOR SF = 197,390 SF
6. SECOND FLOOR SF = 94,079 SF
7. MECHANICAL PENTHOUSES AND MEZZANINES = 30,876 SF
8. SURROUNDING PROPOERTIES INCLUDE SINGLE FAMILY HOMES AND RESIDENTIAL COMMUNITIES, A LANDFILL, FUTURE 540 EXTENSION; SITE IS WITHIN CLOSE PROXIMITY TO STEPHENSON ROAD AND SUNSET LAKE BOULEVARD AND WILL CONSTRUCT A SECTION OF A FUTURE MAJOR COLLETOR STREET ON ITS PROPERTY. MATERIALS OFTHE SCHOOL PRIMARILY INCLUDE BRICK AND GLAZING WITH AREAS OF METAL PANEL ACCENT.
9. REFER TO CIVIL DRAWINGS FOR FINISH FLOOR ELEVATIONS 421.67 100'-0" = 421.67'

GENERAL PROJECT NOTES

1. THE SCREENING OF LOADING DOCKS, ROLL-OUT TRASH CONTAINERS, DUMPSTERS, OUTDOOR STORAGE, MECHANICAL AND HVAC EQUIPMENT, AND SIMILAR FACILITIES ON THE ROOF, GROUND, OR BUILDING SHALL MEET THE REQUIREMENTS OF UDO SEC. 8.2.8. SPECIFICALLY, SCREENING MUST BE DONE SO THATI
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   B, SCREENING MATERIALS ARE NOT DIFFERENT FROM OR INFERIOR TO THE PRINCIPAL MATERIALS OF THE BUILDING OR LANDSCAPE, AND ARE SIMILAR IN MATERIALS AND COLOR,
   C. SCREENED ITEMS ARE OUT OF VIEW FROM ADJACENT PROPERTIES AND PUBLIC STREETS, AND A TOTALLY OPAQUE SCREEN IS ACHIEVED.
   D. ANY GROUND-MOUNTED HVAC OR OTHER MECHANICAL OR UTILITY EQUIPMENT SIX (6) FEET TALL OR HIGHER MUST BE FENCED AND LANDSCAPED.
   E. DUMPSTER ENCLOSURES MUST MEET THE ABOVE REQUIREMENTS PLUS BE EIGHT (8) FEET TALL OR THE HEIGHT OF THE DUMPSTER, WHICHEVER IS GREATER, AND BE BUILT OF MASONRY MATERIAL WITH OPAQUE GATES. WHERE PRACTICABLE, SHRUBS OR OTHER PLANTS MUST BE PLANTED OUTSIDE THE ENCLOSURE TO VISUALLY SOFTEN THE APPEARANCE.

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3. LAMPS FOR NON-CUTOFF LIGHT FIXTURES SHALL NOT EXCEED 100 WATTS.

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5. FLOODLIGHTS OR OTHER TYPES OF LIGHTING ARE PROHIBITED UNLESS APPROVAL IS GIVEN THROUGH THE DEVELOPMENT REVIEW PROCESS AND REFLECTED ON THE APPROVED SITE PLAN.

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EXTERIOR MATERIALS SCHEDULE

SPECIFICATION REF.	MATERIAL	MANUFACTURER (BASIS OF DESIGN)
034100	PRE-CAST CONCRETE	
042000.A01A	FACE BRICK A	Taylor Clay Products #323 Gray Modular Wirecut
042000.A01B	FACE BRICK B	Taylor Clay Products #369 and #371 Autumn Blend Wirecut
072400.00	EIFS	DRYVIT SYSTEMS
074213.23.A00	METAL PANEL A	DRI-DESIGN METAL PANELS - ORANGE
074213.23.C01	METAL PANEL B	DRI-DESIGN PERFORATED PANELS - GRAY AND COLOR TO MATCH MAIN BUILDING PANEL ACCENT - ALTERNATE
077100.A01	COPING METAL, MANUFACTURED	COLOR TO BE EARTH TONE TO MATCH FACE BRICK B
084113.A01	ALUMINUM STOREFRONT	KAWNEER - ANODIZED ALUMINUM FINISH
084413	ALUMINUM CURTAIN WALL	KAWNEER - ANODIZED ALUMINUM FINISH
088000	GLAZING	GUARDIAN GLASS; SUNGUARD; CLEAR, INSULATING, LOW-E COATED
088113.C01	SPANDREL GLASS	GUARDIAN GLASS - CERAMIC COATED GLASS
107316.B01	ALUMINUM CANOPIES	MAPES INDUSTRIES, INC. - ANODIZED ALUMINUM FINISH
323119.A00	DECORATIVE METAL FENCES & GATES	

0' 16' 32' 64' 128'

NOT FOR CONSTRUCTION

Felton Grove High School (H12)

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Apex, NC 27539

Owner
Wake County Public Schools
111 Corning Road, Ste 190
Cary, NC 27518
919-588-3602

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SEAL | DATE 3/5/21

SHEET ISSUE

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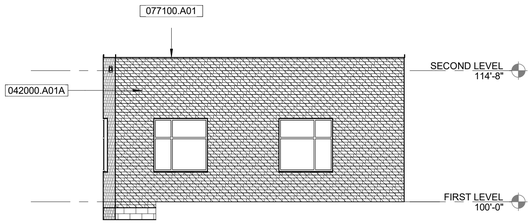
PROJECT NO. 19150.000

SHEET TITLE
EXTERIOR ELEVATIONS

SHEET NUMBER
A-01.02.

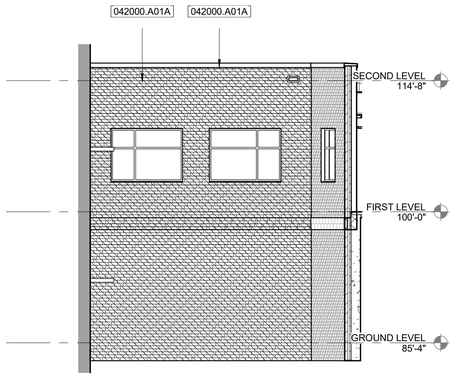
3/3/2021 3:51:42 PM



E1 A-01.03

EXTERIOR ELEVATION

1/8" = 1'-0"



E2 A-01.03

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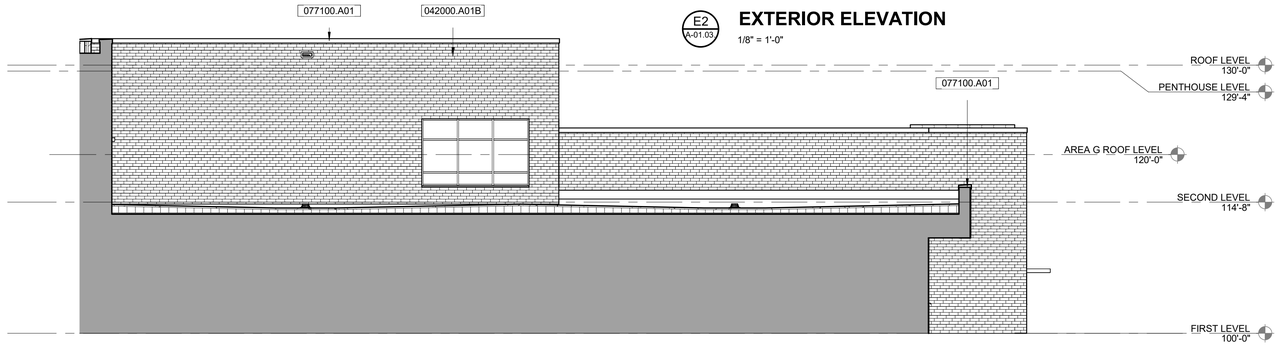

D1 A-01.03

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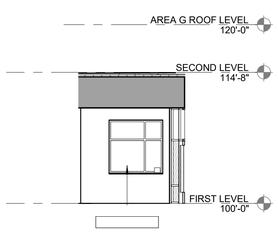

B1 A-01.03

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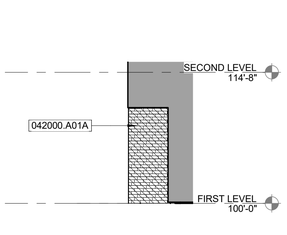

B2 A-01.03

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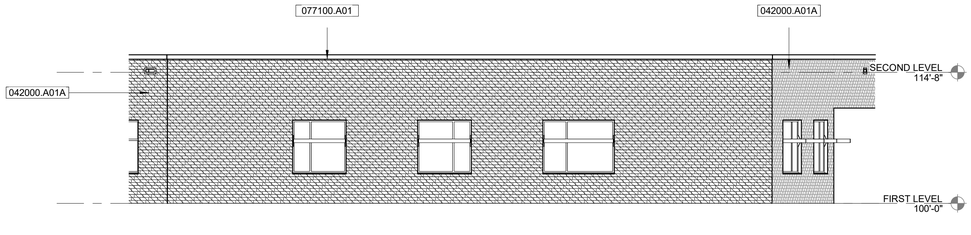

B3 A-01.03

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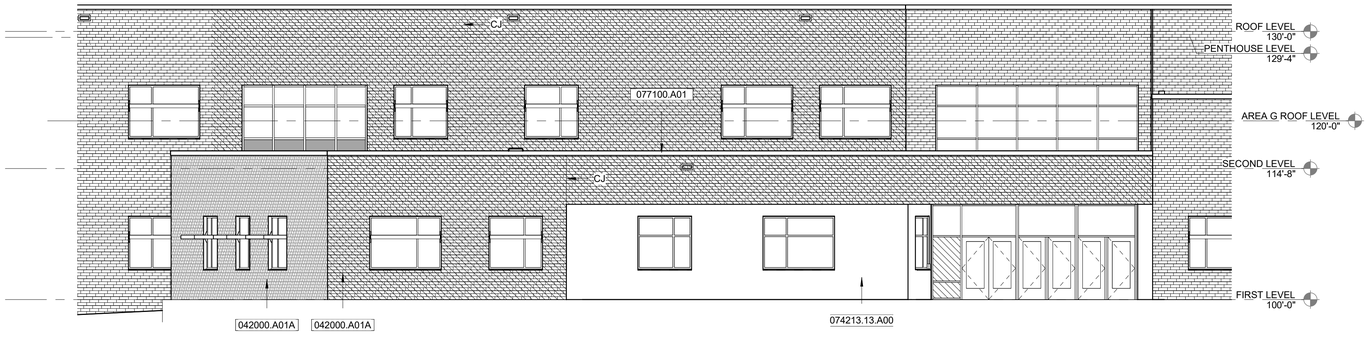

A1 A-01.03

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0' 4' 8' 16' 32'

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SEAL | DATE 3/5/21

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EXTERIOR ELEVATIONS

SHEET NUMBER
A-01.03.

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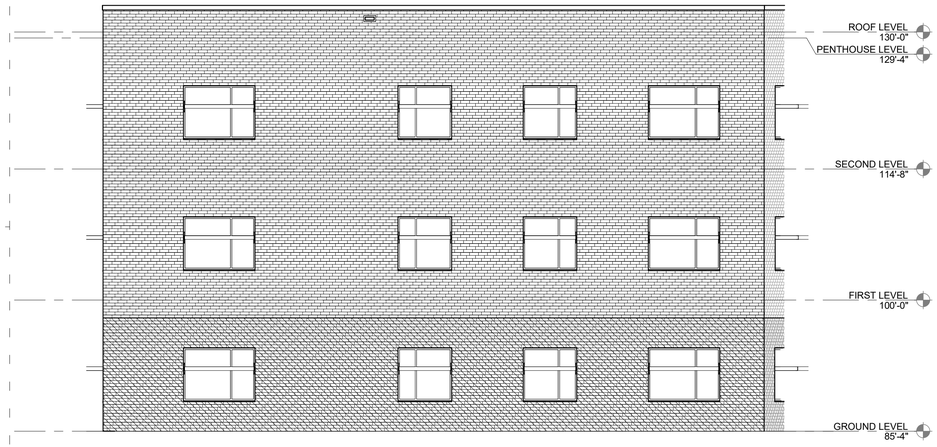

E1 / A-01.04 **EXTERIOR ELEVATION**

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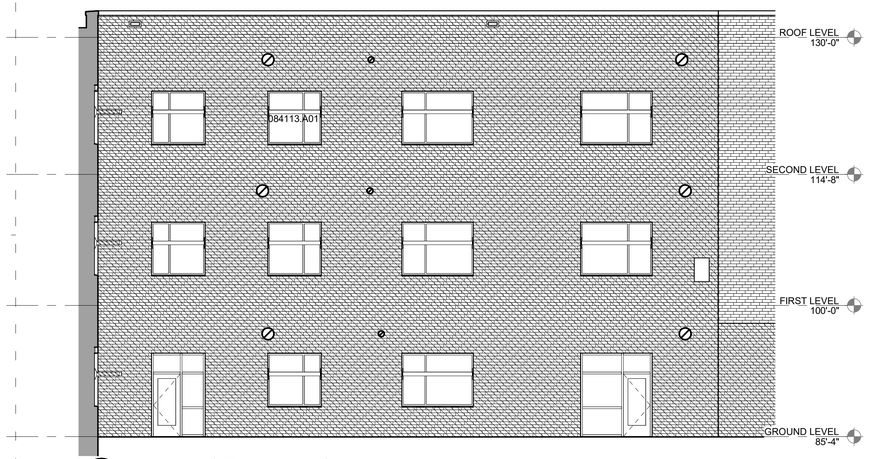
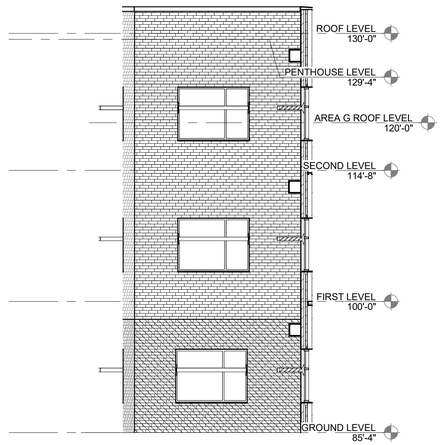


C1 / A-01.04 **EXTERIOR ELEVATION**

1/8" = 1'-0"



C4 / A-01.04 **EXTERIOR ELEVATION**

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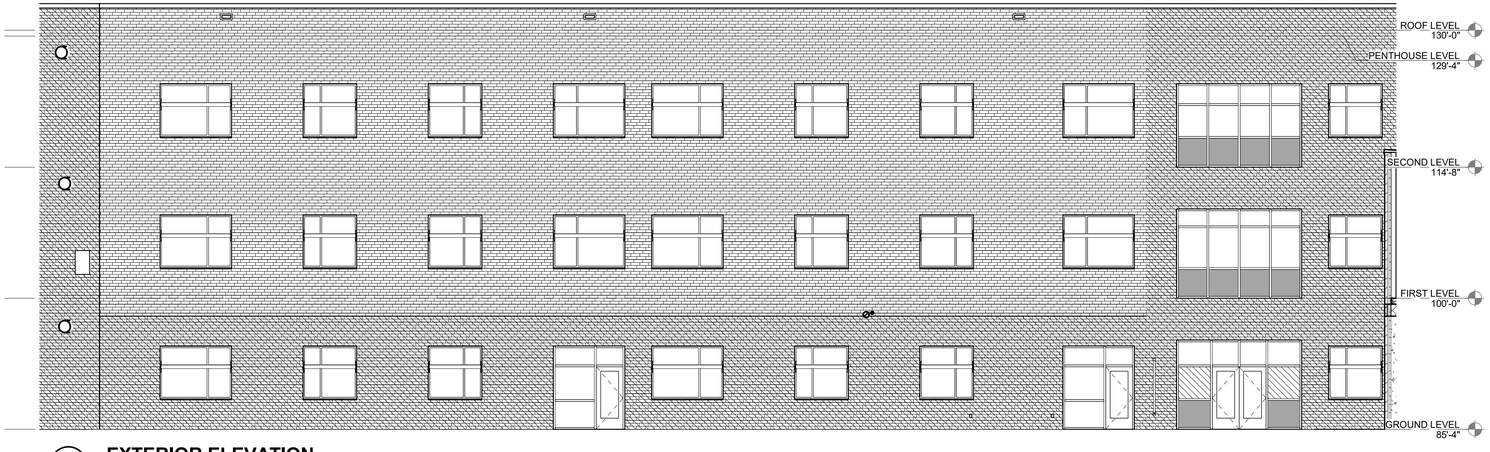

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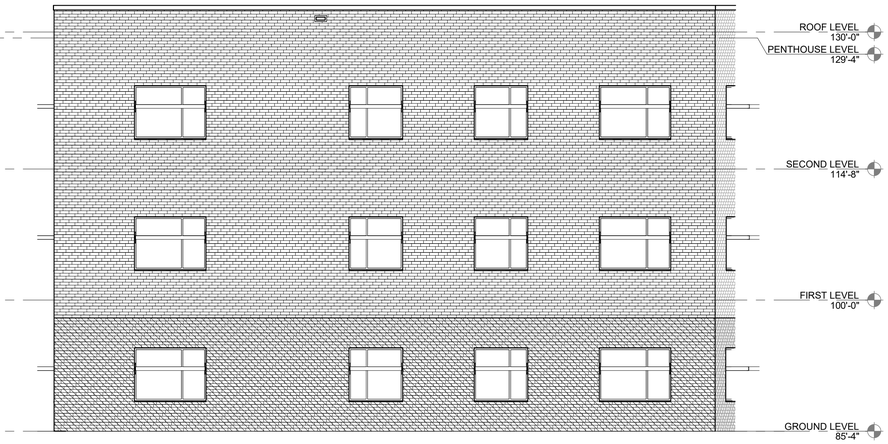
SHEET NUMBER
A-01.04.

0' 0" 8' 4' 16' 8' 32' 16' 64' 32"

NOT FOR CONSTRUCTION

3/3/2021 3:51:59 PM



E1 / A-01.04

EXTERIOR ELEVATION

1/8" = 1'-0"

EXTERIOR MATERIALS SCHEDULE

SPECIFICATION REF.	MATERIAL	MANUFACTURER (BASIS OF DESIGN)
034100	PRE-CAST CONCRETE	
042000.A01A	FACE BRICK A	Taylor Clay Products #323 Gray Modular Wirecut
042000.A01B	FACE BRICK B	Taylor Clay Products #369 and #371 Autumn Blend Wirecut
072400.00	EIFS	DRYVIT SYSTEMS
074213.23.A00	METAL PANEL A	DRI-DESIGN METAL PANELS - ORANGE
074213.23.C01	METAL PANEL B	DRI-DESIGN PERFORATED PANELS - GRAY AND COLOR TO MATCH MAIN BUILDING PANEL ACCENT - ALTERNATE
077100.A01	COPING METAL, MANUFACTURED	COLOR TO BE EARTH TONE TO MATCH FACE BRICK B
084113.A01	ALUMINUM STOREFRONT	KAWNEER - ANODIZED ALUMINUM FINISH
084413	ALUMINUM CURTAIN WALL	KAWNEER - ANODIZED ALUMINUM FINISH
088000	GLAZING	GUARDIAN GLASS; SUNGUARD; CLEAR, INSULATING, LOW-E COATED
088113.C01	SPANDREL GLASS	GUARDIAN GLASS - CERAMIC COATED GLASS
107316.B01	ALUMINUM CANOPIES	MAPES INDUSTRIES, INC. - ANODIZED ALUMINUM FINISH
323119.A00	DECORATIVE METAL FENCES & GATES	

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   A. IT IS INCORPORATED INTO THE OVERALL DESIGN THEME OF THE BUILDING AND LANDSCAPE.
   B, SCREENING MATERIALS ARE NOT DIFFERENT FROM OR INFERIOR TO THE PRINCIPAL MATERIALS OF THE BUILDING OR LANDSCAPE, AND ARE SIMILAR IN MATERIALS AND COLOR,
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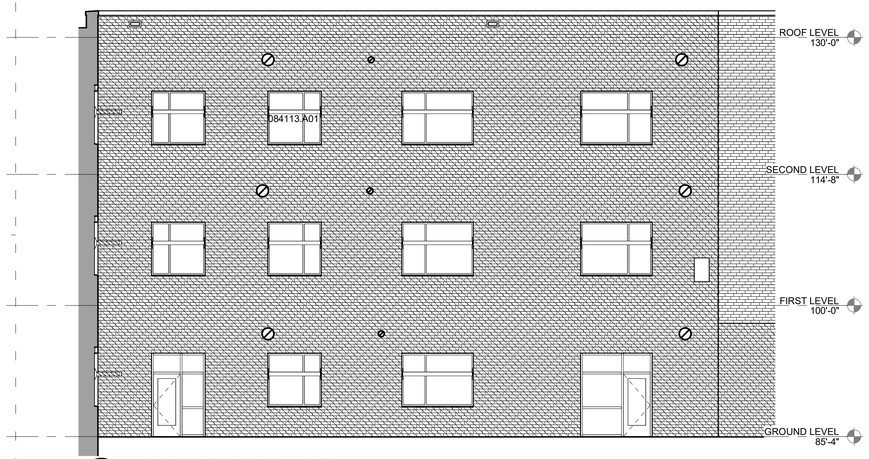
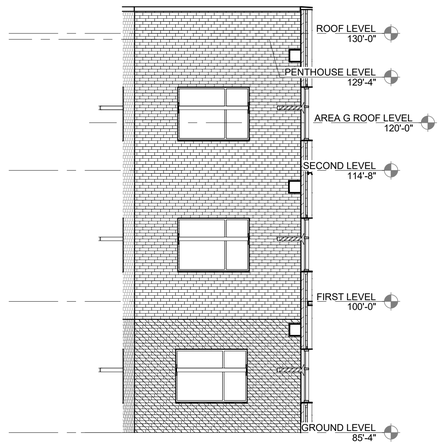


C1 / A-01.04

EXTERIOR ELEVATION

1/8" = 1'-0"



C4 / A-01.04

EXTERIOR ELEVATION

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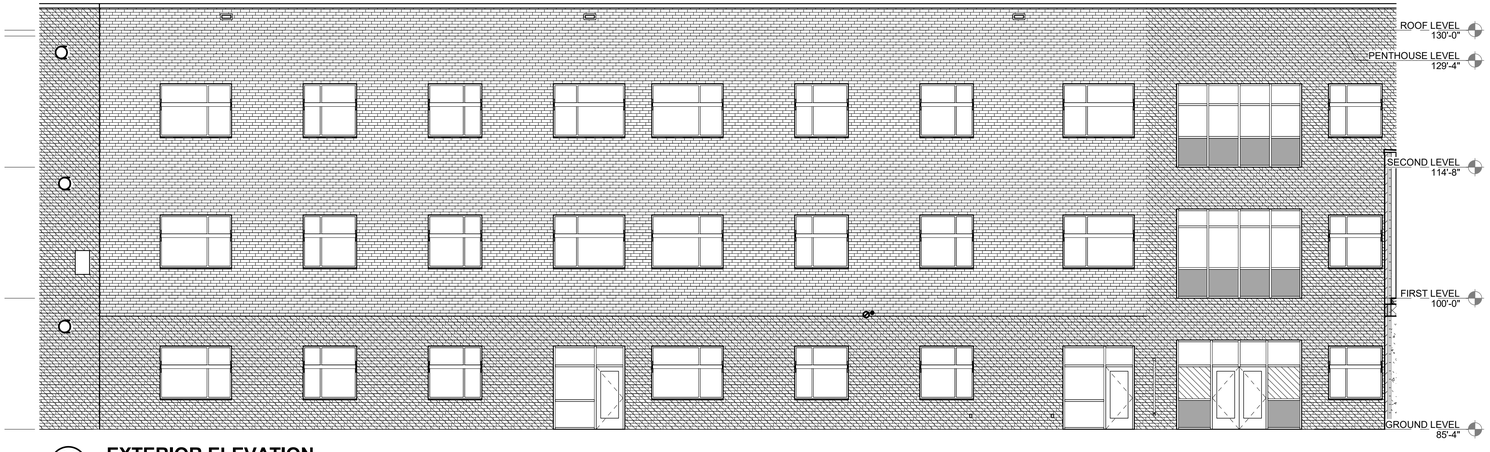

A1 / A-01.04

EXTERIOR ELEVATION

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Felton Grove High School (H12)

8550 Stephenson Road
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Cary, NC 27518
919-588-3602

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SEAL | DATE 3/5/21

SHEET ISSUE

1	Town of Apex Major Site Plan Submittal #1	12/1/20
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3	Town of Apex Major Site Plan Submittal #3	3/5/21

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PROJECT NO. 19150.000

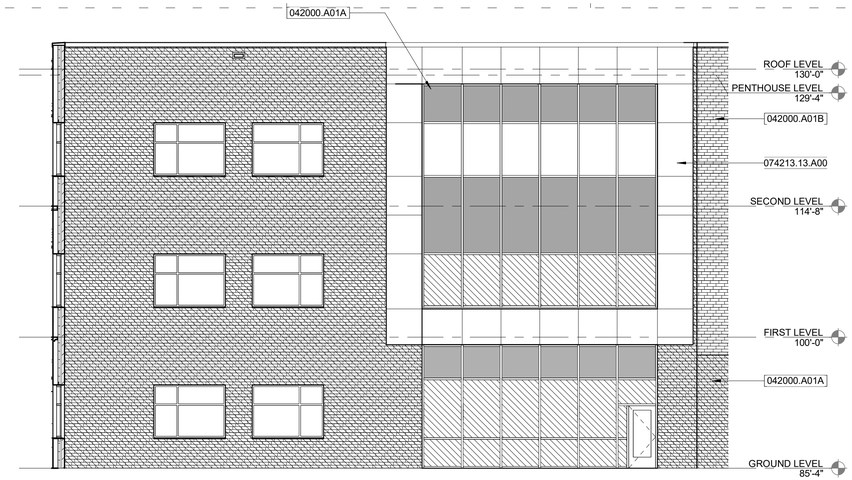
SHEET TITLE
EXTERIOR ELEVATION

SHEET NUMBER
A-01.04.

0' 0' 8' 4' 16' 8' 32' 16' 64' 32'

NOT FOR CONSTRUCTION

3/3/2021 3:51:59 PM



E1
A-01.05

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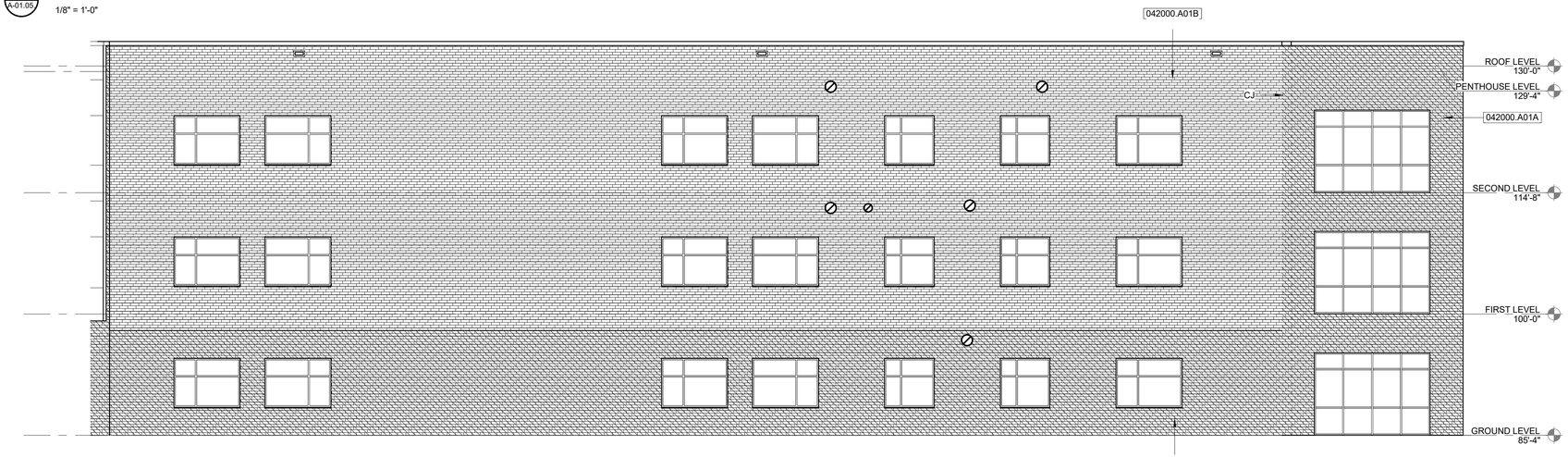
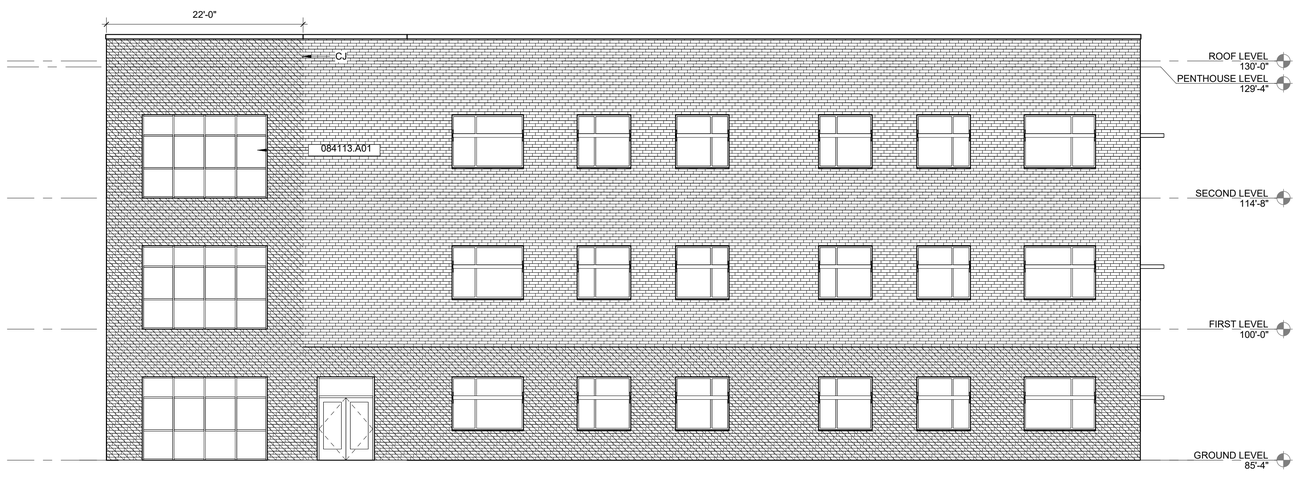


C1
A-01.05

EXTERIOR ELEVATION

1/8" = 1'-0"



A1
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0' 4' 8' 16' 32'

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EXTERIOR ELEVATIONS

SHEET NUMBER
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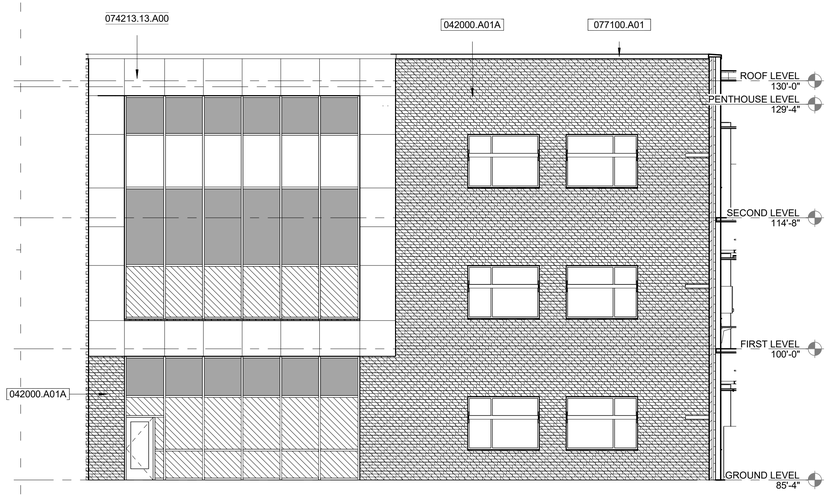

E1 A-01.06 **EXTERIOR ELEVATION**

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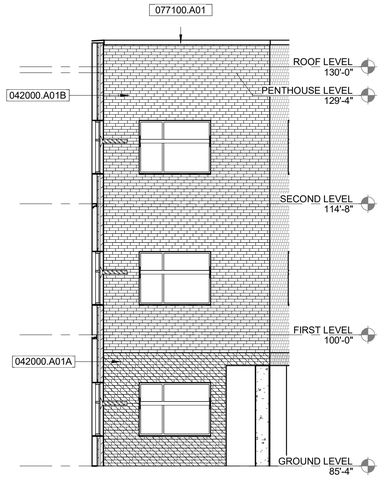

E3 A-01.06 **EXTERIOR ELEVATION**

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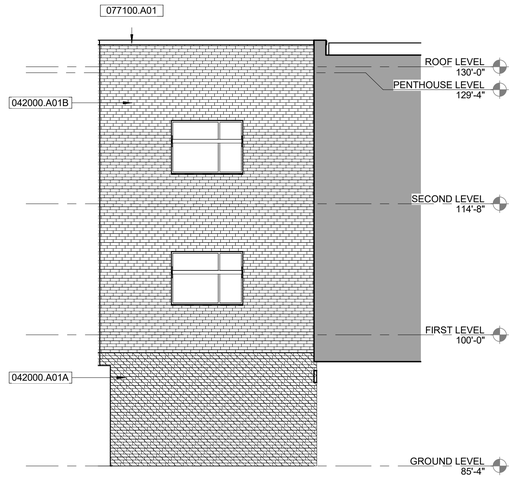

E5 A-01.06 **EXTERIOR ELEVATION**

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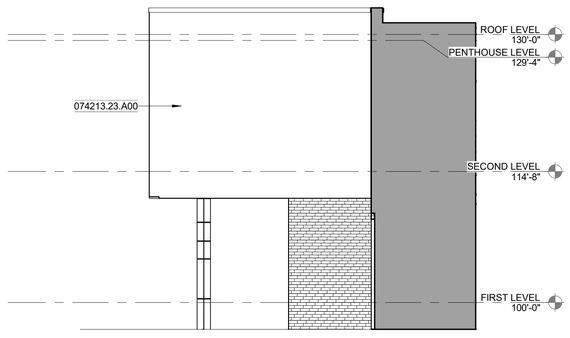

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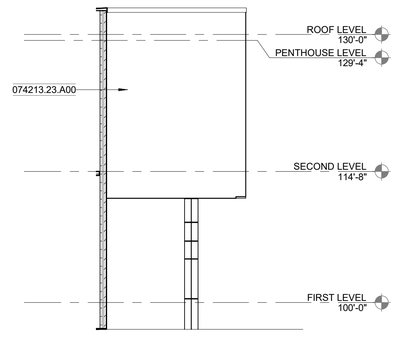

C3 A-01.06 **EXTERIOR ELEVATION**

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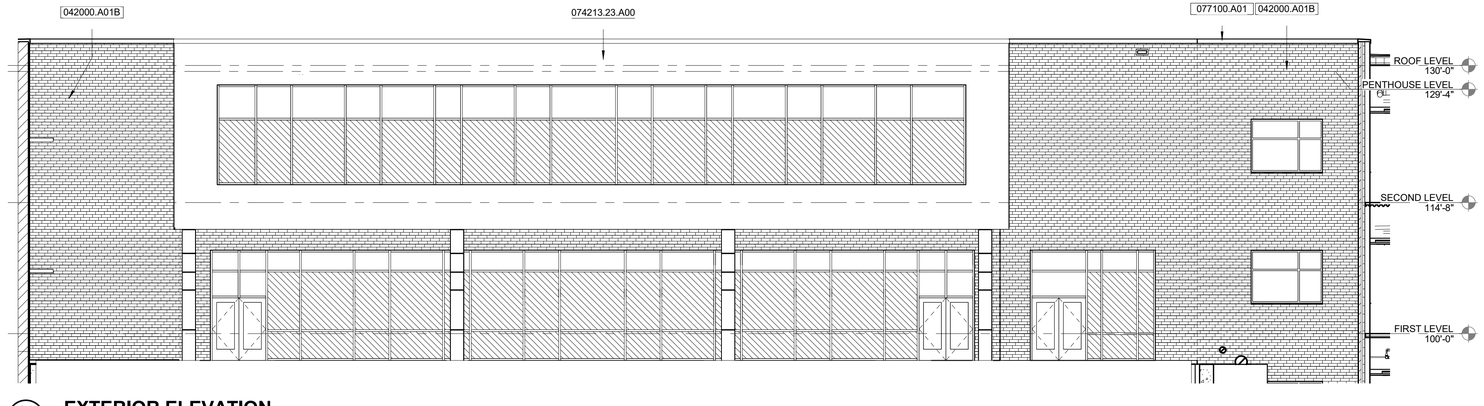

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EXTERIOR ELEVATIONS

SHEET NUMBER
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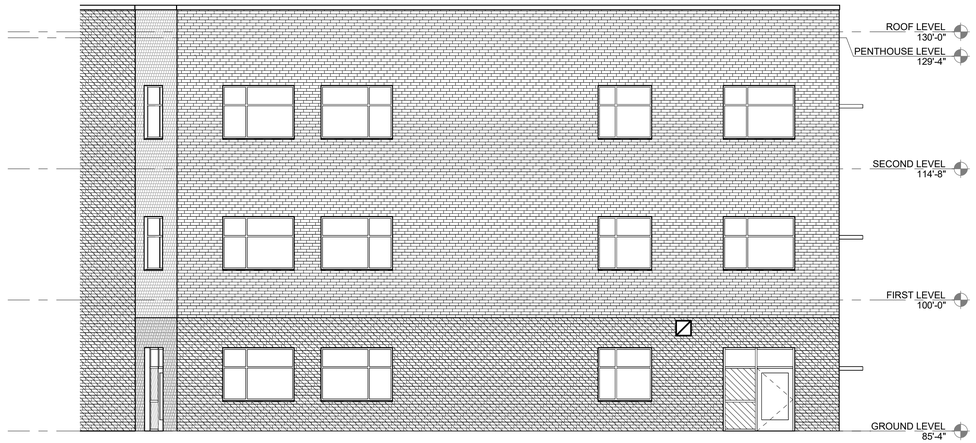

E1 A-01.07

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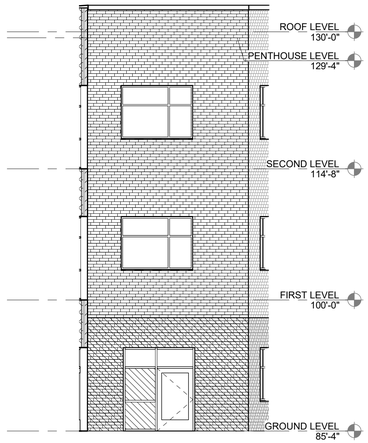

E4 A-01.07

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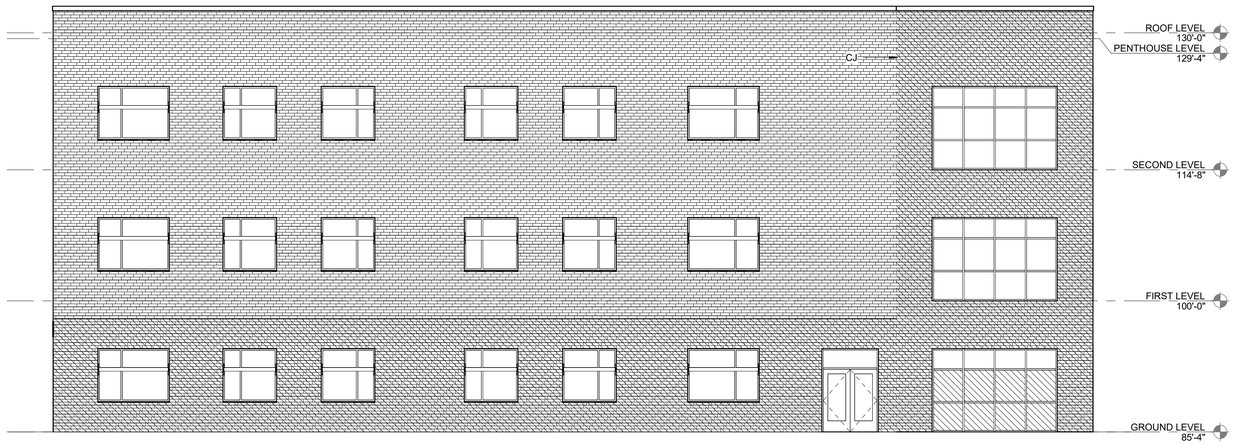

C1 A-01.07

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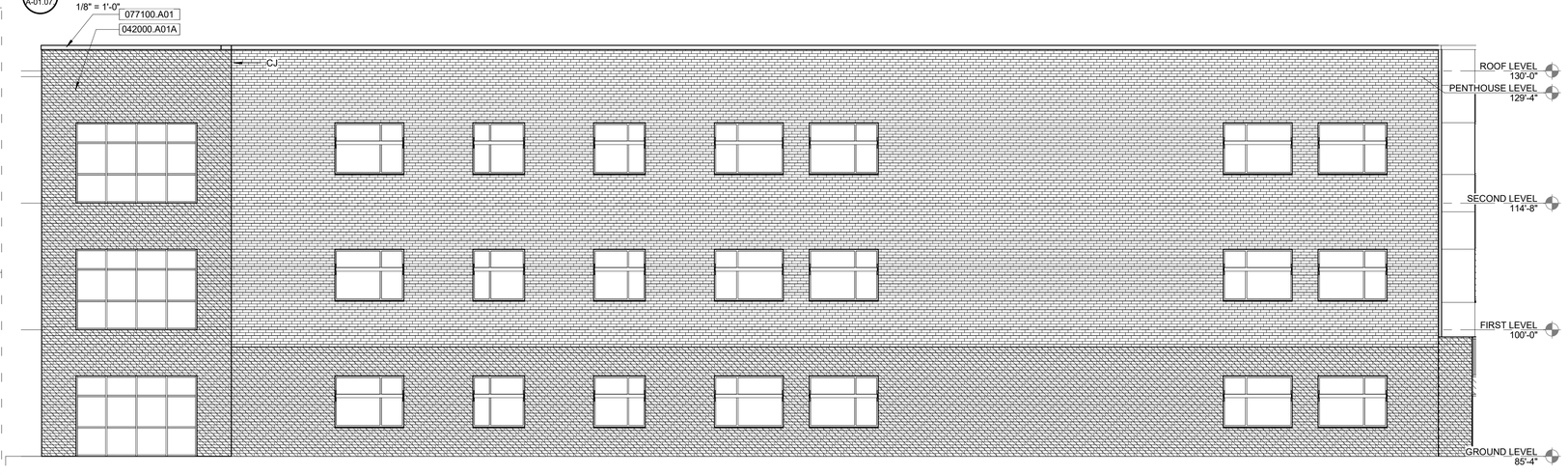

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EXTERIOR MATERIALS SCHEDULE

SPECIFICATION REF.	MATERIAL	MANUFACTURER (BASIS OF DESIGN)
034100	PRE-CAST CONCRETE	
042000.A01A	FACE BRICK A	Taylor Clay Products #323 Gray Modular Wirecut
042000.A01B	FACE BRICK B	Taylor Clay Products #369 and #371 Autumn Blend Wirecut
072400.00	EIFS	DRYVIT SYSTEMS
074213.23.A00	METAL PANEL A	DRI-DESIGN METAL PANELS - ORANGE
074213.23.C01	METAL PANEL B	DRI-DESIGN PERFORATED PANELS - GRAY AND COLOR TO MATCH MAIN BUILDING PANEL ACCENT - ALTERNATE
077100.A01	COPING METAL, MANUFACTURED	COLOR TO BE EARTH TONE TO MATCH FACE BRICK B
084113.A01	ALUMINUM STOREFRONT	KAWNEER - ANODIZED ALUMINUM FINISH
084413	ALUMINUM CURTAIN WALL	KAWNEER - ANODIZED ALUMINUM FINISH
088000	GLAZING	GUARDIAN GLASS; SUNGUARD; CLEAR, INSULATING, LOW-E COATED
088113.C01	SPANDREL GLASS	GUARDIAN GLASS - CERAMIC COATED GLASS
107316.B01	ALUMINUM CANOPIES	MAPES INDUSTRIES, INC. - ANODIZED ALUMINUM FINISH
323119.A00	DECORATIVE METAL FENCES & GATES	

GENERAL PROJECT NOTES

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   B. SCREENING MATERIALS ARE NOT DIFFERENT FROM OR INFERIOR TO THE PRINCIPAL MATERIALS OF THE BUILDING OR LANDSCAPE, AND ARE SIMILAR IN MATERIALS AND COLOR,
   C. SCREENED ITEMS ARE OUT OF VIEW FROM ADJACENT PROPERTIES AND PUBLIC STREETS, AND A TOTALLY OPAQUE SCREEN IS ACHIEVED.
   D. ANY GROUND-MOUNTED HVAC OR OTHER MECHANICAL OR UTILITY EQUIPMENT SIX (6) FEET TALL OR HIGHER MUST BE FENCED AND LANDSCAPED.
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3. LAMPS FOR NON-CUTOFF LIGHT FIXTURES SHALL NOT EXCEED 100 WATTS.

4. WALL PACK LIGHT FIXTURES MUST BE FULLY SHIELDED, TRUE CUTOFF TYPE FIXTURES WITH A CONCEALED LAMP/LIGHT SOURCE. THE LIGHTING MUST BE DIRECTED DOWNWARD AND THE WATTAGE MUST NOT EXCEED 100 WATTS.

5. FLOODLIGHTS OR OTHER TYPES OF LIGHTING ARE PROHIBITED UNLESS APPROVAL IS GIVEN THROUGH THE DEVELOPMENT REVIEW PROCESS AND REFLECTED ON THE APPROVED SITE PLAN.

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7. BEFORE CERTIFICATES OF OCCUPANCY ARE RELEASED, THE OWNER/BUILDER MUST SUPPLY THE TOWN WITH A FINAL LETTER OF CERTIFICATION FROM THE LIGHTING ENGINEER AND/OR LIGHTING MANUFACTURER VERIFYING THAT ALL SITE LIGHTING IS INSTALLED ACCORDING TO TOWN STANDARDS, THE APPROVED PLANS, AND ANY APPLICABLE CONDITIONS.

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0' 4' 8' 16' 32'

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SEAL | DATE 3/5/21

SHEET ISSUE

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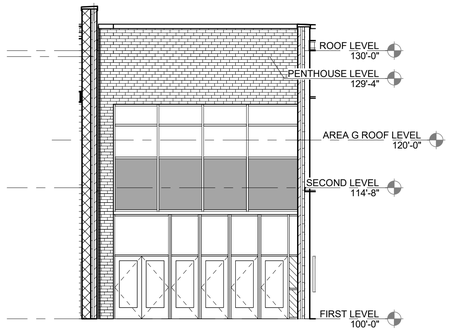
PROJECT NO. 19150.000

SHEET TITLE
EXTERIOR ELEVATIONS

SHEET NUMBER
A-01.07.

3/3/2021 3:52:10 PM



E1 / A-01.08

EXTERIOR ELEVATION

1/8" = 1'-0"

EXTERIOR MATERIALS SCHEDULE

SPECIFICATION REF.	MATERIAL	MANUFACTURER (BASIS OF DESIGN)
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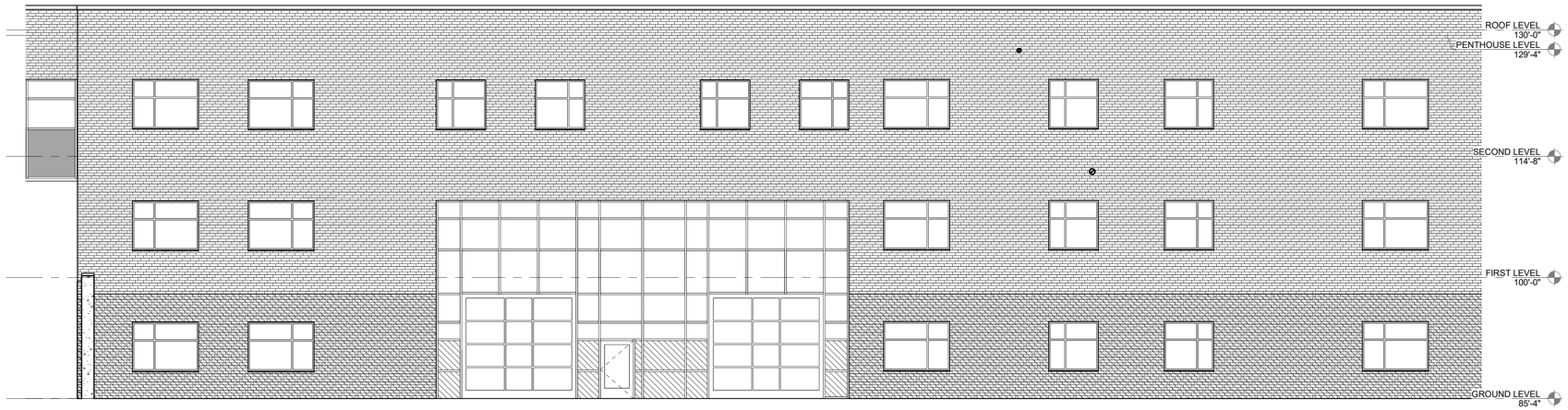
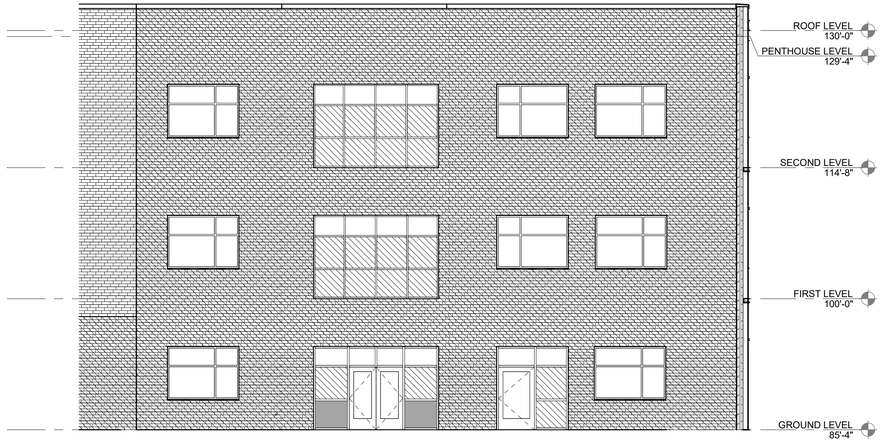


C1 / A-01.08

EXTERIOR ELEVATION

1/8" = 1'-0"



A1 / A-01.08

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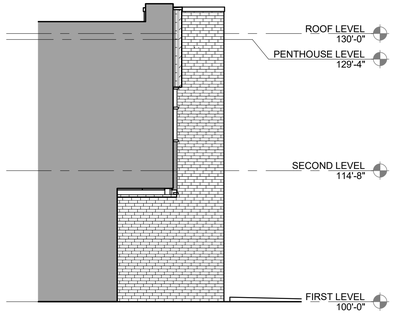

A4 / A-01.08

EXTERIOR ELEVATION

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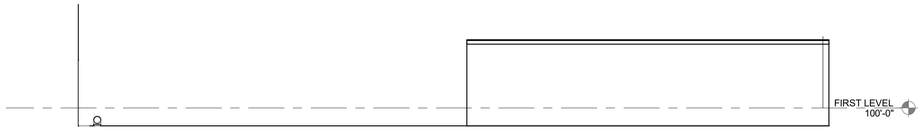

E1 A-01.09

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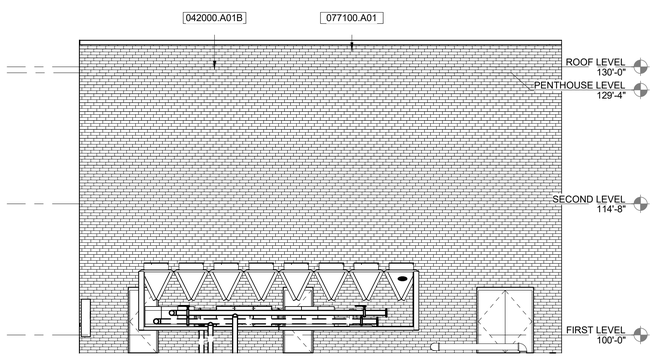

D1 A-01.09

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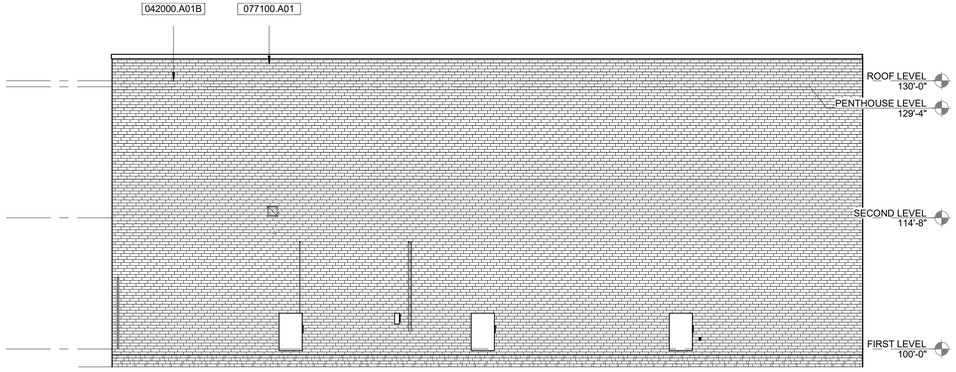

D3 A-01.09

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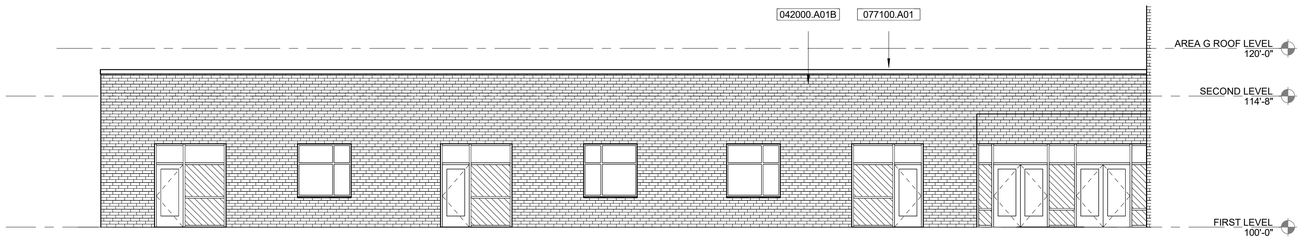

B1 A-01.09

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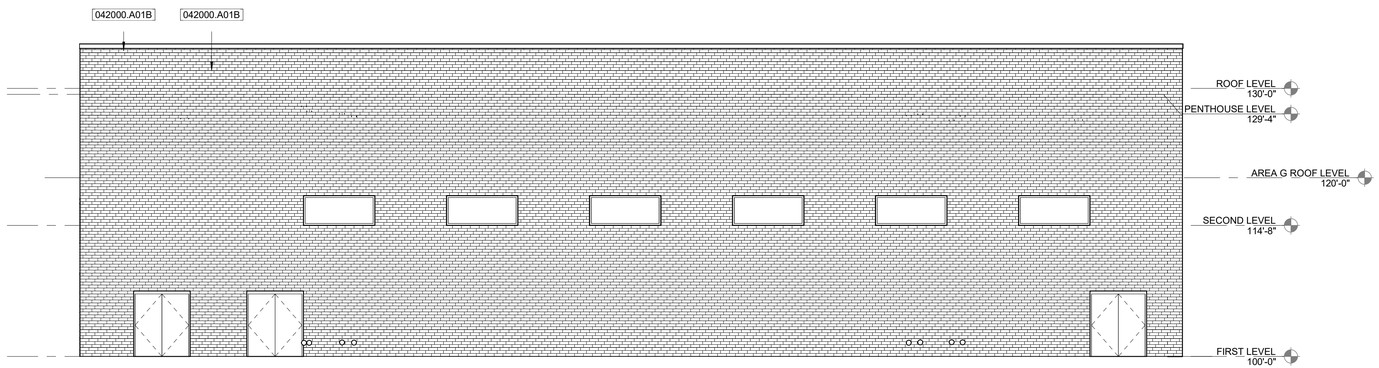

A1 A-01.09

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3/3/2021 3:52:24 PM

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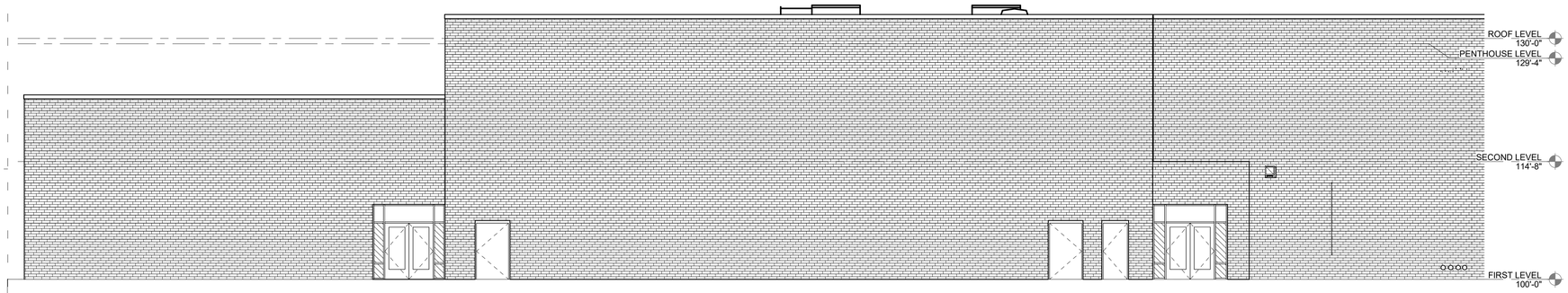

D1 / A-01.10

EXTERIOR ELEVATION

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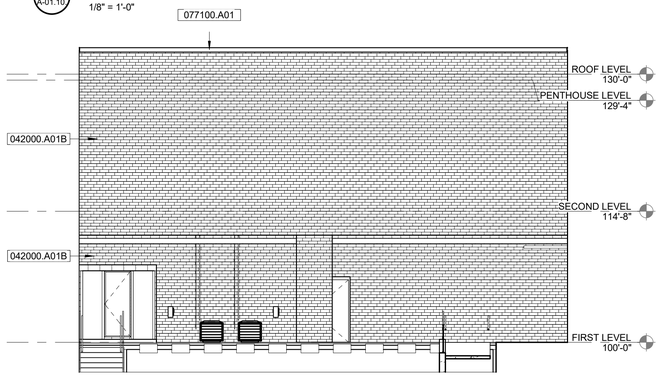

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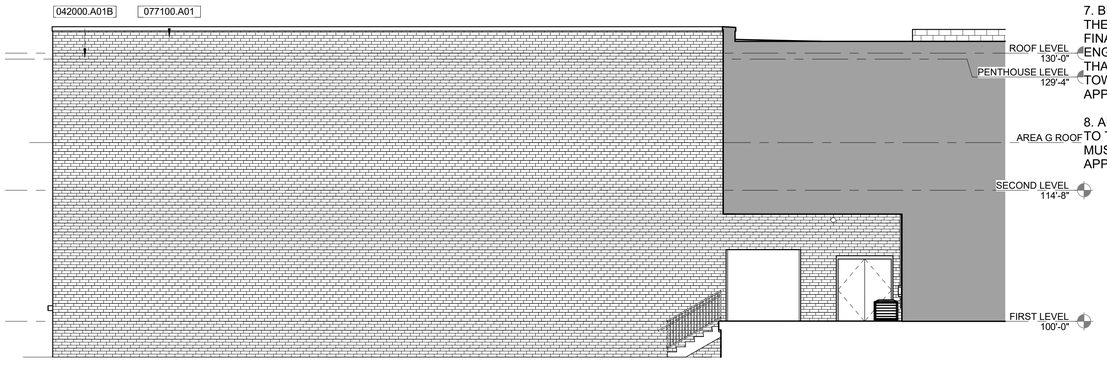

B3 / A-01.10

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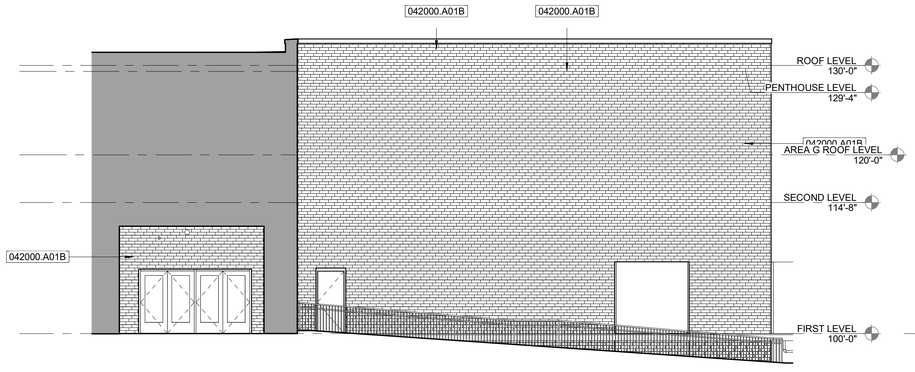

A1 / A-01.10

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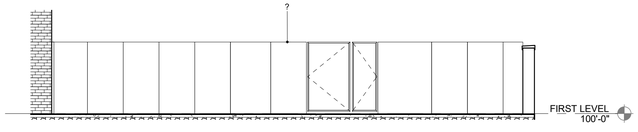

A4 / A-01.10

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(919) 319-6716

SEAL | DATE 3/5/21

SHEET ISSUE

1	Town of Apex Major Site Plan Submittal #1	12/1/20
2	Town of Apex Major Site Plan Submittal #2	2/12/21
3	Town of Apex Major Site Plan Submittal #3	3/5/21

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PROJECT NO. 19150.000

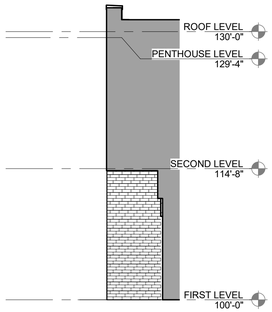
SHEET TITLE
EXTERIOR ELEVATIONS

SHEET NUMBER
A-01.10.

0' 4' 8' 16' 32'

NOT FOR CONSTRUCTION

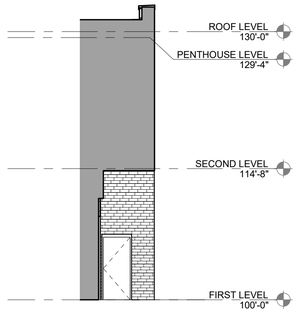
3/3/2021 3:52:31 PM



C1 A-01.11

EXTERIOR ELEVATION

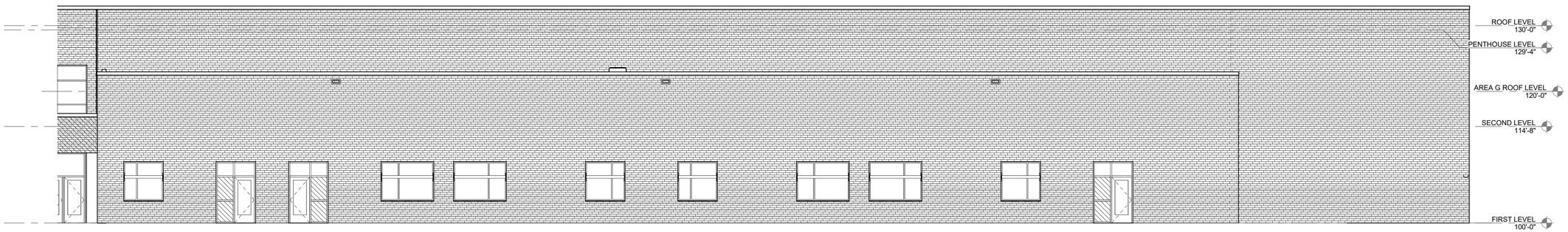
1/8" = 1'-0"



C2 A-01.11

EXTERIOR ELEVATION

1/8" = 1'-0"



B1 A-01.11

EXTERIOR ELEVATION

1/8" = 1'-0"

EXTERIOR MATERIALS SCHEDULE

SPECIFICATION REF.	MATERIAL	MANUFACTURER (BASIS OF DESIGN)
034100	PRE-CAST CONCRETE	
042000.A01A	FACE BRICK A	Taylor Clay Products #323 Gray Modular Wirecut
042000.A01B	FACE BRICK B	Taylor Clay Products #369 and #371 Autumn Blend Wirecut
072400.00	EIFS	DRYVIT SYSTEMS
074213.23.A00	METAL PANEL A	DRI-DESIGN METAL PANELS - ORANGE
074213.23.C01	METAL PANEL B	DRI-DESIGN PERFORATED PANELS - GRAY AND COLOR TO MATCH MAIN BUILDING PANEL ACCENT - ALTERNATE
077100.A01	COPING METAL, MANUFACTURED	COLOR TO BE EARTH TONE TO MATCH FACE BRICK B
084113.A01	ALUMINUM STOREFRONT	KAWNEER - ANODIZED ALUMINUM FINISH
084413	ALUMINUM CURTAIN WALL	KAWNEER - ANODIZED ALUMINUM FINISH
088000	GLAZING	GUARDIAN GLASS; SUNGUARD; CLEAR, INSULATING, LOW-E COATED
088113.C01	SPANDREL GLASS	GUARDIAN GLASS - CERAMIC COATED GLASS
107316.B01	ALUMINUM CANOPIES	MAPES INDUSTRIES, INC. - ANODIZED ALUMINUM FINISH
323119.A00	DECORATIVE METAL FENCES & GATES	

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SEAL | DATE 3/5/21

SHEET ISSUE

1	Town of Apex Major Site Plan Submittal #1	12/1/20
2	Town of Apex Major Site Plan Submittal #2	2/12/21
3	Town of Apex Major Site Plan Submittal #3	3/5/21

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PROJECT NO. 19150.000

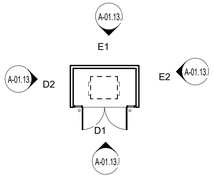
SHEET TITLE
EXTERIOR ELEVATIONS

SHEET NUMBER
A-01.11.

0' 4' 8' 16' 32'

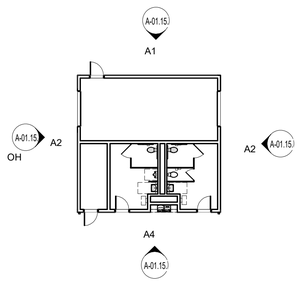
NOT FOR CONSTRUCTION

3/3/2021 3:52:37 PM



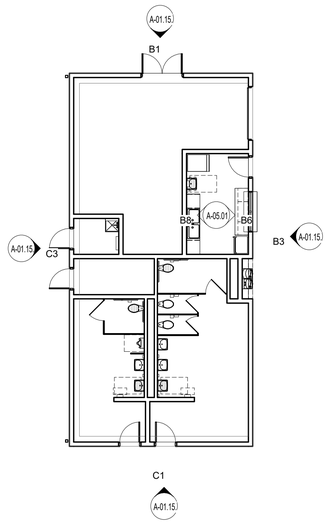
E1 A-01.12 **FIRST LEVEL FLOOR PLAN - TRASH ENCLOSURE**

1/16" = 1'-0"



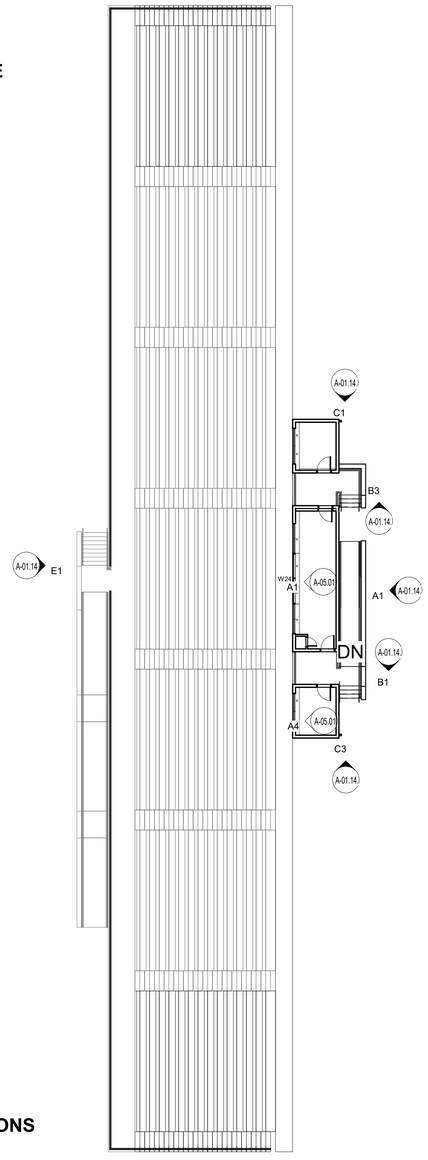
D1 A-01.12 **FIRST LEVEL FLOOR PLAN - LAWN STORAGE**

1/16" = 1'-0"



A1 A-01.12 **FIRST LEVEL FLOOR PLAN - VISITOR CONCESSIONS**

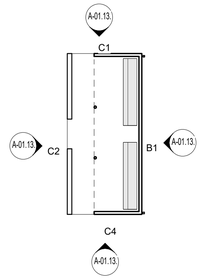
3/32" = 1'-0"



FIRST LEVEL FLOOR PLAN - HOME BLEACHERS AND PRESSBOX

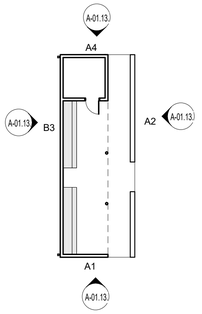
A2 A-01.12

1/16" = 1'-0"



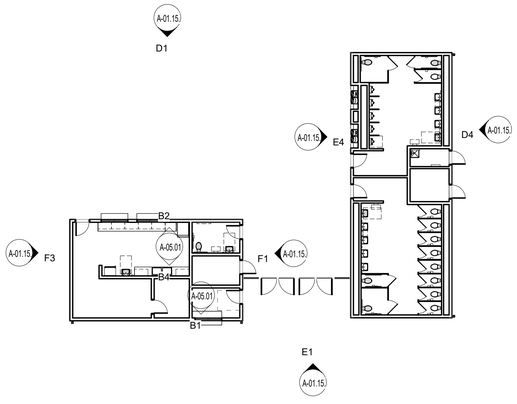
E4 A-01.12 **FIRST LEVEL FLOOR PLAN - VISITOR DUGOUT - BASEBALL AND SOFTBALL**

1/16" = 1'-0"



D4 A-01.12 **FIRST LEVEL FLOOR PLAN - HOME DUGOUT - BASEBALL AND SOFTBALL**

1/16" = 1'-0"



A3 A-01.12 **FIRST LEVEL FLOOR PLAN - ENTRY GATE**

1/16" = 1'-0"

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SEAL | DATE 03/5/21

SHEET ISSUE

1	Town of Apex Major Site Plan Submittal #1	12/1/20
2	Town of Apex Major Site Plan Submittal #2	02/12/21
3	Town of Apex Major Site Plan Submittal #3	03/5/21

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PROJECT NO. 12345.000

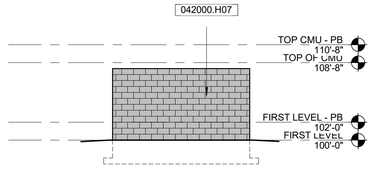
SHEET TITLE
ATHLETICS FLOOR PLANS

SHEET NUMBER
A-01.12.

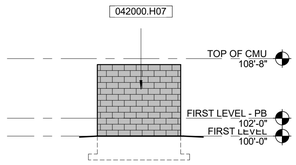
0' 8' 16' 32' 64'

NOT FOR CONSTRUCTION

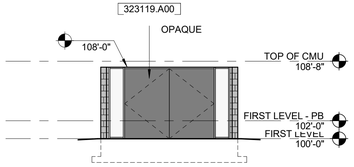
3/3/2021 4:30:04 PM



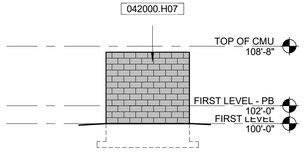
E1 A-01.13 **REAR EXT ELEV - TRASH ENCL.**
1/8" = 1'-0"



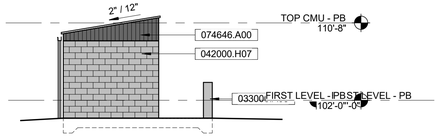
E2 A-01.13 **SIDE EXT ELEV - TRASH ENCL - EAST**
1/8" = 1'-0"

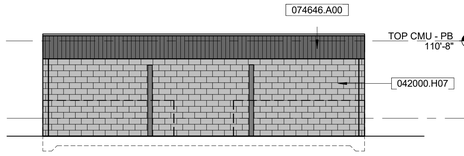


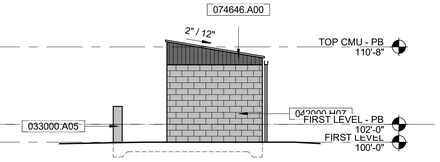
D1 A-01.13 **FRONT EXT ELEV - TRASH ENCL**
1/8" = 1'-0"



D2 A-01.13 **SIDE EXT ELEV - TRASH ENCL - WEST**
1/8" = 1'-0"



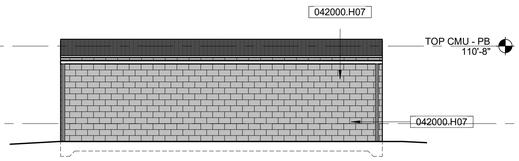


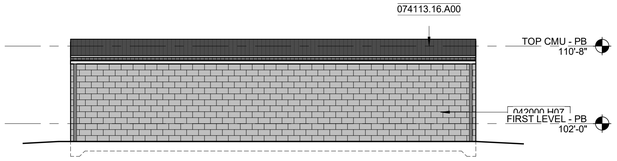


C1 A-01.13 **LEFT EXT ELEV - VISITOR DUGOUT**
1/8" = 1'-0"

C2 A-01.13 **FRONT EXT ELEV - VISITOR DUGOUT**
1/8" = 1'-0"

C4 A-01.13 **RIGHT EXT ELEV - VISITOR DUGOUT**
1/8" = 1'-0"





B1 A-01.13 **REAR EXT ELEV - VISITOR DUGOUT**
1/8" = 1'-0"

B3 A-01.13 **REAR EXT ELEV - HOME DUGOUT**
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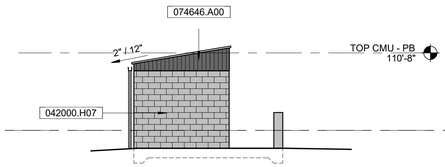

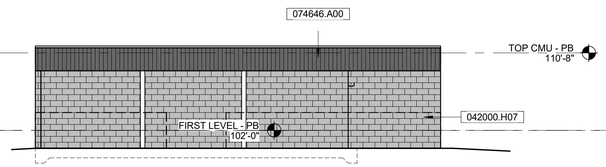

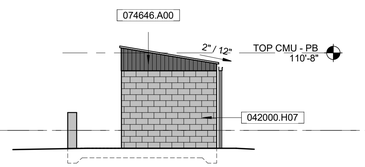

A1 A-01.13 **LEFT EXT ELEV - HOME DUGOUT**
1/8" = 1'-0"

A2 A-01.13 **FRONT EXT ELEV - HOME DUGOUT**
1/8" = 1'-0"

A4 A-01.13 **RIGHT EXT ELEV - HOME DUGOUT**
1/8" = 1'-0"

EXTERIOR MATERIALS SCHEDULE

SPECIFICATION REF.	MATERIAL	MANUFACTURER (BASIS OF DESIGN)
033000.A05	PRE-CAST CONCRETE	
042000.A01B	CEMENTITIOUS SIDING	HARDIPANEL HZ10 SMOOTH BOARD AND BATTEN, RICH EXPRESSO
042000.H07	GROUND FACE BLOCK	JOHNSON CONCRETE PRODUCTS JCL-3063 SHORELINE SAND
074646.A00	STANDING SEAM METAL ROOF	BERRIDGE HIGH SEAM TEE PANEL, DARK BRONZE
084113.A01	ALUMINUM STOREFRONT	KAWNEER - ANODIZED ALUMINUM FINISH
088000	GLAZING	GUARDIAN GLASS; SUNGUARD; CLEAR, INSULATING, LOW-E COATED
107316.B01	ALUMINUM CANOPIES	MAPES INDUSTRIES, INC. - ANODIZED ALUMINUM FINISH
323119.A00	DECORATIVE METAL FENCES & GATES	

GENERAL PROJECT NOTES

1. THE SCREENING OF LOADING DOCKS, ROLL-OUT TRASH CONTAINERS, DUMPSTERS, OUTDOOR STORAGE, MECHANICAL AND HVAC EQUIPMENT, AND SIMILAR FACILITIES ON THE ROOF, GROUND, OR BUILDING SHALL MEET THE REQUIREMENTS OF UDO SEC. 8.2.8. SPECIFICALLY, SCREENING MUST BE DONE SO THATI
   A. IT IS INCORPORATED INTO THE OVERALL DESIGN THEME OF THE BUILDING AND LANDSCAPE.
   B, SCREENING MATERIALS ARE NOT DIFFERENT FROM OR INFERIOR TO THE PRINCIPAL MATERIALS OF THE BUILDING OR LANDSCAPE, AND ARE SIMILAR IN MATERIALS AND COLOR,
   C. SCREENED ITEMS ARE OUT OF VIEW FROM ADJACENT PROPERTIES AND PUBLIC STREETS, AND A TOTALLY OPAQUE SCREEN IS ACHIEVED.
   D. ANY GROUND-MOUNTED HVAC OR OTHER MECHANICAL OR UTILITY EQUIPMENT SIX (6) FEET TALL OR HIGHER MUST BE FENCED AND LANDSCAPED.
   E. DUMPSTER ENCLOSURES MUST MEET THE ABOVE REQUIREMENTS PLUS BE EIGHT (8) FEET TALL OR THE HEIGHT OF THE DUMPSTER, WHICHEVER IS GREATER, AND BE BUILT OF MASONRY MATERIAL WITH OPAQUE GATES. WHERE PRACTICABLE, SHRUBS OR OTHER PLANTS MUST BE PLANTED OUTSIDE THE ENCLOSURE TO VISUALLY SOFTEN THE APPEARANCE.

2. ALL OUTDOOR LIGHT FIXTURES SHALL BE LOCATED A MINIMUM OF 10 FEET FROM A PROPERTY OR RIGHT-OF-WAY LINE, AND AT LEAST TWO FEET AWAY FROM ANY REQUIRED PERIMETER OR STREETSCAPE BUFFER AND TREE SAVE AREA.

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0' 4' 8' 16' 32'

NOT FOR CONSTRUCTION

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SEAL | DATE 03/5/21

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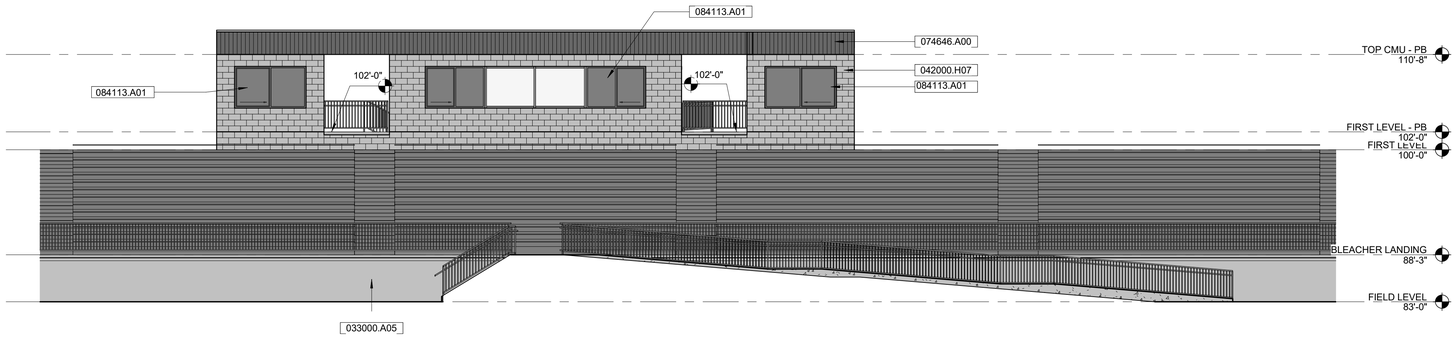
PROJECT NO. 12345.000

SHEET TITLE
EXTERIOR ELEVATIONS - AUX ATHL

SHEET NUMBER
A-01.13.

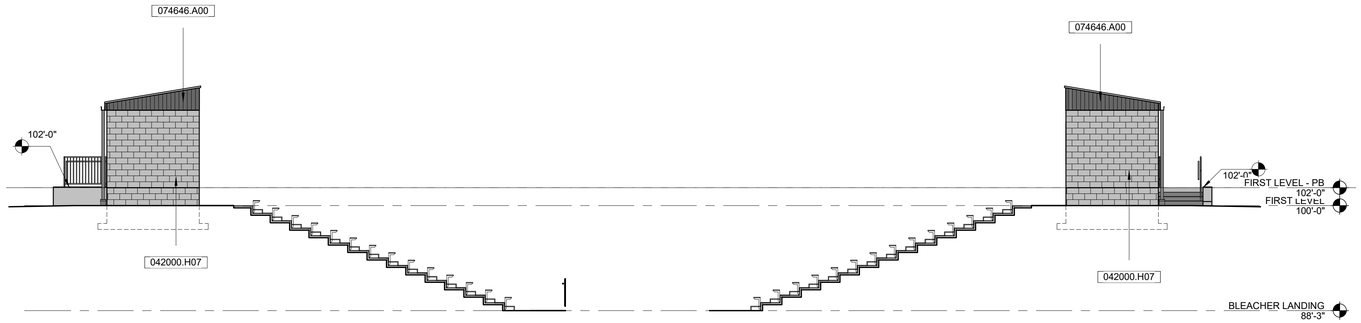
3/3/2021 4:32:31 PM



E1 A-01.14

WEST EXT ELEV - PRESS BOX AND GRANDSTAND

1/8" = 1'-0"



C1 A-01.14

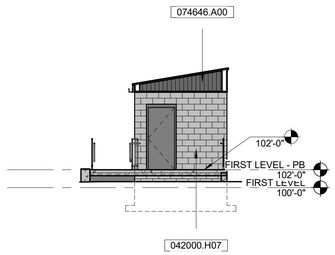
NORTH EXT ELEV - PRESS BOX

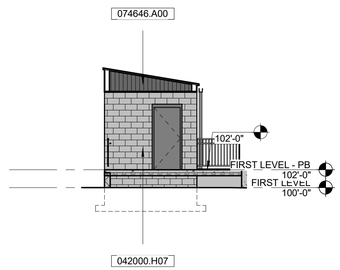
1/8" = 1'-0"

C3 A-01.14

SOUTH EXT ELEV - PRESS BOX

1/8" = 1'-0"





B1 A-01.14

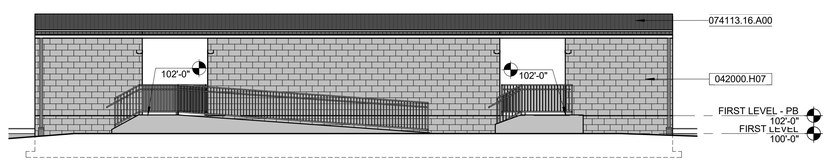
NORTH EXT ELEV - PRESS BOX 2

1/8" = 1'-0"

B3 A-01.14

SOUTH EXT ELEV - PRESS BOX 2

1/8" = 1'-0"



A1 A-01.14

EAST EXT ELEV - PRESS BOX

1/8" = 1'-0"

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SEAL | DATE 03/5/21

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PROJECT NO. 12345.000

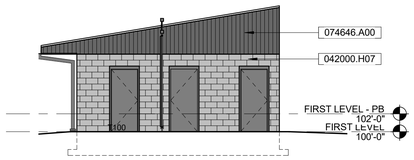
SHEET TITLE
EXTERIOR ELEVATIONS - AUX ATHL

SHEET NUMBER
A-01.14.

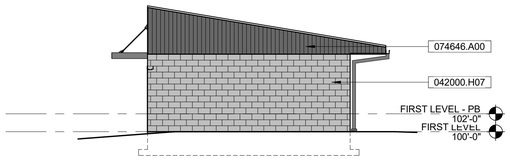
0' 4' 8' 16' 32'

NOT FOR CONSTRUCTION

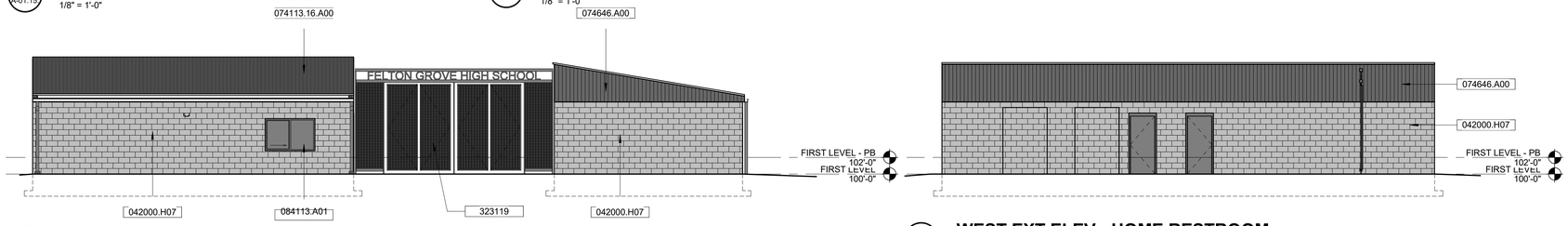
3/3/2021 4:30:12 PM



F1 A-01.15 **EAST EXT ELEV - TICKETS**
1/8" = 1'-0"

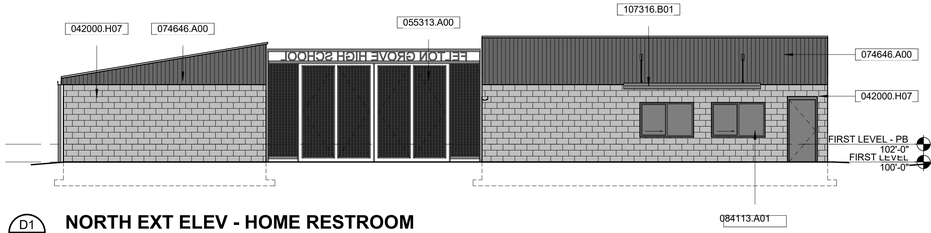


F3 A-01.15 **WEST EXT ELEV - TICKETS**
1/8" = 1'-0"

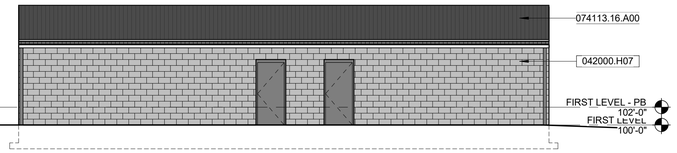


E1 A-01.15 **SOUTH EXT ELEV - TICKETS**
1/8" = 1'-0"

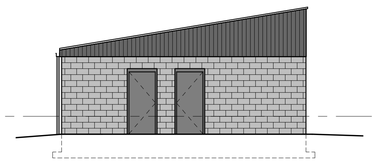
E4 A-01.15 **WEST EXT ELEV - HOME RESTROOM**
1/8" = 1'-0"



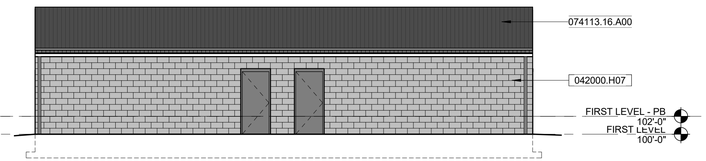
D1 A-01.15 **NORTH EXT ELEV - HOME RESTROOM**
1/8" = 1'-0"



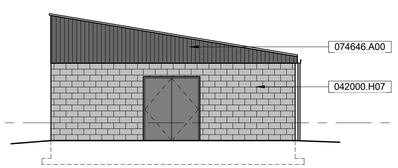
D4 A-01.15 **EAST EXT ELEV - HOME RESTROOM**
1/8" = 1'-0"



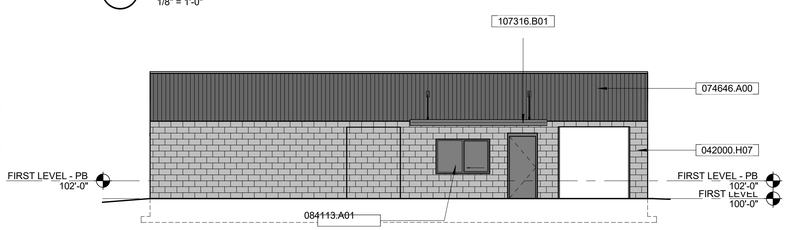
C1 A-01.15 **SOUTH EXT ELEV - VISITOR RESTROOM**
1/8" = 1'-0"



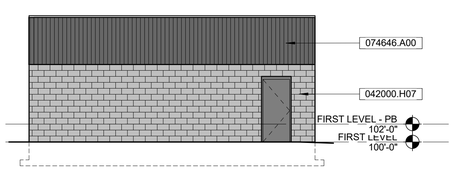
C3 A-01.15 **WEST EXT ELEV - VISITOR RESTROOM**
1/8" = 1'-0"



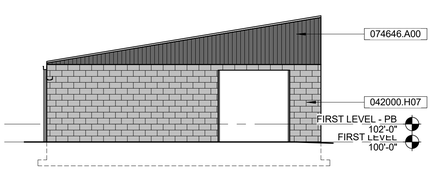
B1 A-01.15 **NORTH EXT ELEV - VISITOR RESTROOM**
1/8" = 1'-0"



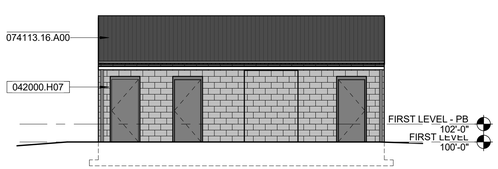
B3 A-01.15 **EAST EXT ELEV - VISITOR RESTROOM**
1/8" = 1'-0"



A1 A-01.15 **NORTH EXT ELEV - LAWN STORAGE**
1/8" = 1'-0"



A2 A-01.15 **EAST EXT ELEV - LAWN STORAGE**
1/8" = 1'-0"



A4 A-01.15 **SOUTH EXT ELEV - LAWN STORAGE**
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3	Town of Apex Major Site Plan Submittal #3	03/5/21

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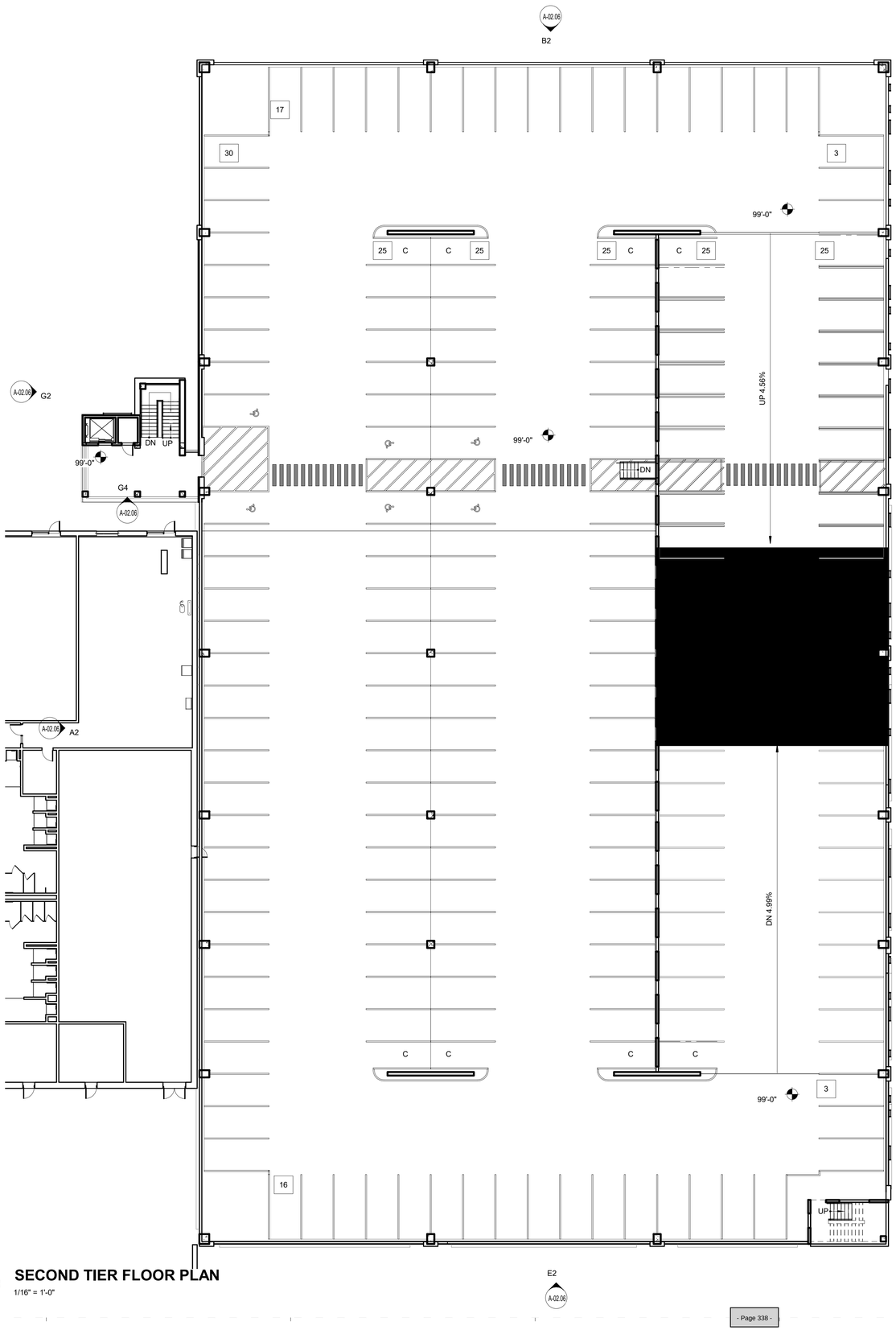
PROJECT NO. 12345.000

SHEET TITLE
EXTERIOR ELEVATIONS - AUX ATHL

SHEET NUMBER
A-01.15.

3/3/2021 4:30:14 PM



1 A-01.16 **SECOND TIER FLOOR PLAN**

1/16" = 1'-0"

GENERAL PROJECT NOTES

1. THE SCREENING OF LOADING DOCKS, ROLL-OUT TRASH CONTAINERS, DUMPSTERS, OUTDOOR STORAGE, MECHANICAL AND HVAC EQUIPMENT, AND SIMILAR FACILITIES ON THE ROOF, GROUND, OR BUILDING SHALL MEET THE REQUIREMENTS OF UDO SEC. 8.2.8. SPECIFICALLY, SCREENING MUST BE DONE SO THATI

A. IT IS INCORPORATED INTO THE OVERALL DESIGN THEME OF THE BUILDING AND LANDSCAPE.

B. SCREENING MATERIALS ARE NOT DIFFERENT FROM OR INFERIOR TO THE PRINCIPAL MATERIALS OF THE BUILDING OR LANDSCAPE, AND ARE SIMILAR IN MATERIALS AND COLOR.

C. SCREENED ITEMS ARE OUT OF VIEW FROM ADJACENT PROPERTIES AND PUBLIC STREETS, AND A TOTALLY OPAQUE SCREEN IS ACHIEVED.

D. ANY GROUND-MOUNTED HVAC OR OTHER MECHANICAL OR UTILITY EQUIPMENT SIX (6) FEET TALL OR HIGHER MUST BE FENCED AND LANDSCAPED.

E. DUMPSTER ENCLOSURES MUST MEET THE ABOVE REQUIREMENTS PLUS BE EIGHT (8) FEET TALL OR THE HEIGHT OF THE DUMPSTER, WHICHEVER IS GREATER, AND BE BUILT OF MASONRY MATERIAL WITH OPAQUE GATES. WHERE PRACTICABLE, SHRUBS OR OTHER PLANTS MUST BE PLANTED OUTSIDE THE ENCLOSURE TO VISUALLY SOFTEN THE APPEARANCE.

2. ALL OUTDOOR LIGHT FIXTURES SHALL BE LOCATED A MINIMUM OF 10 FEET FROM A PROPERTY OR RIGHT-OF-WAY LINE, AND AT LEAST TWO FEET AWAY FROM ANY REQUIRED PERIMETER OR STREETSCAPE BUFFER AND TREE SAVE AREA.

3. LAMPS FOR NON-CUTOFF LIGHT FIXTURES SHALL NOT EXCEED 100 WATTS.

4. WALL PACK LIGHT FIXTURES MUST BE FULLY SHIELDED, TRUE CUTOFF TYPE FIXTURES WITH A CONCEALED LAMP/LIGHT SOURCE. THE LIGHTING MUST BE DIRECTED DOWNWARD AND THE WATTAGE MUST NOT EXCEED 100 WATTS.

5. FLOODLIGHTS OR OTHER TYPES OF LIGHTING ARE PROHIBITED UNLESS APPROVAL IS GIVEN THROUGH THE DEVELOPMENT REVIEW PROCESS AND REFLECTED ON THE APPROVED SITE PLAN.

6. AWNINGS AND CANOPIES USED FOR ACCENTS OVER DOORS AND WINDOWS SHALL NOT BE INTERNALLY LIT.

7. BEFORE CERTIFICATES OF OCCUPANCY ARE RELEASED, THE OWNER/BUILDER MUST SUPPLY THE TOWN WITH A FINAL LETTER OF CERTIFICATION FROM THE LIGHTING ENGINEER AND/OR LIGHTING MANUFACTURER VERIFYING THAT ALL SITE LIGHTING IS INSTALLED ACCORDING TO TOWN STANDARDS, THE APPROVED PLANS, AND ANY APPLICABLE CONDITIONS.

8. ARCHITECTURAL CONSTRUCTION PLANS MUST ADHERE TO THE APPROVED SITE PLANS. ANY PROPOSED CHANGES MUST BE SUBMITED TO THE PLANNING DEPARTMENT FOR APPROVAL.

0' 8' 16' 32' 64'

NOT FOR CONSTRUCTION

Felton Grove High School (H12)

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SEAL | DATE 3/5/21

SHEET ISSUE

1	Town of Apex Major Site Plan Submittal #1	12/1/20
2	Town of Apex Major Site Plan Submittal #2	02/12/21
3	Town of Apex Major Site Plan Submittal #3	3/5/21

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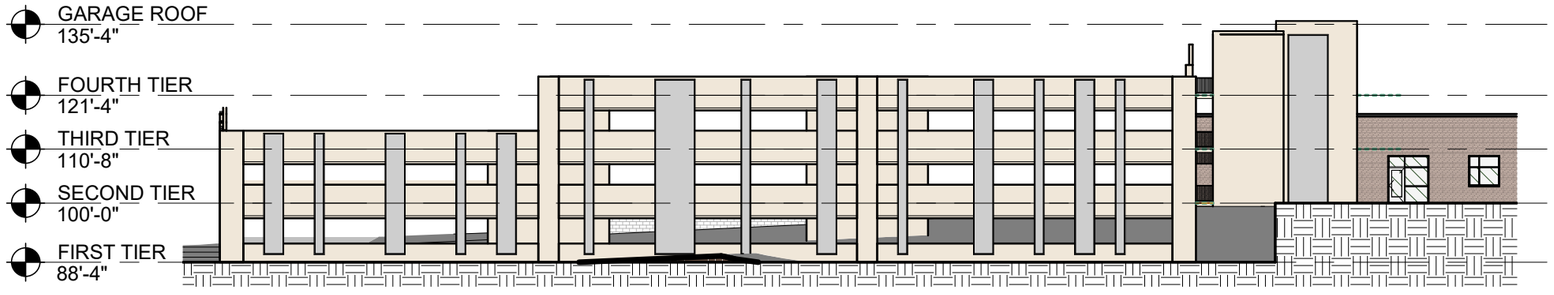
PROJECT NO. 12345.000

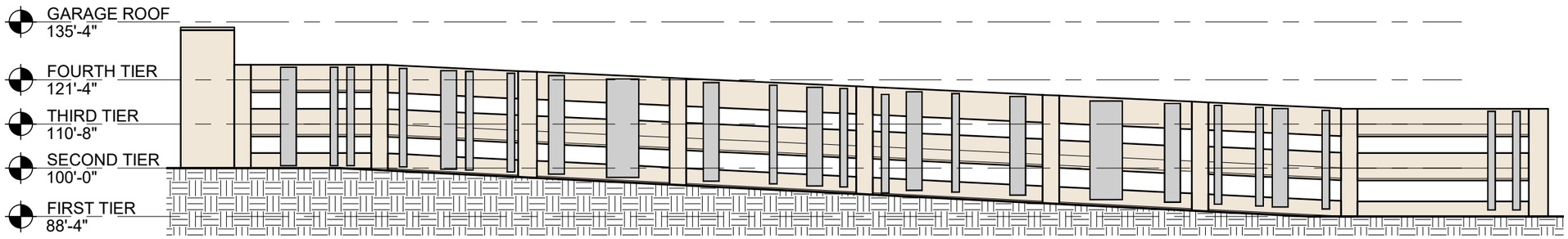
SHEET TITLE
PARKING GARAGE FLOOR PLAN

SHEET NUMBER
A-01.16.

3/3/2021 8:58:05 PM



NORTH



EAST

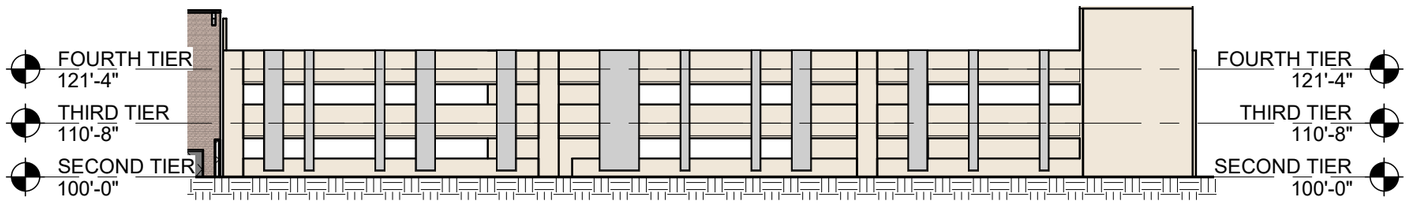
[4/1/2021 2:46:31 PM 12345.000

RATIO

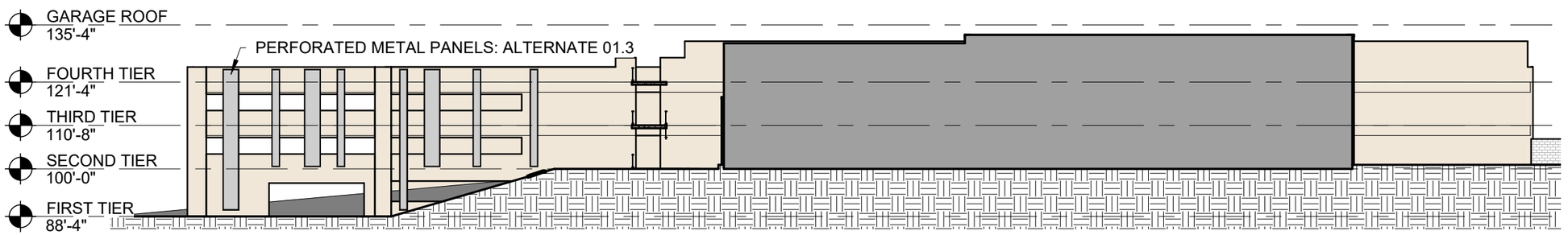
2019-xx-xx

1" = 30'-0"

TERIOR ELEVATIONS **Felton Grove High School**



SOUTH



WEST

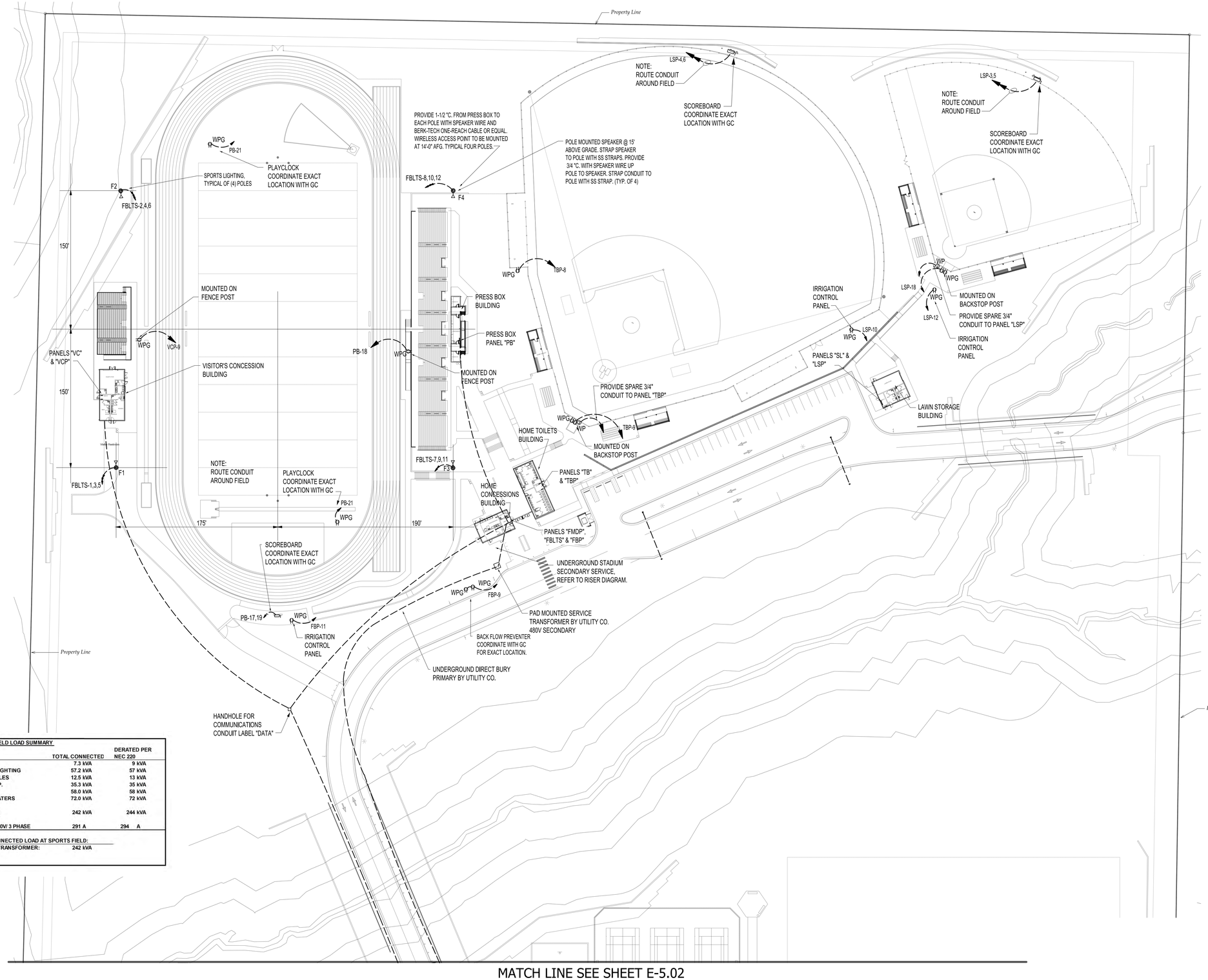
[4/1/2021 2:46:31 PM 12345.000

RATIO

2019-xx-xx

1" = 30'-0"

TERIOR ELEVATIONS **Felton Grove High School**



SPORTS FIELD LOAD SUMMARY

	TOTAL CONNECTED	DERATED PER NEC 220
LIGHTING	7.3 kVA	9 kVA
STADIUM LIGHTING	57.2 kVA	57 kVA
RECEPTACLES	12.5 kVA	13 kVA
MISC EQUIP.	35.3 kVA	35 kVA
HVAC	58.0 kVA	58 kVA
WATER HEATERS	72.0 kVA	72 kVA
TOTAL kVA	242 kVA	244 kVA
AMPS AT 480V/ 3 PHASE	291 A	294 A

TOTAL CONNECTED LOAD AT SPORTS FIELD:
TOTAL AT TRANSFORMER: 242 kVA

MATCH LINE SEE SHEET E-5.02

50' 25' 0 50' 100' 150'

SCALE: 1" = 50'

1 E-04.01 ELECTRICAL SITE PLAN - NORTH

SCALE: 1"= 50'

FOR REFERENCE ONLY NOT FOR CONSTRUCTION

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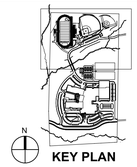

KEY PLAN

SEAL | DATE

NORTH CAROLINA PROFESSIONAL ENGINEER ROBERT E. EAN PRELIMINARY

SHEET ISSUE

1	Town of Apex Major Site Plan Submittal	12/01/20
2	Town of Apex Major Site Plan Submittal #2	2/12/21
3	Town of Apex Major Site Plan Submittal #3	3/05/21
4	Town of Apex Major Site Plan Submittal #4	3/26/21

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PROJECT NO. 3153-W

SHEET TITLE

ELECTRICAL SITE PLAN - NORTH

SHEET NUMBER

E-05.01

MATCH LINE SEE SHEET E-05.01

ELECTRICAL LOAD SUMMARY

	TOTAL CONNECTED	DERATED PER NEC 220
LIGHTING	310 kVA	388 kVA
STAGE LIGHTING	180 kVA	144 kVA
RECEPTACLES	681 kVA	346 kVA
MISC. POWER	192 kVA	192 kVA
MECHANICAL EQUIP.	1165 kVA	850 kVA
KITCHEN EQUIP.	36 kVA	36 kVA
ELEVATORS	153 kVA	153 kVA
TOTAL kVA	2717 kVA	2108 kVA
AMPS AT 480V/ 3 PHASE	3268 A	2536 A

TOTAL CONNECTED LOAD AT SERVICE TRANSFORMER:		
CHILLER	832 kVA	832
BUILDING	2717 kVA	2108
TOTAL AT TRANSFORMER:	3549 kVA	2940 kVA

GENERATOR LOAD SUMMARY

	TOTAL CONNECTED	DERATED PER NEC 220
LIGHTING	45 kVA	56 kVA
STAGE LIGHTING	0 kVA	0 kVA
RECEPTACLES	4 kVA	4 kVA
MECHANICAL EQUIP.	0 kVA	0 kVA
KITCHEN EQUIP.	14 kVA	11 kVA
ELEVATOR	0 kVA	0 kVA
TOTAL kVA	63 kVA	71 kVA
AMPS AT 480V/ 3 PHASE	76 A	86 A

TOTAL CONNECTED LOAD AT GENERATOR:	
CHILLER	0 kVA
BUILDING	63 kVA
TOTAL AT GENERATOR:	63 kVA

PRIMARY BY UTILITY CO.

TWO 2" CONDUITS TO STADIUM

3"C SLEEVES FOR SITE LIGHTING BY UTILITY COMPANY. COORDINATE WITH UTILITY COMPANY FOR EXACT SLEEVE LOCATIONS.

HANDHOLE FOR COMMUNICATIONS CONDUIT LABEL "DATA"

PROVIDE ONE 2"C. FOR COMMUNICATIONS

UNDERGROUND DIRECT BURY PRIMARY BY UTILITY CO.

TWO 2" CONDUITS TO STADIUM

Property Line

3"C SLEEVES FOR BY UTILITY COMPA WITH UTILITY COM SLEEVE LOCATION

3"C SLEEVES FOR SITE LIGHTING BY UTILITY COMPANY. COORDINATE WITH UTILITY COMPANY FOR EXACT SLEEVE LOCATIONS.

PROVIDE ONE 2"C. FOR COMMUNICATIONS

HANDHOLE FOR COMMUNICATIONS CONDUIT, LABEL "DATA"

MDF RM

MAIN ELEC RM

UNDERGROUND SECONDARY SERVICES, REFER TO RISER DIAGRAM.

STAND-BY GENERATOR PHP-1.3.5

FOR PIV

PAD MOUNTED SERVICE TRANSFORMER BY UTILITY CO. 480V SECONDARY

BACK FLOW PREVENTER COORDINATE WITH GC FOR EXACT LOCATION.

UNDERGROUND DIRECT BURY PRIMARY BY UTILITY CO.

3"C SLEEVES FOR SITE LIGHTING BY UTILITY COMPANY. COORDINATE WITH UTILITY COMPANY FOR EXACT SLEEVE LOCATIONS.

3"C SLEEVES FOR SITE LIGHTING BY UTILITY COMPANY. COORDINATE WITH UTILITY COMPANY FOR EXACT SLEEVE LOCATIONS.

HANDHOLES FOR COMMUNICATIONS CONNECTIONS
ONE 4" CONDUIT FOR FUTURE DATA CONNECTION. LABEL "FUTURE" & PROVIDE PULL STRING.
TWO 4" CONDUITS FOR TELEPHONE SERVICE. LABEL "TELEPHONE" ONE 2" CONDUIT FOR CATV SERVICE. LABEL "CATV"

50' 25' 0 50' 100' 150'

SCALE: 1" = 50'

1 / E-05.02 ELECTRICAL SITE PLAN - SOUTH

SCALE: 1"= 50'

FOR REFERENCE ONLY NOT FOR CONSTRUCTION

H12/Felton Grove High School

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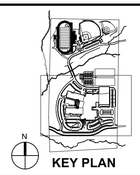

KEY PLAN

SEAL | DATE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042161 SCOTT E. CAIN PRELIMINARY

SHEET ISSUE

1	Town of Apex Major Site Plan Submittal	12/01/20
2	Town of Apex Major Site Plan Submittal #2	2/12/21
3	Town of Apex Major Site Plan Submittal #3	3/05/21
4	Town of Apex Major Site Plan Submittal #4	3/26/21

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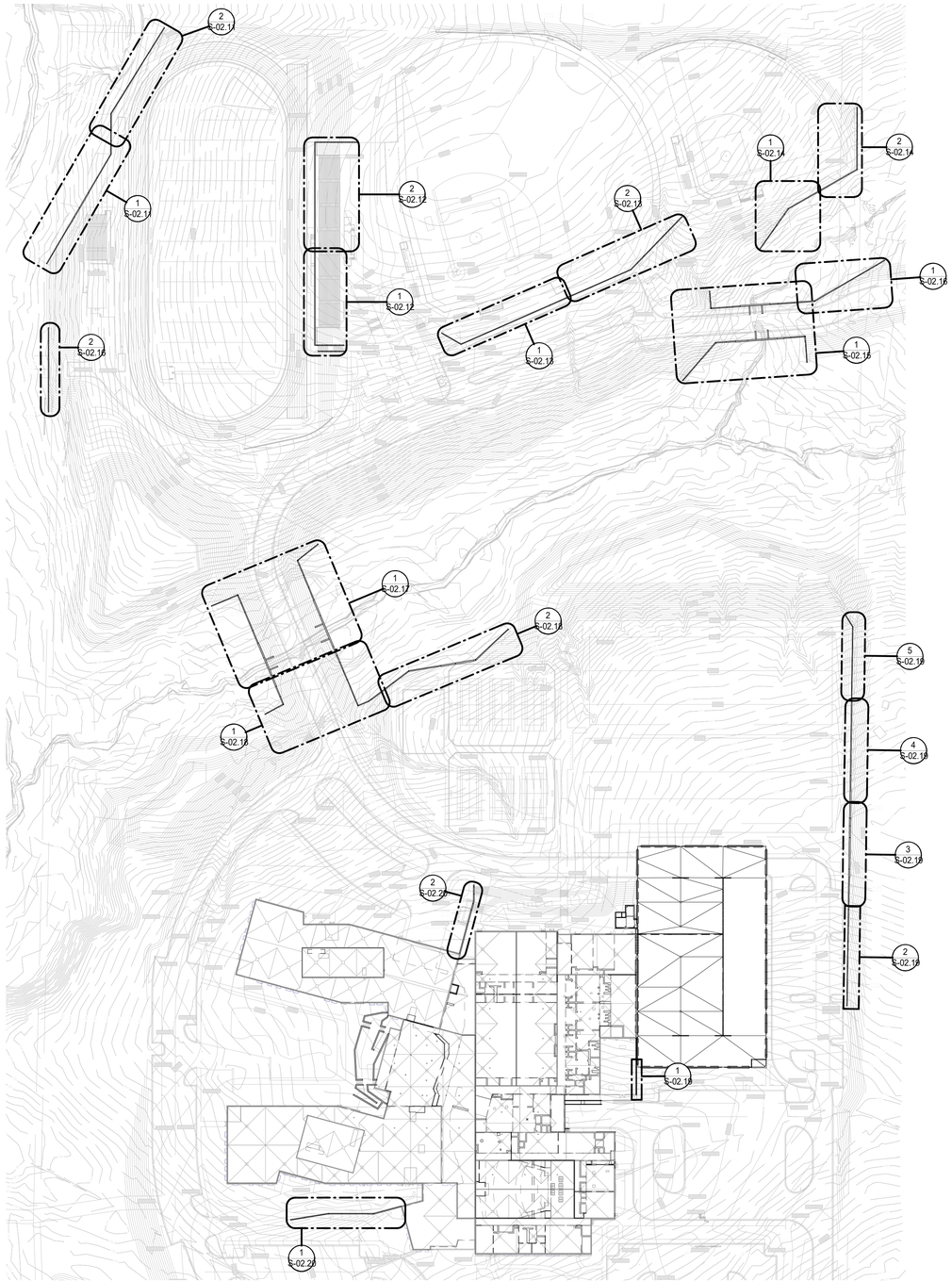
PROJECT NO. 3153-W

SHEET TITLE

ELECTRICAL SITE PLAN - SOUTH

SHEET NUMBER

E-05.02



1 S-02.10 FIRST FLOOR SLAB & FRAMING PLAN
1" = 100'-0"

NOT FOR CONSTRUCTION

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SEAL | DATE 03/26/21

SHEET ISSUE

1	60% Construction Documents	3/26/21
2	TOA Major Site Plan Submittal #1	12/01/20
3	TOA Major Site Plan Submittal #2	02/12/21
4	TOA Major Site Plan Submittal #3	03/05/21
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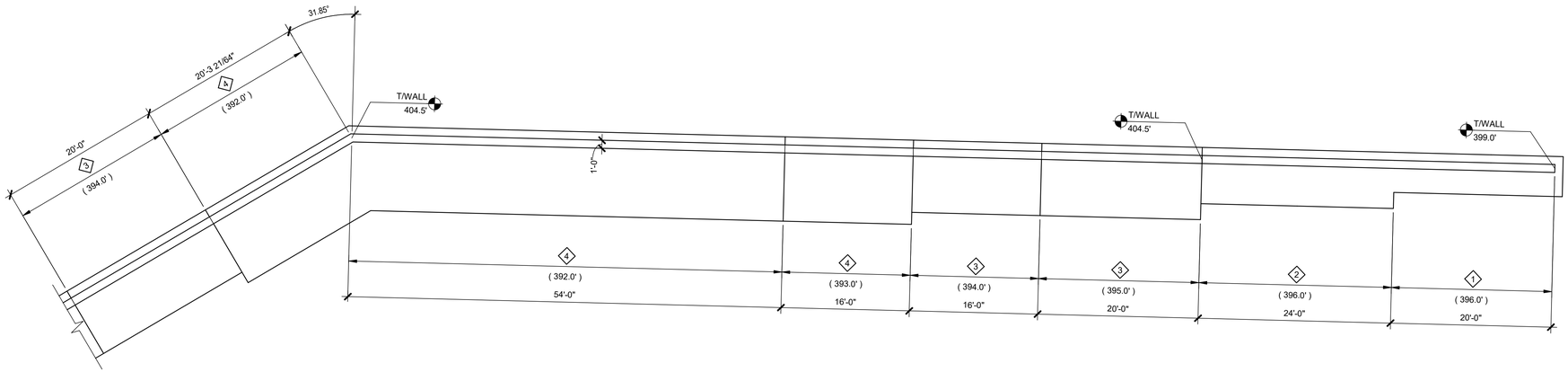
PROJECT NO. 02000.000

SHEET TITLE
SITE WALL OVERALL PLAN

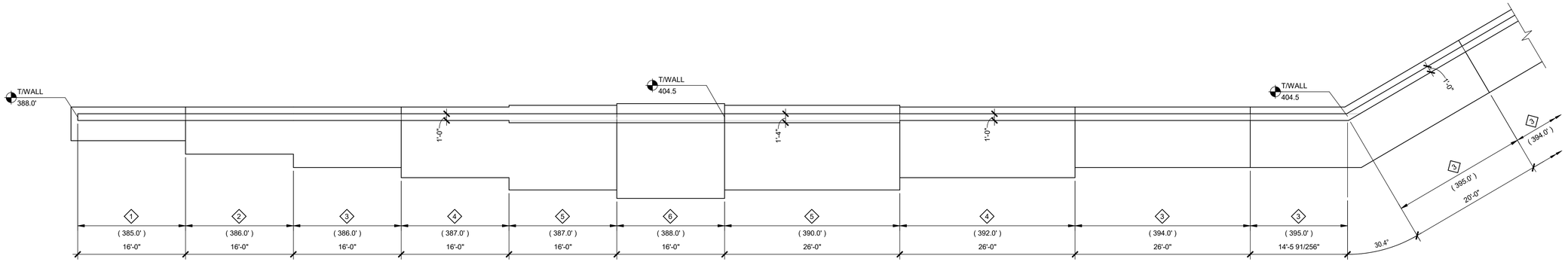
SHEET NUMBER
S-02.10

3/25/2021 12:48:07 PM



2 S-02.11 RETAINING WALL #1 - FDN PLAN

1/8" = 1'-0"



1 S-02.11 RETAINING WALL #1 - FDN PLAN

1/8" = 1'-0"

3/25/2021 12:48:09 PM

NOT FOR CONSTRUCTION

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SEAL | DATE 03/26/21

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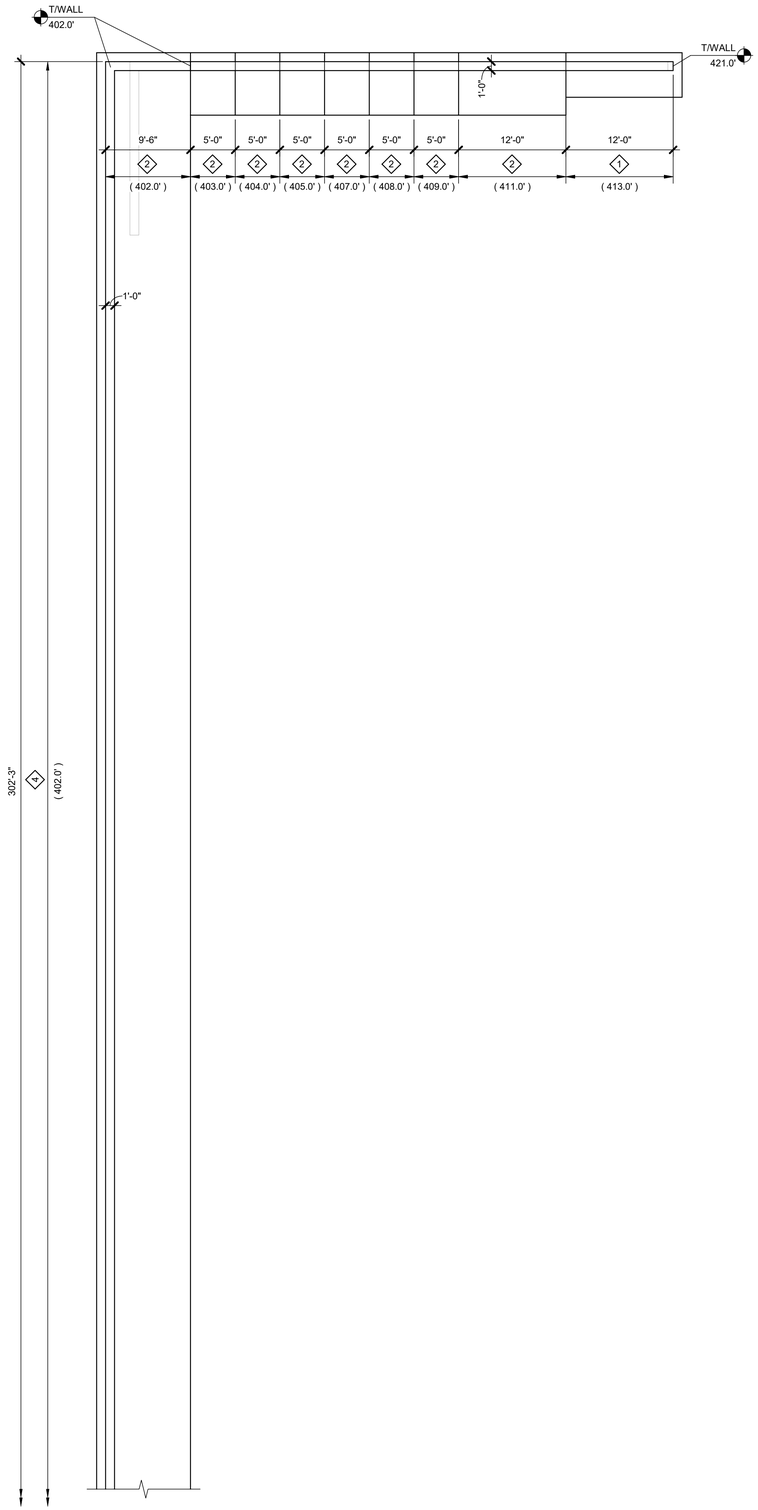
PROJECT NO. 02000.000

SHEET TITLE
SITE WALL PLANS

SHEET NUMBER
S-02.11



2 S-02.12 RETAINING WALL #4 - FDN PLAN
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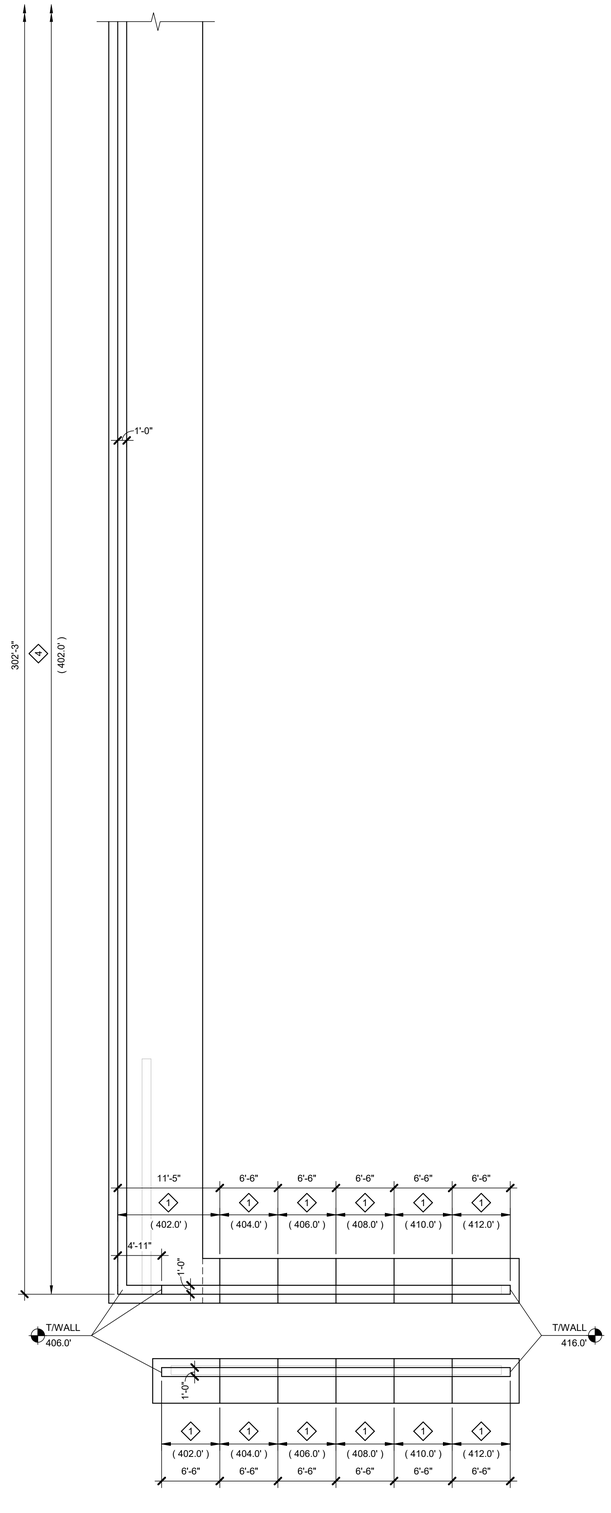

1 S-02.12 RETAINING WALL #3 & #4 - FDN PLAN
1/8" = 1'-0"

NOT FOR CONSTRUCTION

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PROJECT NO. 02000.000

SHEET TITLE
SITE WALL PLANS

SHEET NUMBER
S-02.12

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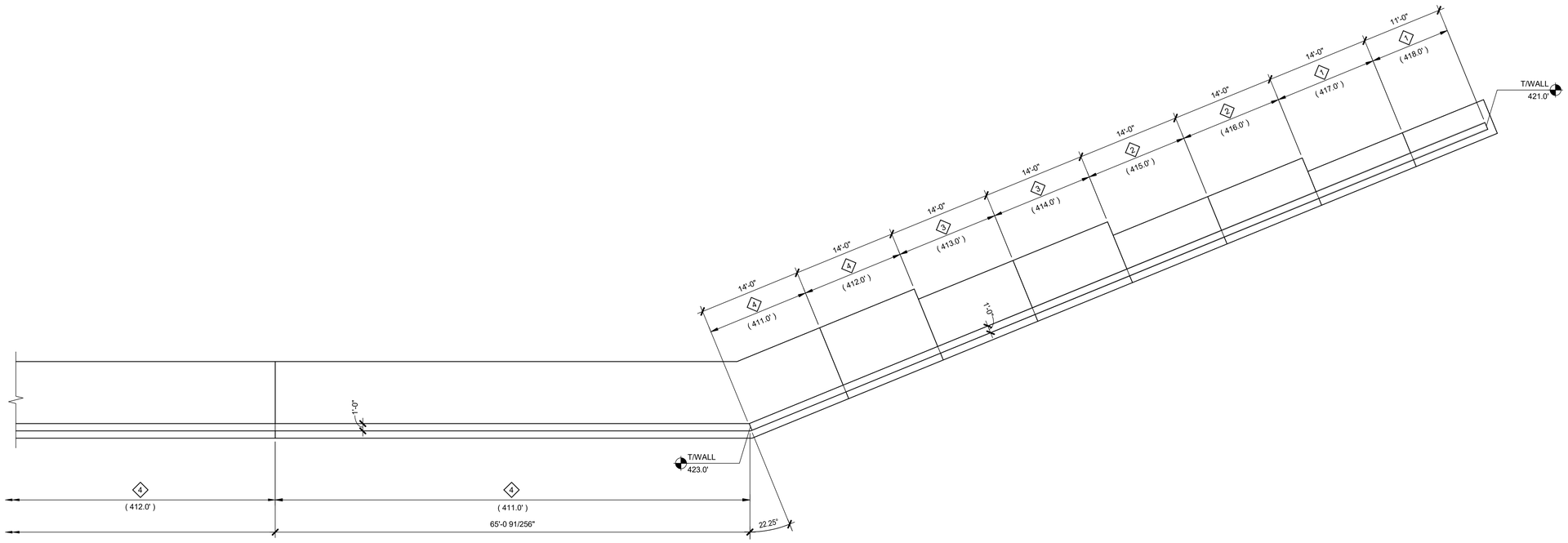
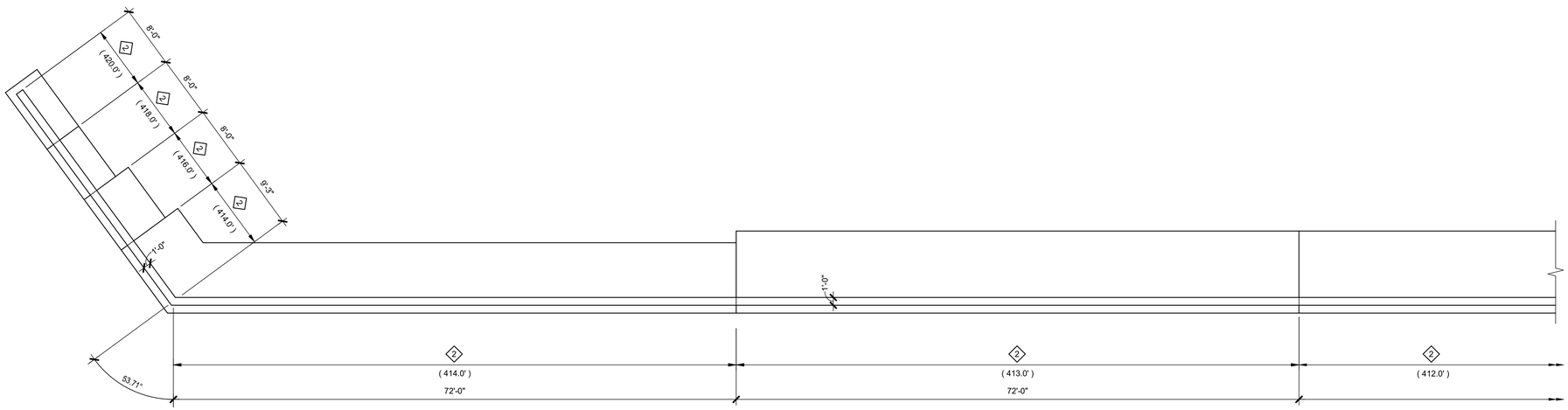


2 S-02.13 RETAINING WALL #5 - FDN PLAN

1/8" = 1'-0"



1 S-02.13 RETAINING WALL #5 - FDN PLAN

1/8" = 1'-0"

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5	TOA Major Site Plan Submittal #4	03/26/21

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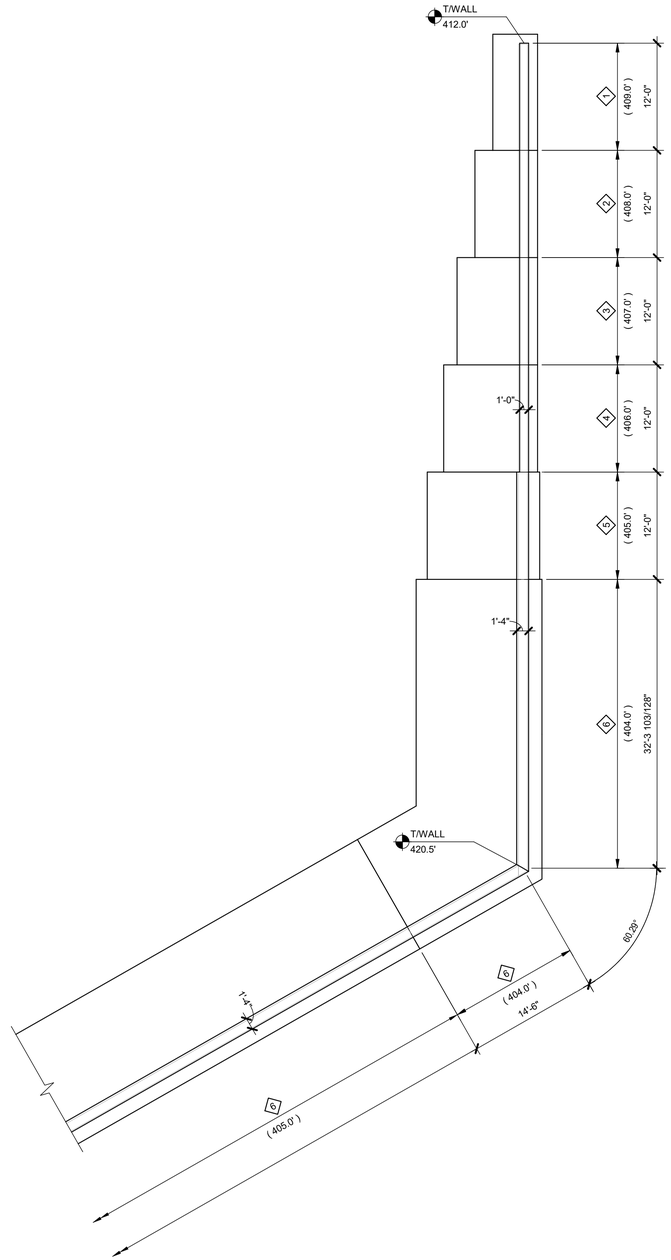
PROJECT NO. 02000.000

SHEET TITLE
SITE WALL PLANS

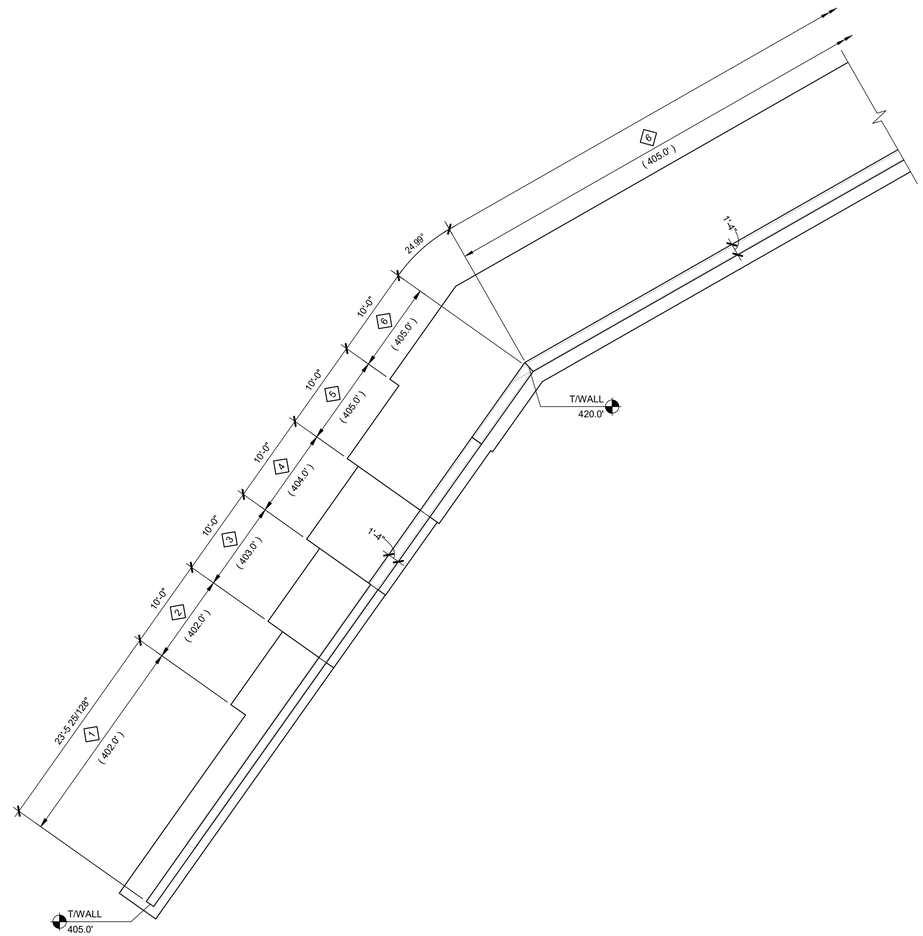
SHEET NUMBER
S-02.13

NOT FOR CONSTRUCTION

3/25/2021 12:48:15 PM



2 RETAINING WALL #8 - FDN PLAN
S-02.14 1/8" = 1'-0"



1 RETAINING WALL #8 - FDN PLAN
S-02.14 1/8" = 1'-0"

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Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

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SHEET ISSUE

1	60% Construction Documents	3/26/21
2	TOA Major Site Plan Submittal #1	12/01/20
3	TOA Major Site Plan Submittal #2	02/12/21
4	TOA Major Site Plan Submittal #3	03/05/21
5	TOA Major Site Plan Submittal #4	03/26/21

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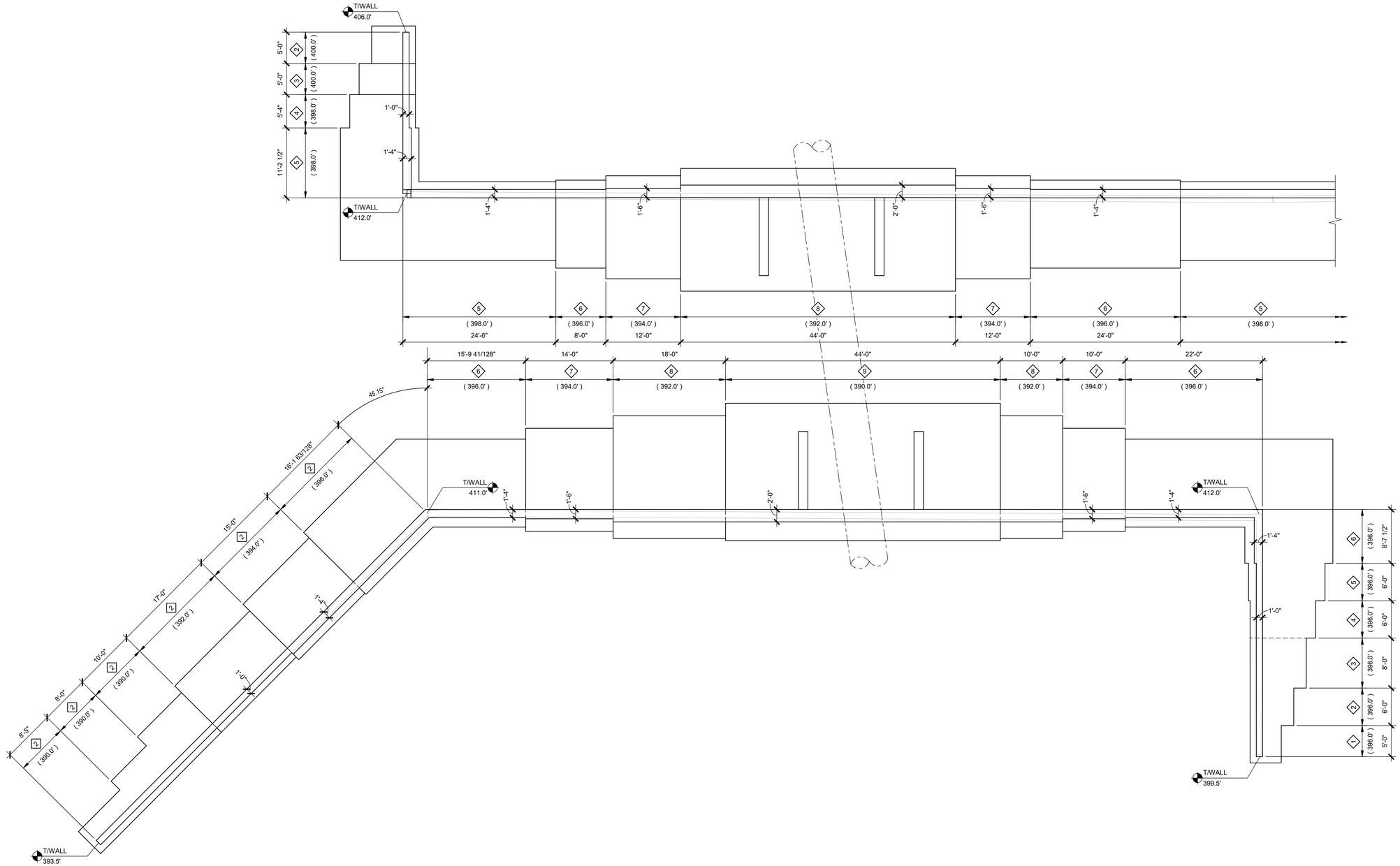
SHEET TITLE
SITE WALL PLANS

SHEET NUMBER
S-02.14



1 S-02.15 RETAINING WALL #9 & #11 - FDN PLAN

1/8" = 1'-0"

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SITE WALL PLANS

SHEET NUMBER
S-02.15

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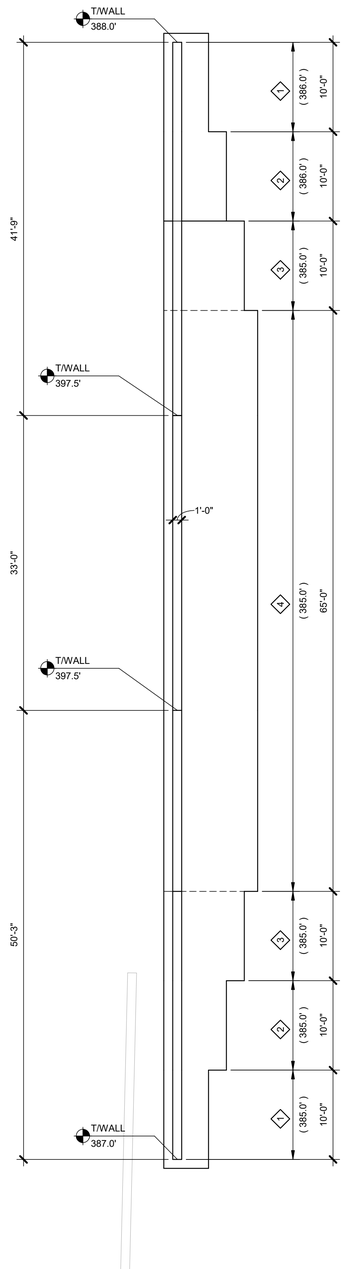
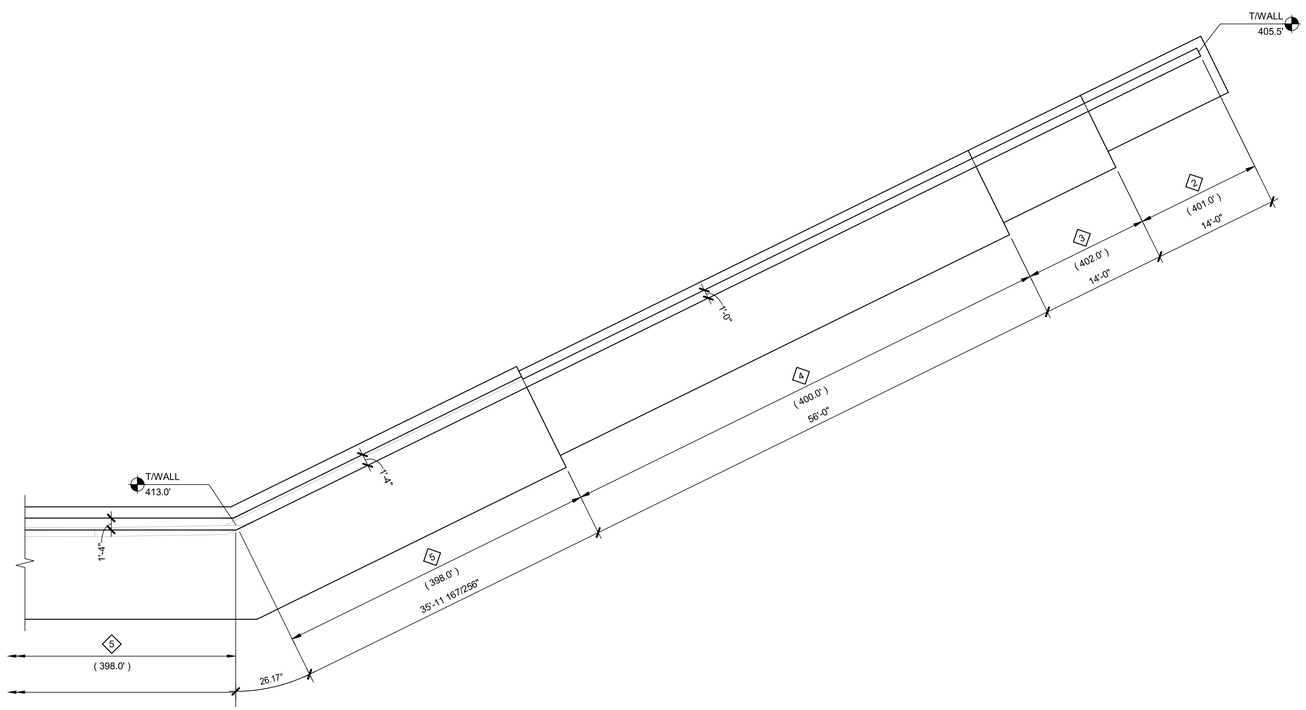


2 RETAINING WALL #10 - FDN PLAN
S-02.16 1/8" = 1'-0"



1 RETAINING WALL #9 - FDN PLAN
S-02.16 1/8" = 1'-0"

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SHEET TITLE
SITE WALL PLANS

SHEET NUMBER
S-02.16

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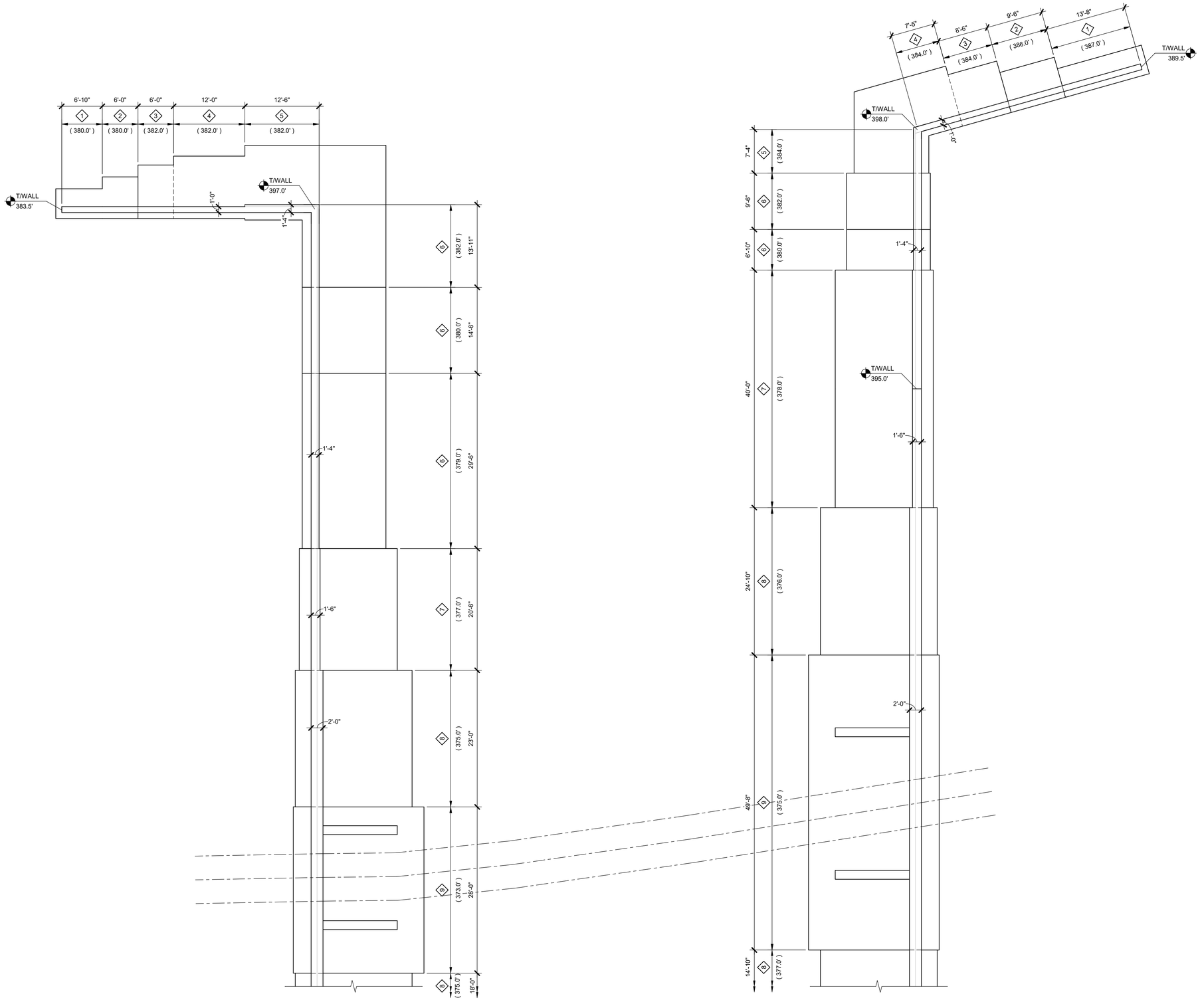

1 S-02.17 RETAINING WALL #12 & #13 - FDN PLAN

1/8" = 1'-0"

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SHEET TITLE
SITE WALL PLANS

SHEET NUMBER
S-02.17

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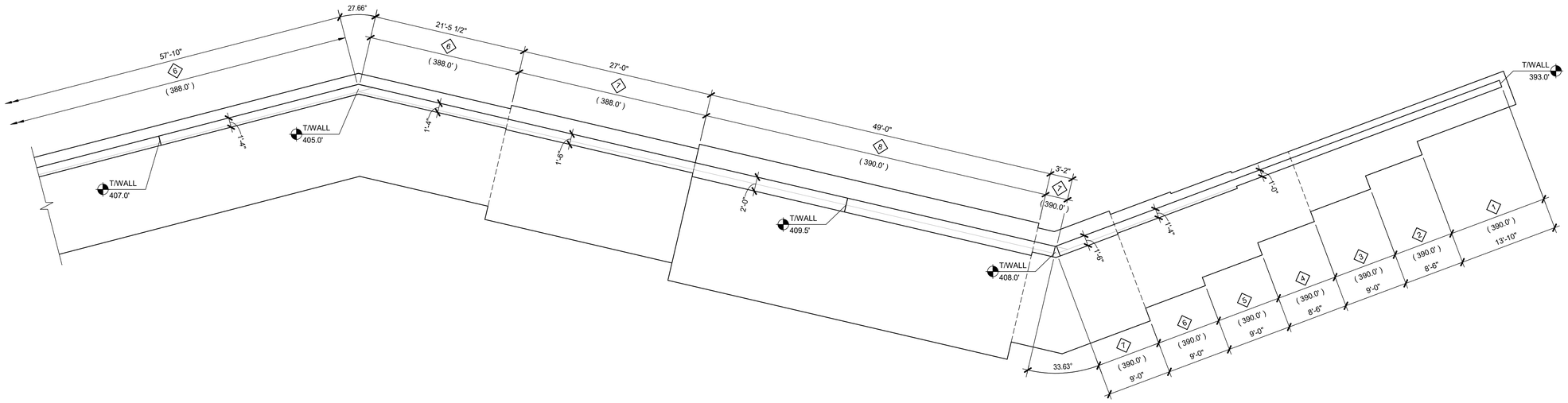
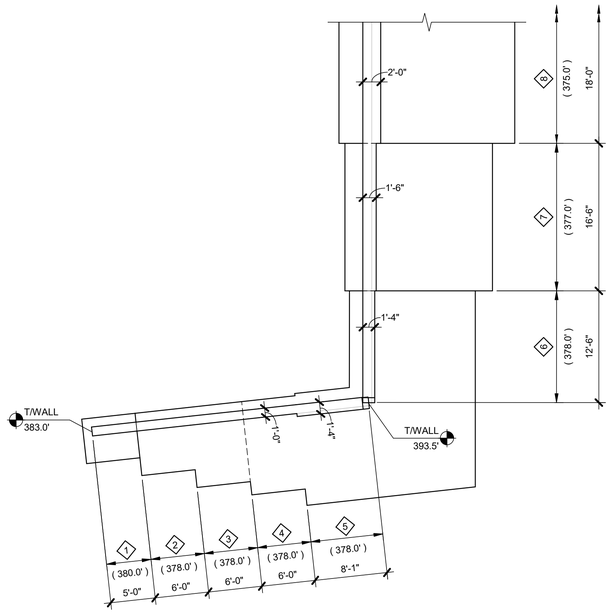
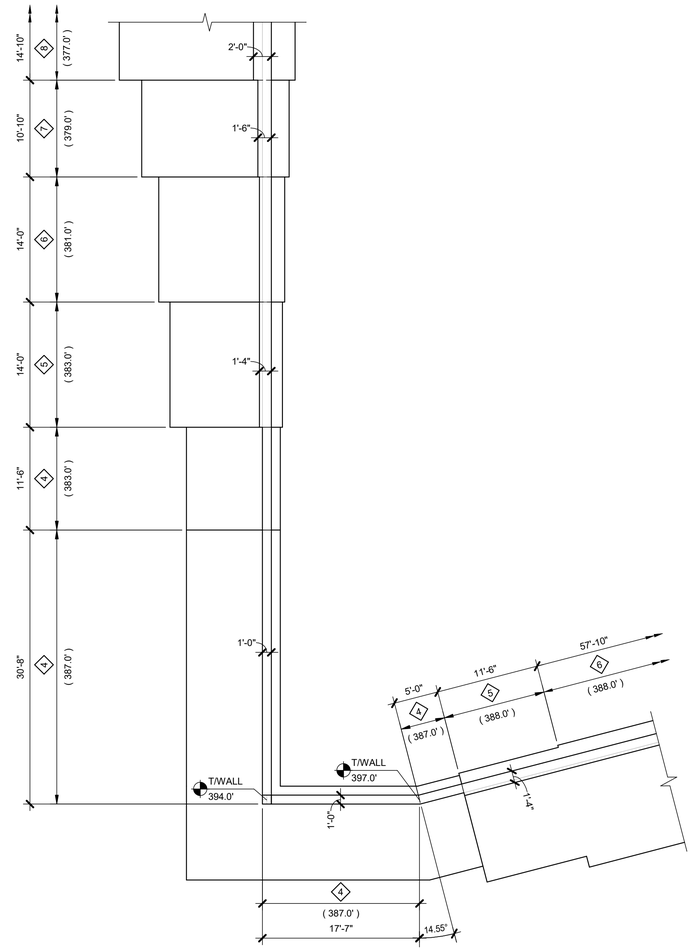


2 RETAINING WALL #12 - FDN PLAN
3-02.18 1/8" = 1'-0"





1 RETAINING WALL #12 & #13 - FDN PLAN
S-02.18 1/8" = 1'-0"

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SITE WALL PLANS

SHEET NUMBER
S-02.18

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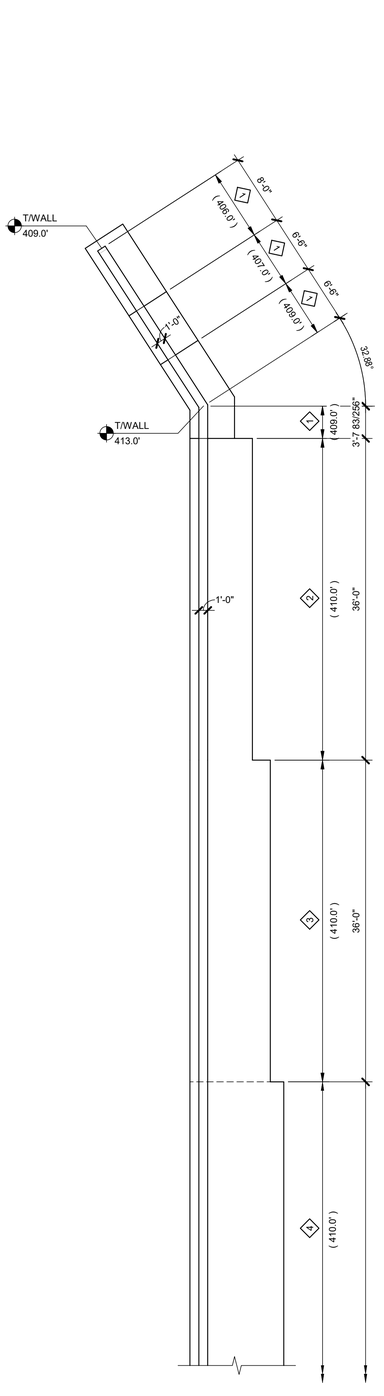
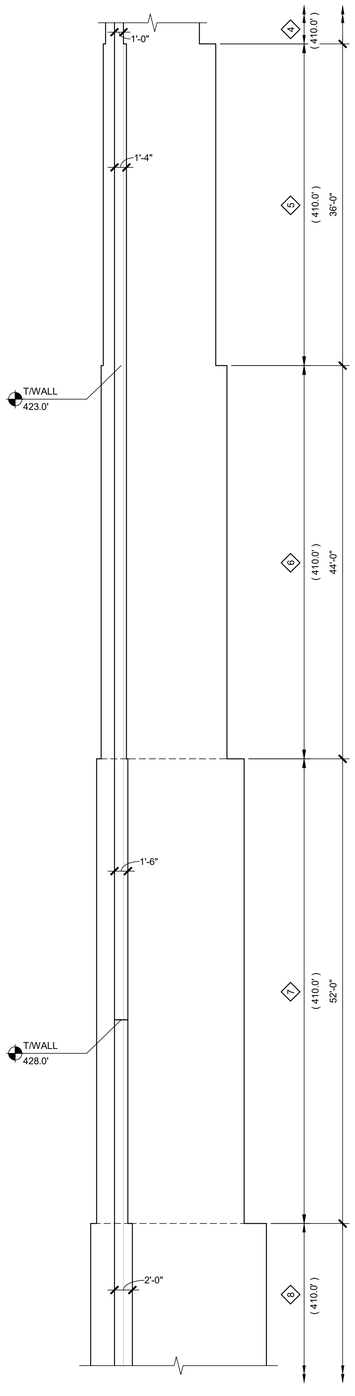
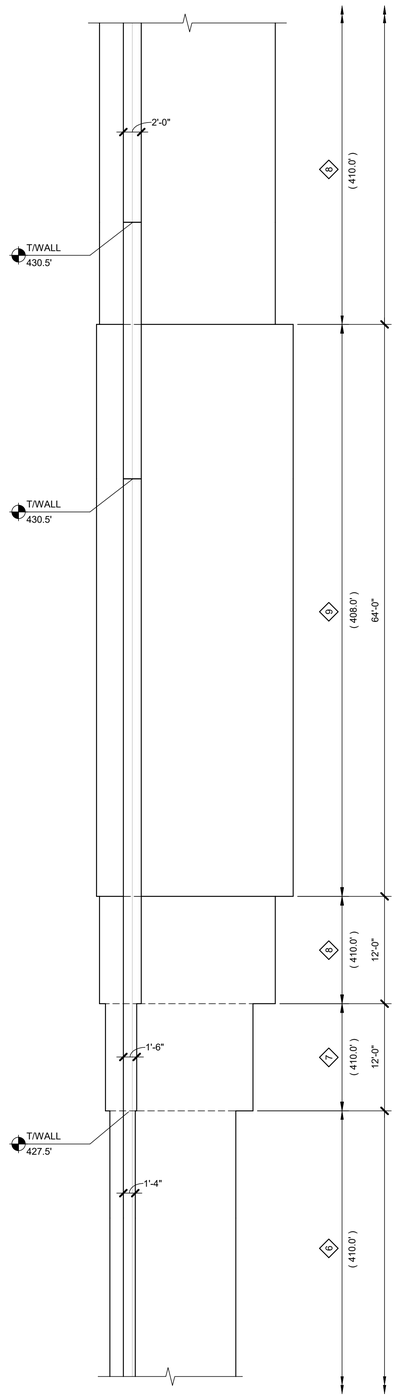


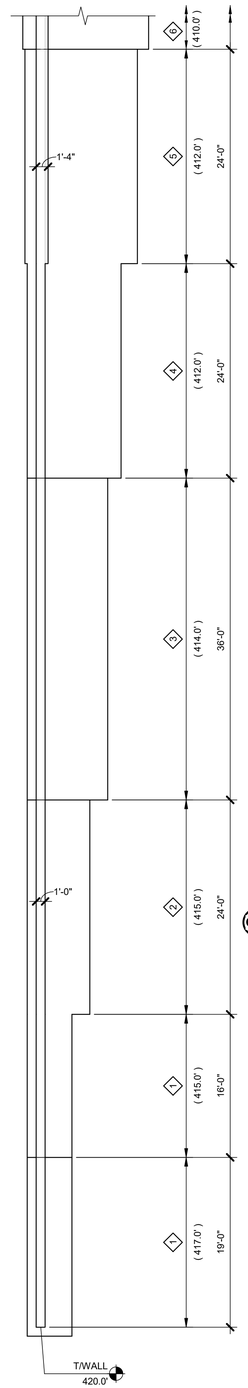
5 RETAINING WALL #15 - FDN PLAN
S-02.19 1/8" = 1'-0"



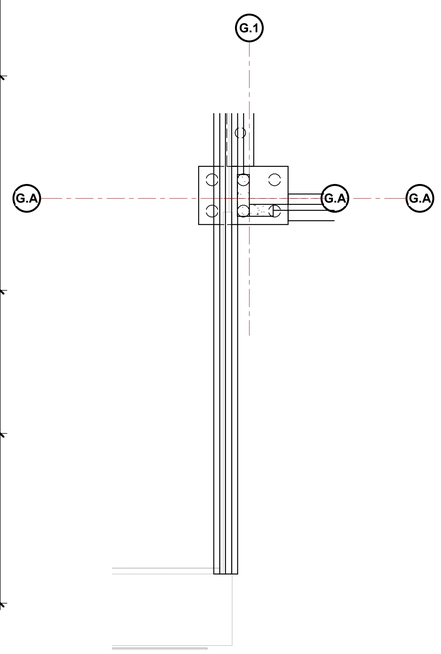
4 RETAINING WALL #15 - FDN PLAN
S-02.19 1/8" = 1'-0"



3 RETAINING WALL #15 - FDN PLAN
S-02.19 1/8" = 1'-0"



2 RETAINING WALL #15 - FDN PLAN
S-02.19 1/8" = 1'-0"



1 RETAINING WALL #14 - FDN PLAN
S-02.19 1/8" = 1'-0"

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SHEET TITLE
SITE WALL PLANS

SHEET NUMBER
S-02.19

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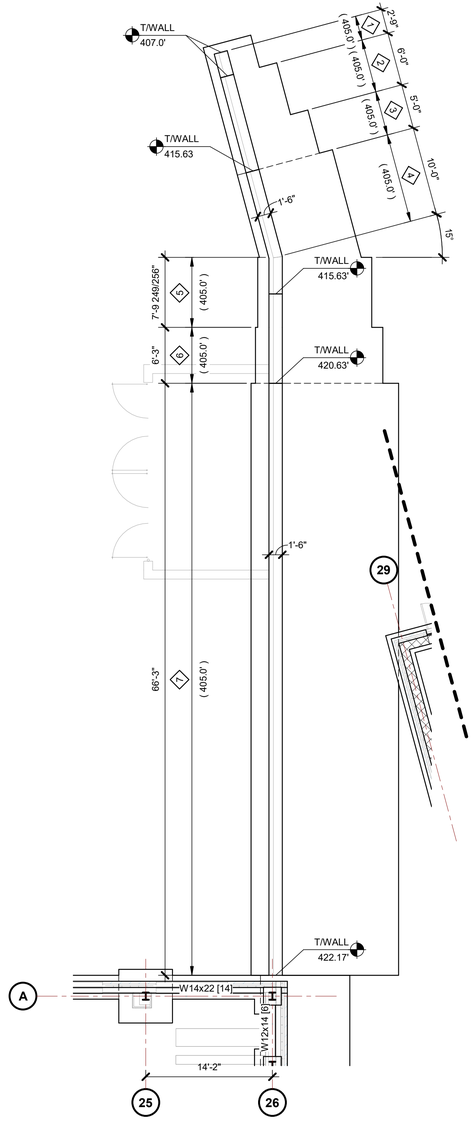
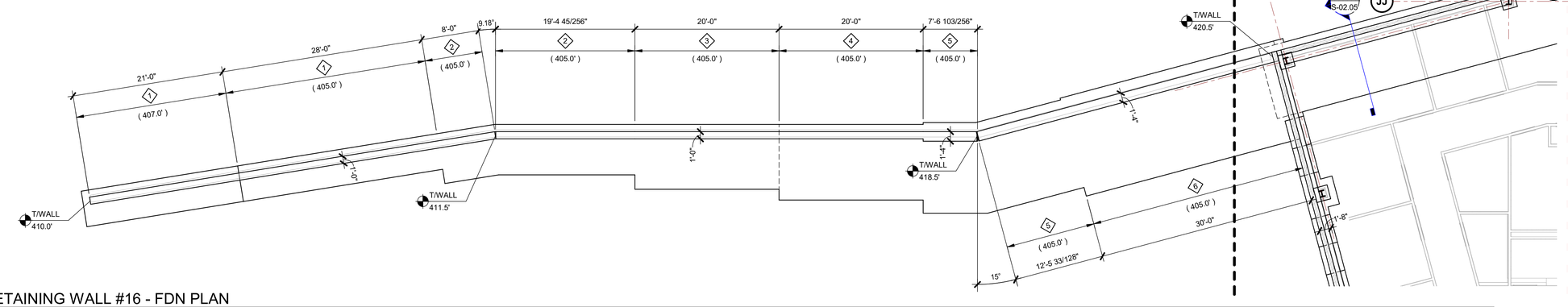


2 S-02.20 RETAINING WALL #17 - FDN PLAN

1/8" = 1'-0"



1 S-02.20 RETAINING WALL #16 - FDN PLAN

1/8" = 1'-0"

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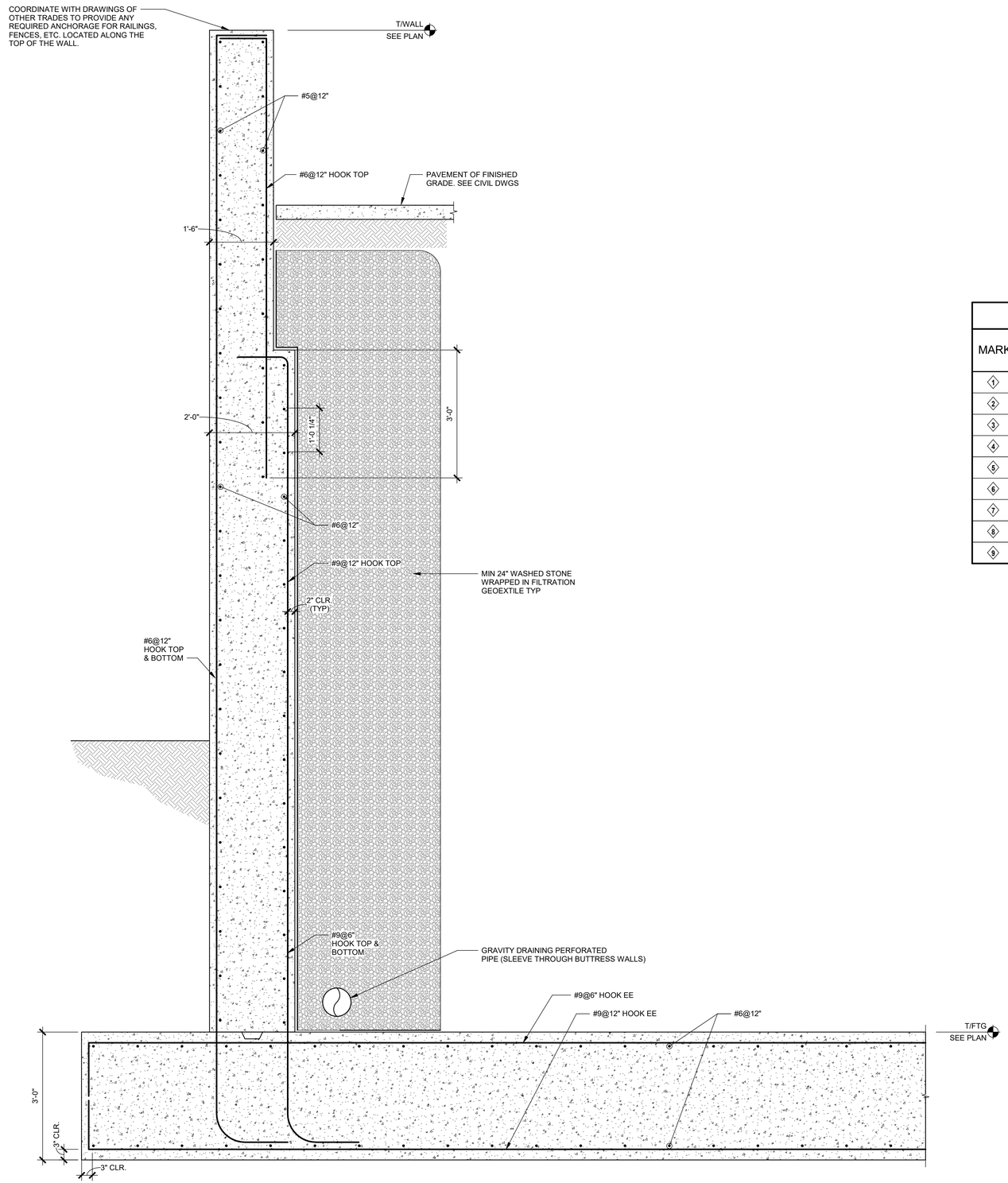
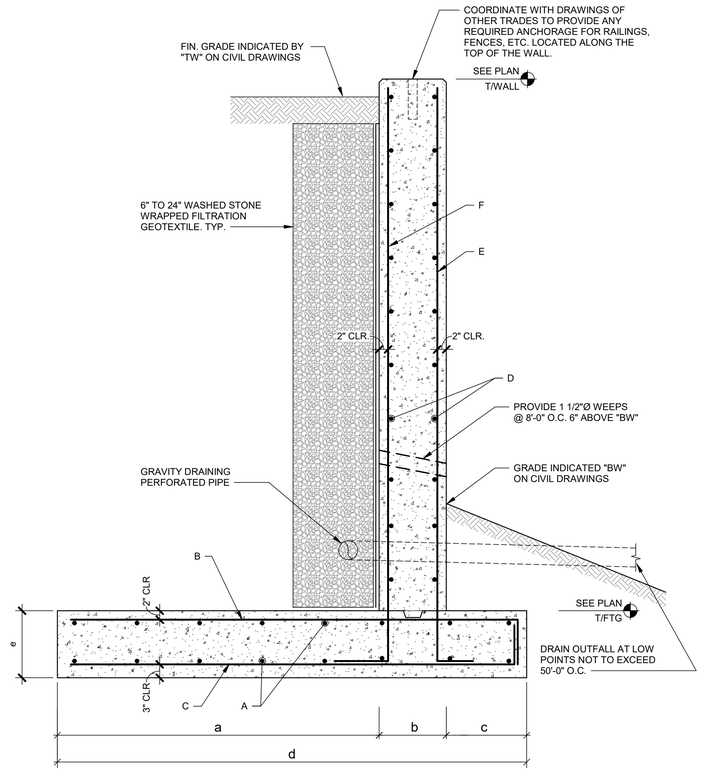


2 S-02.21 SECTION THRU CULVERT WALL
3/4" = 1'-0"

RETAINING WALL SCHEDULE													
MARK	MAX HEIGHT	DIMENSIONS					REINFORCING						REMARK
		a	b	c	d	e	A	B	C	D	E	F	
1	6'-0"	3'-0"	1'-0"	1'-0"	5'-0"	1'-0"	#4@16"	#4@8"	#4@8"	#4@16"	#4@16"	#4@16"	
2	8'-0"	5'-0"	1'-0"	1'-0"	7'-0"	1'-0"	#4@16"	#4@8"	#4@8"	#4@16"	#4@16"	#4@8"	
3	10'-0"	7'-0"	1'-0"	1'-0"	9'-0"	1'-0"	#4@16"	#5@8"	#4@8"	#4@16"	#4@16"	#5@8"	
4	12'-6"	8'-6"	1'-0"	1'-0"	10'-6"	1'-3"	#5@16"	#6@8"	#5@8"	#4@16"	#4@16"	#6@8"	
5	14'-0"	10'-0"	1'-3"	1'-3"	12'-6"	1'-3"	#5@16"	#7@8"	#5@8"	#4@12"	#4@16"	#7@8"	
6	16'-0"	11'-0"	1'-3"	1'-9"	14'-0"	1'-3"	#5@16"	#7@6"	#6@12"	#4@12"	#4@12"	#7@6"	
7	18'-0"	13'-0"	1'-6"	2'-0"	16'-6"	1'-6"	#5@16"	#7@6"	#6@12"	#5@12"	#4@12"	#7@6"	
8	20'-0"	15'-0"	2'-0"	2'-8"	19'-8"	2'-0"	#6@12"	#8@6"	#7@12"	#6@12"	#5@12"	#8@6"	
9	22'-0"	17'-0"	2'-0"	3'-0"	22'-0"	2'-8"	#6@12"	#9@6"	#8@12"	#6@12"	#5@12"	#9@6"	



1 S-02.21 RETAINING WALL SECTION
3/4" = 1'-0"

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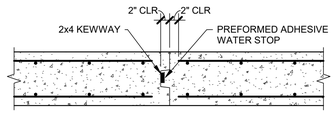
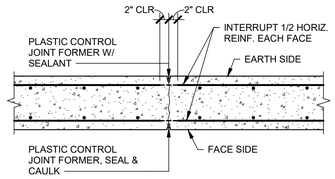
SHEET TITLE
SITE WALL DETAILS AND SECTIONS

SHEET NUMBER
S-02.21

3/25/2021 12:48:41 PM

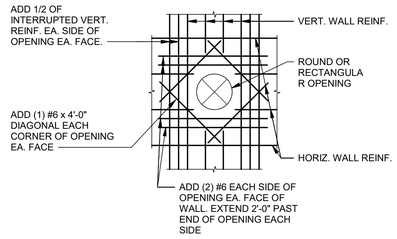


WALL CONSTRUCTION JOINT DETAIL

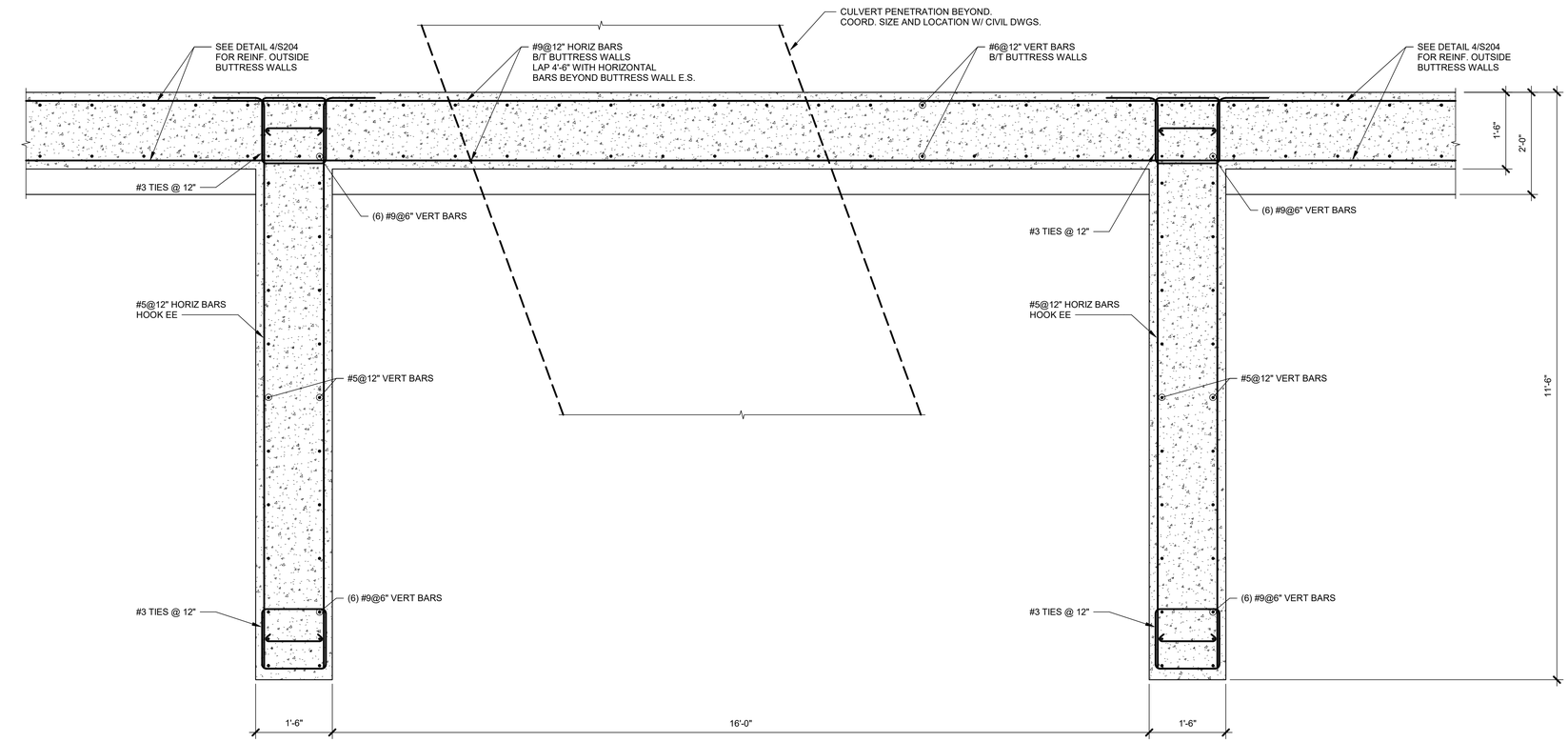


WALL CONTROL JOINT DETAIL

3 S-02.23 WALL CONTROL JOINT
3/4" = 1'-0"



2 S-02.23 CONC. WALL OPENING DETAIL
1/2" = 1'-0"



1 S-02.23 BUTTRESS WALL PLAN DETAIL
3/4" = 1'-0"

NOT FOR CONSTRUCTION

Felton Grove High School

8550 Stephenson Road
Apex, NC 27539

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SEAL | DATE 03/26/21

SHEET ISSUE

1	60% Construction Documents	3/26/21
2	TOA Major Site Plan Submittal #1	12/01/20
3	TOA Major Site Plan Submittal #2	02/12/21
4	TOA Major Site Plan Submittal #3	03/05/21
5	TOA Major Site Plan Submittal #4	03/26/21

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PROJECT NO. 02000.000

SHEET TITLE
SITE WALL DETAILS AND SECTIONS

SHEET NUMBER
S-02.23

3/25/2021 12:48:43 PM

SPECIFICATION : SEGMENTAL BLOCK RETAINING WALL WITH GEOGRID REINFORCED SOILS

PART 1 GENERAL

1.01 Section Includes:
A. Preparing site and foundation soil.
B. Constructing leveling pad for retaining wall units.
C. Furnishing and installing modular concrete retaining wall units as shown on the construction drawings or as directed by the ENGINEER Soil Engineering Consultants, PLLC (SEC)
D. Furnishing and installing geogrid reinforcement, drainage fill, and backfill to the lines and grades designated on the construction drawings.
E. Furnishing and installing all appurtenant materials required for construction of the retaining wall as shown on the construction drawings.

1.02 Related Work
A. Site Preparation from Project Specs
B. Earthwork from Project Specs

1.03 Reference Standards
A. Engineering Design
1. NCMA Design Manual for Segmental Retaining Walls
2. NCMA SRWU-1 - Determination of Connection Strength between Geosynthetics and Segmental Concrete Units
3. NCMA SRWU-2 - Determination of Shear Strength between Segmental Concrete Units

B. Segmental Retaining Wall Units
1. ASTM C-140-75 (1981 Rev) Sampling and Testing Concrete Masonry Units
2. ASTM C-1262 - Evaluating the Freeze-Thaw Durability of Manufactured Concrete Units

C. Geosynthetic Reinforcement
1. ASTM D 5262 - Test Method for Evaluating the Unconfined Tension Creep Behavior of Geosynthetics
2. ASTM D 6637 - Test Method for Determining Tensile Properties of Geogrids
3. GRI GG4(b) - Determination of the Long Term Design Strength of Flexible Geogrids
4. GRI GG5 - Test Method for Geogrid Pullout

D. Soils
1. ASTM D 698 - Moisture Density Relationship for Soils, Standard Method
2. ASTM D 422 - Particle-Size Analysis
3. ASTM D 424 - Atterberg Limits of Soils
4. ASTM D G51 - Soil pH

E. Drainage Pipe
1. ASTM D 3034 - Specification for Polyvinyl Chloride (PVC) Plastic Pipe.
2. ASTM D 1248 - Specification for Corrugated Plastic Pipe

F. Where specifications and reference documents conflict, the Owner's Engineer shall make the final determination of applicable document.

1.04 Delivery, Storage, and Handling
A. Retaining Wall Units:
1. Contractor shall check the units upon delivery to ensure that proper materials have been recieved.
2. Contractor shall prevent excessive mud, wet cement, epoxy, and like materials from coming in contact with and affixing to the units.
3. Contractor shall protect the units from damage (i.e. cracks, chips, spalls). Damaged units shall be evaluated for usage in the wall according to ASTM: C-145-75.

B. Geogrid:
1. Contractor shall check the geogrid upon delivery to ensure that the proper material has been recieved.
2. Geogrids shall be stored as recommended by manufacturer.
3. Contractor shall prevent excessive mud, wet cement, epoxy, and like materials from coming in contact with and affixing to the geogrid material.
4. Rolled geogrid material may be laid flat or stood on end for storage.

PART 2 MATERIALS

2.01 Concrete Segmental Retaining Wall Units
A. Concrete segmental units shall have a minimum 28 days compressive strength of 3000 psi and a maximum absorption of 7% by weight as determined in accordance with ASTM C 140. For areas subject to detrimental freeze-thaw cycles as determined by the Owner or Owner's Engineer the concrete shall have adequate freeze-thaw protection and meet the requirements of ASTM C 1262.
B. All units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the construction.
C. SRW unit dimensions shall not differ more than +/- 1/8 inch except height, which shall not differ more than, +/- 1/16 inch, as measured in accordance with ASTM C 140.
D. SRW units shall match the color, surface finish and dimension for height, width, depth and batter as shown on the plans.
E. Cap adhesive shall meet the requirements of the SRW manufacturer.

2.02 Geosynthetic Reinforcement
A. The geosynthetic shall consist of high tenacity polyester geogrids manufactured for soil reinforcement. The polyester yarns used in the manufacture of the geosythetic shall have a molecular weight exceeding 25,000 Meg/m and carboxyl end group values less than 30. Polyester geosynthetic shall be coated with an impregnated PVC coating that resists peeling, cracking and stripping. The type, strength and placement location of the reinforcing geosynthetic shall be as shown on the plans.

2.03 Drainage Pipe
A. The drainage collection pipe shall be a perforated or slotted, PVC or corrugated HDPE pipe. The pipe and drainage aggregate may be wrapped with a geotextile that will function as a filter.
B. Drainage pipe shall be manufactured in accordance with ASTM D 3024 and/or ASTM 1248.

2.04 Geotextile Fabric
A. Drainage geotextile shall have the following minimum properties or shall meet the criteria recommended by the Wall Design Engineer.

Apparent Opening Size	ASTM D 4751	US Sieve	70
Grab Tensile	ASTM D 4632	lbs	115
Trapezoidal Tear Strength	ASTM D 4533	lbs	50
Water Flow Rate	ASTM D 4491	lbs	140
Puncture Strength	ASTM D 4833	lbs	65
Weight	ASTM D 5261	oz	4

PART 2 MATERIALS

2.05 Drainage Aggregate
A. Drainage aggregate shall be a clean crushed stone or granular fill meeting the following gradation as determined in accordance with ASTM D 422.

Sieve Size	Percent Passing
1 inch	100
3/4 inch	75-100
No. 4	0-50
No. 40	0-20
No. 200	0-5

2.06 Reinforced Backfill
A. Reinforced backfill shall be free of debris and consist of one of the following inorganic USCS soil types: GW, GP, SW, SP, SM or SC meeting the following gradation as determined in accordance with ASTM D 422.

Sieve Size	Percent Passing
1 inch	100
3/4 inch	100-75
No. 4	100-20
No. 40	0-60
No. 200	0-35

The plasticity index of the reinforced soil shall be less than 20 and the Liquid Limit less than 40.

B. The pH of the reinforced backfill shall be between 3 and 9 when tested in accordance with ASTM G-51.

C. Soil strength properties.

Soil Zone	Angle of Internal Friction	Moist Unit Weight	Cohesion
Reinforced	28 degrees	120 pcf	0 psf
Retained	28 degrees	120 pcf	0 psf
Foundation	28 degrees	120 pcf	100 psf

2.07 Impervious Fill
A. Impervious Fill shall be free of debris and consist of a USCS soil type CL.
B. At least 50% shall pass the No. 200 sieve
C. The Liquid Limit shall be less than 50, the PI >7 and plot on or above the "A" line.

The above soil properties are based on information assumed or provided to the Engineer. If the soil conditions do not reflect these properties, the Engineer shall be notified immediately.

PART 3 CONSTRUCTION

3.01 Excavation
A. Contractor shall excavate to the lines and grades shown on the construction drawings. Excavation support, if required, shall be designed by the Contractor. Contractor shall be careful not to disturb base beyond the lines shown.

3.02 Foundation Soil Preparation
A. Foundation soil shall be excavated as required for footing dimensions and degree of tilt-back shown on the construction drawings, or as directed by the Engineer.
B. Foundation soil shall be examined by the Geotechnical Engineer to insure that the actual soil strength meets or exceeds the bearing capacities stated on the elevation sheet(s). Soil not meeting the required strength shall be removed and replaced with acceptable material.
C. Over-excavated areas shall be filled with compacted backfill material.

3.03 Base Preparation
A. Place a minimum of 6 inches of compacted base material in excavated trench and compact to 95% of the maximum dry density as determined by the Standard Proctor method (ASTM D 698).
B. Base material shall be compacted to insure no gaps between the base and the retaining wall units.

3.04 Unit Installation (see Manufacturer's specs for additional details)
A. Place the first course of segmental units end to end on the prepared base so they are touching. Proper alignment may be achieved with the aid of a string line using the back of the block as a guide.
B. Segmental units shall be placed side by side for the full length of the wall.
C. Install the units of the second row, set squarely with no rocking on the first row. Backfill units with drainage fill.
D. All excess material shall be swept from the top of units prior to installing the next course.
E. Make sure the material is compacted behind the units.

3.05 Geogrid Installation
A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.
B. Geogrid reinforcement shall be placed at the elevation and to the extent shown on the construction drawings or as directed by the Engineer.
C. The geogrid soil reinforcement shall be laid horizontally on compacted reinforced fill. Place geogrid to the front faces of the wall so that it is visible after wall construction, install next course of units. Place drainage fill and pull geogrid taut. Anchor geogrid prior to placing backfill.
D. Slack in the geogrid will not be allowed and shall be removed in a manner and to such a degree as approved by the Engineer.
E. Geogrid reinforcements shall be continuous throughout full embedment length. Spliced connections between shorter pieces of geogrid will not be allowed unless approved by the engineer prior to construction.

3.06 Back Fill Placement
A. Reinforced fill shall be placed and compacted to 95% of the maximum dry density as determined by the Standard Proctor method (ASTM D-698) at a moisture content within 2% of optimum in 8" recommended lift thickness unless directed otherwise by the on-site geotechnical engineer.
B. Reinforced fill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid.
C. Only lightweight hand-operated compaction equipment shall be allowed within 3 feet of the wall units.
D. Tracked construction equipment shall not be operated directly upon the geogrid. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to minimum to prevent tracks from displacing the fill and damaging the geogrid.
E. Rubber tired equipment may pass over the geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning shall be avoided.
F. At the end of each day's operation, the contractor shall slope the last level of backfill away from the wall facing to direct runoff of rainwater away from the wall face. In addition, the contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

Recommended Testing to Verify Wall Construction

The construction of the retaining wall(s) contained in this set of plans should include the inspection of walls during construction and at the completition of construction, a registered professional engineer should review the documentation and state that the walls were built according to the plans and specifications. The owner shall arrange for inspection and subsequent certification. Construction shall not begin until these arrangements are in place.

The following checklist is provided as an aid to the on-site inspector and the engineer performing the certification. It is not to be taken as all-inclusive. All items included in the wall design specification and the block and geogrid manufactures shall be followed.

Materials to be evaluated before construction begins
Block Type
Grid Type
Soils see 2.06 A, B and C
Bearing Capacity testing every 50 ft and spaced from wall face to tails of the geogrid
Soft soils and other conditions that do not meet the project specifications shall be undercut and replaced or otherwise remedied as directed by the on-site geotechnical testing firm.

Construction
Leveling Pad dimensions
Leveling Pad elevations
Leveling Pad compliance with drainage aggregate
Drianage Pipe sloping to daylight
Drainage Pipe daylighted every 50ft one block above grade at toe of wall
Drainage aggregate used in block core fill and one foot behind back of block.

The owner's engineer should verify placement of the geogrid. Since geogrid type, strength or lengths may change across the extent and height of the wall, competent construction monitoring should verify that the contractor's placement of geogrid is in accordance with construction plans and specifications.

All grid layers shall be visible from the face of wall after wall construction.

Grid length, elevation and type to be verified by on-site geotechnical testing firm for conformance with these plans.

Soil Compaction testing should be performed at least every 100 cu yd of backfill placed or one test for every 50 linear ft of wall length per geogrid placement.

Caps adhered securely to the top of top block.

Surface drainage properly accounted for

The owners on-site geotechinal engineer and/or the engineers technical representative should communicate on a regular basis with the engineer of record about retaining wall construction activities.

General Notes
1. The owner shall obtain all permits before beginning work.
2. The owner shall locate all utilities before beginning work.
3. The owner shall coordinate the construction of the retaining walls with all utilities.
4. Control runoff water by grading the slope away from the face of the wall during construction.
5. The owner is to provide a quality control program including construction monitoring by a registered Professional Engineer as required by the local Building Codes.
6. Notify SEC immediately of any discrepancies between these plans and field conditions.
7. Construct the wall to the lines and grades shown in these plans and specifications.
8. This design is based on information provided by the contractor. If the site changes it is the contractors responsibility to inform SEC of changing site conditions.
9. This design complies with section 1807 of the building code including additional loads from the buildings within 50 feet horizontal of the retaining walls.

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KEY PLAN

SEAL | DATE 01/01/17

SHEET ISSUE

1	Town of Apex Major Site Plan Submittal #1	12/1/20
2	Town of Apex Major Site Plan Submittal #2	2/12/21
3	Town of Apex Major Site Plan Submittal #3	3/5/21
4	Town of Apex Major Site Plan Submittal #4	3/26/21

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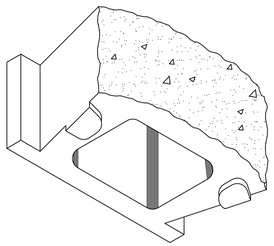
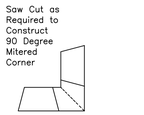
PROJECT NO. 19150.000

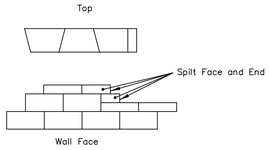
SHEET TITLE
SPECIFICATIONS

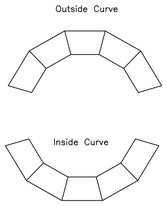
SHEET NUMBER
SX-01.01



8" X 18" X 12"

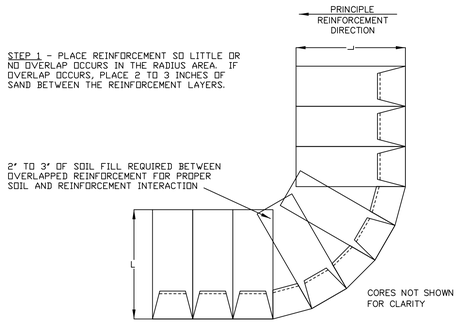




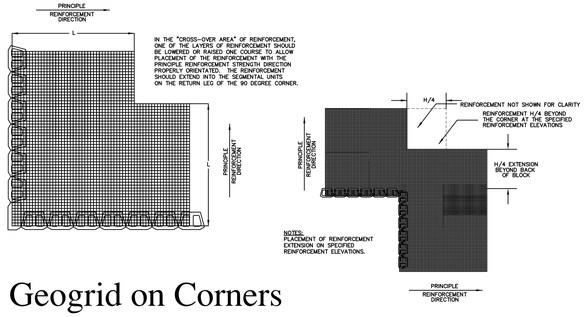


1. Always Start Capping Wall From the Lowest Elevation.
2. Layout Caps Prior to Using Adhesive.
3. Cut Caps to Fit. Various Combinations of Long and Short Cap Faces will be Necessary for Radii Greater than the Minimum.
4. Alternate Short and Long Cap Faces Every Other Cap to Achieve a Straight Row of Caps.
5. Use Exterior-Grade Construction Adhesive to Secure Caps.

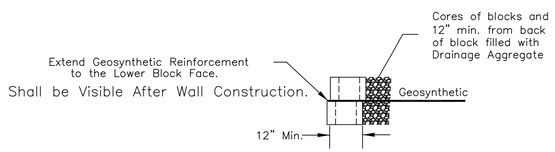
Cap Detail



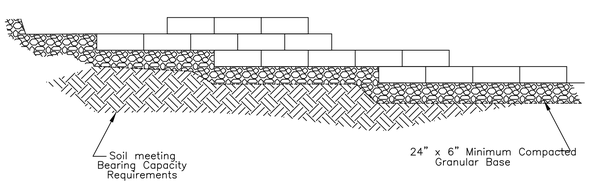
Geogrid on Curves



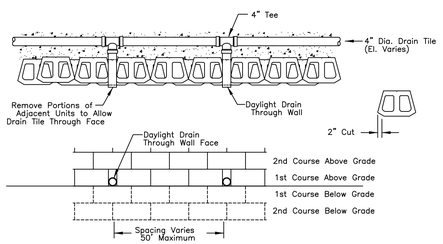
Geogrid on Corners



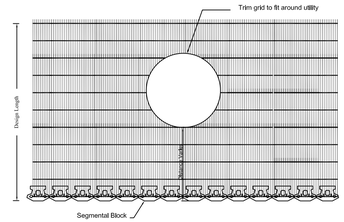
Connection Detail



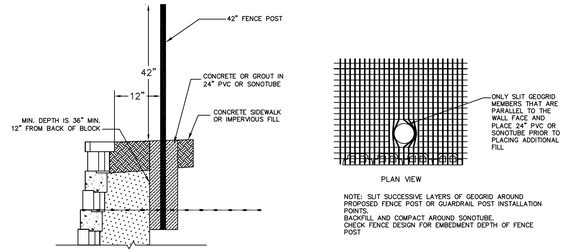
Leveling Pad Detail



Drain Tile Detail



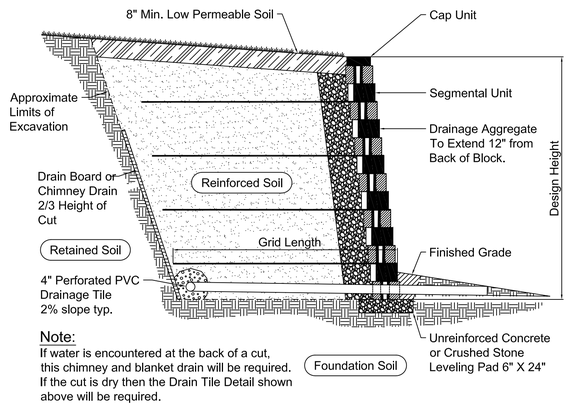
Plan at Utility



ALL HANDRAILS/GUARDRAILS MUST COMPLY WITH SECTION 1015 OF THE 2018 INTERNATIONAL BUILDING CODE.

SCALE: NONE

Fence/Rail Detail



Note:
If water is encountered at the back of a cut, this chimney and blanket drain will be required. If the cut is dry then the Drain Tile Detail shown above will be required.

Typical Section

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KEY PLAN

SEAL | DATE 01/01/17

SHEET ISSUE

1	Town of Apex Major Site Plan Submittal #1	12/1/20
2	Town of Apex Major Site Plan Submittal #2	2/12/21
3	Town of Apex Major Site Plan Submittal #3	3/5/21
4	Town of Apex Major Site Plan Submittal #4	3/26/21

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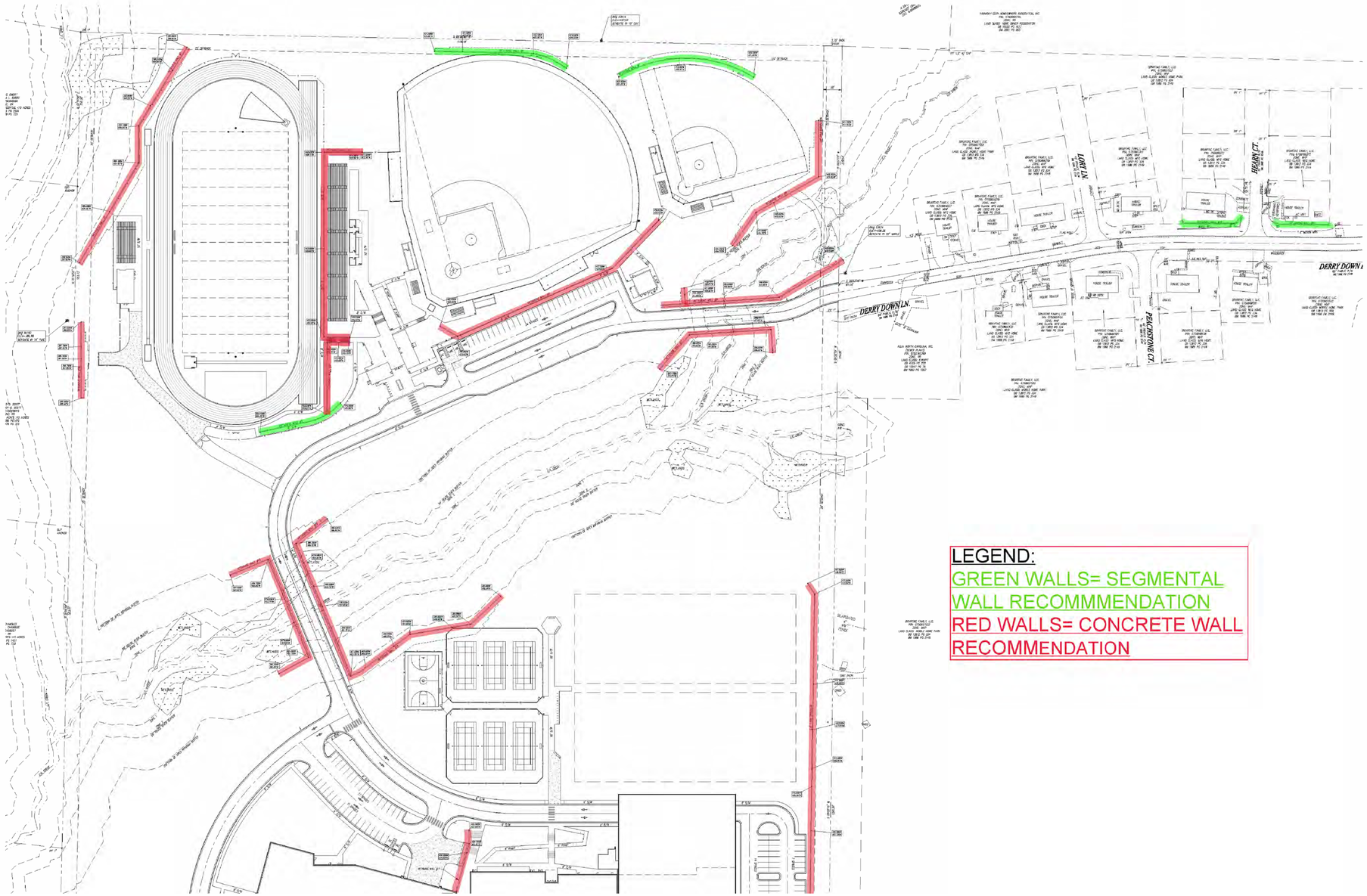
PROJECT NO. 19150.000

SHEET TITLE
DETAILS

SHEET NUMBER
SX-01.02



LEGEND:
GREEN WALLS= SEGMENTAL WALL RECOMMMENDATION
RED WALLS= CONCRETE WALL RECOMMENDATION

H12/Felton Grove High School

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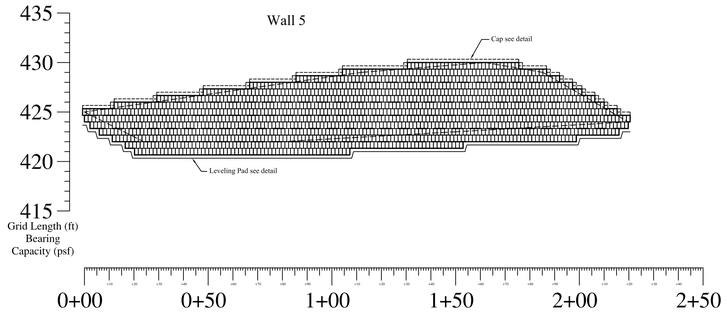
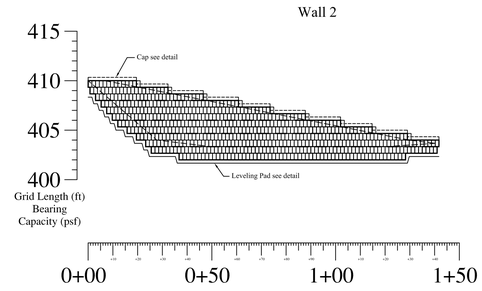
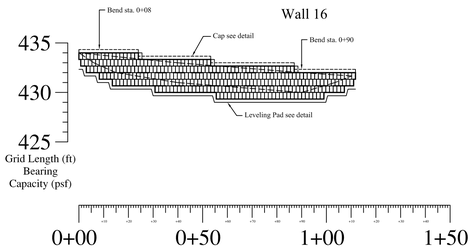
PROJECT NO. 19150.000

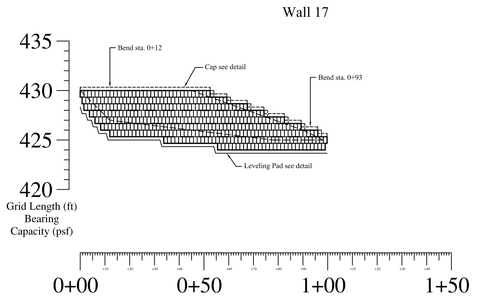
SHEET TITLE
PLAN

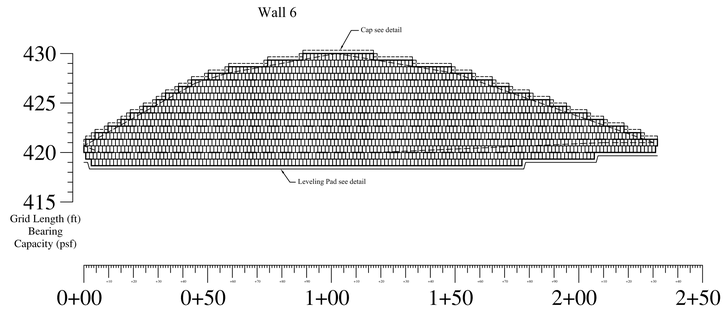
SHEET NUMBER
SX-01.03











RETAINING WALL ELEVATIONS

SCALE
H: 1"=20'
V: 1"=5'

H12/Felton Grove High School

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KEY PLAN

SEAL | DATE 01/01/17

SHEET ISSUE

1	Town of Apex Major Site Plan Submittal #1	12/1/20
2	Town of Apex Major Site Plan Submittal #2	2/12/21
3	Town of Apex Major Site Plan Submittal #3	3/5/21
4	Town of Apex Major Site Plan Submittal #4	3/26/21

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PROJECT NO. 19150.000

SHEET TITLE
ELEVATION

SHEET NUMBER
SX-01.04

H-12 (Felton Grove) High School

Traffic Impact Analysis

Stephenson Road, Apex, North Carolina

November 30, 2020

Prepared for:

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November 30, 2020

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11/30/2020

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Executive Summary

H-12, also known as Felton Grove, is a proposed high school in Apex, Wake County, North Carolina. The school is anticipated to be constructed by the start of the fall semester in 2024 and is located at 8550 Stephenson Road. The school is anticipated to open with a full freshman and sophomore class and will not be at full capacity until the fall of 2026. The school is designed for a capacity of 2,350 students.

Access to the school is anticipated to be provided by extending two existing private roadways, Derry Down Lane and Thriftwood Drive. Both facilities terminate to the east of the site and provide local access to a residential area and have existing full-movement access onto Stephenson Road.

An alternate access scenario is included in this study which assumes that Reunion Creek Parkway is extended from its current terminus west of the site and connected to Thriftwood Drive. This would provide a continuous east/west connection between E. Williams Street and Stephenson Road. This would improve traffic dispersion and reduce the volume of traffic on Stephenson Road; particularly at the intersection of Stephenson Road at Sunset Lake Road. The extension of Reunion Creek Parkway is shown on the Town of Apex Thoroughfare and Collector Street Plan Map as a future major collector. This connection is currently not funded by either the Town of Apex or the Wake County Public School System. Accordingly, this is not anticipated to be completed by the time the school is operating with at full capacity.

This report evaluates the feasibility of the adjacent transportation system to accommodate the traffic demands associated with the new school for the Build year of 2026 (i.e. full capacity). Trip generation, trip distribution, and traffic analysis for the following AM and PM peak hours scenarios are included in this study:

- 2020 Existing;
- 2026 No-Build
- 2026 Build;
- 2026 Build with Improvements;
- 2026 Build with Reunion Creek Parkway Extension;
- 2026 Build with Improvements and Reunion Creek Parkway Extension.

Capacity analyses for the AM and PM (i.e. school PM peak) peak hours in each applicable scenario were performed for the following existing intersections:

- E. Williams Street at Reunion Creek Parkway;
- E. Williams Street / N. Main Street at Sunset Lake Road / Old Smithfield Road;
- Sunset Lake Road at Stephenson Road;
- Stephenson Road at Thriftwood Drive / Tear Drop Circle;
- Stephenson Road at Derry Down Lane / Cockle Burr Drive; and
- Stephenson Road at Smith Road.

Capacity analyses for the AM and PM (i.e. school PM peak) peak hours in each applicable scenario were performed for the following proposed access points to public roads:

- Thriftwood Drive at Staff / Bus Driveway;

- Thriftwood Drive / Reunion Creek Parkway Extension at Connector Road

Results of the analysis indicate that the proposed school is projected to have impacts on the surrounding roadway network and intersections. Accordingly, recommendations for improvement are provided.

RECOMMENDATIONS

Per North Carolina General Stature 136-18(29a), School systems such as WCPSS can be reimbursed for the total cost of any public roadway improvements required by NCDOT. As such, the final determination of improvements attributed to the construction of H-12 High School is to be determined by appropriate personnel within NCDOT. To this end, and to mitigate the impact of traffic generated by the proposed school has on the surrounding roadway network, specific improvements are recommended where as others are recommended for consideration by appropriate personnel within NCDOT.

Internal Site Layout

- On-site pick-up and drop-off queue should be provided for a minimum of 2,350 feet of full-width storage space to accommodate queuing vehicles. This will provide more than 30 percent greater than the "high demand length" requirement set by the MSTA School Traffic Calculator.
- It is recommended that parent drop-off and pick-up traffic should enter and exit the site using Derry Down Lane. On-site, Derry Down Lane provides approximately 2,700 linear feet of queuing for parent traffic. Of this, approximately 400 linear feet can be used to double-lane queue parent traffic. This brings the total on-site parent queue to approximately 3,100 feet. This exceeds the high-demand length as required by the MSTA School Traffic Calculator by approximately 1,300 feet or 72 percent.
- Develop and enact a Transportation Management Plan (TMP) outlining policies and procedures for students, parents, and staff to manage traffic on-site.

It should be noted that both Derry Down Lane and Thriftwood Drive are not currently maintained by either the Town of Apex or NCDOT. The nearest existing public facility to the site is Stephenson Road, which is approximately 1,500 feet along Derry Down Lane from the H-12 property line and 1,000 feet along Thriftwood Drive from the H-12 property line.

E. Williams Street at Reunion Creek Parkway

Without Reunion Creek Parkway Extension

- There are no recommended improvements at this intersection

With Reunion Creek Parkway Extension

- Construct an exclusive northbound right-turn lane with 225 feet of full-width storage and appropriate taper
- Construct an exclusive westbound left-turn lane with 325 feet of full-width storage and appropriate taper
- Construct an exclusive westbound right-turn lane with 450 feet of full-width storage and appropriate taper
- Extend striping for the existing southbound left-turn lane as far back as possible to Straywhile Avenue
- *Consider: the installation of a traffic signal*

E. Williams Street / N. Main Street at Sunset Lake Road / Old Smithfield Road

Without Reunion Creek Parkway Extension

- *Consider: construct an exclusive northbound right-turn lane with 500 feet of full-width storage and appropriate taper.*
- *Consider: construct an exclusive westbound right-turn lane with 450 feet of full-width storage and appropriate taper.*
- *Consider: The above recommendations will require modification of the traffic signal at this intersection.*

With Reunion Creek Parkway Extension

- *Consider: construct an exclusive northbound right-turn lane with 225 feet of full-width storage and appropriate taper.*
- *Consider: construct an exclusive westbound right-turn lane with 350 feet of full-width storage and appropriate taper.*
- *Consider: The above recommendations will require modification of the traffic signal at this intersection.*

Sunset Lake Road at Stephenson Road

Without Reunion Creek Parkway Extension

- *Consider: construct a second exclusive eastbound left-turn with maximum available length of full-width storage and appropriate taper (maximum queue length = 1,150 feet).*
  - *The above recommendation to consider will require a second northbound receiving lane on Stephenson Road with a minimum of 600 feet of full with storage and appropriate taper to merge traffic into one northbound thru lane on Stephenson Road.*
  - *The above recommendation will require the existing eastbound left-turn lane be extended from it's current storage of 150 feet.*
- *Consider: extend the exclusive westbound right-turn lane to 625 feet of full-width storage and appropriate taper.*
- *Consider: extend the exclusive southbound left-turn lane to 525 feet of full-width storage and appropriate taper.*
- *Consider: The above recommendations will require modification of the traffic signal at this intersection.*

With Reunion Creek Parkway Extension

- *Consider: construct a second exclusive eastbound left-turn with 475 feet of full-width storage and appropriate taper.*
  - *The above recommendation to consider will require a second northbound receiving lane on Stephenson Road with a minimum of 600 feet of full with storage and appropriate taper to merge traffic into one northbound thru lane on Stephenson Road.*
  - *The above recommendation will require the existing eastbound left-turn lane be extended from it's current storage of 150 feet to 475 feet of full-width storage and appropriate taper.*
- *Consider: extend the exclusive westbound right-turn lane to 525 feet of full-width storage and appropriate taper.*
- *Consider: extend the exclusive southbound left-turn lane to 525 feet of full-width storage and appropriate taper.*
- *Consider: The above recommendations will require modification of the traffic signal at this intersection.*

Stephenson Road at Thriftwood Drive / Tear Drop Circle

Without Reunion Creek Parkway Extension

- Construct an exclusive northbound left-turn lane with 500 feet of full-width storage and appropriate taper
- Construct a shared eastbound left-through lane with 250 feet of full-width storage and appropriate taper
- Construct an exclusive southbound right-turn lane with 100 feet of full-width storage and appropriate taper

With Reunion Creek Parkway Extension

- Construct an exclusive northbound left-turn lane with 425 feet of full-width storage and appropriate taper
- Construct a shared eastbound left-through lane with 125 feet of full-width storage and appropriate taper

Stephenson Road at Derry Down Lane / Cockle Burr Drive

Without Reunion Creek Parkway Extension

- Construct an exclusive northbound left-turn lane with 100 feet of full-width storage and appropriate taper
- Construct a shared eastbound left-through lane with 100 feet of full-width storage and appropriate taper

With Reunion Creek Parkway Extension

- Construct an exclusive northbound left-turn lane with 100 feet of full-width storage and appropriate taper
- Construct a shared eastbound left-through lane with 100 feet of full-width storage and appropriate taper

Stephenson Road at Smith Road

Without Reunion Creek Parkway Extension

- There are no recommended improvements at this intersection

With Reunion Creek Parkway Extension

- There are no recommended improvements at this intersection

Thriftwood Drive at Staff / Bus Driveway

Without Reunion Creek Parkway Extension

- Construct an unsignalized intersection with the stop-controlled intersection being the southbound Staff/Buses Driveway approach

With Reunion Creek Parkway Extension

- Construct an unsignalized intersection with the stop-controlled approach being the southbound Staff/Buses Driveway approach
- Construct an exclusive eastbound left-turn lane with 500 feet of full-width storage and appropriate taper
- Construct an exclusive westbound right-turn lane with 275 feet of full-width storage and appropriate taper
- Construct an exclusive southbound left-turn lane with maximum available full-width storage and appropriate taper

Thriftwood Drive / Reunion Creek Parkway Extension at Connector Road

Without Reunion Creek Parkway Extension

- Provide signage and striping as necessary to inform drivers of the road termination ahead.

With Reunion Creek Parkway Extension

- Construct an unsignalized intersection with the stop-controlled approach being the southbound Connector Road approach

The recommended improvements are shown in Figures ES-1 and ES-2.

Table ES-1: Level of Service Summary

LOS/Delay		2020		2026						2026			
Intersection		Existing		No-Build		Build		Build Improved		Build w/ Reunion Creek		Build Improved w/ Reunion Creek	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
E Williams St & Reunion Creek Pkwy	**Overall**	**# (4.1)**	**# (3.3)**	**# (6.8)**	**# (4.4)**	**# (35.2)**	**# (17.3)**	**# (35.2)**	**# (17.3)**	**# (8.4)**	**# (##)**	**D (40.0)**	**C (29.1)**
	EB	E (38.0)	D (31.1)	F (60.5)	E (47.2)	F (##)	F (197.4)	F (##)	F (197.4)	F (##)	F (##)	F (77.2)	D (45.8)
	WB	E (40.6)	D (26.4)	F (76.5)	E (41.8)	F (##)	F (268.8)	F (##)	F (268.8)	F (##)	F (##)	F (85.5)	D (48.7)
	NB	# (0.1)	# (0.3)	# (0.1)	# (0.3)	# (0.2)	# (0.2)	# (0.2)	# (0.2)	# (0.1)	# (0.2)	C (27.9)	C (27.4)
	SB	# (0.6)	# (0.7)	# (0.6)	# (0.7)	# (0.3)	# (0.8)	# (0.3)	# (0.8)	# (20.4)	# (0.8)	D (39.9)	B (16.2)
E Williams St/N Main St & Sunset Lake Rd/Old Smithfield Rd	**Overall**	**D (45.6)**	**C (32.2)**	**F (80.8)**	**D (35.9)**	**F (##)**	**F (133.8)**	**F (187.7)**	**E (61.0)**	**F (260.3)**	**E (67.7)**	**F (122.9)**	**E (66.4)**
	EB	C (32.4)	D (55.0)	C (29.9)	E (56.1)	F (296.4)	D (49.3)	F (##)	F (105.3)	F (209.7)	E (74.8)	F (189.2)	F (106.7)
	WB	E (56.2)	C (29.2)	F (87.6)	C (25.5)	F (##)	F (163.8)	D (54.3)	C (34.4)	C (31.1)	E (71.7)	D (47.1)	D (49.0)
	NB	D (42.4)	C (29.2)	E (75.4)	D (38.2)	F (##)	F (125.2)	F (178.6)	E (77.8)	F (##)	E (58.4)	F (130.9)	E (64.8)
	SB	D (37.1)	C (23.9)	F (88.7)	C (30.1)	F (##)	F (131.7)	F (248.7)	E (75.9)	F (##)	E (65.4)	F (137.4)	E (62.4)
Sunset Lake Rd & Stephenson Rd	**Overall**	**# (5.0)**	**# (10.0)**	**B (14.3)**	**B (16.3)**	**F (263.9)**	**E (79.9)**	**F (115.2)**	**F (84.0)**	**F (131.9)**	**D (35.2)**	**D (48.0)**	**C (31.9)**
	EB	# (4.3)	# (1.0)	A (5.9)	A (3.8)	F (##)	A (4.3)	F (132.7)	A (4.0)	F (167.4)	B (11.1)	D (38.1)	C (21.4)
	WB	# (0.0)	# (0.0)	B (10.3)	B (11.2)	F (212.1)	F (84.8)	F (114.8)	E (76.1)	F (115.7)	B (18.5)	E (57.2)	C (33.6)
	NB	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
	SB	E (38.9)	E (44.3)	D (50.4)	D (48.9)	D (54.8)	F (116.2)	E (57.2)	F (127.0)	D (54.1)	E (71.1)	E (56.0)	D (41.3)
Stephenson Rd & Thriftwood Dr/Tear Drop Cir	**Overall**	**# (1.1)**	**# (1.0)**	**# (1.0)**	**# (0.8)**	**# (198.3)**	**# (498.5)**	**# (198.3)**	**# (338.2)**	**# (8.4)**	**# (68.2)**	**# (8.4)**	**# (15.3)**
	EB	B (12.3)	B (11.8)	C (15.4)	C (15.0)	F (##)	F (##)	F (##)	F (##)	F (##)	F (179.5)	F (##)	E (37.4)
	WB	B (12.4)	B (11.2)	C (15.3)	B (13.7)	F (##)	F (##)	F (##)	F (##)	F (##)	F (112.5)	F (##)	F (112.5)
	NB	# (0.1)	# (0.2)	# (0.1)	# (0.1)	# (260.4)	# (1.2)	# (260.4)	# (1.2)	# (11.1)	# (1.2)	# (11.1)	# (1.2)
	SB	# (0.3)	# (0.1)	# (0.2)	# (0.1)	# (0.1)	# (0.1)	# (0.1)	# (0.1)	# (0.1)	# (0.1)	# (0.1)	# (0.1)
Stephenson Rd & Derry Down Ln/Cockle Burr Dr	**Overall**	**# (1.1)**	**# (0.9)**	**# (1.0)**	**# (0.7)**	**# (95.2)**	**# (5.2)**	**# (13.0)**	**# (4.5)**	**# (35.5)**	**# (3.6)**	**# (11.3)**	**# (3.4)**
	EB	B (13.2)	B (11.9)	C (17.3)	B (14.9)	F (##)	C (19.0)	E (37.7)	C (15.2)	F (245.7)	C (18.9)	F (62.0)	C (16.5)
	WB	B (12.6)	B (11.4)	C (15.6)	B (14.0)	F (199.1)	D (31.5)	F (149.4)	D (30.4)	F (96.6)	D (26.6)	F (74.1)	D (25.7)
	NB	# (0.1)	# (0.2)	# (0.1)	# (0.1)	# (3.9)	# (3.1)	# (3.9)	# (3.1)	# (3.9)	# (3.1)	# (3.9)	# (3.1)
	SB	# (0.3)	# (0.1)	# (0.2)	# (0.1)	# (0.1)	# (0.1)	# (0.1)	# (0.1)	# (0.1)	# (0.1)	# (0.1)	# (0.1)
Stephenson Rd & Smith Rd	**Overall**	**# (4.0)**	**# (7.4)**	**# (6.0)**	**# (9.8)**	**# (10.1)**	**# (10.2)**	**# (10.1)**	**# (10.2)**	**# (10.1)**	**# (10.2)**	**# (10.1)**	**# (10.2)**
	EB	# (7.6)	# (6.5)	# (7.1)	# (5.6)	# (7.2)	# (5.7)	# (7.2)	# (5.7)	# (7.2)	# (5.7)	# (7.2)	# (5.7)
	WB	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)
	NB	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
	SB	B (12.4)	B (11.6)	C (18.7)	C (16.9)	D (28.3)	C (18.7)	D (28.3)	C (18.7)	D (28.3)	C (18.8)	D (28.3)	C (18.8)
Thriftwood Dr & Staff/Buses Dwy	**Overall**					**# (0.8)**	**# (179.7)**	**# (0.8)**	**# (179.7)**	**# (72.5)**	**# (161.1)**	**# (37.6)**	**# (13.7)**
	EB					# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (16.4)	# (0.0)	# (91.3)	# (0.0)
	WB					# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)
	NB					- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
	SB					C (19.9)	F (189.6)	C (19.9)	F (189.6)	F (##)	F (169.9)	F (##)	B (14.5)
Thriftwood Dr/Reunion Creek Extension & Connector Rd	**Overall**									**# (2.3)**	**# (2.4)**	**# (2.3)**	**# (2.4)**
	EB									# (0.0)	# (0.0)	# (0.0)	# (0.0)
	WB									# (0.0)	# (0.0)	# (0.0)	# (0.0)
	NB									- (-)	- (-)	- (-)	- (-)
	SB									A (9.3)	C (17.6)	A (9.3)	C (17.6)
Connector Rd & Parent Dwy	**Overall**					**# (9.2)**	**# (8.3)**	**# (9.2)**	**# (8.3)**	**# (83.3)**	**# (10.1)**	**# (69.4)**	**# (9.6)**
	EB					- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
	WB					B (10.4)	A (9.1)	B (10.4)	A (9.1)	F (158.7)	B (12.8)	F (130.9)	B (11.7)
	NB					# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)
	SB					# (8.0)	# (7.5)	# (8.0)	# (7.5)	# (8.0)	# (7.5)	# (8.0)	# (7.5)
Derry Down Ln/Student Dwy & Connector Rd	**Overall**					**# (7.6)**	**# (5.1)**	**# (7.6)**	**# (5.1)**	**# (3.1)**	**# (2.7)**	**# (3.1)**	**# (2.7)**
	EB					# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)
	WB					# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)	# (0.0)
	NB					C (15.3)	B (10.2)	C (15.3)	B (10.2)	B (11.0)	A (9.4)	B (11.0)	A (9.4)
	SB					- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)

X (X)

Legend:

LOS (Delay)
Unsignalized Intersection
Signalized Intersection
\# No level of service provided
\## Delay exceeds 300 seconds
- (-) No movement

Figure ES-1: Recommended Improvements without Reunion Creek Parkway Extension

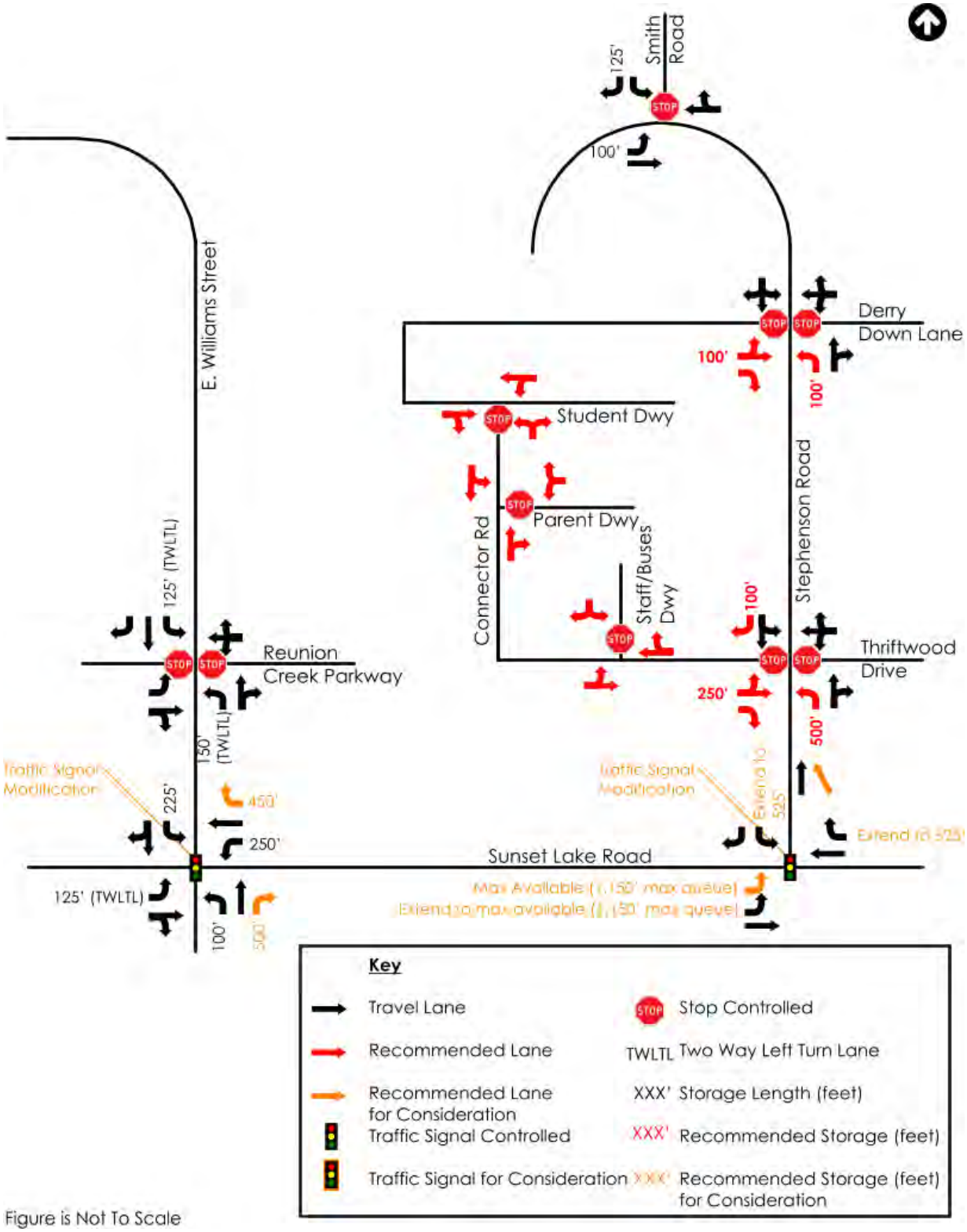
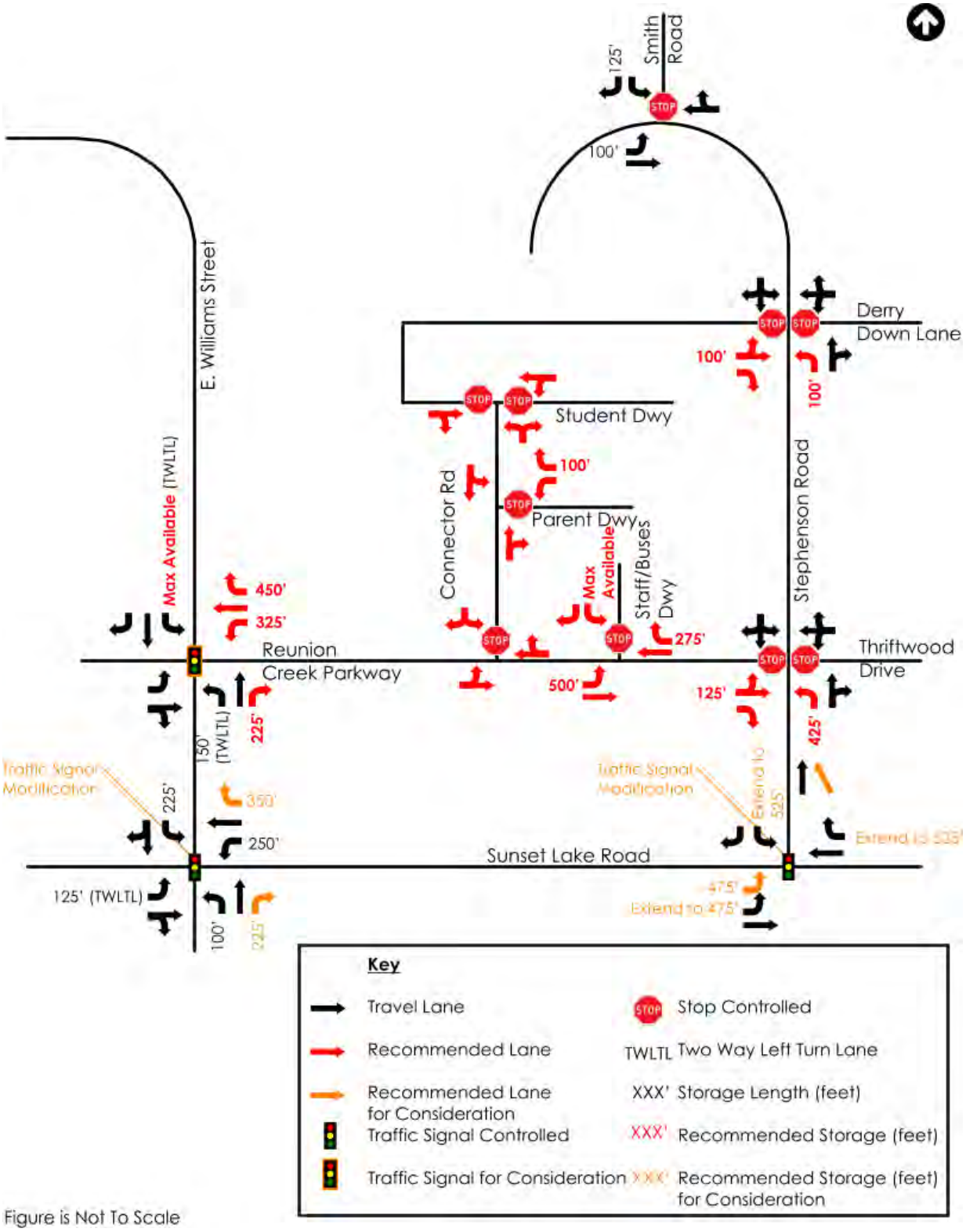


Figure ES-2: Recommended Improvements with Reunion Creek Parkway Extension



1.0 INTRODUCTION

H-12, also known as Felton Grove, is a proposed high school in Apex, Wake County, North Carolina. The school is anticipated to be constructed by the start of the fall semester in 2024 and is located at 8550 Stephenson Road. The school is anticipated to open with a full freshman and sophomore class and will not be at full capacity until the fall of 2026. The school is designed for a capacity of 2,350 students.

The Town of Apex and North Carolina Department of Transportation (NCDOT) were contacted to obtain background information and to establish the elements to be covered in this traffic impact analysis (TIA). A copy of the scoping forms and approvals can be found in the appendix.

Access to the school is anticipated to be provided by extending two existing private roadways, Derry Down Lane and Thriftwood Drive. Both facilities terminate to the east of the site and provide local access to a residential area and have existing full-movement access onto Stephenson Road.

An alternate access scenario is included in this study. Where Reunion Creek Parkway is extended from its current terminus west of the site and connected to Thriftwood Drive. This would provide a continuous east/west connection between E. Williams Street and Stephenson Road. This would improve traffic dispersion and reduce the volume of traffic on Stephenson Road; particularly at the intersection of Stephenson Road at Sunset Lake Road. The extension of Reunion Creek Parkway is shown on the Town of Apex Thoroughfare and Collector Street Plan Map as a future major collector. This connection is currently not funded by either the Town of Apex or the Wake County Public School System. Accordingly, this is not anticipated to be completed by the time the school is operating at full capacity.

Figure 1 shows the existing site and study area. Figure 2 shows the most recent version of the site plan. An electronic copy of the site plan is provided in the appendix.

This report evaluates the feasibility of the adjacent transportation system to accommodate the traffic demands associated with the school expansion for the Build year of 2026. Trip generation, trip distribution, and traffic analysis for the following AM and PM peak hours scenarios are included in this study:

- 2020 Existing;
- 2026 No-Build;
- 2026 Build;
- 2026 Build with Improvements;
- 2026 Build with Reunion Creek Parkway Extension;
- 2026 Build with Improvements and Reunion Creek Parkway Extension.

Figure 1: Site Location and Study Area

Figure 2: Site Plan

2.0 INVENTORY OF TRAFFIC CONDITIONS

2.1 STUDY AREA

Stantec coordinated with the Town of Apex, NCDOT Division 5, District 1, NCDOT Congestion Management, and NCDOT Municipal School Transportation Assistance (MSTA) to determine the appropriate study area and assumptions. The final scoping document and approval emails are included in the appendix. The following existing intersections were agreed upon to be analyzed to determine the associated impacts associated with the school expansion.

- E. Williams St. at Reunion Creek Pkwy. *existing stop-controlled intersection*
- E. Williams St. / N. Main St. at Sunset Lake Rd. / Old Smithfield Rd. *existing signalized intersection*
- Sunset Lake Road at Stephenson Road; *existing stop-controlled intersection*
- Stephenson Rd. at Thriftwood Dr. / Tear Drop Cir. *existing stop-controlled intersection*
- Stephenson Rd. at Derry Down Ln. / Cockle Burr Dr. *existing stop-controlled intersection*
- Stephenson Rd. at Smith Rd. *existing stop-controlled intersection*

The new school will be accessed by up to three (3) extensions of roads onto the site:

2.1.1 Thriftwood Drive

Classified as a major collector on the Town of Apex Thoroughfare and Collector Street Plan Map[1] (adopted February 5, 2019, last amended October 6, 2020), Thriftwood Drive travels east / west providing access to residential areas. It currently intersects Stephenson Road across from Tear Drop Circle at a full movement unsignalized intersection.

The Town of Apex Thoroughfare and Collector Street Plan Map[1] shows Thriftwood Drive ultimately being connected to Reunion Creek Parkway.

Two (2) driveways are proposed for Thriftwood Drive. One leading to staff parking and bus pick-up & drop-off zones, and another connecting Thriftwood Drive to Derry Down Lane, student parking, and parent pick-up & drop-off zones (referred to in this report as “Connector Road”).

2.1.2 Derry Down Lane

Classified as a minor collector on the Town of Apex Thoroughfare and Collector Street Plan Map[1], Derry Down Lane travels east / west providing access to residential areas. It currently intersects Stephenson Road across from Cockle Burr Drive at a full movement unsignalized intersection.

Derry Down Lane, will terminate on-site at surface parking lot and parking deck serving student drivers.

2.1.3 Reunion Creek Parkway

Classified as a major collector on the Town of Apex Thoroughfare and Collector Street Plan Map[1], Reunion Creek Parkway travels east / west providing access to residential areas. It currently intersects E. Williams Street at a full movement unsignalized intersection across from the Hope Community Church driveway.

The Town of Apex Thoroughfare and Collector Street Plan Map[1] shows Reunion Creek Parkway ultimately being connected to Thriftwood Drive.

2.2 EXISTING ROADWAY CONDITIONS

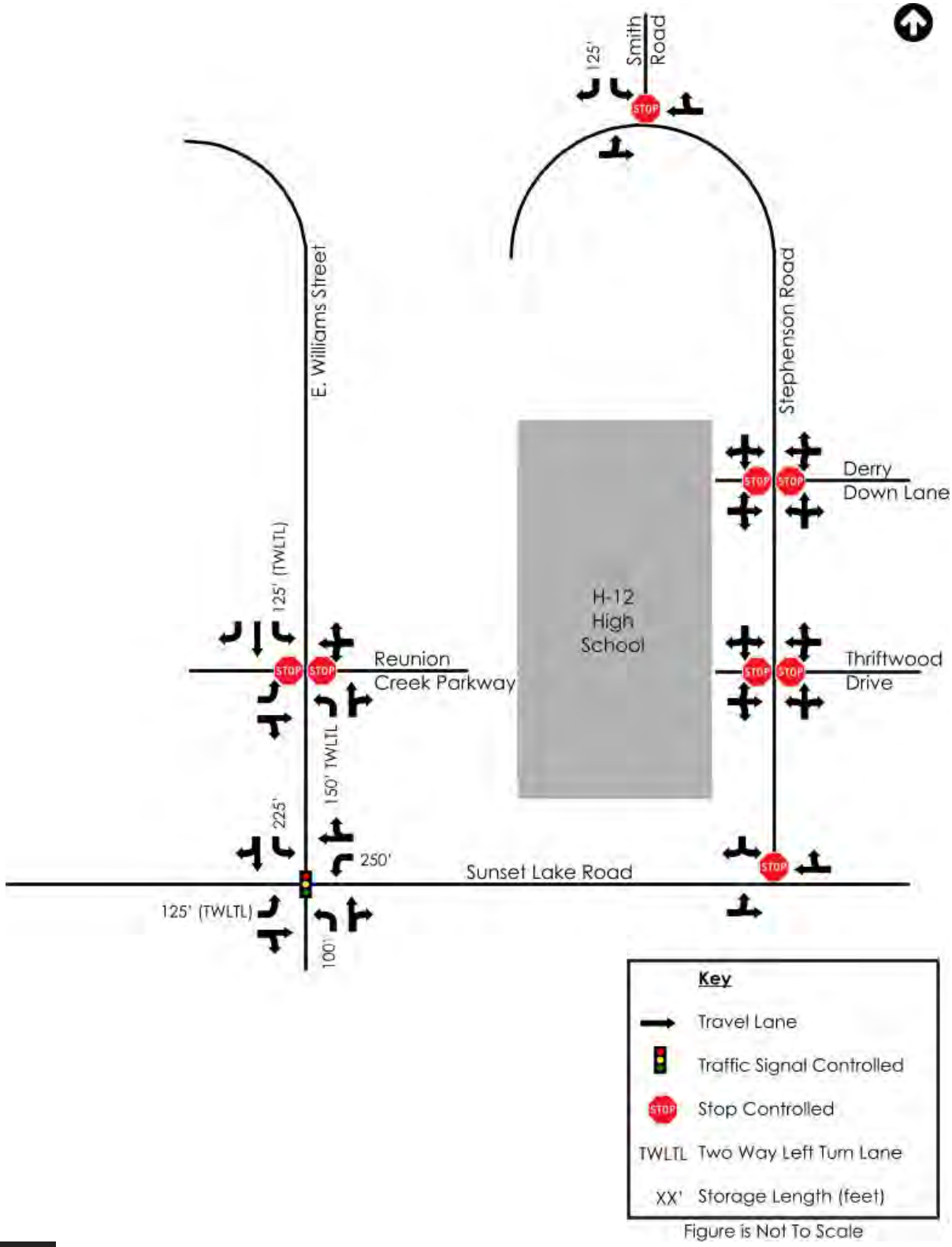
Table 1 provides a detailed description of the existing study area roadway network. All functional classification and average annual daily traffic (AADT) information were obtained from NCDOT via the NCDOT.gov website.

Table 1: Existing Conditions

Road Name	Road Number	Primary Cross-Section	Functional Classification[2]	2015-2019 AADT[3] (vpd)	Speed Limit (mph)	Maintenance Agency
E Williams Street	NC 55	2 or 3 lanes undivided	Minor Arterial	13,000 (2017)	45 mph	NCDOT
N Main Street	NC 55	2 lanes undivided	Minor Arterial	15,500 (2019)	45 mph	NCDOT
Sunset Lake Road	SR 1301	2 or 3 lanes undivided	Major Collector	11,500-12,500 (2019)	45 mph	NCDOT
Old Smithfield Road	SR 1172	3 lanes undivided	Local	-	35 mph	NCDOT
Stephenson Road	SR 1302	2 lanes undivided	Local	4,900 (2015)	35 mph	NCDOT
Reunion Creek Parkway	-	2 lanes undivided	Local	-	25 mph	Town of Apex
Thriftwood Drive	-	2 lanes undivided	Local	-	35 mph	Private Road
Tear Drop Circle	-	2 lanes undivided	Local	-	35 mph	Private Road
Derry Down Lane	-	2 lanes undivided	Local	-	35 mph	Private Road
Cockle Burr Drive	-	2 lanes undivided	Local	-	35 mph	Private Road
Smith Road	SR 1303	2 lanes undivided	Local	-	35 mph	NCDOT

Speed limits on-campus are 10 miles per hour (mph) per NCDOT MSTA. The existing lane configuration and traffic control for the study area intersections are illustrated in Figure 3.

Figure 3: Existing Lane Configurations and Traffic Control



3.0 TRIP GENERATION

The new high school is proposed to have a maximum enrollment of 2,350 students. At the request of NCDOT MSTA staff, available traffic data was reviewed at four (4) similar public high schools in Wake and Durham Counties. Those are as follows:

- Apex High School, Apex, Wake County
- Fuquay Varina High School; Fuquay-Varina, Wake County
- Garner High School, Garner, Wake County
- North Durham High School, Durham, Durham County

The resultant trip generation rates for AM and PM peak hour traffic was lower than the rates provided by the MSTA School Calculator[4]. To be conservative, it was recommended that the trip generation results from the MSTA School Calculator[4] be used as part of this study. This letter, supporting documentation, and MSTA School Calculator[4] can be found in the appendix. Trip generation results from the MSTA School Calculator[4] are shown in Table 2.

Table 2: Trip Generation

Category	AM Peak Hour Trips (VPH)		PM Peak Hour Trips (VPH)	
	Enter	Exit	Enter	Exit
Total Trips	**1107**	**253**	**139**	**776**
Parents	*216*	*216*	*102*	*102*
Buses	*37*	*37*	*37*	*37*
Staff	*217*	*0*	*0*	*0*
Student Drivers	*637*	*0*	*0*	*637*

3.1 SIMILAR SITES PARENT QUEUE

The traffic studies for the four (4) existing schools did not provide sufficient information to determine the on-site queuing needed for this proposed high school. This is discussed in the letter contained in the appendix of this report.

The MSTA School Calculator[4] provides a high demand length of 1,804 feet for a 2,350 student public high school. MSTA has expressed concerns regarding the MSTA School Calculator[4] under-estimating by as much as thirty percent (30%). An additional 30% of on-site queuing would result in approximately 2,345 linear feet.

Wake County Public School System staff have agreed to route parent pick-up and drop-off traffic in and out using Derry Down Lane. This provides approximately 2,700 linear feet of queuing for parent traffic. Of this, approximately 400 linear feet can be used to double-lane queue parent traffic. This brings the total on-site parent queue to approximately 3,100 feet. This exceeds the high-demand length as required by the MSTA School Calculator[4] by approximately 1,300 feet or 72 percent.

It should be noted that both Derry Down Lane and Thriftwood Drive are not currently maintained by either the Town of Apex or NCDOT. Between the site and Stephenson Road, the nearest existing public facility, traffic must use the following:

- Approximately 1,500 linear feet of Derry Down Lane from Stephenson Road to school property
- Approximately 1,000 linear feet of Thriftwood Drive from Stephenson Road to school property

4.0 TRIP DISTRIBUTION

The following subsections detail the methodology used to account for future school traffic.

4.1 NEW TRIP DISTRIBUTION AND ASSIGNMENT

Trips, as estimated by the MSTA School Calculator[4] for a 2,350-student enrollment high school, were distributed and assigned to the study intersections separately for the student, parent, and bus/staff trips. These percentages were developed using turning movement counts obtained at the existing school driveways, the school base attendance area map, historic AADT counts, and engineering judgment. The trip distribution was submitted and approved by both NCDOT and the Town of Apex staff during scoping.

The following percentages were used in the AM and PM peak hours:

- 35 percent to/from the north on East Williams Street;
- 35 percent to/from the west on Old Smithfield Road;
- 15 percent to/from the south on East Williams Street;
- 10 percent to/from the east on Sunset Lake Road; and
- 5 percent to/from the north on Smith Road.

On-site patterns are illustrated in Figure 4 and Figure 5

Student trip distribution and trip assignment for both alternatives are illustrated in Figure 6 to Figure 9.

Parent, bus, and staff trip distribution and trip assignment for both alternatives are illustrated in Figure 10 to Figure 17.

Figure 4: Traffic Pattern

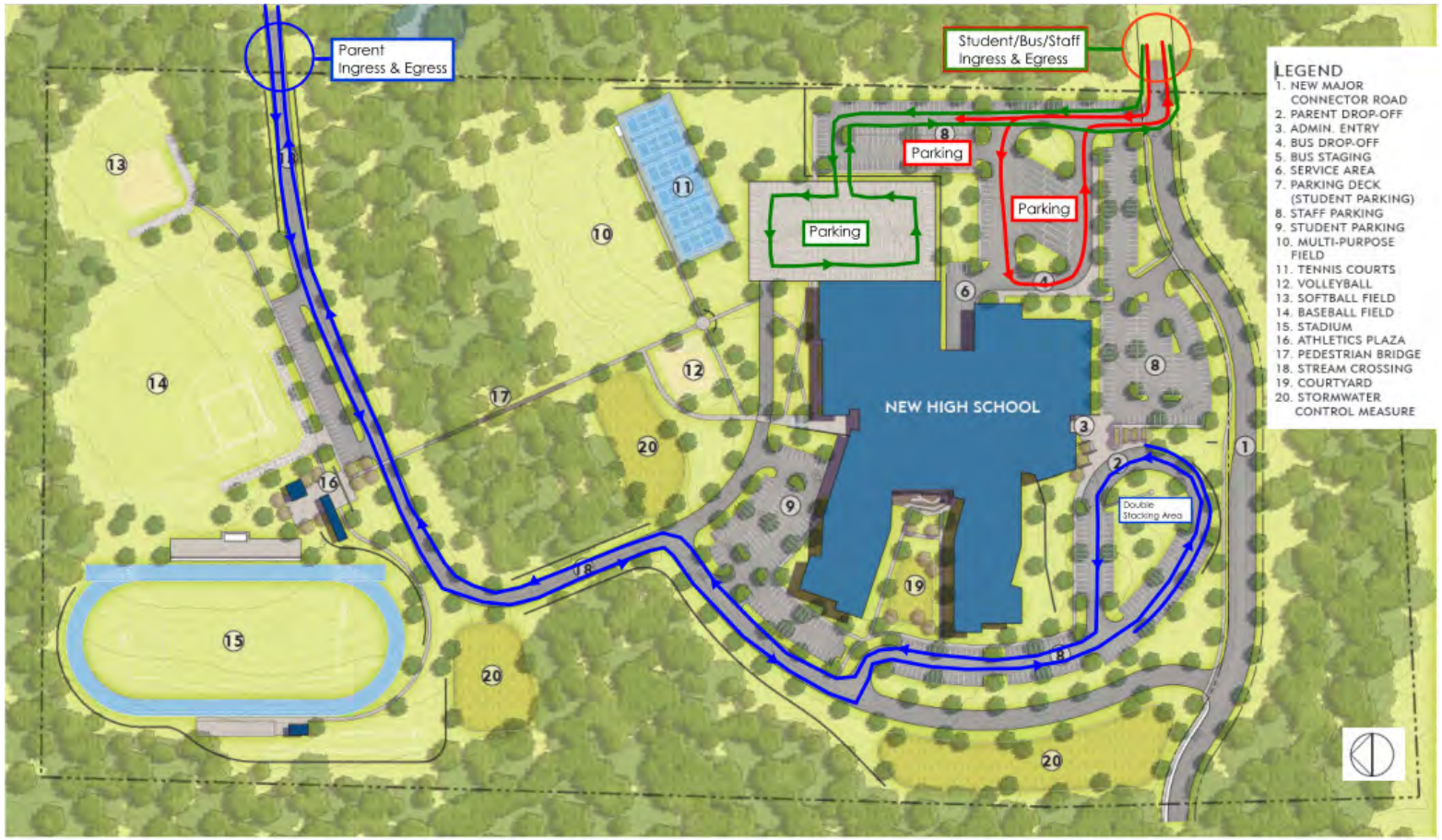
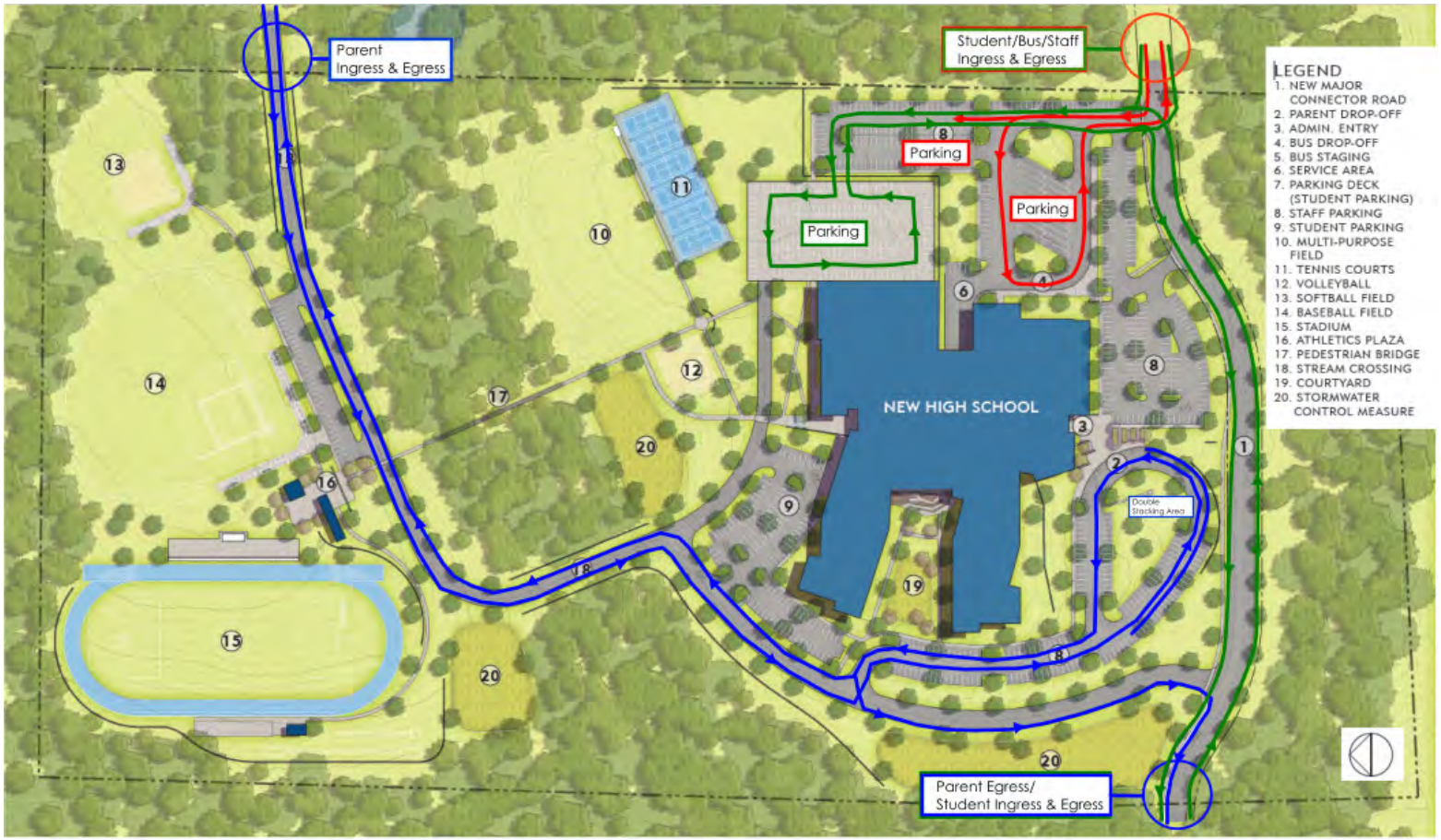


Figure 5: Traffic Pattern – Reunion Creek Alternative



H-12 High School

2,350 Student Population

Bus / Staff Traffic
Parents Traffic
Student Traffic

Queues:
1,388 ft. Average Queue Length
1,804 ft. High Demand Queue Length

400 ft. Double Stacking
2,700 ft. Single Stacking
3,100 ft. Total Provided Stacking

SITE PLAN | RATIO

Figure 6: Student Trip Distribution

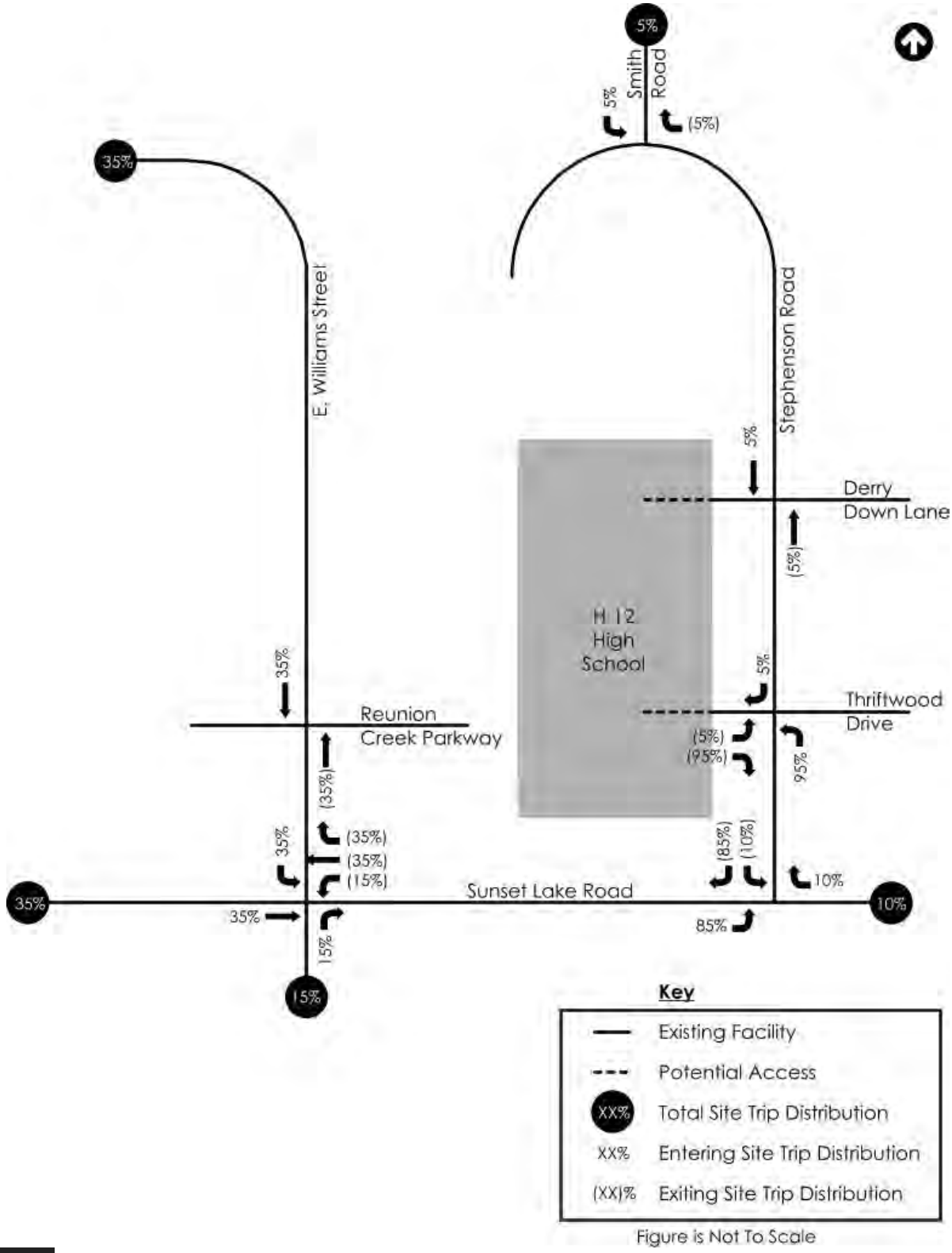


Figure 7: Student Trip Distribution – Reunion Creek Alternative

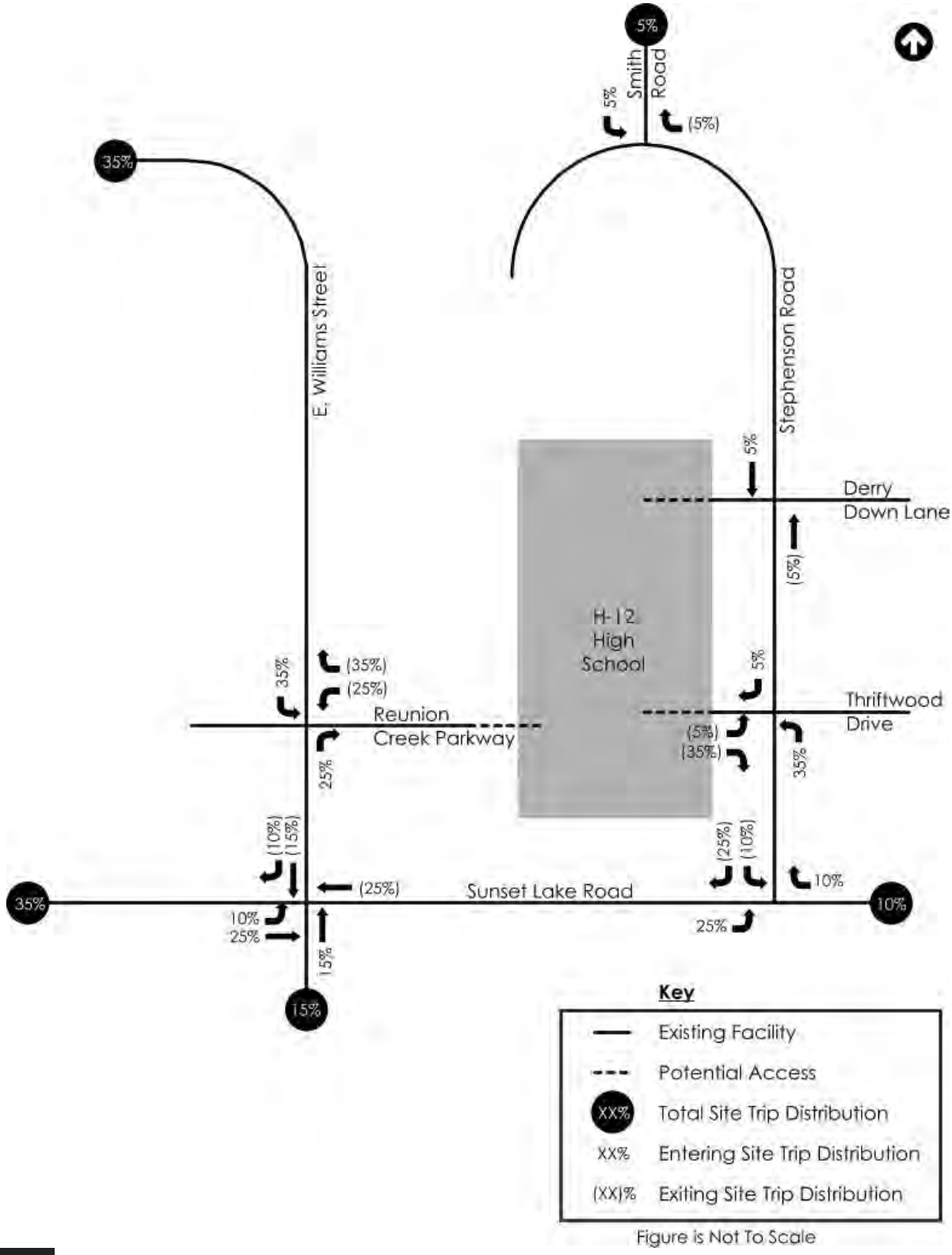


Figure 8: Student Trips

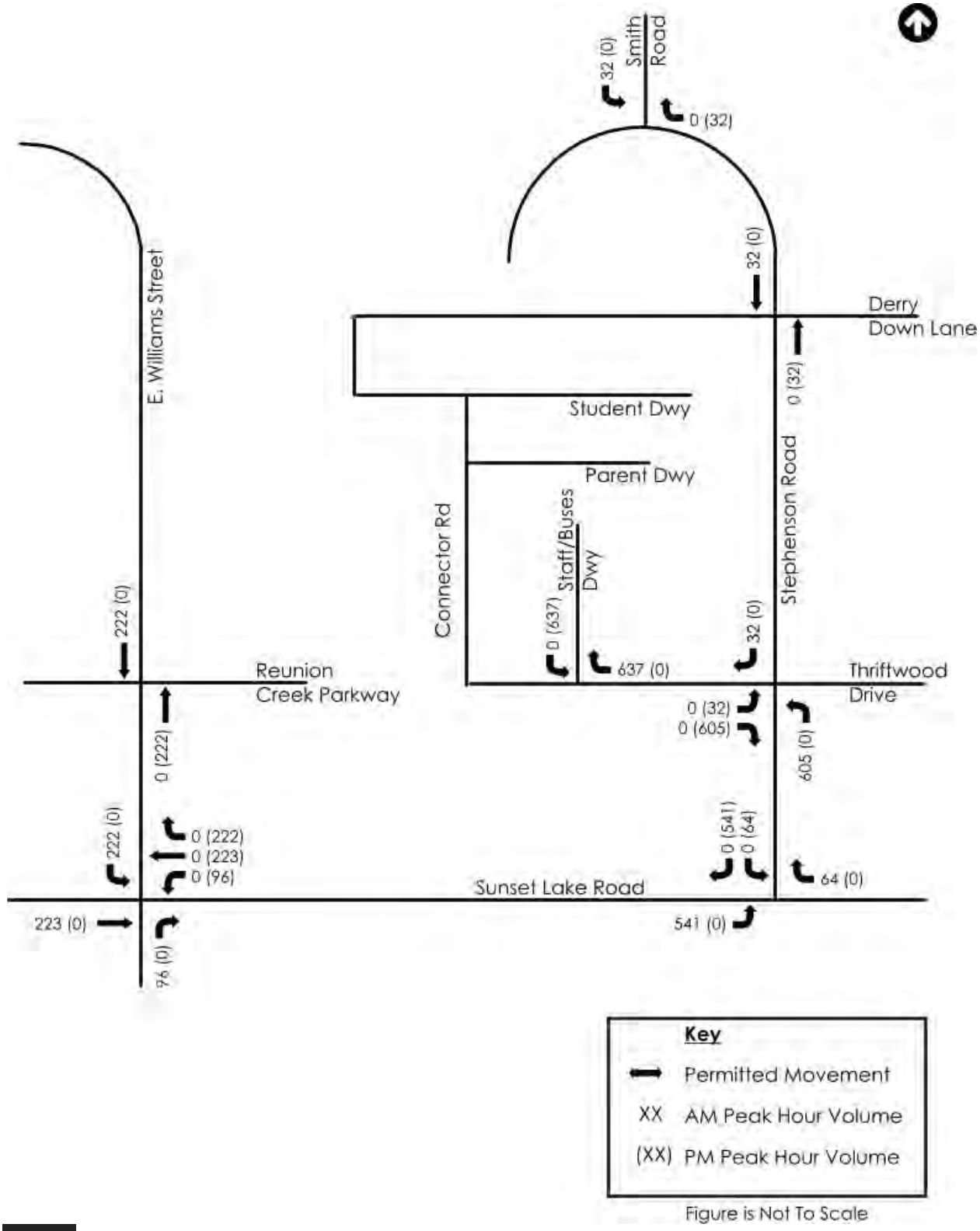


Figure 9: Student Trips – Reunion Creek Alternative

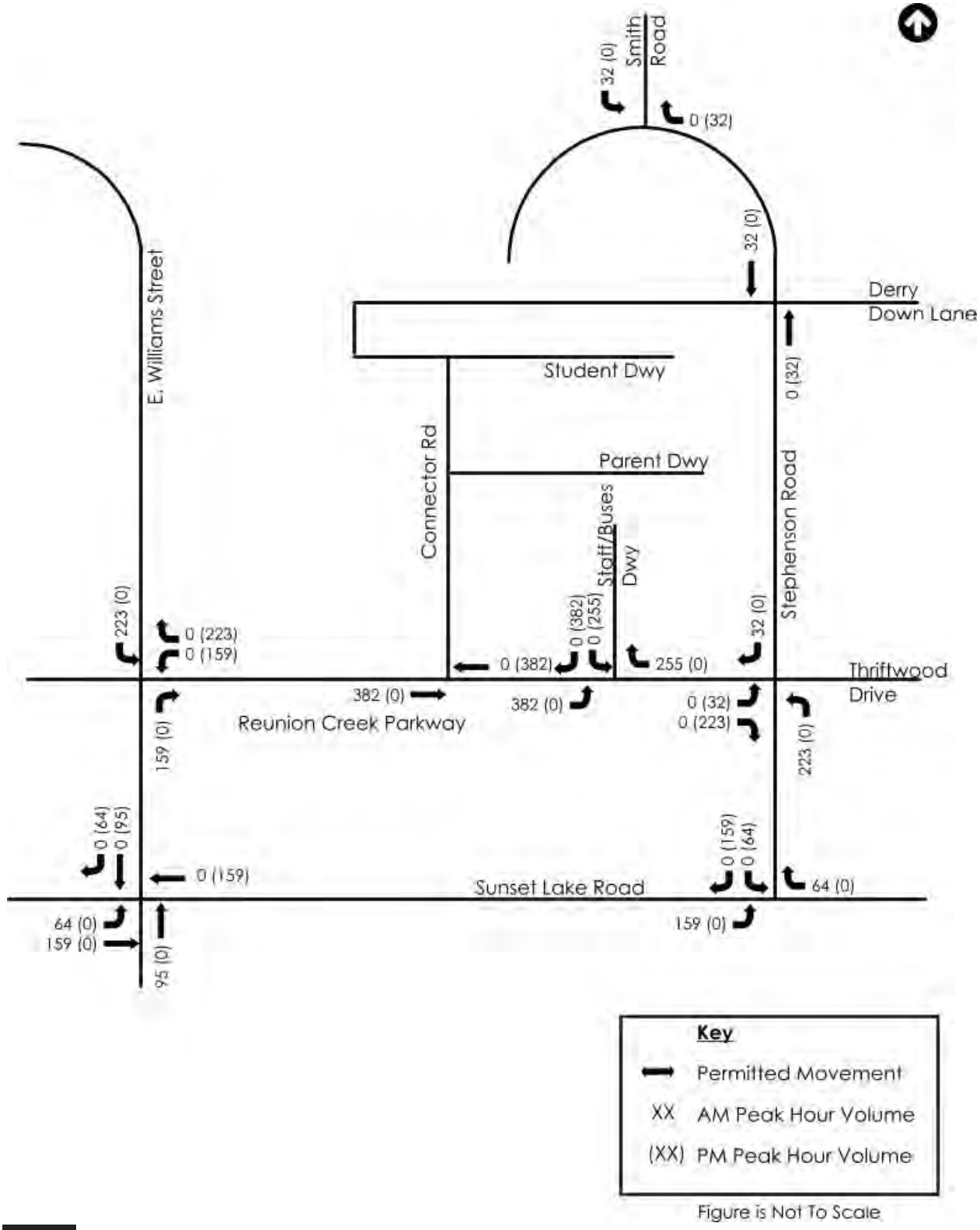


Figure 10: Parent Trip Distribution

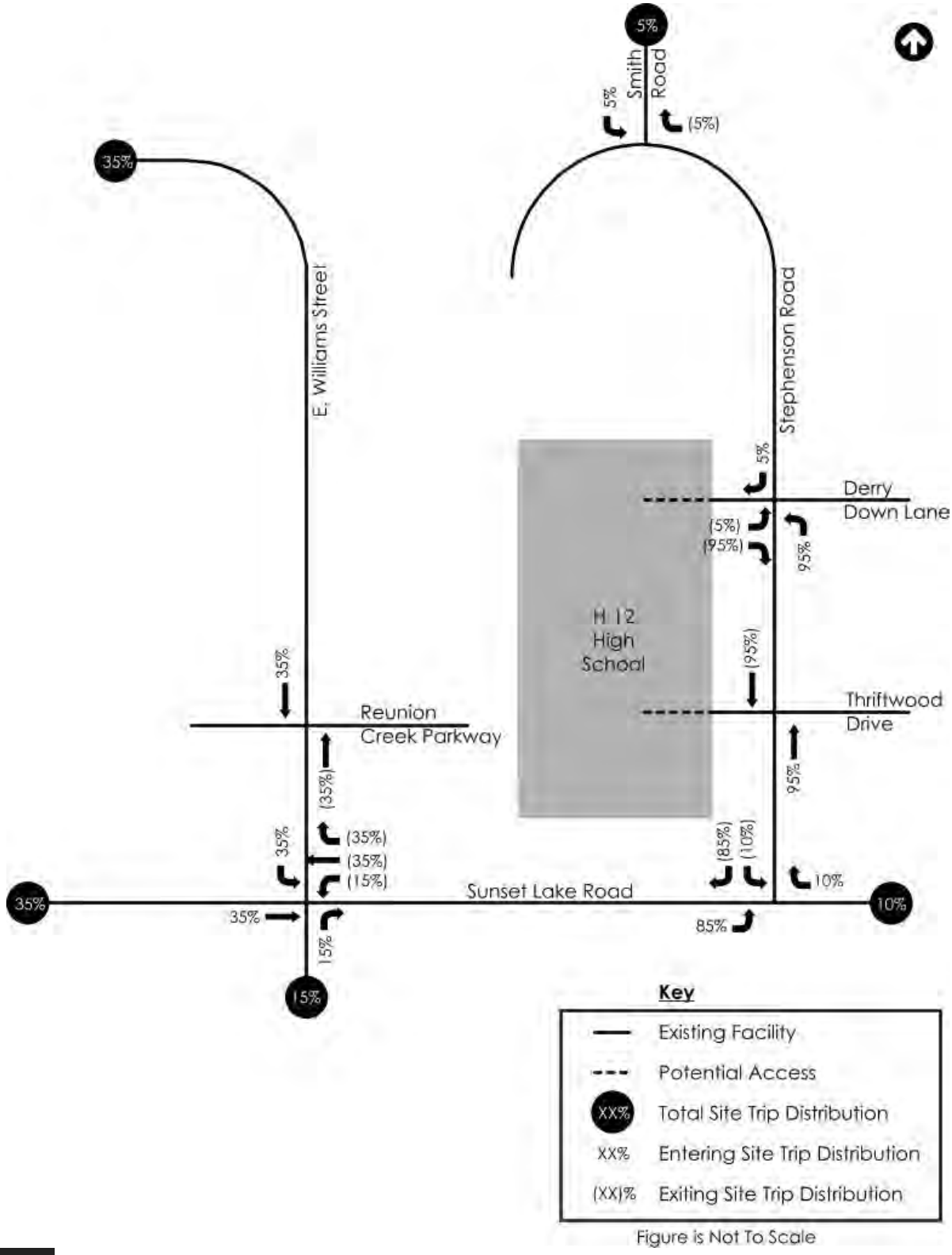


Figure 11: Parent Trip Distribution – Reunion Creek

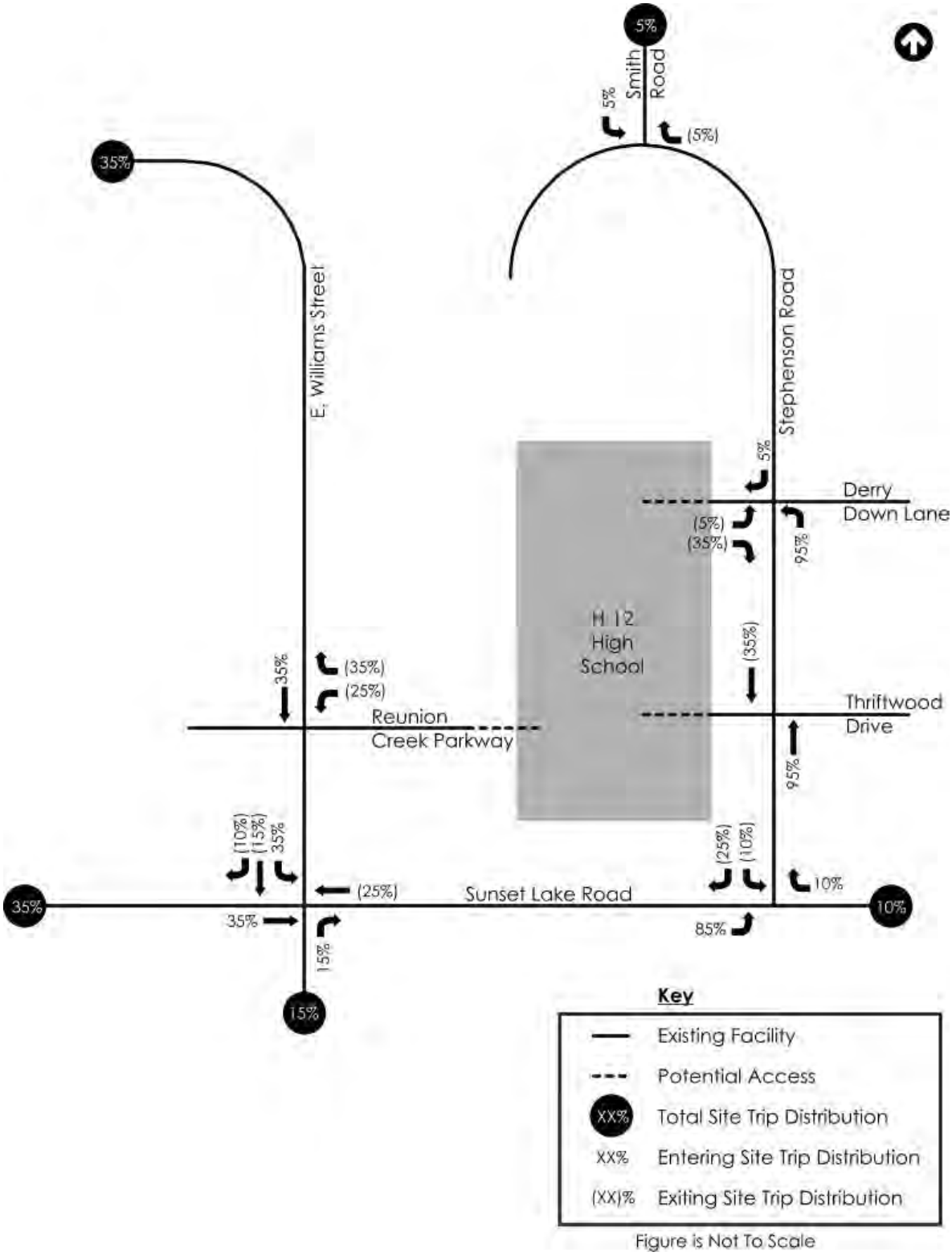


Figure 12: Parent Trips

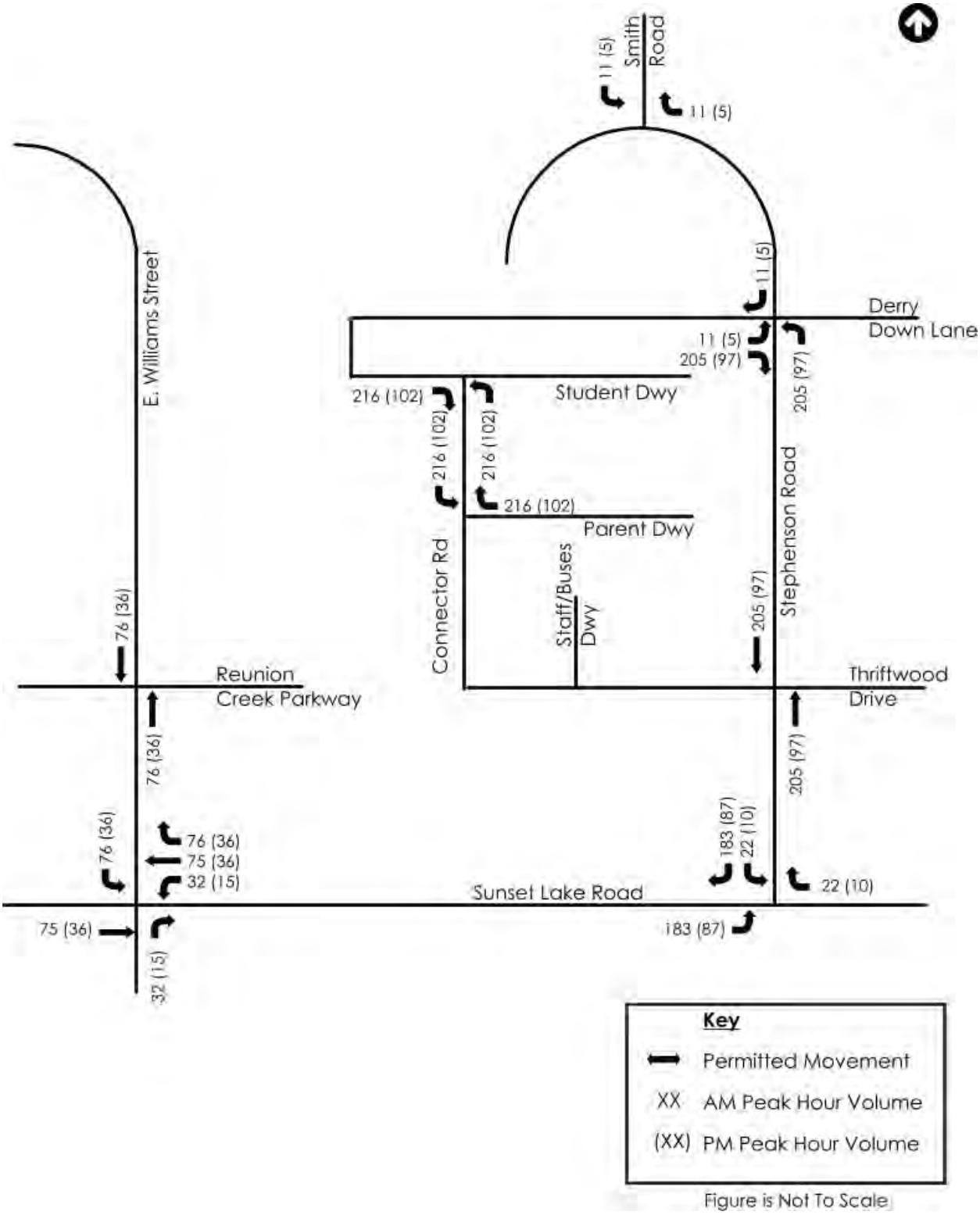


Figure 13: Parent Trips – Reunion Creek

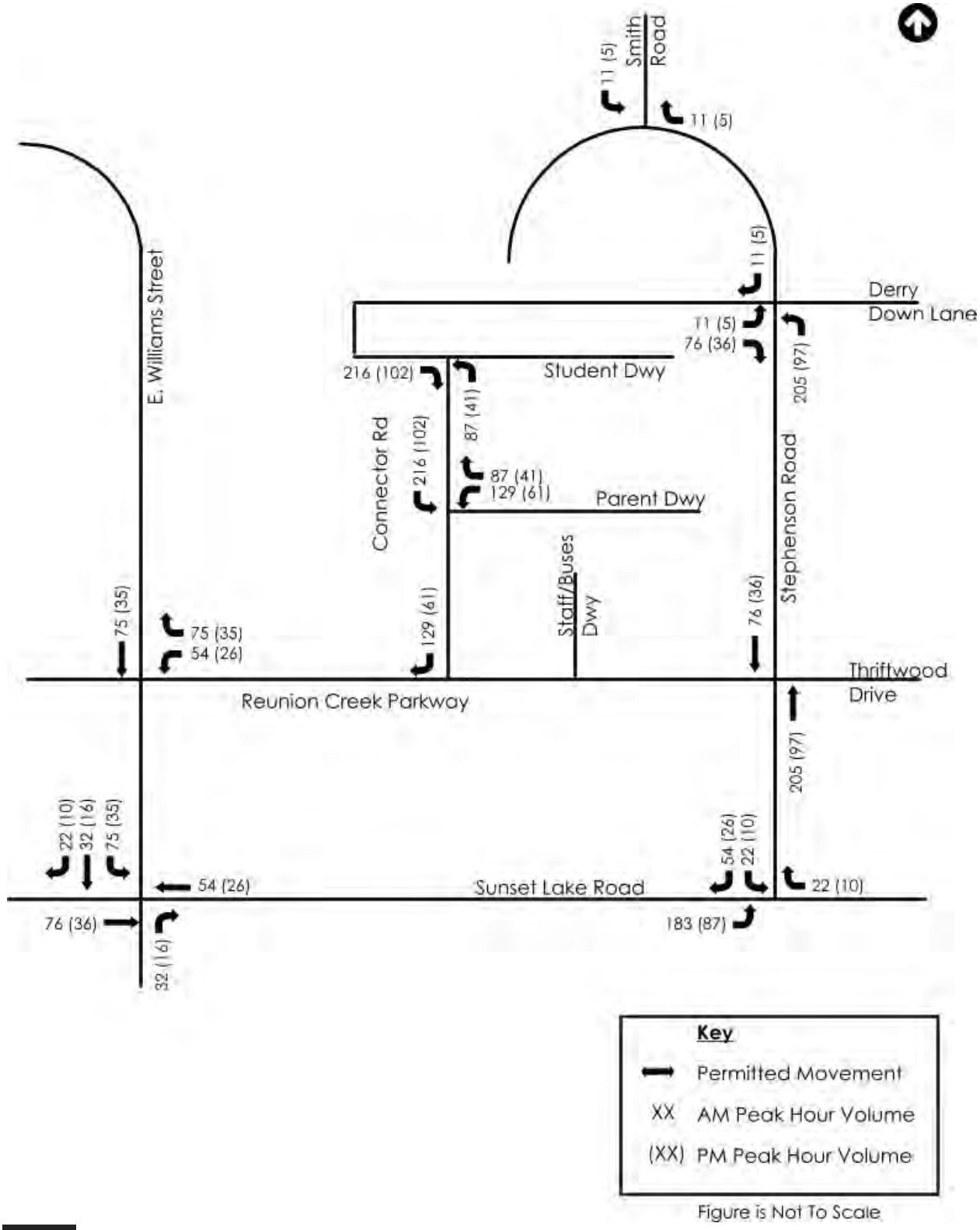


Figure 14: Staff/Buses Trip Distribution

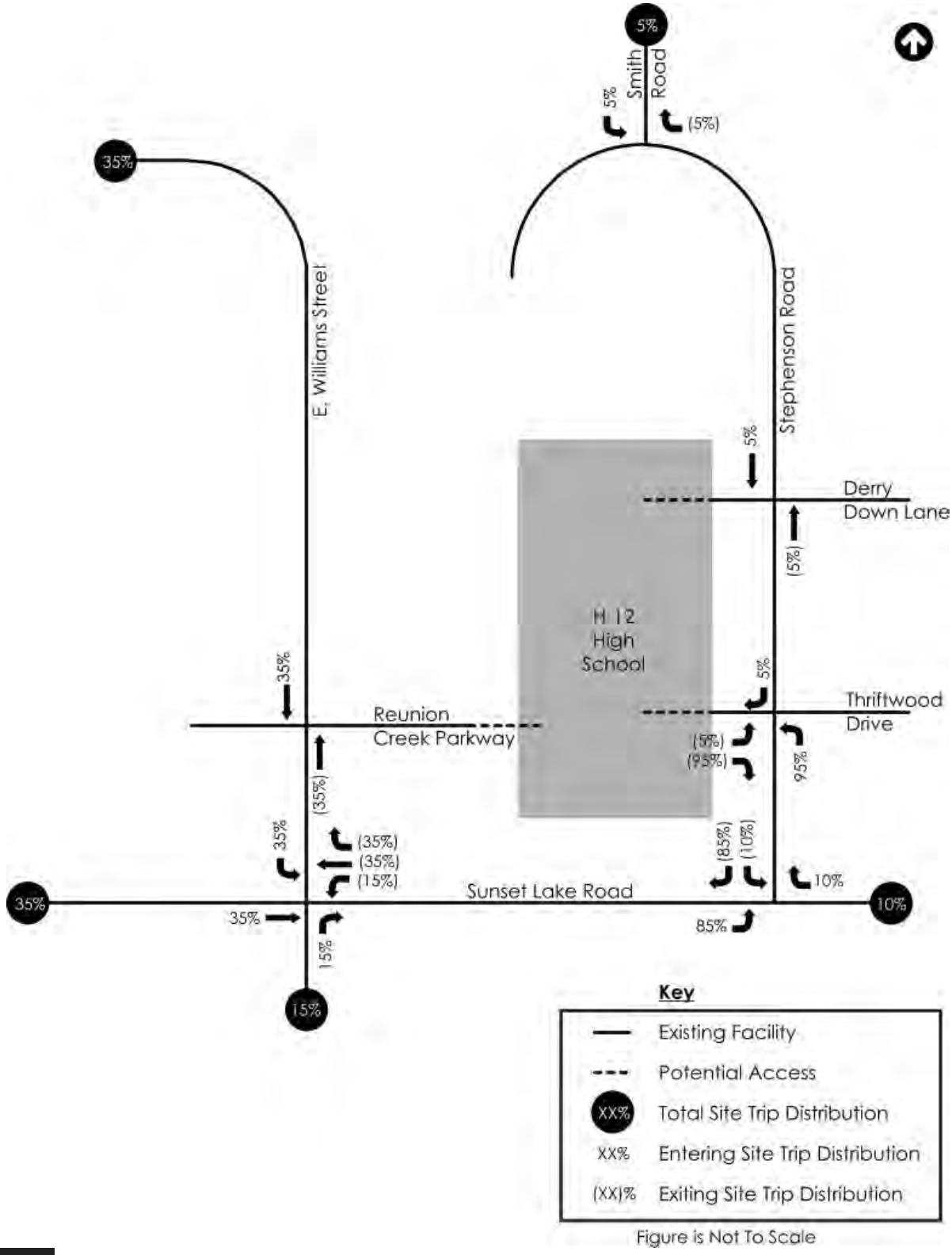


Figure 15: Staff/Buses Trip Distribution – Reunion Creek

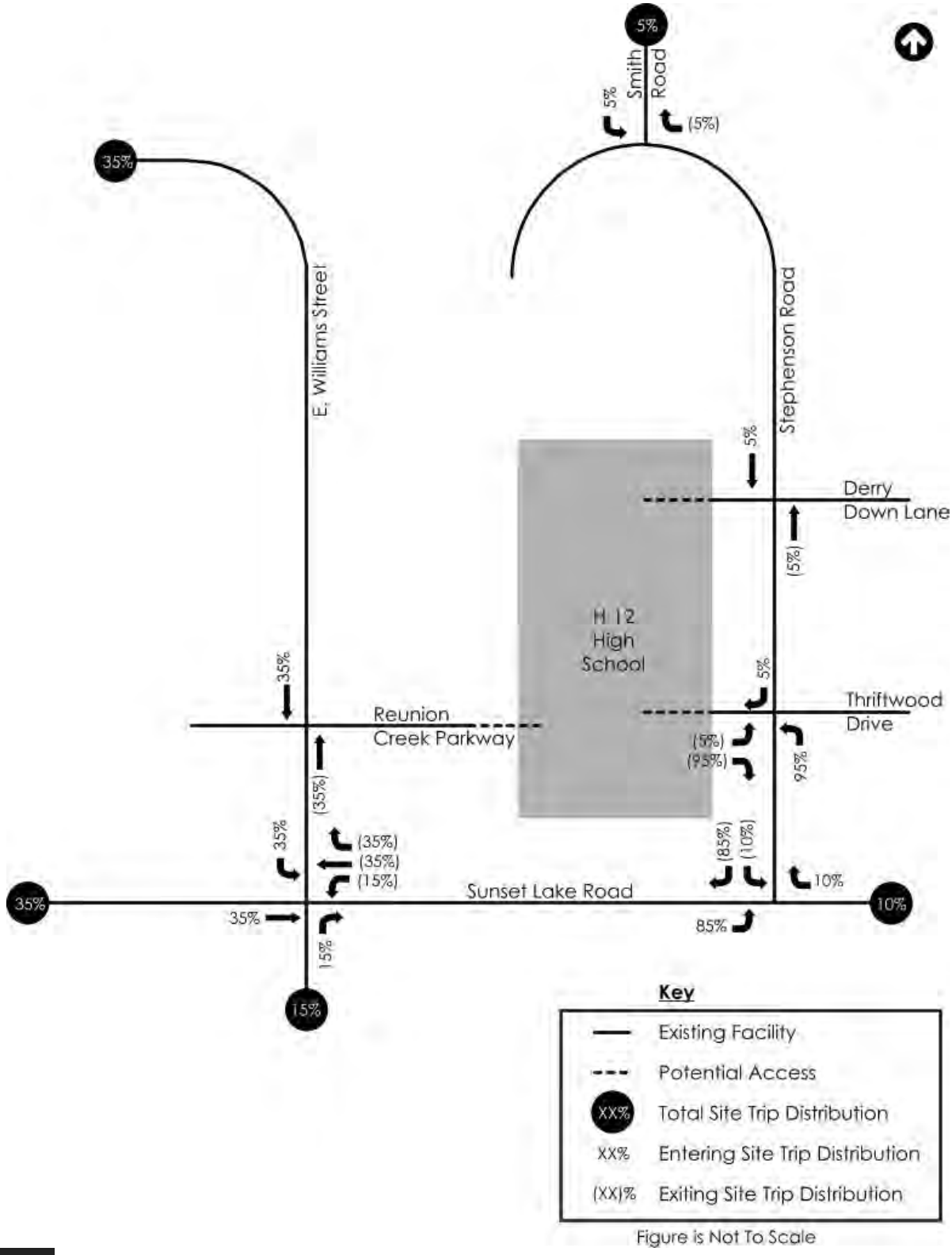


Figure 16: Staff/Buses Trips

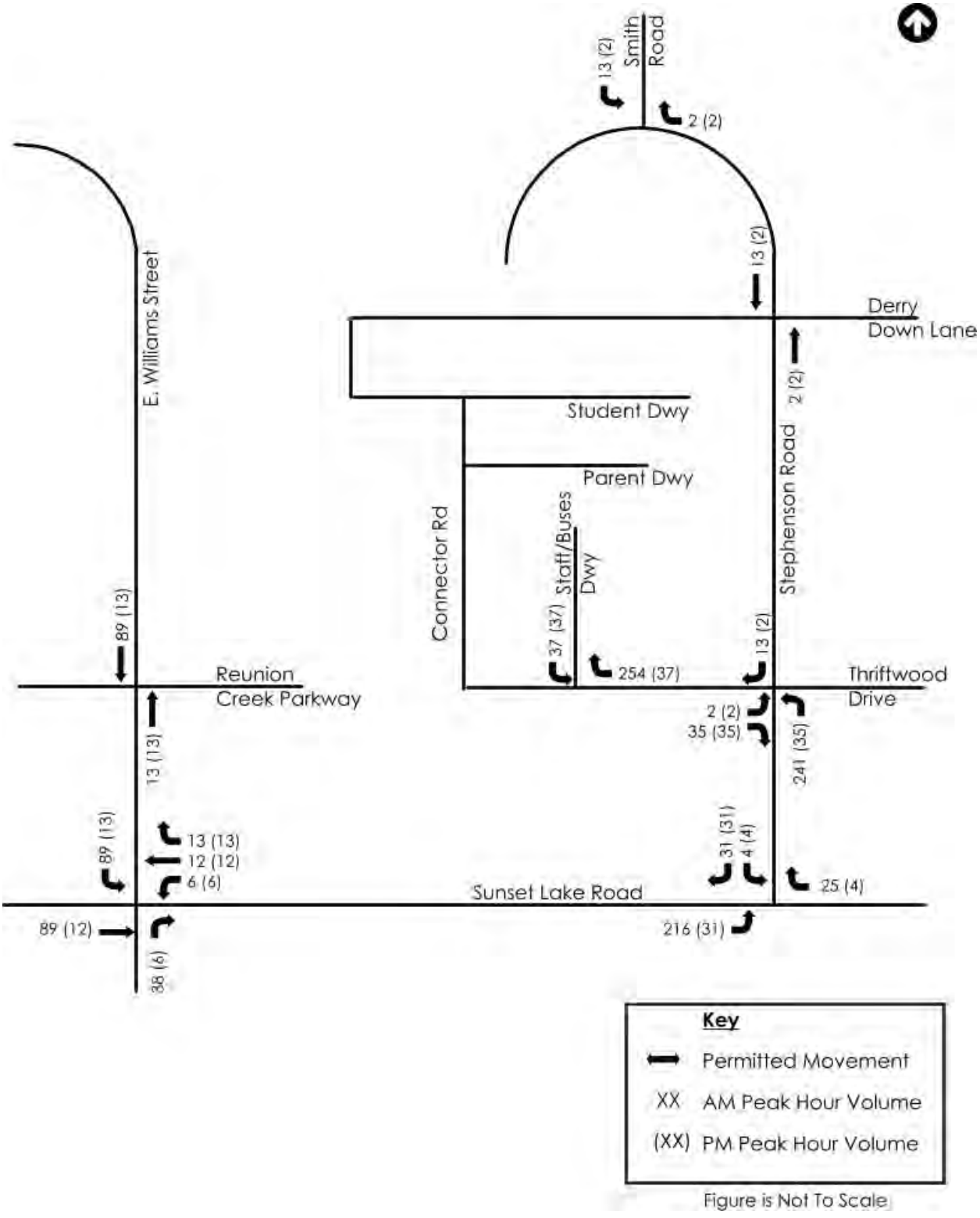
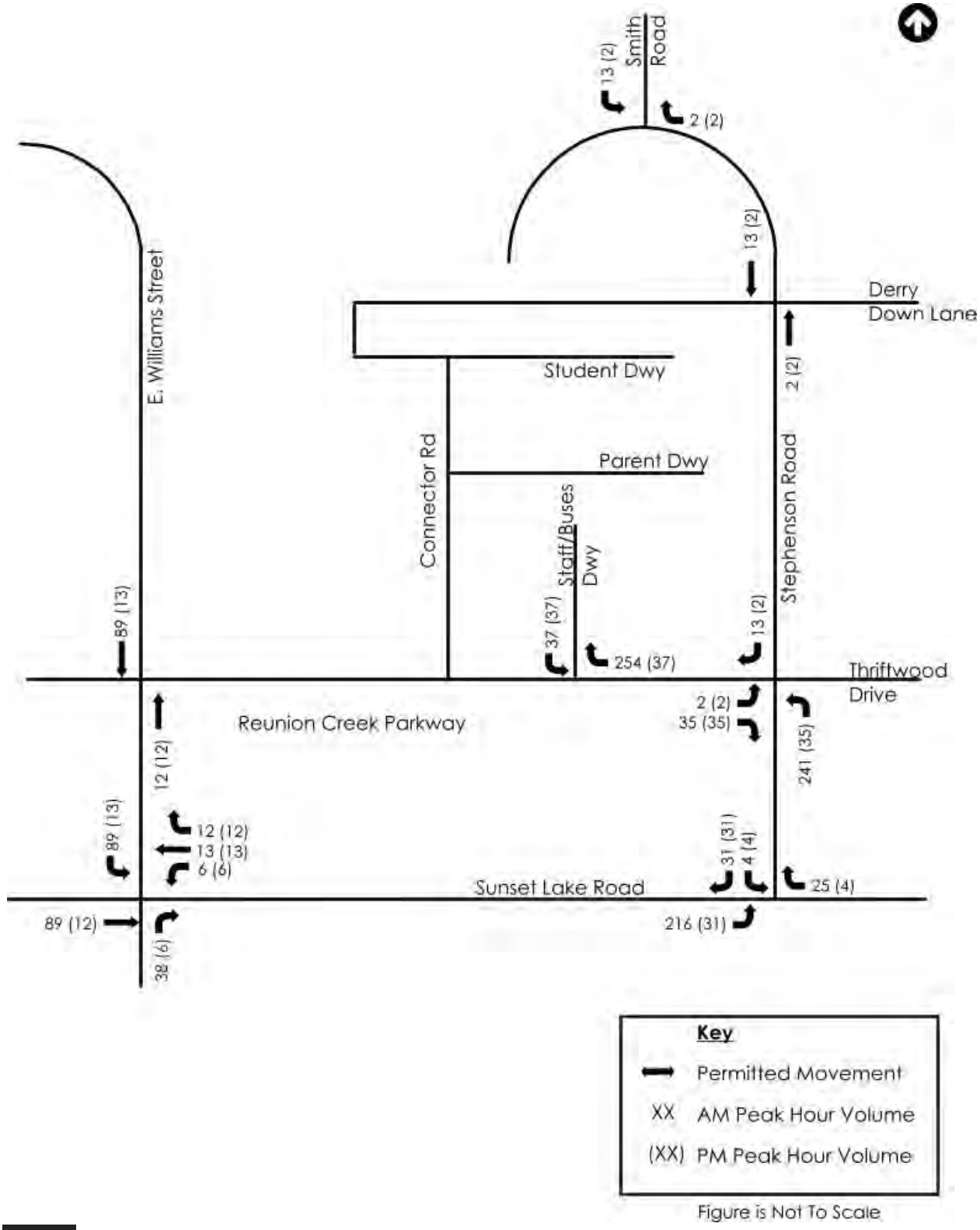


Figure 17: Staff/Buses Trips – Reunion Creek



5.0 TRAFFIC VOLUMES

5.1 EXISTING TRAFFIC VOLUMES

5.1.1 Previous Counts

Counts collected during the Horton Park and Sunset Lake Apartments traffic impact analysis were used at several of the study intersections. These counts are as follows:

- E Williams Street/N Main Street & Sunset Lake Road/Old Smithfield Road (Sunset Lake Apartments – 9/7/2016)
- Sunset Lake Road & Stephenson Road (Sunset Lake Apartments – 9/7/2016)
- Stephenson Road & Smith Road (Horton Park – 5/3/2017)

After a review of historical daily traffic volumes from 2003 to 2017, volumes have grown rapidly along Sunset Lake Road. Traffic on other facilities within the study area show stagnant or very little growth over the same time period. As a result, these counts were grown by 1% annually out to 2020, with the exception of through movements on Sunset Lake Road and Old Smithfield Road which were grown out by 4% annually. This approach was documented and approved as part of the NCDOT TIA Scoping Checklist. The Scoping Checklist, traffic counts, and all traffic volume calculations can be found in the appendix.

It should be noted that when volumes were not available for the 2:00-4:00 time period, volumes were adjusted proportionally based on the Sunset Lake Road & Stephenson Road intersections.

5.1.2 Traffic Counts

Where data was not available, morning (7:00 – 9:00 AM) and afternoon (2:00 – 4:00 PM) turning movement counts were collected on September 22, 2020, at the intersections listed below.

- E Williams Street & Reunion Creek Parkway
- Stephenson Road & Thriftwood Drive/Tear Drop Circle
- Stephenson Road & Derry Down Lane/Cockle Burr Drive

All counts were performed in five (5) minute intervals per NCDOT MSTA requirements. Due to the COVID-19 pandemic, these counts may not be reflective of pre-pandemic traffic. To account for this, the traffic counts discussed in section 5.1.1, and these were balanced. The traffic counts and all traffic volume calculations can be found in the appendix.

5.1.3 Volume Balancing

Using the previous traffic counts discussed in section 5.1.1 that have been projected to 2020 and the collected traffic counts discussed in section 5.1.2, the traffic volumes were then balanced throughout the study area. This produces both a balanced network and normalizes traffic to pre-pandemic levels. The balanced 2020 existing traffic volumes are shown in Figure 18 and the traffic volume calculations are provided in the appendix.

5.2 APPROVED DEVELOPMENTS

Two approved developments were also included in this analysis:

- Horton Park – located north of the H-12 High School site with access from E Williams Street and Smith Road
- Sunset Lake Apartments – located on the east side of Stephenson Road north of the Sunset Lake Road & Stephenson Road intersection

Since the Sunset Lake Apartments driveway in the future No-Build/Build scenarios is located on Stephenson Road between Sunset Lake Road and Thriftwood Drive, a slight imbalance occurs in that section of Stephenson Road. This condition exists in all future-year (i.e. 2026) traffic conditions.

Copies of these traffic studies can be found in the appendix. Site trips generated by these approved developments traveling along study roads/intersections were included in the future No-Build and Build volumes. The trips generated by the approved developments are shown in Figure 19.

5.3 NO-BUILD TRAFFIC VOLUMES

The balanced 2020 Existing traffic volumes were grown by 1% annually out to 2026, except the through movements on Sunset Lake Road and Old Smithfield Road which were grown out by 4% annually. The background growth between the Existing and No-Build scenarios is shown in Figure 20. The 2026 No-Build traffic volumes are shown in Figure 21.

5.4 BUILD TRAFFIC VOLUMES

The 2026 Build traffic volumes include the 2026 No-Build traffic and the proposed development traffic discussed in Section 3.0 and Section 4.0. The total school traffic volumes are shown in Figure 22 and Figure 23. The 2026 Build traffic volumes are shown in Figure 24. The 2026 Build traffic volumes with the Reunion Creek Extension are shown in Figure 25.

5.4.1 Peak Hour Factors

The total 2026 Build traffic volumes include both the school traffic and the traffic volumes from the 2026 No-Build analysis. The No-Build traffic volumes were assumed to operate with a peak hour factor (PHF) of 0.9 whereas traffic to/from the proposed school is assumed to operate with a PHF of 0.5. Weighted averages were used to determine the individual movement PHFs in the Build and Build-Improved analysis scenarios. Traffic volume calculations, including PHF calculations, are contained in the appendix.

Figure 18: 2020 Existing Traffic Volumes

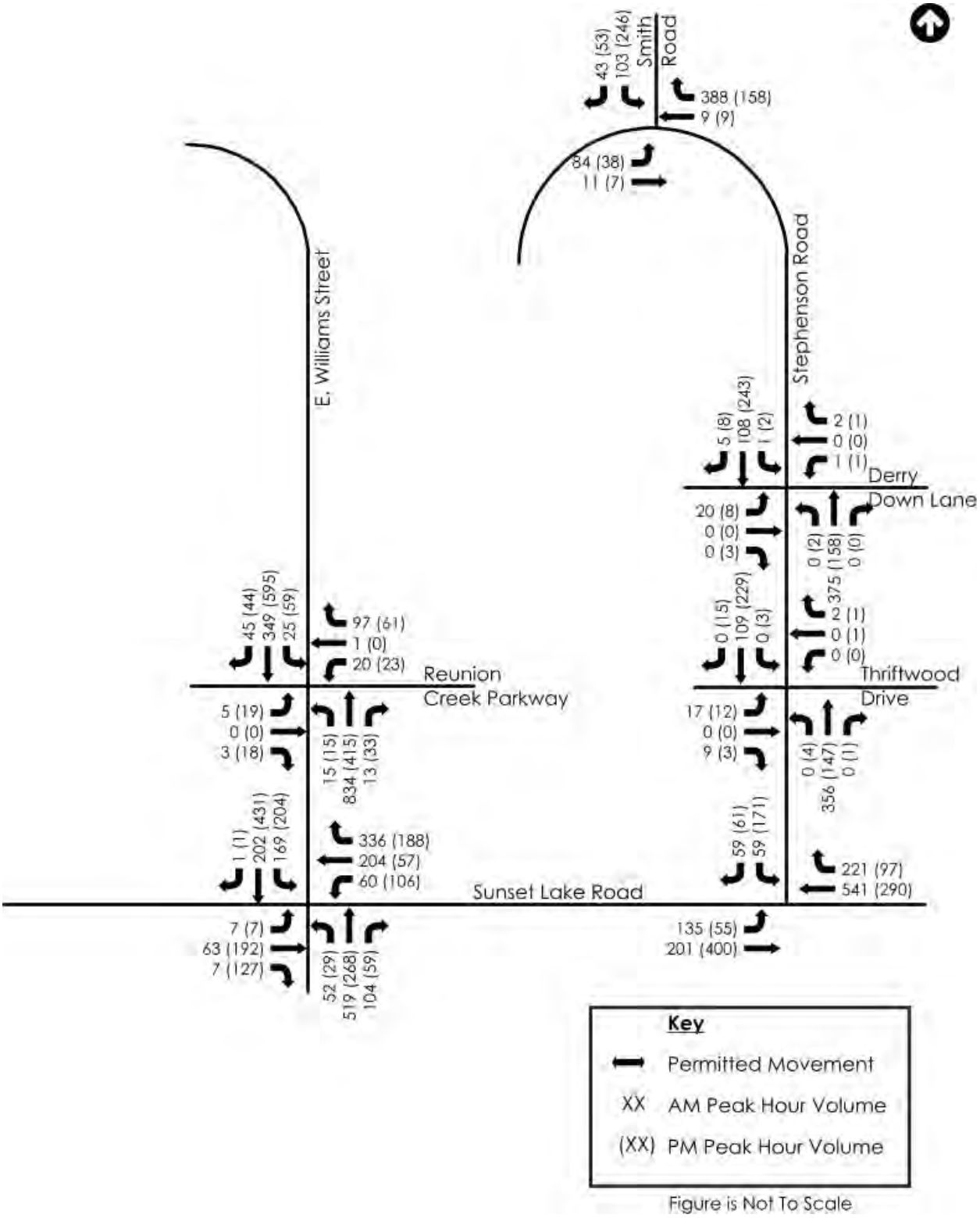


Figure 19: Approved Development Volumes

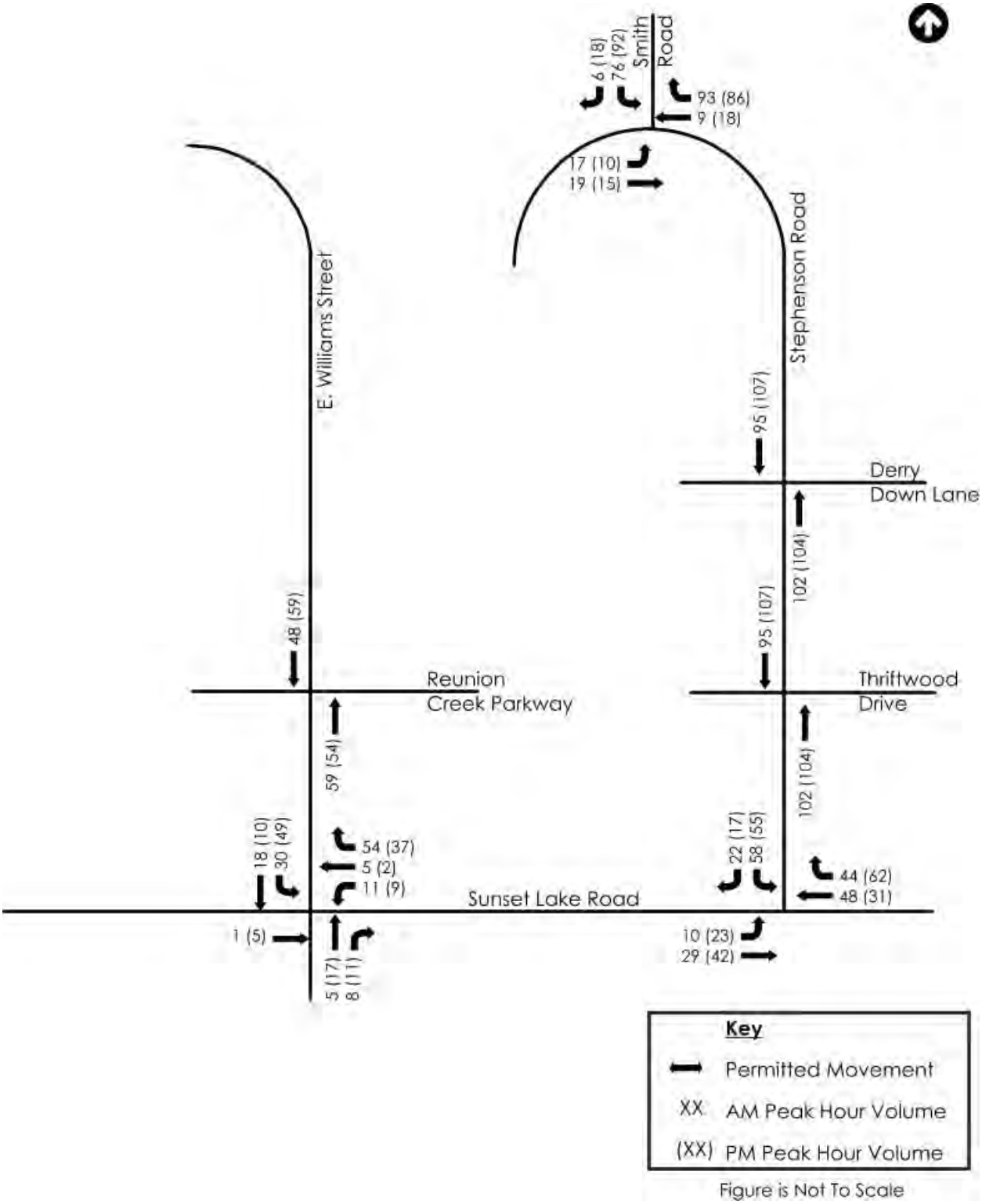


Figure 20: Background Growth Volumes

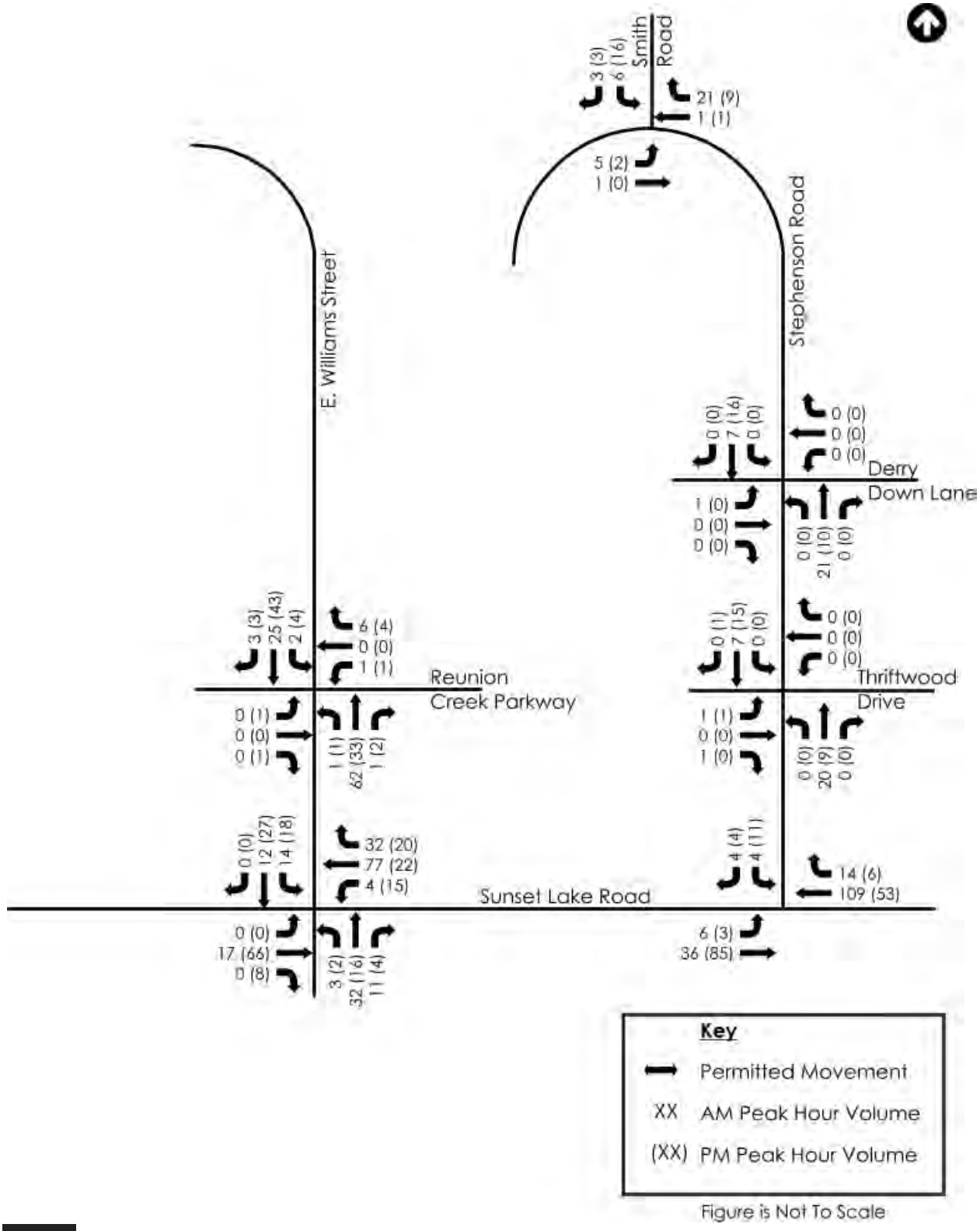


Figure 21: 2026 No-Build Traffic Volumes

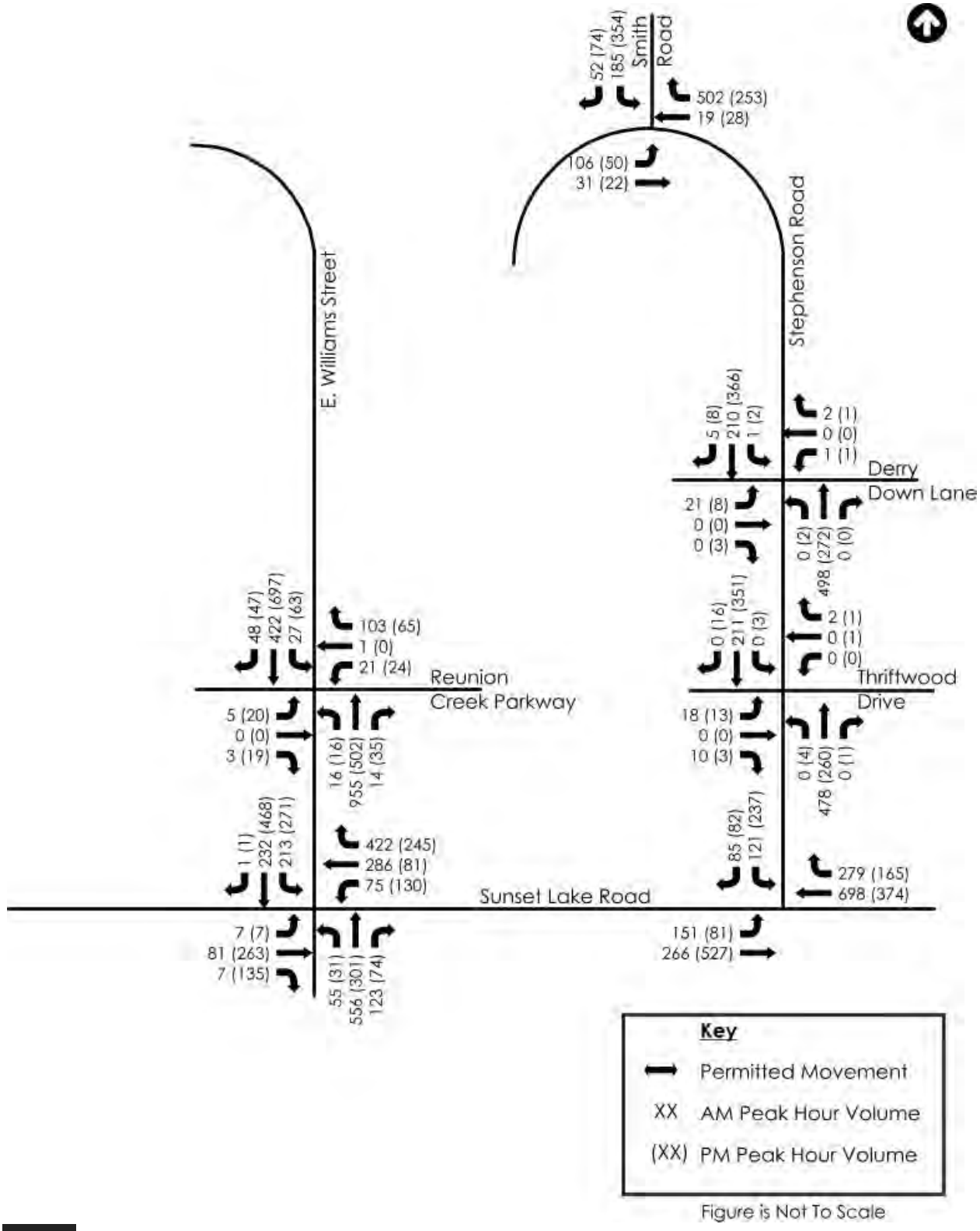


Figure 22: Total School Trips

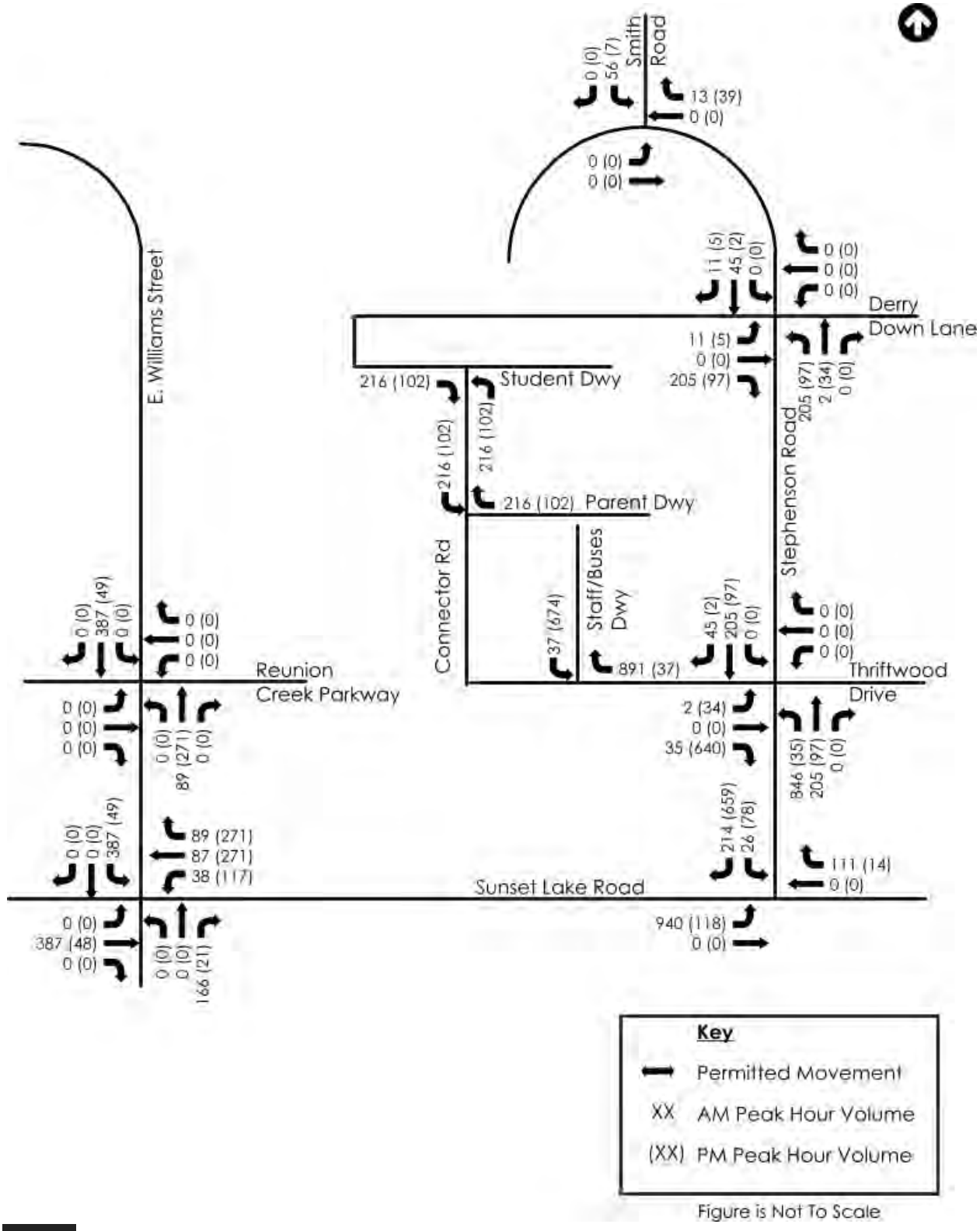


Figure 23: Total School Trips – Reunion Creek

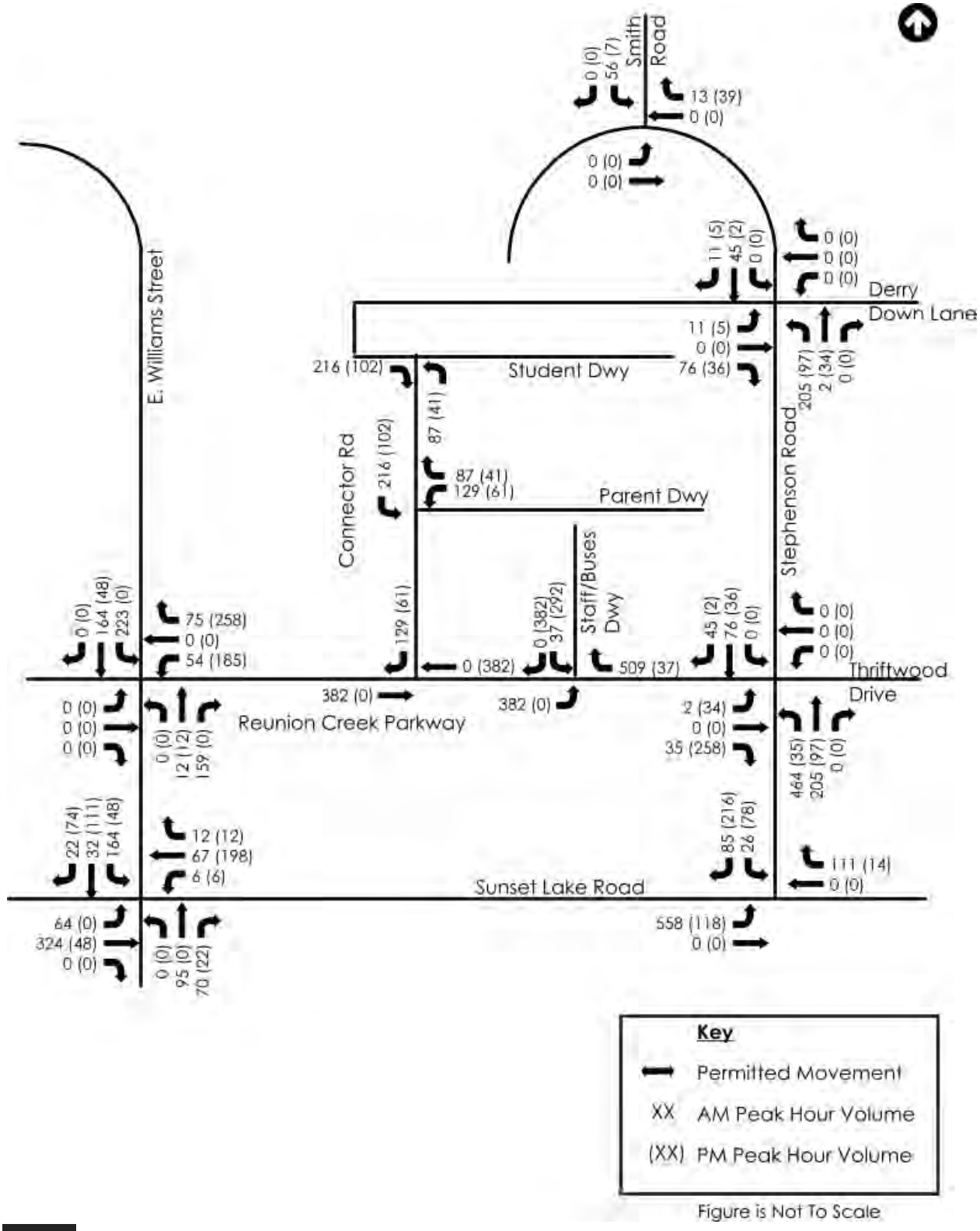


Figure 24: 2026 Build Traffic Volumes

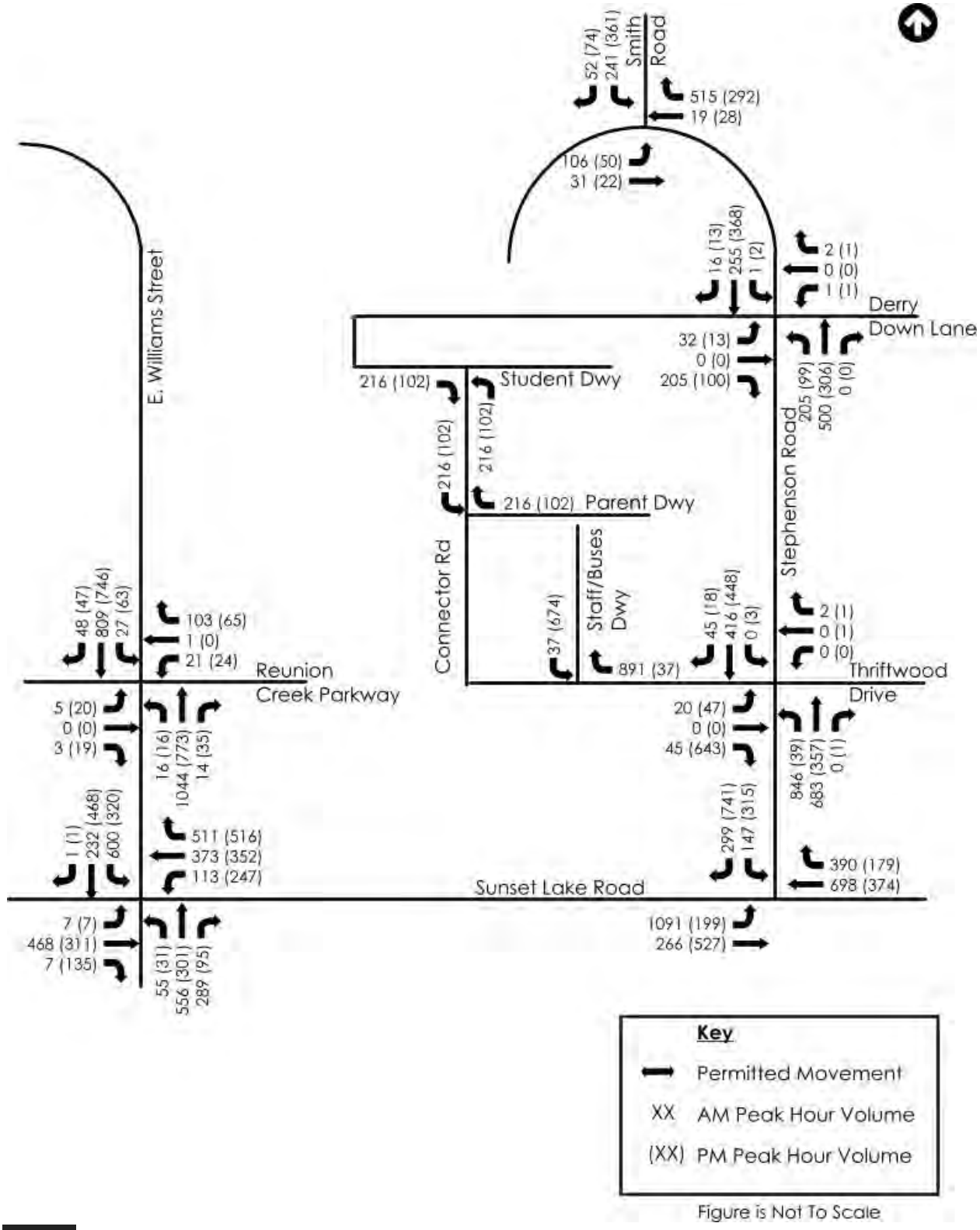
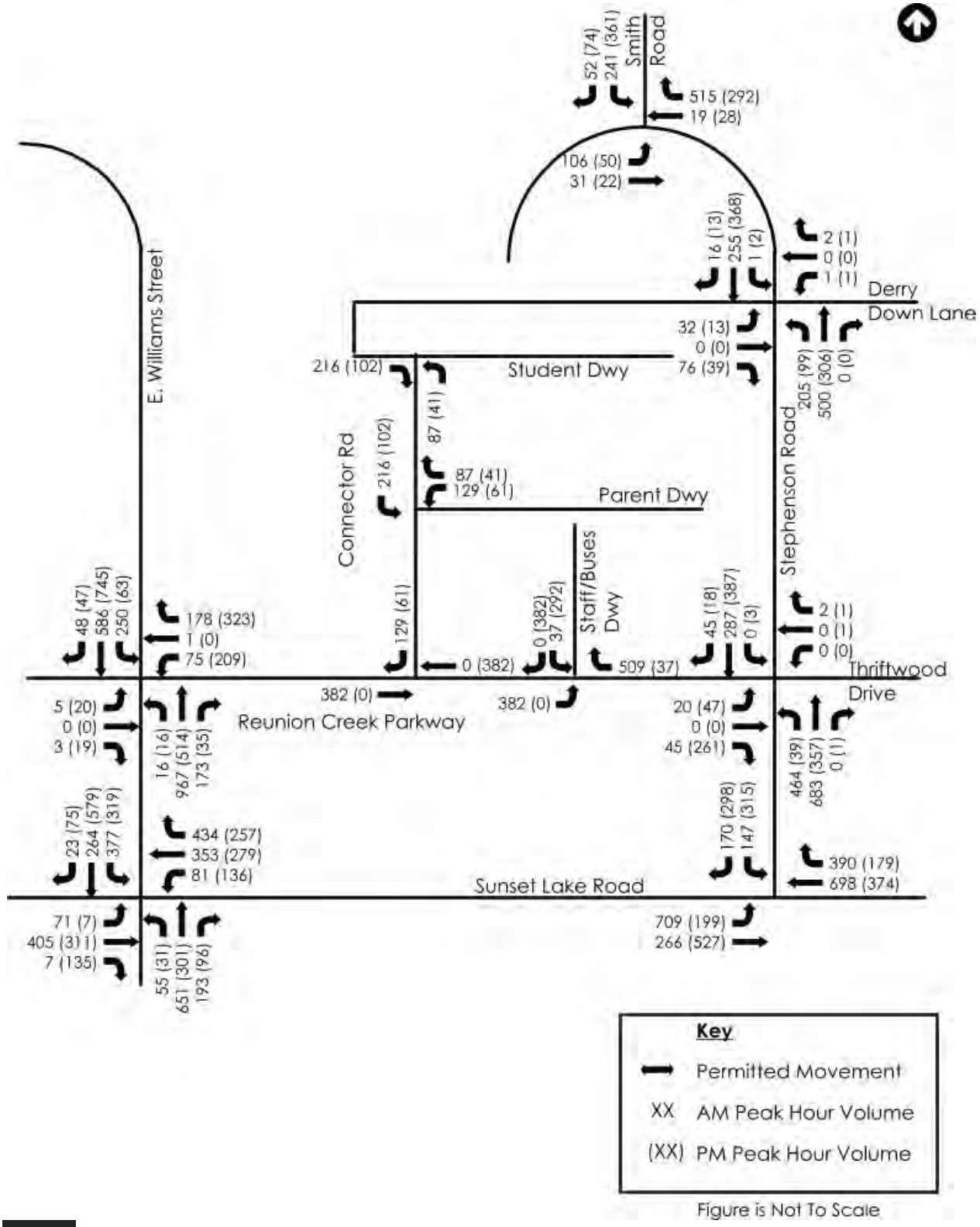


Figure 25: 2026 Build – Reunion Creek Traffic Volumes



6.0 TRAFFIC ANALYSIS

Capacity analyses were performed for the roadway network in the study area. The traffic analysis program Synchro Version 10 was used to analyze all signalized and stop-controlled intersections according to methods put forth by the Transportation Research Board's Highway Capacity Manual (HCM)[5]. The HCM defines capacity as the "maximum rate of flow at which persons or vehicles can be reasonably expected to traverse a point or uniform section of a lane or roadway during a specified period under the prevailing roadway, traffic, and control conditions, usually expressed as vehicles per lane per hour."

Level of service (LOS) is a term used to describe different traffic conditions and is defined as a "qualitative measure describing operational conditions within a traffic stream, and their perception by motorists / or passengers." LOS varies from Level A, representing free flow, to Level F where traffic breakdown conditions are evident. At an unsignalized intersection, the primary traffic on the main roadway is virtually uninterrupted. Therefore, the overall delay for the intersection is usually less than what is calculated for the minor street movements. The overall intersection delay and the delay for the intersections' s minor movement(s) are reported in the summary tables of this report. Generally, LOS D is acceptable for signalized intersections in suburban areas during peak periods. For unsignalized intersections, it is not uncommon for some of the minor street movements or approaches to be operating at LOS F during peak hour conditions and that is not necessarily indicative of an area that requires improvements. Schools generate traffic uniquely as the traffic occurs for a short duration in the morning and another in mid-afternoon on weekdays while school is in session. Outside of these short durations, schools generate minimal traffic. As a result of this, NCDOT is accepting of higher delays (i.e. LOS D, E, or F) at intersections near schools.

Capacity analyses were completed by the NCDOT Congestion Management Capacity Analysis Guidelines[6], and the requirements for school traffic operations studies outlined in the MSTA School Calculator[4]. Table 3 presents the criteria of each LOS as indicated in the HCM[5].

Table 3: Level of Service Criteria

Level of Service (LOS)	Signalized Intersection Control Delay (seconds / vehicle)	Unsignalized Intersection Control Delay (seconds / vehicle)
A	≤ 10	≤ 10
B	>10 and ≤ 20	>10 and ≤ 15
C	>20 and ≤ 35	>15 and ≤ 25
D	>35 and ≤ 55	>25 and ≤ 35
E	>55 and ≤ 80	>35 and ≤ 50
F	>80	>50

Capacity analyses were performed for the following conditions:

- 2020 Existing;
- 2026 No-Build
- 2026 Build;

- 2026 Build with Improvements;
- 2026 Build with Reunion Creek Parkway Extension;
- 2026 Build with Improvements and Reunion Creek Parkway Extension.

SimTraffic runs were completed for all scenarios to observe the predicted traffic operations throughout the study area during each of the peak hours. As in standard practice, ten (10) SimTraffic analysis runs were performed for each scenario, using MSTA simulation settings. Detailed SimTraffic reports can be found in the appendix.

All Synchro files and detailed printouts can be found in the appendix. A summary of the results of the analyses is provided in the following sub-sections.

6.1 2020 EXISTING

In the base year of 2020 under the existing geometric conditions, all study intersections and approaches operate at an acceptable LOS with the following exceptions:

- Eastbound and westbound approaches at E Williams Street & Reunion Creek Parkway in the AM Peak
- Westbound approach at E Williams Street & Sunset Lake Road in the AM Peak
- Southbound approach at Sunset Lake Road & Stephenson Road in both peak hours

Synchro LOS and delay results are listed in Table 4 and illustrated in Figure 26.

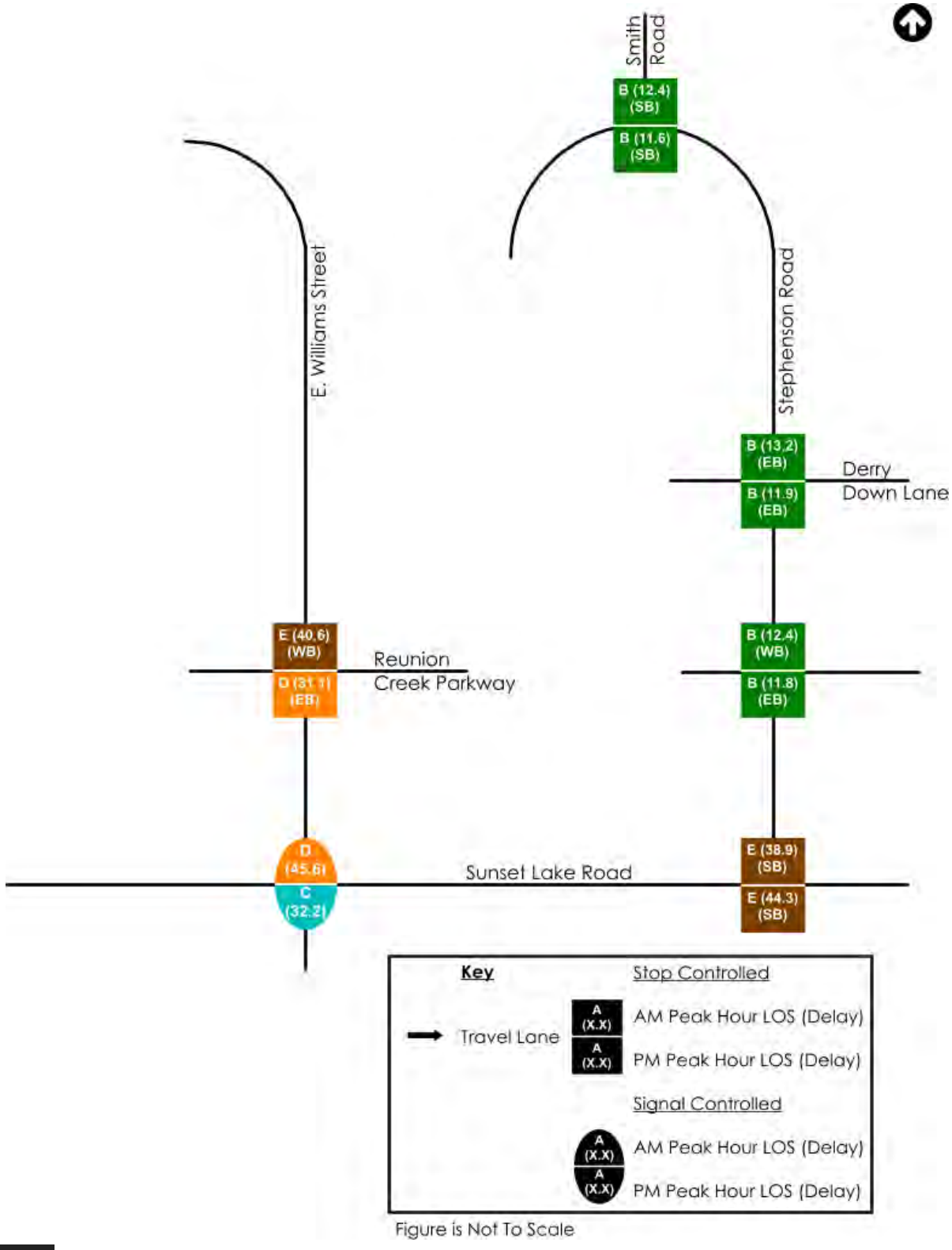
Table 4: 2020 Existing Level of Service and Delay

LOS/Delay		2020 Existing				
		Overall	EB	WB	NB	SB
E Williams St & Reunion Creek Pkwy	AM	**# (4.1)**	E (38.0)	E (40.6)	# (0.1)	# (0.6)
	PM	**# (3.3)**	D (31.1)	D (26.4)	# (0.3)	# (0.7)
E Williams St/N Main St & Sunset Lake Rd/Old Smithfield Rd	AM	**D (45.6)**	C (32.4)	E (56.2)	D (42.4)	D (37.1)
	PM	**C (32.2)**	D (55.0)	C (29.2)	C (29.2)	C (23.9)
Sunset Lake Rd & Stephenson Rd	AM	**# (5.0)**	# (4.3)	# (0.0)	- (-)	E (38.9)
	PM	**# (10.0)**	# (1.0)	# (0.0)	- (-)	E (44.3)
Stephenson Rd & Thriftwood Dr/Tear Drop Cir	AM	**# (1.1)**	B (12.3)	B (12.4)	# (0.1)	# (0.3)
	PM	**# (1.0)**	B (11.8)	B (11.2)	# (0.2)	# (0.1)
Stephenson Rd & Derry Down Ln/Cockle Burr Dr	AM	**# (1.1)**	B (13.2)	B (12.6)	# (0.1)	# (0.3)
	PM	**# (0.9)**	B (11.9)	B (11.4)	# (0.2)	# (0.1)
Stephenson Rd & Smith Rd	AM	**# (4.0)**	# (7.6)	# (0.0)	- (-)	B (12.4)
	PM	**# (7.4)**	# (6.5)	# (0.0)	- (-)	B (11.6)

Legend:

X (X)	LOS (Delay)
	Unsignalized Intersection
	Signalized Intersection
#	No level of service provided
- (-)	No movement

Figure 26: 2020 Existing Level of Service and Delay



6.2 2026 NO-BUILD

As part of the Sunset Lake Apartments, a traffic signal and geometric improvements at the intersection of Stephenson Road at Sunset Lake Road are assumed to be constructed in this scenario. Signal plans showing these improvements can be found in the appendix.

In the future year of 2026, all study intersections and approaches operate similarly as shown in the 2020 Existing analysis with exception of the E Williams Street & Sunset Lake Road intersection which now operates at LOS F in the AM peak hour with several approaches operating at LOS E or F in both peak hours. The operations at Sunset Lake Road & Stephenson Road improve between the Existing and No-Build analysis due to the signal and associated improvements committed to by the Sunset Lake Apartments development.

Synchro LOS and delay results are listed in Table 5 and illustrated in Figure 27.

Table 5: 2026 No-Build Level of Service and Delay

LOS/Delay		2026 No-Build				
		Overall	EB	WB	NB	SB
E Williams St & Reunion Creek Pkwy	AM	**# (6.8)**	F (60.5)	F (76.5)	# (0.1)	# (0.6)
	PM	**# (4.4)**	E (47.2)	E (41.8)	# (0.3)	# (0.7)
E Williams St/N Main St & Sunset Lake Rd/Old Smithfield Rd	AM	**F (80.8)**	C (29.9)	F (87.6)	E (75.4)	F (88.7)
	PM	**D (35.9)**	E (56.1)	C (25.5)	D (38.2)	C (30.1)
Sunset Lake Rd & Stephenson Rd	AM	**B (14.3)**	A (5.9)	B (10.3)	- (-)	D (50.4)
	PM	**B (16.3)**	A (3.8)	B (11.2)	- (-)	D (48.9)
Stephenson Rd & Thriftwood Dr/Tear Drop Cir	AM	**# (1.0)**	C (15.4)	C (15.3)	# (0.1)	# (0.2)
	PM	**# (0.8)**	C (15.0)	B (13.7)	# (0.1)	# (0.1)
Stephenson Rd & Derry Down Ln/Cockle Burr Dr	AM	**# (1.0)**	C (17.3)	C (15.6)	# (0.1)	# (0.2)
	PM	**# (0.7)**	B (14.9)	B (14.0)	# (0.1)	# (0.1)
Stephenson Rd & Smith Rd	AM	**# (6.0)**	# (7.1)	# (0.0)	- (-)	C (18.7)
	PM	**# (9.8)**	# (5.6)	# (0.0)	- (-)	C (16.9)

Legend:

X (X)	LOS (Delay)
	Unsignalized Intersection
	Signalized Intersection
#	No level of service provided
- (-)	No movement

Figure 27: 2026 No-Build Level of Service and Delay

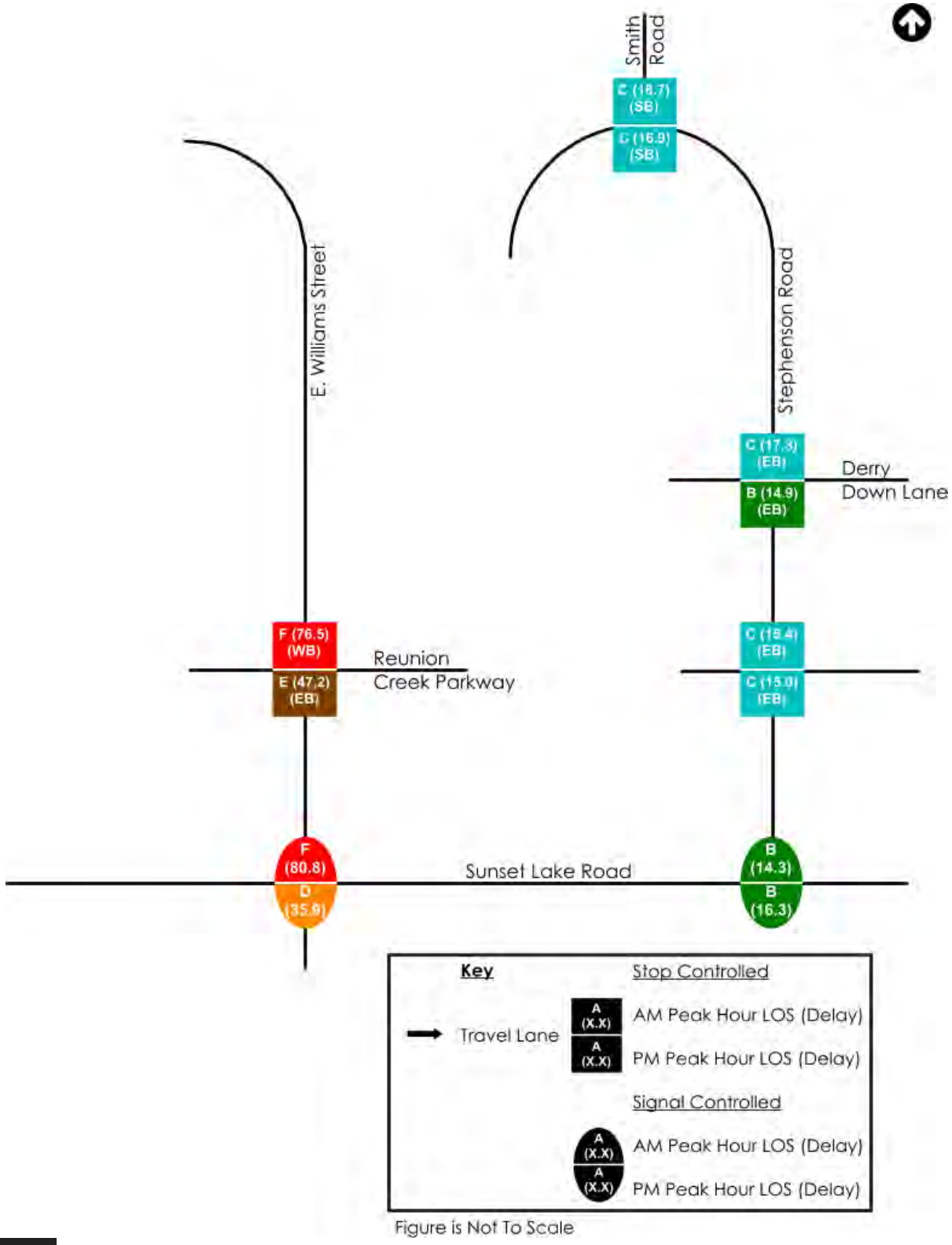


Figure is Not To Scale

6.3 2026 BUILD WITHOUT IMPROVEMENTS

This analysis scenario evaluates traffic operations with the addition of the H-12 High School trips but without any improvements. Under these conditions, study intersections and approaches operate with longer delays as detailed in Table 6 and Figure 28. The following poor operations should be noted:

- The signalized intersections at E Williams Street & Sunset Lake Road and Sunset Lake Road & Stephenson Road operate at LOS E and F in both peak hours, with many approaches having a delay over 300 seconds in the AM peak hour.
  - There is extensive queueing along Sunset Lake Road at the Sunset Lake Road & Stephenson Road intersection as a result of heavy left turns from eastbound Sunset Lake Road to access the school
- The unsignalized intersection of Stephenson Road at Thriftwood Drive operates at LOS F in both peak hours with delays exceeding 300 seconds from the side street approaches.
  - There is extensive queuing along Stephenson Road as a result of heavy left turns from northbound Stephenson Road to access the school
- The unsignalized intersection of Stephenson Road at Derry Down Lane operates at LOS F in the AM peak hour.
- The unsignalized E Williams Street & Reunion Creek Parkway intersection operates at LOS F in both peak hours as a result of queuing spilling back from the E Williams Street & Sunset Lake Road intersection.

Table 6: 2026 Build Level of Service and Delay

LOS/Delay		2026 Build				
		Overall	EB	WB	NB	SB
E Williams St & Reunion Creek Pkwy	AM	**# (35.2)**	F (##)	F (##)	# (0.2)	# (0.3)
	PM	**# (17.3)**	F (197.4)	F (268.8)	# (0.2)	# (0.8)
E Williams St/N Main St & Sunset Lake Rd/Old Smithfield Rd	AM	**F (##)**	F (296.4)	F (##)	F (##)	F (##)
	PM	**F (133.8)**	D (49.3)	F (163.8)	F (125.2)	F (131.7)
Sunset Lake Rd & Stephenson Rd	AM	**F (263.9)**	F (##)	F (212.1)	- (-)	D (54.8)
	PM	**E (79.9)**	A (4.3)	F (84.8)	- (-)	F (116.2)
Stephenson Rd & Thriftwood Dr/Tear Drop Cir	AM	**# (198.3)**	F (##)	F (##)	# (260.4)	# (0.1)
	PM	**# (498.5)**	F (##)	F (##)	# (1.2)	# (0.1)
Stephenson Rd & Derry Down Ln/Cockle Burr Dr	AM	**# (95.2)**	F (##)	F (199.1)	# (3.9)	# (0.1)
	PM	**# (5.2)**	C (19.0)	D (31.5)	# (3.1)	# (0.1)
Stephenson Rd & Smith Rd	AM	**# (10.1)**	# (7.2)	# (0.0)	- (-)	D (28.3)
	PM	**# (10.2)**	# (5.7)	# (0.0)	- (-)	C (18.7)
Thriftwood Dr & Staff/Buses Dwy	AM	**# (0.8)**	# (0.0)	# (0.0)	- (-)	C (19.9)
	PM	**# (179.7)**	# (0.0)	# (0.0)	- (-)	F (189.6)
Connector Rd & Parent Dwy	AM	**# (9.2)**	- (-)	B (10.4)	# (0.0)	# (8.0)
	PM	**# (8.3)**	- (-)	A (9.1)	# (0.0)	# (7.5)
Derry Down Ln/Student Dwy & Connector Rd	AM	**# (7.6)**	# (0.0)	# (0.0)	C (15.3)	- (-)
	PM	**# (5.1)**	# (0.0)	# (0.0)	B (10.2)	- (-)

Legend:

X (X)	LOS (Delay)
	Unsignalized Intersection
	Signalized Intersection
#	No level of service provided
##	Delay exceeds 300 seconds
- (-)	No movement

Figure 28: 2026 Build Level of Service and Delay

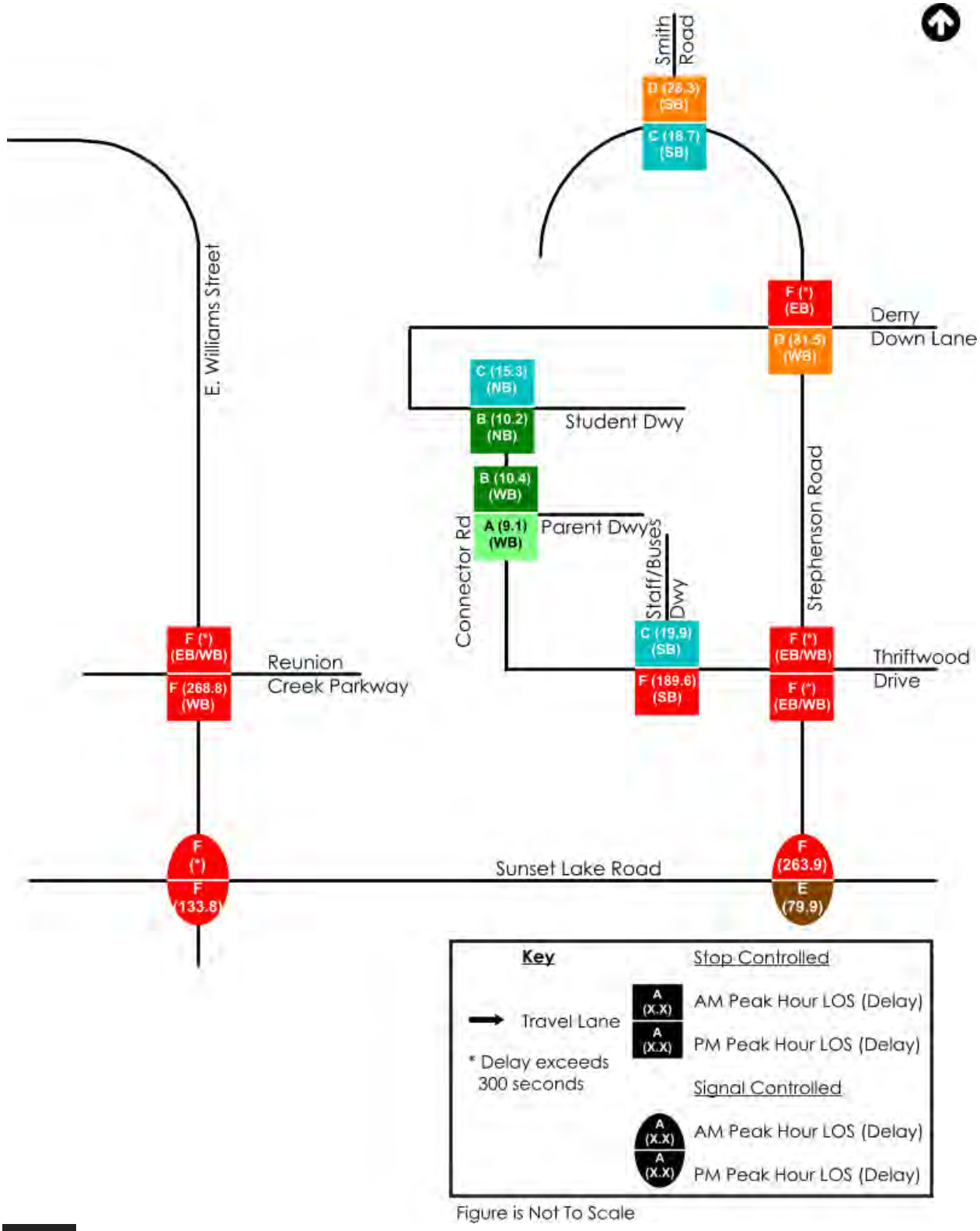


Figure is Not To Scale

6.4 2026 BUILD WITH IMPROVEMENTS

Geometric improvements such as the installation of turn-lanes are analyzed in this scenario. These items are listed in the Recommendations section. Table 7 and Figure 29 shows the results of the capacity analysis under the 2026 Build-Improved traffic conditions.

Table 7: 2026 Build-Improved Level of Service and Delay

LOS/Delay		2026 Build Improved				
		Overall	EB	WB	NB	SB
E Williams St & Reunion Creek Pkwy	AM	**# (35.2)**	F (##)	F (##)	# (0.2)	# (0.3)
	PM	**# (17.3)**	F (197.4)	F (268.8)	# (0.2)	# (0.8)
E Williams St/N Main St & Sunset Lake Rd/Old Smithfield Rd	AM	**F (187.7)**	F (##)	D (54.3)	F (178.6)	F (248.7)
	PM	**E (61.0)**	F (105.3)	C (34.4)	E (77.8)	E (75.9)
Sunset Lake Rd & Stephenson Rd	AM	**F (115.2)**	F (132.7)	F (114.8)	- (-)	E (57.2)
	PM	**F (84.0)**	A (4.0)	E (76.1)	- (-)	F (127.0)
Stephenson Rd & Thriftwood Dr/Tear Drop Cir	AM	**# (198.3)**	F (##)	F (##)	# (260.4)	# (0.1)
	PM	**# (338.2)**	F (##)	F (##)	# (1.2)	# (0.1)
Stephenson Rd & Derry Down Ln/Cockle Burr Dr	AM	**# (13.0)**	E (37.7)	F (149.4)	# (3.9)	# (0.1)
	PM	**# (4.5)**	C (15.2)	D (30.4)	# (3.1)	# (0.1)
Stephenson Rd & Smith Rd	AM	**# (10.1)**	# (7.2)	# (0.0)	- (-)	D (28.3)
	PM	**# (10.2)**	# (5.7)	# (0.0)	- (-)	C (18.7)
Thriftwood Dr & Staff/Buses Dwy	AM	**# (0.8)**	# (0.0)	# (0.0)	- (-)	C (19.9)
	PM	**# (179.7)**	# (0.0)	# (0.0)	- (-)	F (189.6)
Connector Rd & Parent Dwy	AM	**# (9.2)**	- (-)	B (10.4)	# (0.0)	# (8.0)
	PM	**# (8.3)**	- (-)	A (9.1)	# (0.0)	# (7.5)
Derry Down Ln/Student Dwy & Connector Rd	AM	**# (7.6)**	# (0.0)	# (0.0)	C (15.3)	- (-)
	PM	**# (5.1)**	# (0.0)	# (0.0)	B (10.2)	- (-)

Legend:

X (X)	LOS (Delay)
	Unsignalized Intersection
	Signalized Intersection
#	No level of service provided
##	Delay exceeds 300 seconds
- (-)	No movement

The results of this analysis show that the new turn lanes at the Stephenson Road intersections with Thriftwood Drive and Derry Down Lane do not significantly improve operations at these intersections. It was noted from the SimTraffic simulation runs however that the additional turn lanes did improve flow into and out of the school during both peak hours by allowing predominantly right-turning traffic exiting the school to not be impeded by vehicles making a left onto Stephenson Road.

Additional turn lane improvements at the intersections of E Williams St & Sunset Lake Road and Stephenson Road & Sunset Lake Road would significantly improve operations in both peak hours. The addition of a northbound right and westbound right-turn lane at the E Williams St & Sunset Lake Road may reduce the overall delay by 160 seconds in the AM peak hour and 75 seconds in the PM peak hour. The addition of a second eastbound left turn lane at Stephenson Road & Sunset Lake Road, along with a second receiving lane along northbound Stephenson Road may reduce the overall delay by 150 seconds in the AM peak hour. The second receiving lane should provide a minimum of 600 feet of full-width lane before merging into the single northbound lane on Stephenson Road. It should be noted that the adjacent development (i.e. Sunset Lake Apartments) and right-of-way constraints in the northwest quadrant of the intersection of Sunset Lake Road at Stephenson Road may prohibit the construction of this improvement.

6.4.1 SimTraffic Operations

SimTraffic runs were completed for each of the analysis scenarios. In-order to verify proposed turn-bay storage lengths, Table 8 summarizes the queuing results from the Build-improved scenario for both Synchro (95th percentile queues) and SimTraffic (maximum observed queues). As improvements are only recommended at the proposed school driveways, queues are not included in the table for other study intersections. These queues can be found in the appendix.

Table 8: Queue Length Summary

Intersection / Movement		Recommended Storage (feet)	2026 Build-Improved			
			AM Peak Hour		PM Peak Hour	
			95th %'ile Queue (ft.)	Max. Obs. Queue (ft.)	95th %'ile Queue (ft.)	Max. Obs. Queue (ft.)
Stephenson Road & Thriftwood Drive/Tear Drop Circle	Northbound Left	500	2570	600+	5	49
	Eastbound Left-Through	250	N/A	175	63	350
	Southbound Right	100	0	33	0	6
Stephenson Road & Derry Down Lane/Cockle Burr Drive	Northbound Left	100	38	73	15	63
	Eastbound Left-Through	100	98	49	13	41
Sunset Lake Road & Stephenson Road	Eastbound Left	Max Available	773	1138	42	150
	Westbound Right	625	559	725	167	537
	Southbound Left	525	312	272	514	296
E Williams Street/North Main Street & Sunset Lake Road/Old Smithfield Road	Northbound Right	500	376	600	100	477
	Westbound Right	450	419	241	175	234

N/A = No queue provided by Synchro

Queuing results show that there is sufficient storage for these movements with exception of the northbound left-turn lane at the Stephenson Road & Thriftwood Drive intersection where the HCM 95th percentile queue is 2570 feet in the AM peak, but the recommended storage length is 500 feet. In the SimTraffic simulation runs, it was observed that the queue for the northbound left movement extended south to the Sunset Lake Road & Stephenson Road intersection. As Thriftwood Drive is the student entrance and exit to the H-12 High School, the northbound left-turn movement will only occur for a short duration in the AM peak period.

Figure 29: 2026 Build with Improvements Level of Service and Delay

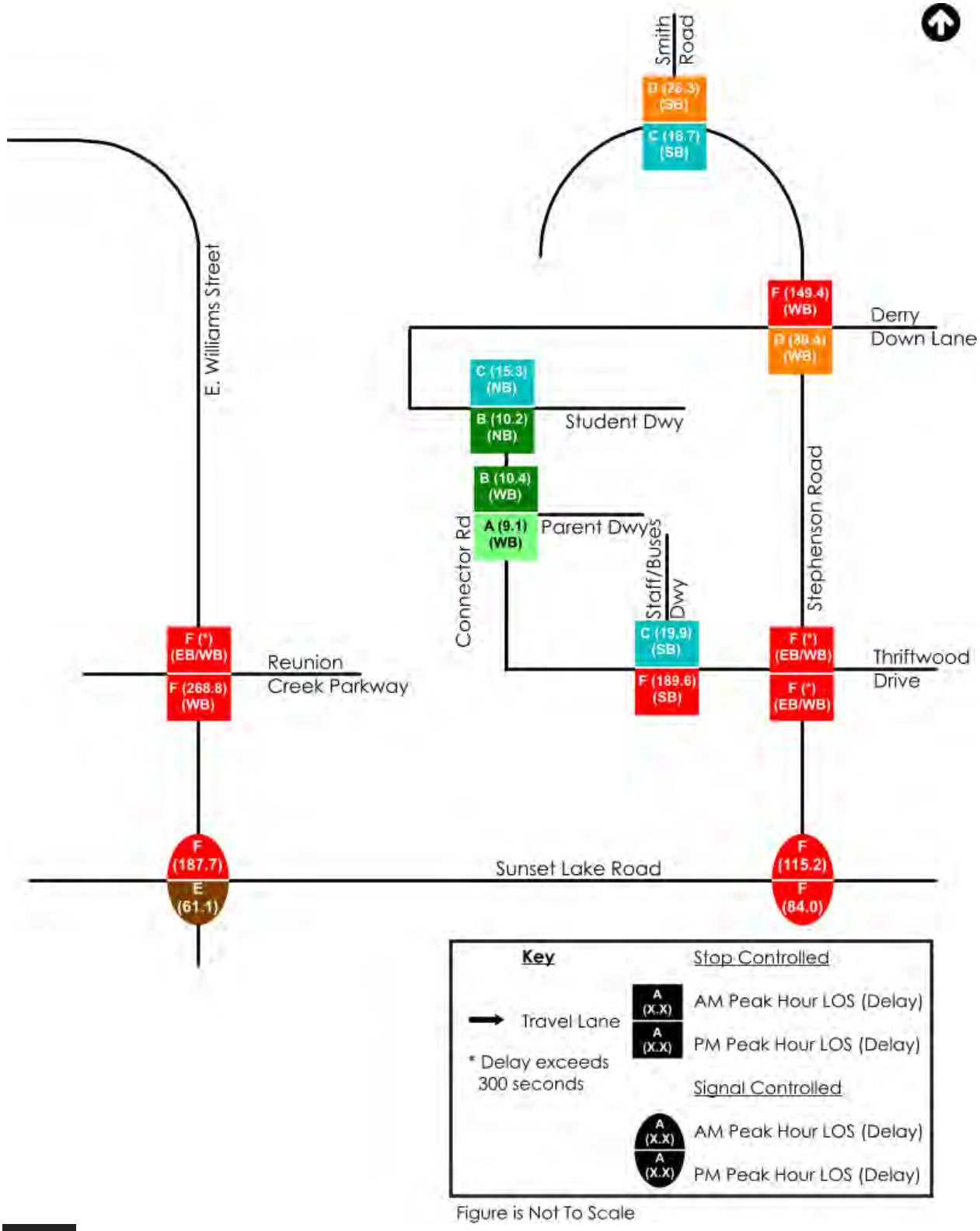


Figure is Not To Scale

6.5 2026 BUILD WITHOUT IMPROVEMENTS – REUNION CREEK

This analysis scenario evaluates traffic operations with the addition of the H-12 High School trips but with the extension of Reunion Creek Parkway to Thriftwood Drive. Under these conditions, study intersections and approaches operate with longer delays as detailed in Table 9 and Figure 30. The following poor operations should be noted:

- The signalized intersections at E Williams Street & Sunset Lake Road operate at LOS E and F in both peak hours.
- The signalized intersection of Sunset Lake Road & Stephenson Road operates at LOS F in the AM peak.
- The unsignalized intersection of Stephenson Road at Thriftwood Drive operates at LOS F in both peak hours with delays exceeding 300 seconds from the side street approaches in the AM peak.
- The unsignalized intersection of Stephenson Road at Derry Down Lane operates at LOS F in the AM peak hour.
- The unsignalized E Williams Street & Reunion Creek Parkway intersection operates at LOS F in both peak hours as a result of increased trips entering and exiting Reunion Creek Parkway to access the school. Delays exceed 300 seconds from the side street approaches.

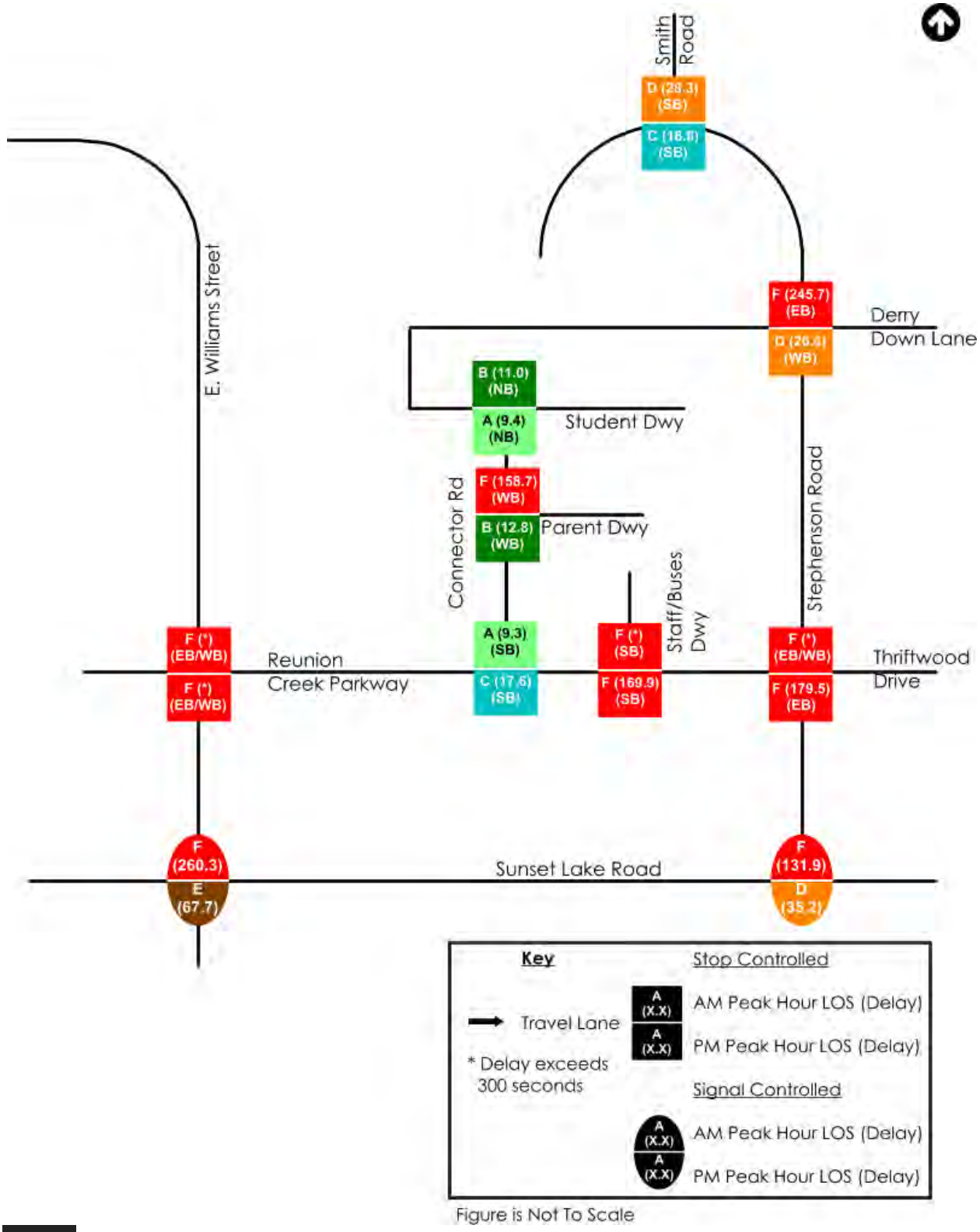
Table 9: 2026 Build – Reunion Creek Level of Service and Delay

LOS/Delay		2026 Build w/ Reunion Creek				
		Overall	EB	WB	NB	SB
E Williams St & Reunion Creek Pkwy	AM	**# (8.4)**	F (##)	F (##)	# (0.1)	# (20.4)
	PM	**# (##)**	F (##)	F (##)	# (0.2)	# (0.8)
E Williams St/N Main St & Sunset Lake Rd/Old Smithfield Rd	AM	**F (260.3)**	F (209.7)	C (31.1)	F (##)	F (##)
	PM	**E (67.7)**	E (74.8)	E (71.7)	E (58.4)	E (65.4)
Sunset Lake Rd & Stephenson Rd	AM	**F (131.9)**	F (167.4)	F (115.7)	- (-)	D (54.1)
	PM	**D (35.2)**	B (11.1)	B (18.5)	- (-)	E (71.1)
Stephenson Rd & Thriftwood Dr/Tear Drop Cir	AM	**# (8.4)**	F (##)	F (##)	# (11.1)	# (0.1)
	PM	**# (68.2)**	F (179.5)	F (112.5)	# (1.2)	# (0.1)
Stephenson Rd & Derry Down Ln/Cockle Burr Dr	AM	**# (35.5)**	F (245.7)	F (96.6)	# (3.9)	# (0.1)
	PM	**# (3.6)**	C (18.9)	D (26.6)	# (3.1)	# (0.1)
Stephenson Rd & Smith Rd	AM	**# (10.1)**	# (7.2)	# (0.0)	- (-)	D (28.3)
	PM	**# (10.2)**	# (5.7)	# (0.0)	- (-)	C (18.8)
Thriftwood Dr & Staff/Buses Dwy	AM	**# (72.5)**	# (16.4)	# (0.0)	- (-)	F (##)
	PM	**# (161.1)**	# (0.0)	# (0.0)	- (-)	F (169.9)
Thriftwood Dr/Reunion Creek Extension & Connector Rd	AM	**# (2.3)**	# (0.0)	# (0.0)	- (-)	A (9.3)
	PM	**# (2.4)**	# (0.0)	# (0.0)	- (-)	C (17.6)
Connector Rd & Parent Dwy	AM	**# (83.3)**	- (-)	F (158.7)	# (0.0)	# (8.0)
	PM	**# (10.1)**	- (-)	B (12.8)	# (0.0)	# (7.5)
Derry Down Ln/Student Dwy & Connector Rd	AM	**# (3.1)**	# (0.0)	# (0.0)	B (11.0)	- (-)
	PM	**# (2.7)**	# (0.0)	# (0.0)	A (9.4)	- (-)

Legend:

X (X)	LOS (Delay)
	Unsignalized Intersection
	Signalized Intersection
#	No level of service provided
##	Delay exceeds 300 seconds
- (-)	No movement

Figure 30: 2026 Build – Reunion Creek Level of Service and Delay



6.6 2026 BUILD WITH IMPROVEMENTS – REUNION CREEK

Geometric improvements such as the installation of turn-lanes are analyzed in this scenario. These items are listed in the Recommendations section. Table 10 lists and illustrates the results of the capacity analysis under the 2026 Build-Improved traffic conditions.

Table 10: 2026 Build-Improved Level of Service and Delay

LOS/Delay		2026 Build Improved w/ Reunion Creek				
		Overall	EB	WB	NB	SB
E Williams St & Reunion Creek Pkwy	AM	**D (40.0)**	F (77.2)	F (85.5)	C (27.9)	D (39.9)
	PM	**C (29.1)**	D (45.8)	D (48.7)	C (27.4)	B (16.2)
E Williams St/N Main St & Sunset Lake Rd/Old Smithfield Rd	AM	**F (122.9)**	F (189.2)	D (47.1)	F (130.9)	F (137.4)
	PM	**E (66.4)**	F (106.7)	D (49.0)	E (64.8)	E (62.4)
Sunset Lake Rd & Stephenson Rd	AM	**D (48.0)**	D (38.1)	E (57.2)	- (-)	E (56.0)
	PM	**C (31.9)**	C (21.4)	C (33.6)	- (-)	D (41.3)
Stephenson Rd & Thriftwood Dr/Tear Drop Cir	AM	**# (8.4)**	F (##)	F (##)	# (11.1)	# (0.1)
	PM	**# (15.3)**	E (37.4)	F (112.5)	# (1.2)	# (0.1)
Stephenson Rd & Derry Down Ln/Cockle Burr Dr	AM	**# (11.3)**	F (62.0)	F (74.1)	# (3.9)	# (0.1)
	PM	**# (3.4)**	C (16.5)	D (25.7)	# (3.1)	# (0.1)
Stephenson Rd & Smith Rd	AM	**# (10.1)**	# (7.2)	# (0.0)	- (-)	D (28.3)
	PM	**# (10.2)**	# (5.7)	# (0.0)	- (-)	C (18.8)
Thriftwood Dr & Staff/Buses Dwy	AM	**# (37.6)**	# (91.3)	# (0.0)	- (-)	F (##)
	PM	**# (13.7)**	# (0.0)	# (0.0)	- (-)	B (14.5)
Thriftwood Dr/Reunion Creek Extension & Connector Rd	AM	**# (2.3)**	# (0.0)	# (0.0)	- (-)	A (9.3)
	PM	**# (2.4)**	# (0.0)	# (0.0)	- (-)	C (17.6)
Connector Rd & Parent Dwy	AM	**# (69.4)**	- (-)	F (130.9)	# (0.0)	# (8.0)
	PM	**# (9.6)**	- (-)	B (11.7)	# (0.0)	# (7.5)
Derry Down Ln/Student Dwy & Connector Rd	AM	**# (3.1)**	# (0.0)	# (0.0)	B (11.0)	- (-)
	PM	**# (2.7)**	# (0.0)	# (0.0)	A (9.4)	- (-)

Legend:

X (X)	LOS (Delay)
	Unsignalized Intersection
	Signalized Intersection
#	No level of service provided
##	Delay exceeds 300 seconds
- (-)	No movement

The results of this analysis show that the new turn lanes at the Stephenson Road intersections with Thriftwood Drive and Derry Down Lane, and E Williams Street intersection with Reunion Creek Parkway, do not significantly improve operations at these intersections. It was noted from the SimTraffic simulation runs however that the additional turn lanes did improve flow into and out of the school during both peak hours by allowing predominantly right-turning traffic exiting the school to not be impeded by vehicles making a left onto Stephenson Road.

Additional turn lane improvements at the intersections of E Williams St & Sunset Lake Road and Stephenson Road & Sunset Lake Road would significantly improve operations in the AM peak hour. The addition of a northbound right and westbound right-turn lane at the E Williams St & Sunset Lake Road may improve reduce the delay by 135 seconds in the AM peak hour and the addition of a second eastbound left turn lane at Stephenson Road & Sunset Lake Road, along with a second receiving lane along northbound Stephenson Road between Sunset Lake Road and Goolsby Court, may improve operations to LOS D in the AM peak hour.

6.6.1 SimTraffic Operations

SimTraffic runs were completed for each of the analysis scenarios. In-order to verify proposed turn-bay storage lengths, Table 8 summarizes the queuing results from the Build-improved scenario for both Synchro (95th percentile queues) and SimTraffic (maximum observed queues). For simplicity, queues are reported where turn lanes are recommended. All queues can be found in the reports provided in the appendix.

Table 11: Queue Length Summary with Reunion Creek

Intersection / Movement		Rec. Storage (feet)	2026 Build-Improved with Reunion Creek			
			AM Peak Hour		PM Peak Hour	
			95th %'ile Queue (ft.)	Max. Obs. Queue (ft.)	95th %'ile Queue (ft.)	Max. Obs. Queue (ft.)
E Williams Street & Reunion Creek Parkway	Northbound Right	225	87	325	25	325
	Westbound Left	325	160	231	308	318
	Westbound Right	450	232	274	328	425
	Southbound Left	Max Available	363	350+	104	252
Stephenson Road & Thriftwood Drive/Tear Drop Circle	Northbound Left	425	255	399	5	52
	Eastbound Left-Through	125	N/A	68	50	210
Stephenson Road & Derry Down Lane/Cockle Burr Drive	Northbound Left	100	38	93	15	70
	Eastbound Left-Through	100	98	60	13	36
Thriftwood Dr & Staff/Buses Dwy	Westbound Right	275	0	291	0	0
	Eastbound Left	500	558	599+	0	0
	Southbound Left	Max Available	N/A	656	92	548
Connector Rd & Parent Dwy	Westbound Right	100	426	80	22	78
Sunset Lake Road & Stephenson Road	Eastbound Left	475	358	460	101	201
	Westbound Right	525	357	625	88	199
	Southbound Left	525	273	280	384	455
E Williams Street/North Main Street & Sunset Lake Road/Old Smithfield Road	Northbound Right	225	147	325	60	325
	Westbound Right	350	260	417	140	360

N/A = No queue provided by Synchro

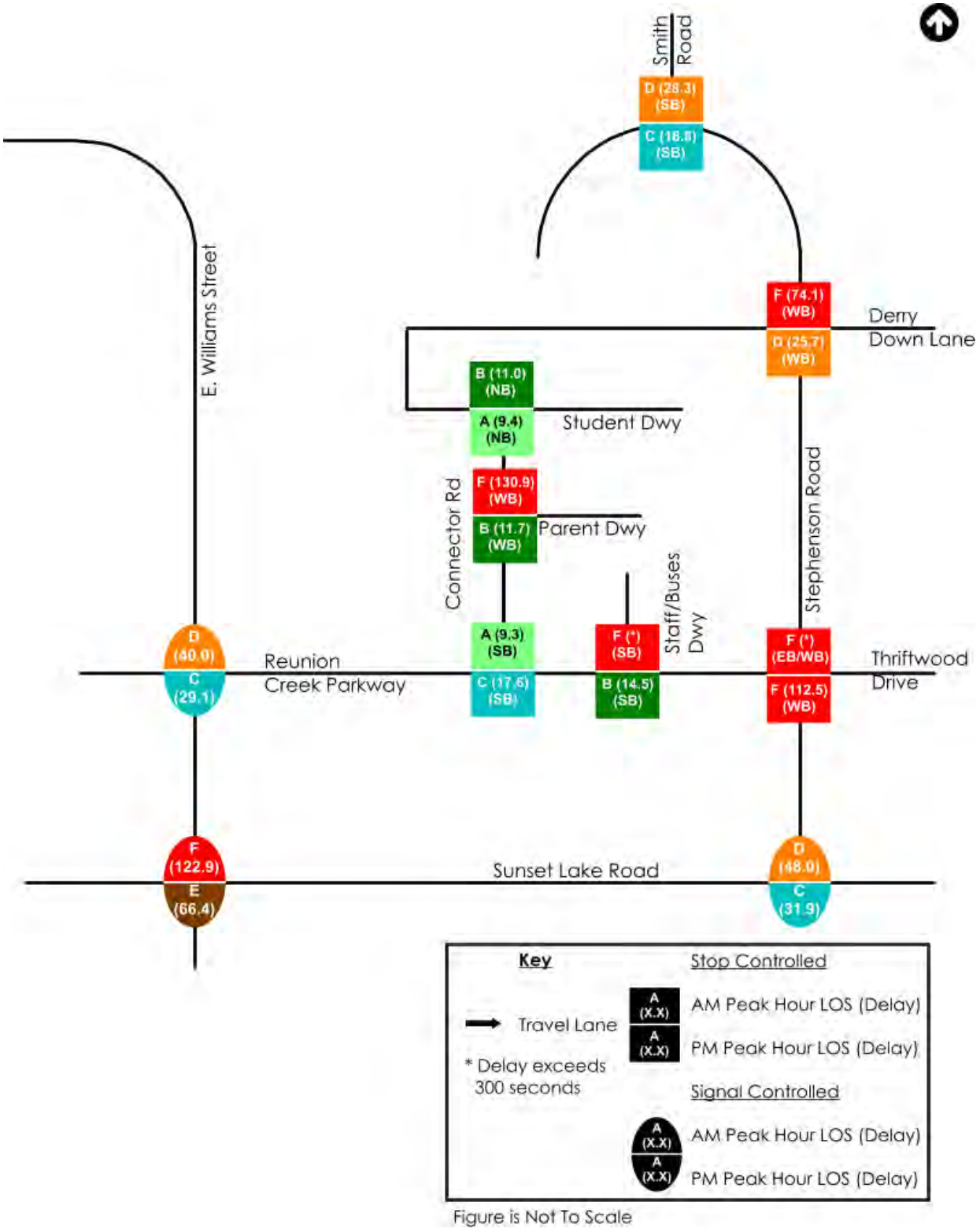
With the recommended improvements in place, there is sufficient storage at the Stephenson Road intersections with Thriftwood Drive and Derry Down Lane. At the E Williams Street & Reunion Creek Parkway intersection, there is insufficient storage available for the westbound left-through turn lane and a southbound left-turn lane.

The southbound left turn lane should be striped such that the storage length is maximized. However, the presence of Straywhite Avenue to the north prevents restriping the length needed to accommodate the queues. Realistically, the southbound lefts will likely queue in the center two way left turn lane, blocking lefts into and out of Straywhite Avenue. This is anticipate to only occur for a short duration in the AM peak period.

Heavy traffic volumes along E. Williams Street cause long delays for traffic turning left from Reunion Creek Parkway onto E. Williams Street. Signalization should be considered in the future to should Reunion Creek Parkway be connected to Thriftwood Drive. The recommended storage for the westbound left-turn lane on Reunion Creek Parkway was based on the storage necessary if a traffic signal is installed at the intersection as the storage necessary for this lane to contain the queue for this movement at a stop-controlled intersection may not be constructible.

At the Thriftwood Drive & Staff/Buses Driveway, it was noted that buses were unable to exit the driveway in the AM peak due to heavy inbound student traffic from both directions of Thriftwood Drive. This condition can be improved if student traffic is permitted to exit the site using either Derry Down Lane or Thriftwood Drive. Currently, student traffic is anticipated to exit only using Thriftwood Drive or Reunion Creek Parkway.

Figure 31: 2026 Build With Improvement – Reunion Creek Level of Service and Delay



7.0 RECOMMENDATIONS

Per North Carolina General Stature 136-18(29a), School systems such as WCPSS can be reimbursed for the total cost of any public roadway improvements required by NCDOT. As such, the final determination of improvements attributed to the construction of H-12 High School is to be determined by appropriate personnel within NCDOT. To this end, and to mitigate the impact of traffic generated by the proposed school has on the surrounding roadway network, specific improvements are recommended where as others are recommended for consideration by appropriate personnel within NCDOT.

Internal Site Layout

- On-site pick-up and drop-off queue should be provided for a minimum of 2,350 feet of full-width storage space to accommodate queuing vehicles. This will provide more than 30 percent greater than the "high demand length" requirement set by the MSTA School Traffic Calculator.
- It is recommended that parent drop-off and pick-up traffic should enter and exit the site using Derry Down Lane. On-site, Derry Down Lane provides approximately 2,700 linear feet of queuing for parent traffic. Of this, approximately 400 linear feet can be used to double-lane queue parent traffic. This brings the total on-site parent queue to approximately 3,100 feet. This exceeds the high-demand length as required by the MSTA School Traffic Calculator by approximately 1,300 feet or 72 percent.
- Develop and enact a Transportation Management Plan (TMP) outlining policies and procedures for students, parents, and staff to manage traffic on-site.

It should be noted that both Derry Down Lane and Thriftwood Drive are not currently maintained by either the Town of Apex or NCDOT. The nearest existing public facility to the site is Stephenson Road, which is approximately 1,500 feet along Derry Down Lane from the H-12 property line and 1,000 feet along Thriftwood Drive from the H-12 property line.

E. Williams Street at Reunion Creek Parkway

Without Reunion Creek Parkway Extension

- There are no recommended improvements at this intersection

With Reunion Creek Parkway Extension

- Construct an exclusive northbound right-turn lane with 225 feet of full-width storage and appropriate taper
- Construct an exclusive westbound left-turn lane with 325 feet of full-width storage and appropriate taper
- Construct an exclusive westbound right-turn lane with 450 feet of full-width storage and appropriate taper
- Extend striping for the existing southbound left-turn lane as far back as possible to Straywhile Avenue
- *Consider: the installation of a traffic signal*

E. Williams Street / N. Main Street at Sunset Lake Road / Old Smithfield Road

Without Reunion Creek Parkway Extension

- *Consider: construct an exclusive northbound right-turn lane with 500 feet of full-width storage and appropriate taper.*
- *Consider: construct an exclusive westbound right-turn lane with 450 feet of full-width storage and appropriate taper.*
- *Consider: The above recommendations will require modification of the traffic signal at this intersection.*

With Reunion Creek Parkway Extension

- *Consider: construct an exclusive northbound right-turn lane with 225 feet of full-width storage and appropriate taper.*
- *Consider: construct an exclusive westbound right-turn lane with 350 feet of full-width storage and appropriate taper.*
- *Consider: The above recommendations will require modification of the traffic signal at this intersection.*

Sunset Lake Road at Stephenson Road

Without Reunion Creek Parkway Extension

- *Consider: construct a second exclusive eastbound left-turn with maximum available length of full-width storage and appropriate taper (maximum queue length = 1,150 feet).*
  - *The above recommendation to consider will require a second northbound receiving lane on Stephenson Road with a minimum of 600 feet of full with storage and appropriate taper to merge traffic into one northbound thru lane on Stephenson Road.*
  - *The above recommendation will require the existing eastbound left-turn lane be extended from it's current storage of 150 feet.*
- *Consider: extend the exclusive westbound right-turn lane to 625 feet of full-width storage and appropriate taper.*
- *Consider: extend the exclusive southbound left-turn lane to 525 feet of full-width storage and appropriate taper.*
- *Consider: The above recommendations will require modification of the traffic signal at this intersection.*

With Reunion Creek Parkway Extension

- *Consider: construct a second exclusive eastbound left-turn with 475 feet of full-width storage and appropriate taper.*
  - *The above recommendation to consider will require a second northbound receiving lane on Stephenson Road with a minimum of 600 feet of full with storage and appropriate taper to merge traffic into one northbound thru lane on Stephenson Road.*
  - *The above recommendation will require the existing eastbound left-turn lane be extended from it's current storage of 150 feet to 475 feet of full-width storage and appropriate taper.*
- *Consider: extend the exclusive westbound right-turn lane to 525 feet of full-width storage and appropriate taper.*
- *Consider: extend the exclusive southbound left-turn lane to 525 feet of full-width storage and appropriate taper.*
- *Consider: The above recommendations will require modification of the traffic signal at this intersection.*

Stephenson Road at Thriftwood Drive / Tear Drop Circle

Without Reunion Creek Parkway Extension

- Construct an exclusive northbound left-turn lane with 500 feet of full-width storage and appropriate taper
- Construct a shared eastbound left-through lane with 250 feet of full-width storage and appropriate taper
- Construct an exclusive southbound right-turn lane with 100 feet of full-width storage and appropriate taper

With Reunion Creek Parkway Extension

- Construct an exclusive northbound left-turn lane with 425 feet of full-width storage and appropriate taper
- Construct a shared eastbound left-through lane with 125 feet of full-width storage and appropriate taper

Stephenson Road at Derry Down Lane / Cockle Burr Drive

Without Reunion Creek Parkway Extension

- Construct an exclusive northbound left-turn lane with 100 feet of full-width storage and appropriate taper
- Construct a shared eastbound left-through lane with 100 feet of full-width storage and appropriate taper

With Reunion Creek Parkway Extension

- Construct an exclusive northbound left-turn lane with 100 feet of full-width storage and appropriate taper
- Construct a shared eastbound left-through lane with 100 feet of full-width storage and appropriate taper

Stephenson Road at Smith Road

Without Reunion Creek Parkway Extension

- There are no recommended improvements at this intersection

With Reunion Creek Parkway Extension

- There are no recommended improvements at this intersection

Thriftwood Drive at Staff / Bus Driveway

Without Reunion Creek Parkway Extension

- Construct an unsignalized intersection with the stop-controlled intersection being the southbound Staff/Buses Driveway approach

With Reunion Creek Parkway Extension

- Construct an unsignalized intersection with the stop-controlled approach being the southbound Staff/Buses Driveway approach
- Construct an exclusive eastbound left-turn lane with 500 feet of full-width storage and appropriate taper
- Construct an exclusive westbound right-turn lane with 275 feet of full-width storage and appropriate taper
- Construct an exclusive southbound left-turn lane with maximum available full-width storage and appropriate taper

Thriftwood Drive / Reunion Creek Parkway Extension at Connector Road

Without Reunion Creek Parkway Extension

- Provide signage and striping as necessary to inform drivers of the road termination ahead.

With Reunion Creek Parkway Extension

- Construct an unsignalized intersection with the stop-controlled approach being the southbound Connector Road approach
-

Figure 32: Recommended Improvements without Reunion Creek Parkway Extension

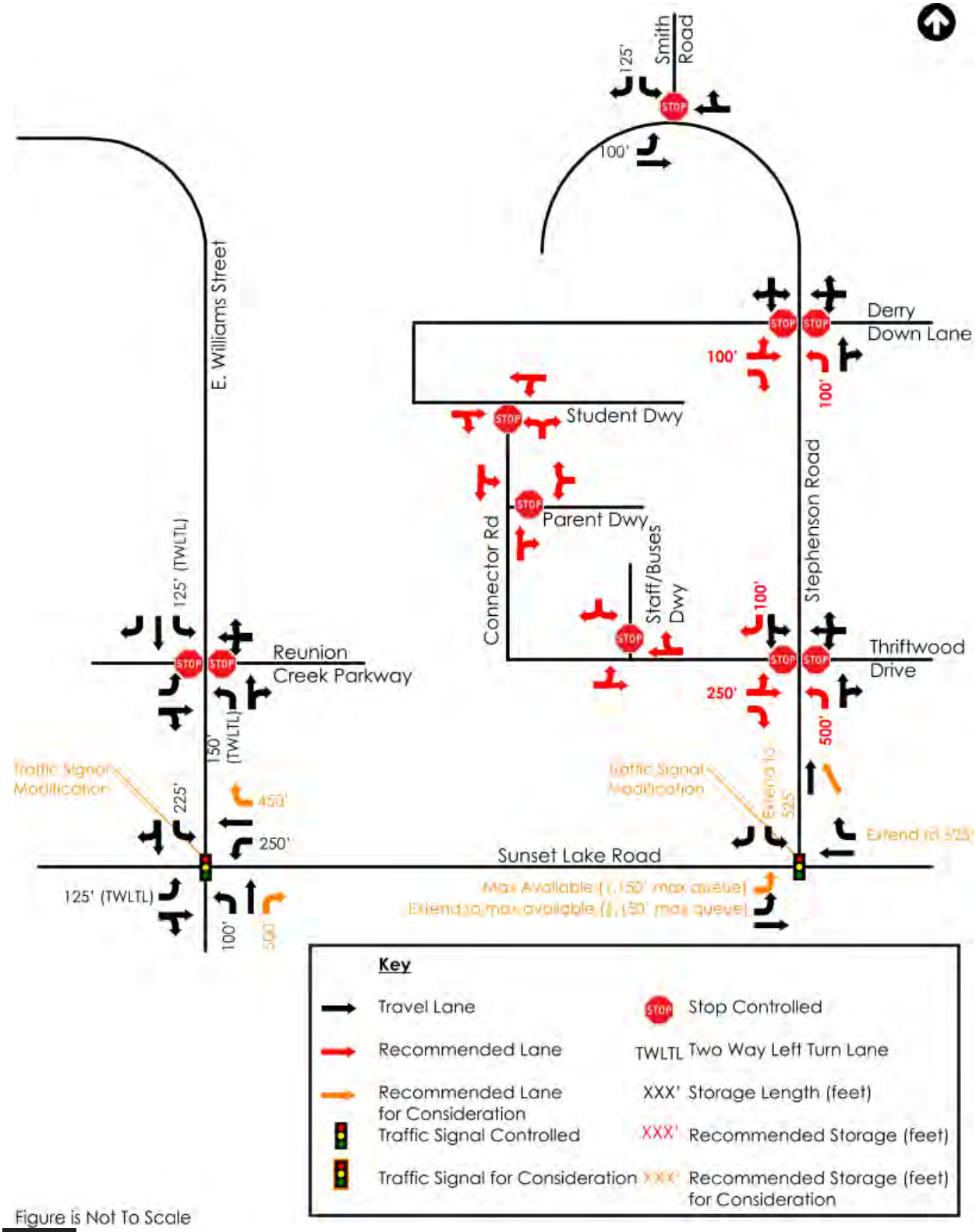


Figure is Not To Scale

Figure 33: Recommended Improvements with Reunion Creek Parkway Extension

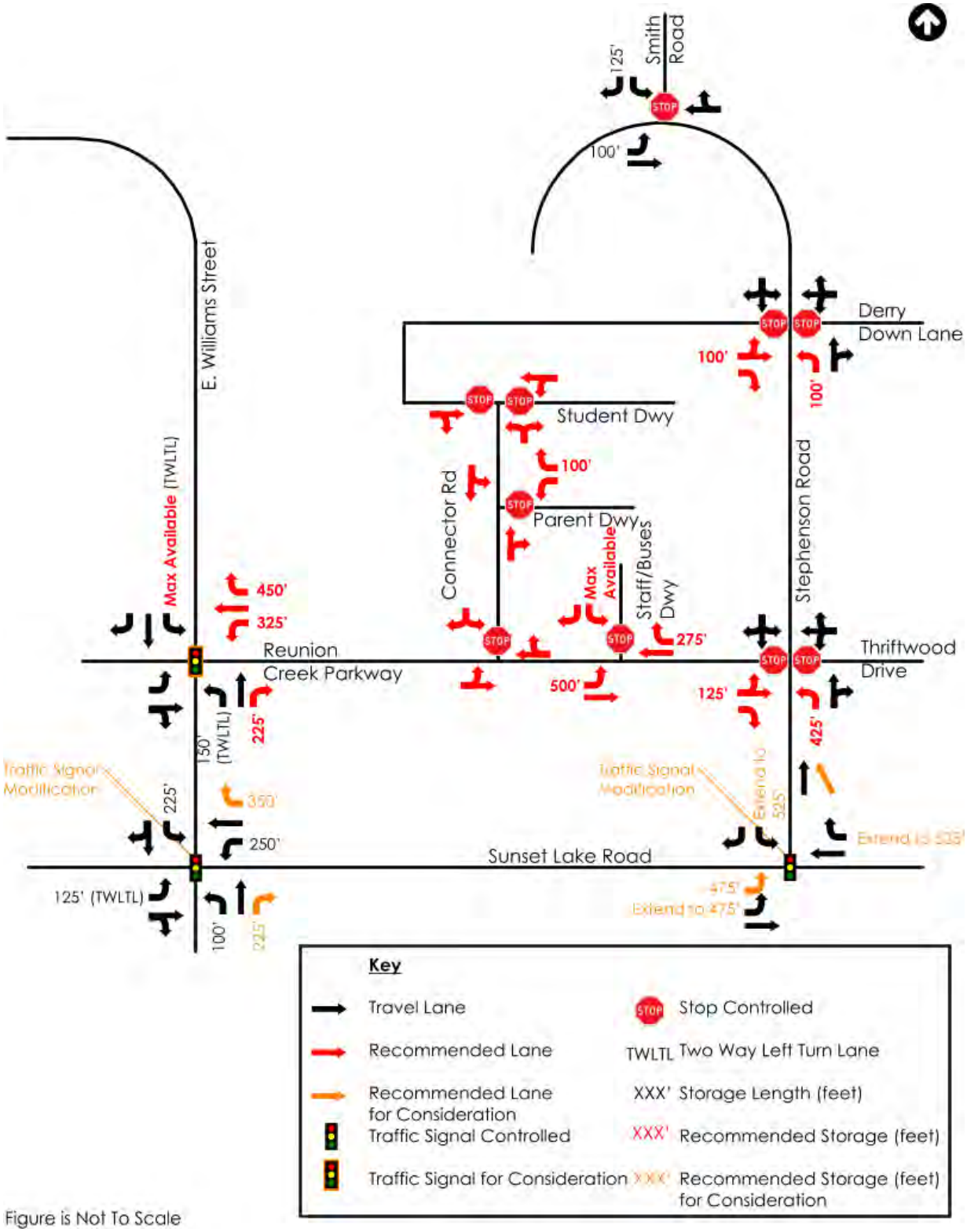


Figure is Not To Scale

8.0 CONCLUSIONS

As indicated in the traffic analysis, the proposed school is projected to have impacts on the surrounding roadway network and intersections. Accordingly, recommendations for improvement are provided.

Per North Carolina General Stature 136-18(29a), School systems such as WCPSS can be reimbursed for the total cost of any public roadway improvements required by NCDOT. As such, the final determination of improvements attributed to the construction of H-12 High School is to be determined by appropriate personnel within NCDOT. To this end, and to mitigate the impact of traffic generated by the proposed school has on the surrounding roadway network, specific improvements are recommended where as others are recommended for consideration by appropriate personnel within NCDOT.

.

9.0 REFERENCES

[1]***Thoroughfare and Collector Street Plan Map***, Town of Apex, 2020
http://apexnc.org/DocumentCenter/View/487/Transportation-Plan---Thoroughfare-and-Collector-Street-Plan-Map-PDF?bidId=

[2]***NCDOT Functional Classification Map***,
http://ncdot.maps.arcgis.com/home/webmap/viewer.html?layers=029a9a9fe26e43d687d30cd3c08b1792

[3]***2017 NCDOT Average Daily Traffic Volumes***,
https://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=b7a26d6d8abd419f8c27f58a607b25a1

[4]***School Calculator***, North Carolina Department of Transportation (NCDOT) Municipal School Transportation Assistance (MSTA).
https://connect.ncdot.gov/municipalities/School/Documents/SchoolCalculator.zip

[5]***HCM6: Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis***. Washington D.C.: Transportation Research Board, 2016.

[6]***NCDOT Congestion Management Capacity Analysis Guidelines***. North Carolina Department of Transportation (NCDOT), July 2015,
https://connect.ncdot.gov/resources/safety/Congestion%20Mngmt%20and%20Signing/Congestion%20Management/Capacity%20Analysis%20Guidelines.pdf

[7]***N.C. Gen. Stat. § 136-18 (29a).***
https://www.ncleg.gov/EnactedLegislation/Statutes/HTML/BySection/Chapter_136/GS_136-18.html

10.0 APPENDIX

A link to the following files is provided via Microsoft OneDrive:

- Site Plan
- Annotated Site Plan
- NCDOT Scoping Checklist and approvals
- Similar Sites Traffic Data (i.e. local data)
- Traffic Signal Plans
- Raw Traffic Count Data
- Approved Development Traffic Studies
- Traffic Volume Calculations
- Synchro Files
- SimTraffic Reports

Not secure | apexnc.org/Doc... Paused
Todoist Apps & Schedules UDO
Legal Ad 1 / 1 70%

POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

QUASI-JUDICIAL PUBLIC HEARING

MAJOR SITE PLAN for
Felton Grove High School

Pursuant to the provisions of North Carolina General Statutes §160D-406 and to the Town of Apex Unified Development Ordinance (UDO) Section 2.2.11, notice is hereby given of a quasi-judicial public hearing before the Town Council of the Town of Apex. The purpose of this hearing is to consider the following:

Applicant: Wake County Board of Education
Authorized Agent: Renee Pfeifer, CLH Design PA
Property Address: 8550 Stephenson Rd
Acreage: +/- 66.48
Proposed Use and Square Footage of Buildings: School, public or private; 399,641 ft²
Property Identification Number (PIN): 0750545646

Public Hearing Location: Apex Town Hall
Council Chamber, 2nd Floor
73 Hunter Street, Apex, North Carolina

Town Council Public Hearing Date and Time: April 13, 2021 6:00 PM

Vicinity Map:

Property owners within 300 feet of the proposed Major Site Plan have been sent this notice via first class mail. All interested parties may appear at the public hearing and provide sworn testimony with respect to the application. In addition to the above map, the location of the property may be viewed online at https://maps.raleighnc.gov/imaps. The 2045 Land Use Map may be viewed online at www.apexnc.org/DocumentCenter/View/478. You may call 919-249-3426, Department of Planning and Community Development, with questions or for further information. To view the petition and related documents on-line: https://www.apexnc.org/DocumentCenter/View/34094.

Published Dates: March 24 – April 13, 2021

Dianne Khin, AICP
Director of Planning and Community Development

5:28 PM
3/24/2021

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

PUBLIC NOTIFICATION OF QUASI-JUDICIAL PUBLIC HEARING

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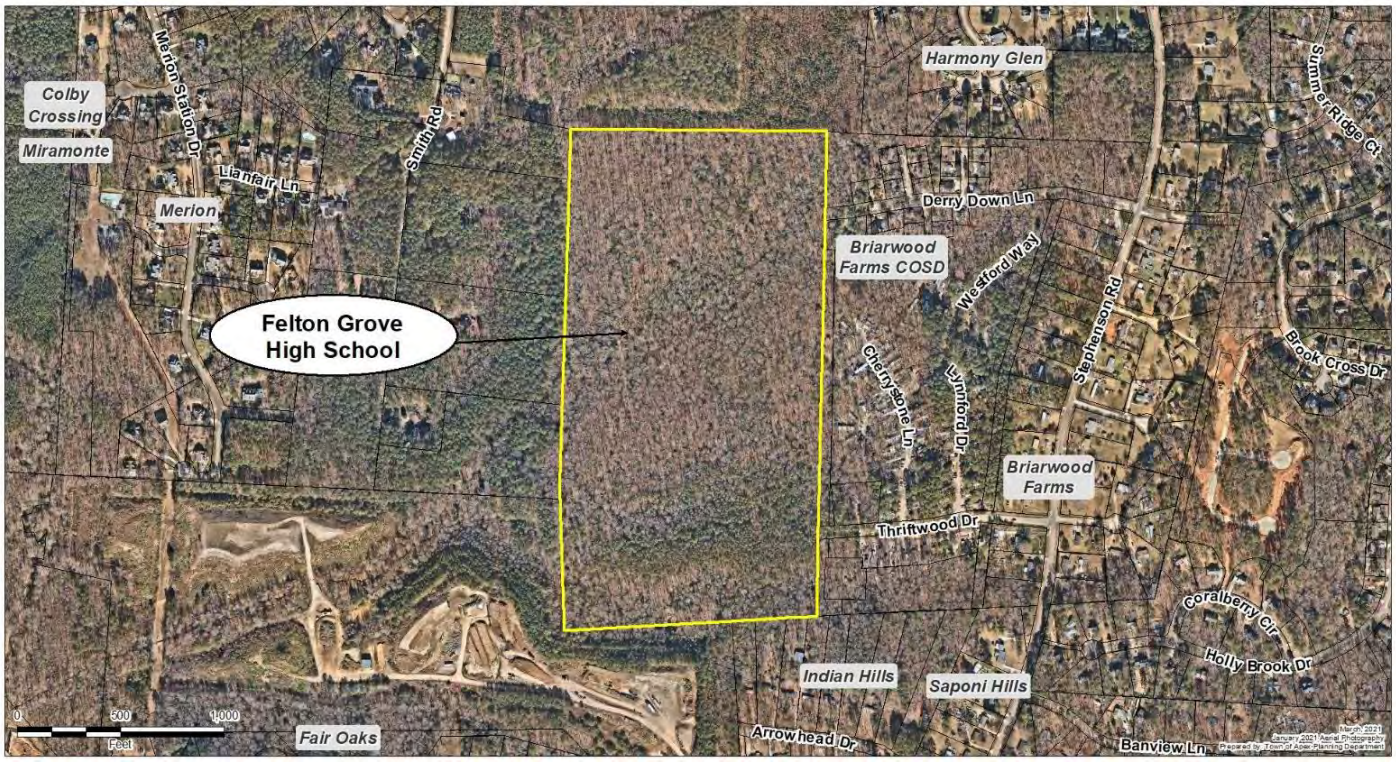

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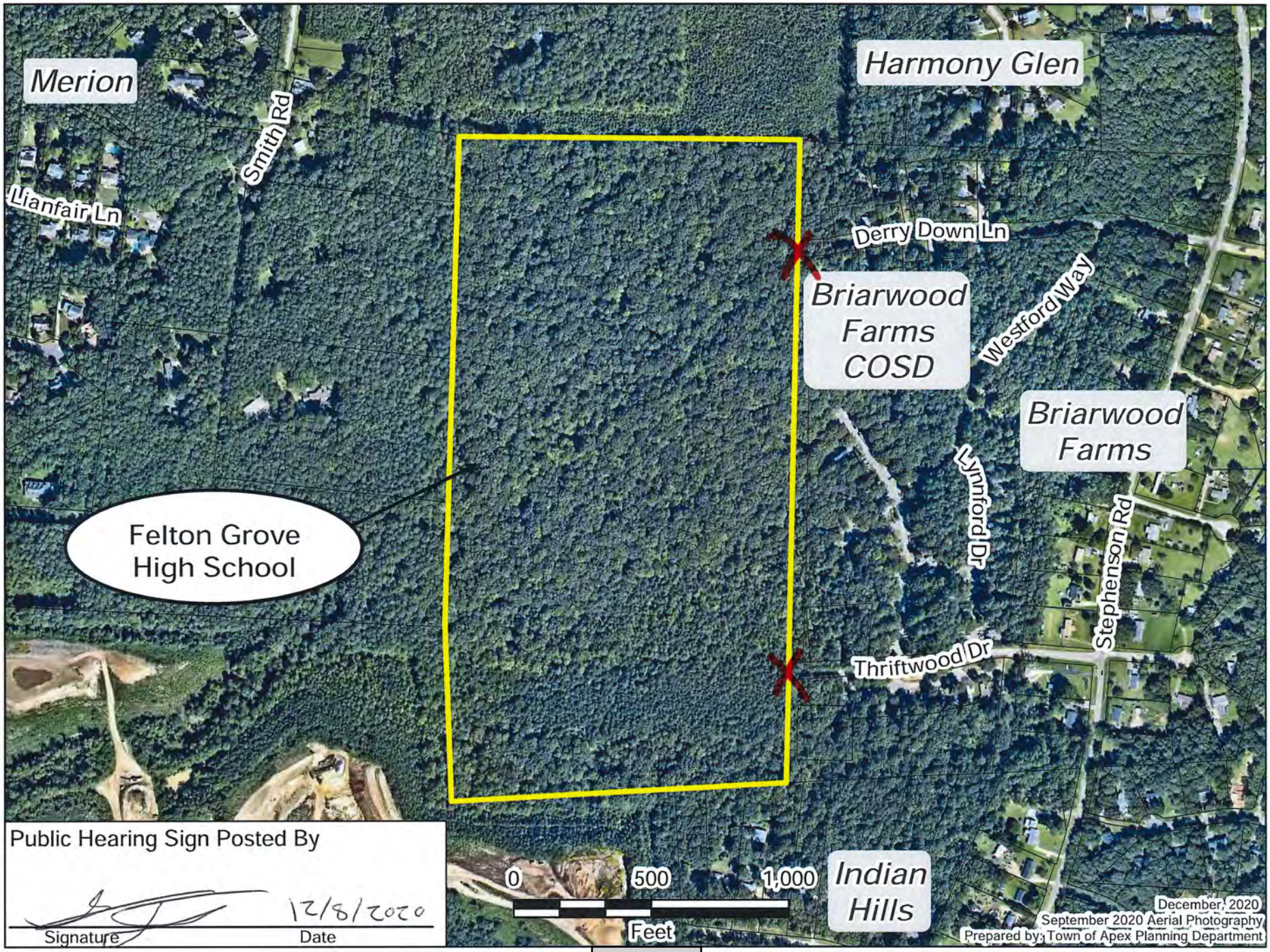


Public Hearing Sign Posted By

12/8/2020

Signature Date

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

AFFIDAVIT CERTIFYING
Public Notification – Written (Mailed) Notice

Section 2.2.11
Town of Apex Unified Development Ordinance

Project Name:	Felton Grove High School Major Site Plan
Project Location:	**8550 Stephenson Road**
Applicant or Authorized Agent:	Renee Pfeiffer
Firm:	CLH Design, PA

This is to certify that I, as Director of Planning and Community Development, mailed or caused to have mailed by first class postage for the above mentioned project on March 24, 2021, a notice containing the time and place, location, nature and scope of the application, where additional information may be obtained, and the opportunity for interested parties to be heard, to the property owners within 300' of the land subject to notification. I further certify that I relied on information provided to me by the above-mentioned person as to accuracy and mailing addresses of property owners within 300' of the land subject to notification.

4-5-2021
Date

Lauren Staudenmaier for Dianne Khin
Director of Planning and Community Development

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Jeri Chastain Pederson, a Notary Public for the above State and County, this the 5 day of April, 2021.

Jeri Chastain Pederson
Notary Public

JERI CHASTAIN PEDERSON
Notary Public
Wake County, North Carolina
My Commission Expires
March 10, 2024

My Commission Expires: 03/10/2024

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

PUBLIC NOTIFICATION OF QUASI-JUDICIAL PUBLIC HEARING

MAJOR SITE PLAN for
Felton Grove High School
CONTINUED

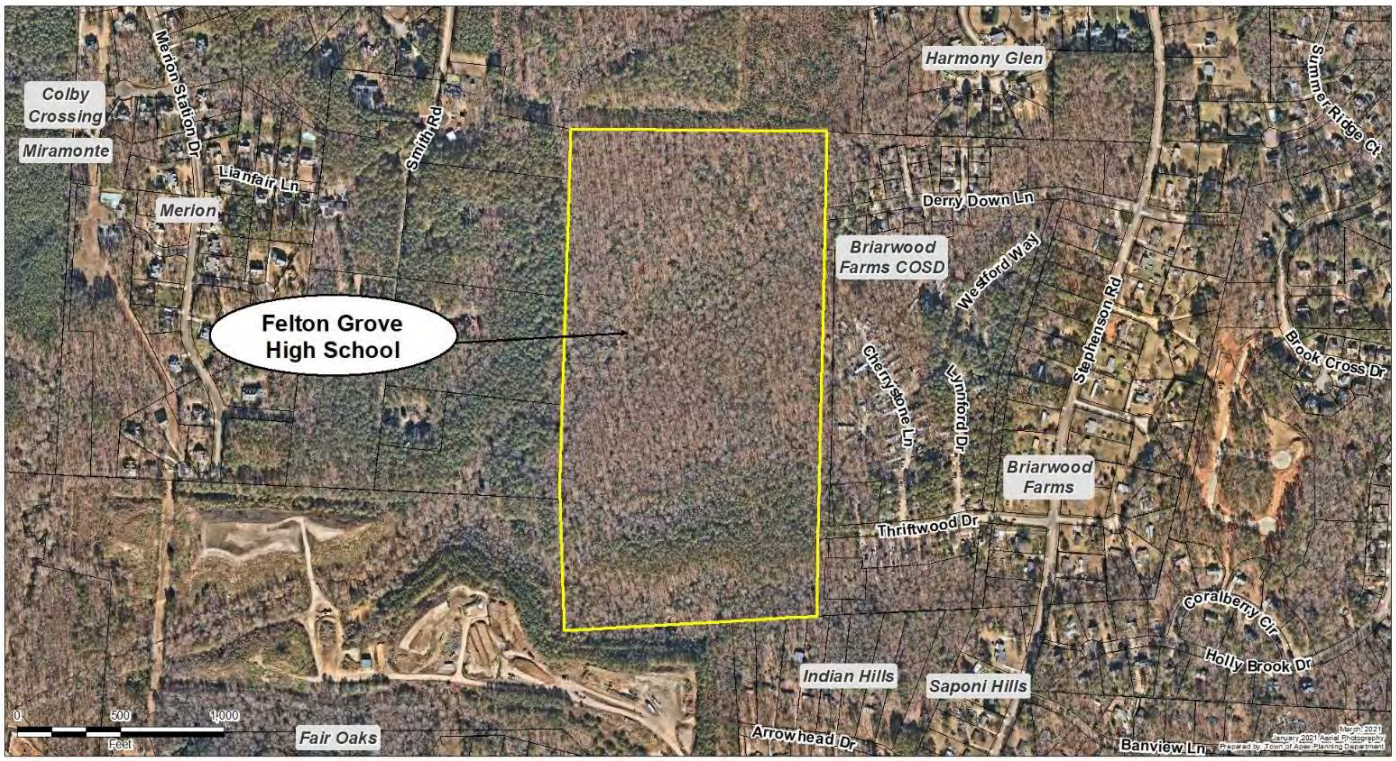
Pursuant to the provisions of North Carolina General Statutes §160D-406 and to the Town of Apex Unified Development Ordinance (UDO) Section 2.2.11, notice is hereby given of a quasi-judicial public hearing before the Town Council of the Town of Apex. The purpose of this hearing is to consider the following:

Applicant: Wake County Board of Education
Authorized Agent: Renee Pfeifer, CLH Design PA
Property Address: 8550 Stephenson Rd
Acreage: +/- 66.08
Proposed Use and Square Footage of Buildings: School, public or private; 399,641 ft^2
Property Identification Number (PIN): 0750545646

Public Hearing Location: Apex Town Hall
Council Chamber, 2nd Floor
73 Hunter Street, Apex, North Carolina

Town Council Public Hearing Date and Time: ~~April 13, 2021 6:00 PM~~ Continued to April 27, 2021 6:00 PM

Vicinity Map:



Property owners within 300 feet of the proposed Major Site Plan have been sent this notice via first class mail. All interested parties may appear at the public hearing and provide sworn testimony with respect to the application. In addition to the above map, the location of the property may be viewed online at https://maps.raleighnc.gov/imaps. The 2045 Land Use Map may be viewed online at www.apexnc.org/DocumentCenter/View/478. You may call 919-249-3426, Department of Planning and Community Development, with questions or for further information. To view the petition and related documents on-line: https://www.apexnc.org/DocumentCenter/View/34094.

Published Dates: March 24 – ~~April 13, 2021~~ April 27, 2021

Dianne Khin, AICP
Director of Planning and Community Development

MUNICIPALIDAD DE APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
TELÉFONO 919-249-3426

NOTIFICACIÓN PÚBLICA DE AUDIENCIA PÚBLICA CUASI JUDICIAL

PLANO DEL TERRENO para la Escuela Secundaria de Felton Grove

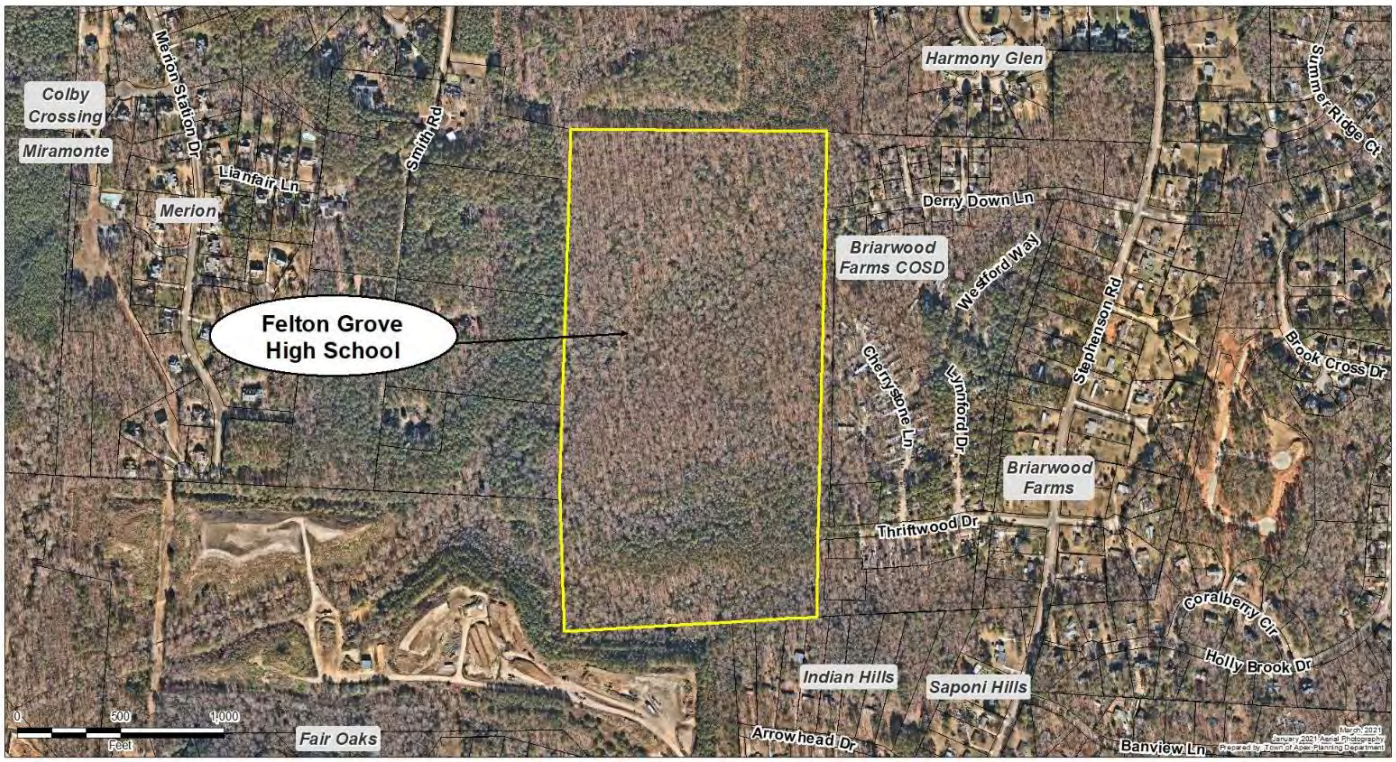
Por la presente, se notifica una audiencia pública cuasi judicial ante el Concejo Municipal de la Municipalidad de Apex. El propósito de esta audiencia es considerar lo siguiente:

Solicitante: Junta de Educación del Condado de Wake
Agente autorizado: Renee Pfeifer, CLH Design PA
Dirección del inmueble: 8550 Stephenson Rd
Acres: +/- 66.08
Uso propuesto y pies cuadrados de los edificios: Escuela, pública o privada; 399,641 ft^2
Número de identificación del inmueble (PIN por sus siglas en inglés): 0750545646

Lugar de la audiencia pública: Edificio Municipal de Apex
Sala del Concejo, 2do Piso
73 Hunter Street, Apex, North Carolina

Fecha y hora de la audiencia pública del Concejo Municipal: ~~13 de abril~~ 27 de abril de 2021 6:00 PM

Mapa de la zona:



Quienes actualmente residen dentro de los 300 pies del Plano del Terreno han recibido esta notificación por correo de primera clase. Todas las partes interesadas pueden presentarse en la audiencia pública y ofrecer testimonio bajo juramento con respecto a la solicitud. Además del mapa mencionado anteriormente, la ubicación del inmueble puede verse en línea en https://maps.raleighnc.gov/imaps. El Mapa de Uso de Terrenos 2045 puede verse en línea en www.apexnc.org/DocumentCenter/View/478. Puede llamar al 919-249-3426, Departamento de Planificación y Desarrollo Comunitario, si tiene preguntas o para pedir más información. Para ver la petición y los documentos relacionados en línea: https://www.apexnc.org/DocumentCenter/View/34094.

Fechas de publicación: 1. ° de abril al ~~13 de abril~~ 27 de a

Dianne Khin, AICP
Directora de Planificación y Desarrollo Comunitario

H12/Felton Grove High School

8550 Stephenson Road, Apex, NC 27539

WAKE COUNTY PUBLIC SCHOOL SYSTEM

Stormwater Management Design Narrative & Calculations

Site Plan Submittal #2
February 2021

Prepared by:
CLH Design, pa

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Design Narrative

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- Quad Map
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Stormwater Management Design Narrative
H12/Felton Grove High School
CLH Project No.: 19-168
February 2021

PROJECT DESCRIPTION

The 68 acre proposed H12-Felton Grove site is located in southern Apex just west of Stephenson Road and north of Sunset Lake Road. The property is located at the western terminus of Derry Down Lane and Thriftwood Drive. The project consists of building a new High School building, roadways, parking lots, athletic fields with concessions and comfort stations, stormwater control devices, water, sewer and other utility extensions to serve the property.

The site is currently vacant and wooded. The proposed impervious built upon area is 20.14 acres. All of the site impervious areas will be directed to stormwater control measures (SCMs).

Most of the site has Type B Appling and Cecil soils, with Type D Worsham and Wahadkee soils along the streams within the site.

There are no flood hazard boundaries within the property as indicated on FEMA map 3720075000J dated May 2, 2006.

There are two streams with Neuse River Buffers and several existing wetland areas on-site. All wetland and stream impacts will be permitted with NC DEQ and US Corps of Engineers.

Erosion and Sedimentation Control will be permitted with NC DEQ – Land Quality Section.

All SCM's will be permitted by the Town of Apex.

STORMWATER MANAGEMENT

All of drainage analysis points (A through G) are located at the western property line. Areas A, B, C and E post development areas are greatly reduced and have no proposed impervious areas within their limits. Area D has three proposed stormwater wetlands, Area F has one proposed dry detention basin and Area G has one proposed stormwater wetland.

The site is designed to meet the Town of Apex stormwater quality and quantity requirements. The site stormwater is designed to reduce or be equal to the pre-development rates for the 1-year and 10-year 24-hour design storm.

The proposed greenway trail required by the Town of Apex will not be included in the stormwater quantity design calculations.

Stormwater Quality

In accordance with Town of Apex's UDO section 6.1.7 A.3, stormwater treatment at this site will be achieved by capturing and slowly releasing the impervious runoff from the first 1-inch of rainfall. The four wetlands will be designed to meet this requirement. The proposed dry detention pond is designed to reduce the peak flow rates.

All of the site impervious areas will be treated by the proposed SCMs except the proposed Town of Apex greenway trail. The greenway trail is required within the proposed sanitary sewer easement at the southern side of the site.

Nitrogen Reduction

As of this date, the Town of Apex is not a named local government under 15A NCAC 02B .0235: Neuse River Basin-Nutrient Sensitive Waters Management Strategy: Basinwide Stormwater Requirements. It is anticipated that the Town may be added to that rule in the future. Since this project has been submitted for permitting prior to Apex being added to that rule, the project is considered exempt from the rule if Apex is added in the future. As such, there is no nitrogen removal required for this site.

Stormwater Quantity

The four proposed stormwater wetlands and one dry detention basin are designed to meet the current NCDEQ-MDC and Town of Apex requirements that to reduce the runoff to meet the pre-development peak flows of the 1-year, 10-year, and 100-year 24 hour Design Storms. The 100-year Design Storm shall have a minimum of 1 foot of freeboard at the SCM embankments.

The site requires a stormwater study of the downstream impacts downstream to where the site is 10 percent of the drainage area. All existing structures or culverts downstream are required to be included in the study. This report does not determine if the structures or culverts are designed to meet the current storm drainage conditions, but to determine if there are increases to the run-off that may cause negative impacts. The study determined that the run-off is below or equal to the existing run-off rates for the 1-year, 10-year and 100-year 24 hour Design Storms.

Calculations are performed using the 2021 Autocad Hydraflow program that utilizes TR-55 methods.

Table 1: Pre-Development / Post-Development Peak Runoff Comparison Summary

Drainage Area	Phase	Q_1 (cfs)	Q_{10} (cfs)	Q_{100} (cfs)	Notes
A	Pre Dev.	0.35	8.01	22.12	
	Post Dev.	0.33	4.87	12.81	
	Managed				
B	Pre Dev.	0.09	1.92	5.35	
	Post Dev.	0.03	0.40	1.02	
	Managed				
C	Pre Dev.	0.17	3.86	10.65	
	Post Dev.	0.16	1.31	3.08	
	Managed				
D	Pre Dev.	69.74	257.45	518.37	3 Stormwater Wetlands
	Post Dev.	106.04	332.16	624.41	
	Managed	68.22	237.42	509.98	
E	Pre Dev.	0.21	2.76	7.10	
	Post Dev.	0.18	2.41	6.09	
	Managed				
F	Pre Dev.	6.35	34.93	81.66	One Dry Detention Pond
	Post Dev.	9.00	34.83	67.52	
	Managed	3.97	13.14	45.62	
G	Pre Dev.	50.75	182.70	364.47	One Stormwater Wetland
	Post Dev.	76.26	240.56	455.56	
	Managed	49.00	175.02	357.45	
H	Pre Dev.	265.14	1007.95	2033.27	Existing 48” CMP culverts
	Post Dev.				
	Managed	260.10	958.19	1981.70	
I	Pre Dev.	966.04	4127.88	8713.51	Study Analysis Point
	Post Dev.				
	Managed	966.04	4127.88	8713.51	

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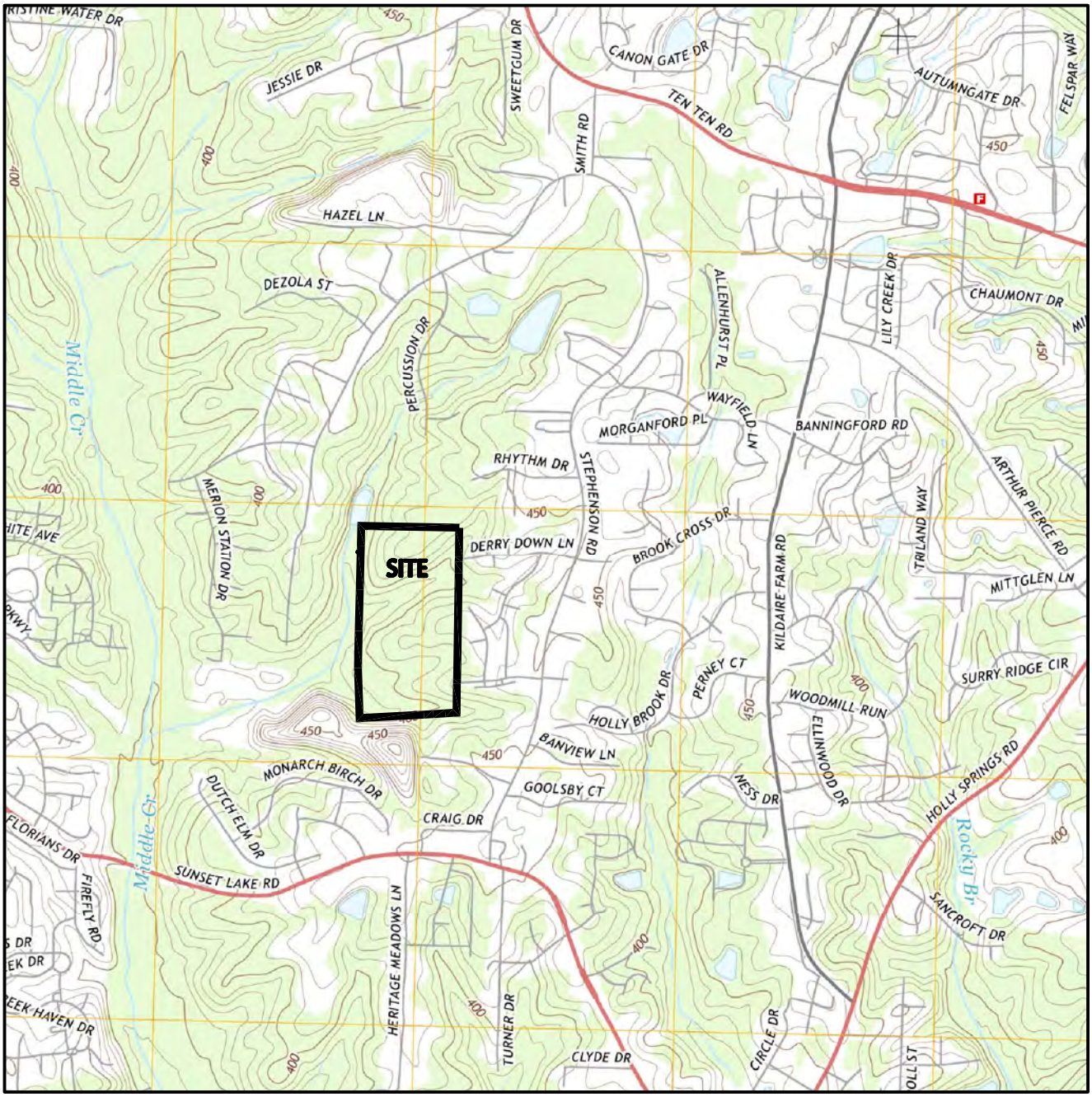
Maps



SCALE: 1" = 2000'

H12/FELTON GROVE HIGH SCHOOL

8550 STEPHENSON RD, APEX, NC 27539

DATE: FEBRUARY, 2021

PROJECT NO.: 19–168

USGS QUAD MAP

REFERENCE: USGS TOPOGRAPHIC MAP: APEX

CLH DESIGN, P.A.

Regency Park
400 Regency Forest Drive
Suite 120
Cary, North Carolina 27518
Phone: (919) 319–6716
Fax: (919) 319–7516

SCALE: 1" = 2000'

H12/FELTON GROVE HIGH SCHOOL

8550 STEPHENSON RD, APEX, NC 27539

DATE: FEBRUARY, 2021

PROJECT NO.: 19–168

USGS SOILS MAP

REFERENCE: SHEET NUMBER 75 & 83 OF WAKE COUNTY SOILS SURVEY

CLH DESIGN, P.A.

Regency Park
400 Regency Forest Drive
Suite 120
Cary, North Carolina 27518
Phone: (919) 319–6716
Fax: (919) 319–7516

Supporting Calculations

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: 'A'

Runoff Calculations

Pre-Development:

Site Area = 3.85 ac
Wt. CN = 55.0
Site Soils: (Hydrologic Soil Group B)

Wooded Area:	3.85 ac	CN=	55
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	0.00 ac	CN=	74
Weighted CN:			55.0

Post-Development:

Site Area = 1.02 ac
Wt. CN = 59.3
Site Soils: (Hydrologic Soil Group B)

Wooded Area:	0.60 ac	CN=	55
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	0.22 ac	CN=	74
Brush (No mow seed mix):	0.20 ac	CN=	56
Weighted CN:			59.3

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: Upstream Off-site Area 'A'

Runoff Calculations

Pre-Development

Site Area = 2.40 ac
Wt. CN = 68.7
Site Soils: (Hydrologic Soil Group B)

Wooded Area:	0.95 ac	CN=	55
R 1/2 acre	0.00 ac	CN=	73
R 1/4 acre	1.45 ac	CN=	78
Weighted CN:			68.7

Post-Development

Site Area = 2.40 ac
Wt. CN = 68.7
Site Soils: (Hydrologic Soil Group B)

Wooded Area:	0.95 ac	CN=	55
R 1/2 acre	0.00 ac	CN=	73
R 1/4 acre	1.45 ac	CN=	78
Weighted CN:			68.7

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: 'B'

Runoff Calculations

Pre-Development:

Site Area = 1.75 ac
Wt. CN = 55.0
Site Soils: (Hydrologic Soil Group B)

Wooded Area:	1.75 ac	CN=	55
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	0.00 ac	CN=	74
Weighted CN:			55.0

Post-Development:

Site Area = 0.23 ac
Wt. CN = 55.8
Site Soils: (Hydrologic Soil Group B)

Wooded Area:	0.05 ac	CN=	55
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	0.00 ac	CN=	74
Brush (No mow seed mix):	0.18 ac	CN=	56
Weighted CN:			55.8

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: 'C'

Runoff Calculations

Pre-Development:

Site Area = 3.01 ac
Wt. CN = 55.0
Site Soils: (Hydrologic Soil Group B)

Wooded Area:	3.01 ac	CN=	55
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	0.00 ac	CN=	74
Weighted CN:			55.0

Post-Development:

Site Area = 0.62 ac
Wt. CN = 58.8
Site Soils: (Hydrologic Soil Group B)

Wooded Area:	0.07 ac	CN=	55
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	0.10 ac	CN=	74
Brush (No mow seed mix):	0.45 ac	CN=	56
Weighted CN:			58.8

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: 'D'

Runoff Calculations

Pre-Development:

Site Area = 29.39 ac
Wt. CN = 61.6
Site Soils: (Hydrologic Soil 70% Group B - 30% Group D)

Wooded Area:	29.39 ac	CN=	62
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	0.00 ac	CN=	76
Weighted CN:			61.6

Post-Development:

Site Area = 38.89 ac
Wt. CN = 79.2
Site Soils: (Hydrologic Soil 70% Group B - 30% Group D)

Wooded Area:	5.50 ac	CN=	62
Impervious Area:	10.49 ac	CN=	98
Lawn Area:	21.80 ac	CN=	76
Brush (No mow seed mix):	1.10 ac	CN=	56
Weighted CN:			79.2

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: Upstream Off-site Area 'D'

Runoff Calculations

Pre-Development

Site Area = 101.30 ac
Wt. CN = 71.9
Site Soils: (Hydrologic Soil 70% Group B - 10% GROUP C - 15% Group D)

Wooded Area:	22.00 ac	CN=	60
R 1/2 acre	42.50 ac	CN=	73
R 1/4 acre	36.80 ac	CN=	78

Weighted CN: 71.9

Post-Development

Site Area = 101.38 ac
Wt. CN = 72.0
Site Soils: (Hydrologic Soil 70% Group B - 10% GROUP C - 15% Group D)

Wooded Area:	21.50 ac	CN=	60
R 1/2 acre	42.50 ac	CN=	73
R 1/4 acre	37.38 ac	CN=	78

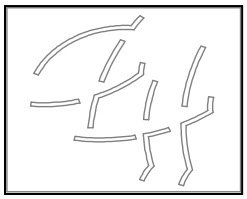
Weighted CN: 72.0

Post-Development (Excluding Area to SCMs)

Site Area = 100.69 ac
Wt. CN = 72.0
Site Soils: (Hydrologic Soil 70% Group B - 10% GROUP C - 15% Group D)

Wooded Area:	21.50 ac	CN=	60
R 1/2 acre	42.50 ac	CN=	73
R 1/4 acre	36.69 ac	CN=	78

Weighted CN: 72.0

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: 'E'

Runoff Calculations

Pre-Development:

Site Area = 2.11 ac
Wt. CN = 57.2
Site Soils: (Hydrologic Soil 90% Group B - 10% Group D)

Wooded Area:	2.11 ac	CN=	57
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	0.00 ac	CN=	75
Weighted CN:			57.2

Post-Development:

Site Area = 1.42 ac
Wt. CN = 56.9
Site Soils: (Hydrologic Soil 90% Group B - 10% Group D)

Wooded Area:	0.80 ac	CN=	57
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	0.02 ac	CN=	75
Brush (No mow seed mix):	0.60 ac	CN=	56
Weighted CN:			56.9

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: 'F'

Runoff Calculations

Pre-Development:

Site Area = 15.62 ac
Wt. CN = 55.0
Site Soils: (Hydrologic Soil Grou B)

Wooded Area:	15.62 ac	CN=	55
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	0.00 ac	CN=	74
Weighted CN:			55.0

Post-Development:

Site Area = 2.11 ac
Wt. CN = 68.7
Site Soils: (Hydrologic Soil Grou B)

Wooded Area:	0.35 ac	CN=	55
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	1.51 ac	CN=	74
Brush (No mow seed mix):	0.25 ac	CN=	56
Weighted CN:			68.7

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: Upstream Off-site Area 'F'

Runoff Calculations

Pre-Development

Site Area = 7.67 ac
Wt. CN = 71.7
Site Soils: (Hydrologic Soil Group B)

Wooded Area:	2.00 ac	CN=	55
R 1/2 acre	0.00 ac	CN=	73
R 1/4 acre	5.67 ac	CN=	78
Weighted CN:			71.7

Post-Development

Site Area = 8.73 ac
Wt. CN = 72.4
Site Soils: (Hydrologic Soil Group B)

Wooded Area:	2.00 ac	CN=	55
R 1/2 acre	0.00 ac	CN=	73
R 1/4 acre	6.73 ac	CN=	78
Weighted CN:			72.4

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: 'G'

Runoff Calculations

Pre-Development:

Site Area = 12.40 ac
Wt. CN = 60.5
Site Soils: (Hydrologic Soil 75% Group B - 25% Group D)

Wooded Area:	12.40 ac	CN=	61
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	0.00 ac	CN=	76

Weighted CN: 60.5

Post-Development:

Site Area = 23.81 ac
Wt. CN = 79.9
Site Soils: (Hydrologic Soil 75% Group B - 25% Group D)

Wooded Area:	6.50 ac	CN=	61
Impervious Area:	9.65 ac	CN=	98
Lawn Area:	6.91 ac	CN=	76
Brush (No mow seed mix):	0.75 ac	CN=	56

Weighted CN: 79.9

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: Total Additional Upstream Area To Point 'G'

Runoff Calculations

Pre-Development

Site Area = 77.61 ac
Wt. CN = 71.7
Site Soils: (Hydrologic Soil 75% Group B - 25% Group D)

Wooded Area:	15.00 ac	CN=	61
R 1/2 acre	53.00 ac	CN=	74
R 1/4 acre	9.61 ac	CN=	78
Weighted CN:			71.7

Post Development

Site Area = 76.60 ac
Wt. CN = 71.6
Site Soils: (Hydrologic Soil 75% Group B - 25% Group D)

Wooded Area:	15.00 ac	CN=	61
R 1/2 acre	53.00 ac	CN=	74
R 1/4 acre	8.60 ac	CN=	78
Weighted CN:			71.6

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

SCM D1 On-site

Site Area = 14.85 ac
Wt. CN = 81.6
Site Soils: (Hydrologic Soil 70% Group B - 30% Group D)

Wooded Area:	0.00 ac	CN=	62
Impervious Area:	3.89 ac	CN=	98
Lawn Area:	10.96 ac	CN=	76

Weighted CN: 81.6

SCM D1 Off-site

Site Area = 0.56 ac
Wt. CN = 62.3
Site Soils: (Hydrologic Soil 70% Group B - 30% Group D)

Wooded Area:	0.55 ac	CN=	62
Impervious Area:	0.01 ac	CN=	98
Lawn Area:	0.00 ac	CN=	76

Weighted CN: 62.3

SCM D2 On-site

Site Area = 11.30 ac
Wt. CN = 86.5
Site Soils: (Hydrologic Soil 70% Group B - 30% Group D)

Wooded Area:	0.00 ac	CN=	62
Impervious Area:	5.45 ac	CN=	98
Lawn Area:	5.85 ac	CN=	76

Weighted CN: 86.5

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

SCM D2 Off-site

Site Area = 0.14 ac
Wt. CN = 61.6
Site Soils: (Hydrologic Soil 70% Group B - 30% Group D)

Wooded Area:	0.14	ac	CN=	62
Impervious Area:	0.00	ac	CN=	98
Lawn Area:	0.00	ac	CN=	76

Weighted CN: 61.6

SCM D3 On-site

Site Area = 2.87 ac
Wt. CN = 84.7
Site Soils: (Hydrologic Soil 70% Group B - 30% Group D)

Wooded Area:	0.00	ac	CN=	62
Impervious Area:	1.15	ac	CN=	98
Lawn Area:	1.72	ac	CN=	76

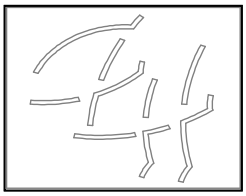
Weighted CN: 84.7

AREA D On-site Bypass

Site Area = 9.87 ac
Wt. CN = 65.7
Site Soils: (Hydrologic Soil 70% Group B - 30% Group D)

Wooded Area:	5.50	ac	CN=	62
Impervious Area:	0.00	ac	CN=	98
Lawn Area:	3.27	ac	CN=	76
Brush (No mow seed mix):	1.10	ac	CN=	56

Weighted CN: 65.7

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

SCM F On-site

Site Area = 1.63 ac
Wt. CN = 72.5
Site Soils: (Hydrologic Soil 75% Group B - 25% Group D)

Wooded Area:	0.13 ac	CN=	55
Impervious Area:	0.00 ac	CN=	98
Lawn Area:	1.50 ac	CN=	74

Weighted CN: 72.5

SCM F Off-site

Site Area = 8.73 ac
Wt. CN = 72.4
Site Soils: (Hydrologic Soil Group B)

Wooded Area:	2.00 ac	CN=	55
R 1/2 acre	0.00 ac	CN=	73
R 1/4 acre	6.73 ac	CN=	78

Weighted CN: 72.4

AREA F On-site Bypass

Site Area = 0.48 ac
Wt. CN = 55.9
Site Soils: (Hydrologic Soil 75% Group B - 25% Group D)

Wooded Area:	0.22 ac	CN=	55	
Impervious Area:	0.00 ac	CN=	98	Greenway Trail
Lawn Area:	0.01 ac	CN=	74	
Brush (No mow seed mix):	0.25 ac	CN=	56	

Weighted CN: 55.9

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

SCM G On-site

Site Area = 14.73 ac
Wt. CN = 89.8
Site Soils: (Hydrologic Soil 75% Group B - 25% Group D)

Wooded Area:	0.00 ac	CN=	61
Impervious Area:	9.34 ac	CN=	98
Lawn Area:	5.39 ac	CN=	76

Weighted CN: 89.8

SCM G Off-site

Site Area = 0.02 ac
Wt. CN = 86.8
Site Soils: (Hydrologic Soil 75% Group B - 25% Group D)

Wooded Area:	0.00 ac	CN=	61
Impervious Area:	0.01 ac	CN=	98
Lawn Area:	0.01 ac	CN=	76

Weighted CN: 86.8

AREA G On-site Bypass

Site Area = 9.07 ac
Wt. CN = 60.3
Site Soils: (Hydrologic Soil 75% Group B - 25% Group D)

Wooded Area:	6.50 ac	CN=	61
Impervious Area:	0.00 ac	CN=	98
Brush (No mow seed mix):	0.25 ac	CN=	56

Weighted CN: 60.3

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: Total Additional Upstream Area To Point 'D/E'

Runoff Calculations

Site Area = 271.00 ac
Wt. CN = 70.2
Site Soils: (Hydrologic Soil 75% Group B - 5% GROUP C - 15% Group D)

Wooded Area:	107.00	ac	CN=	60
R 1/8 acre	62.00	ac	CN=	74
R 1/2 acre	97.00	ac	CN=	78
Water Surface	5.00	ac	CN=	98
Weighted CN:				70.2

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: Area H Landfill Culverts

Runoff Calculations

Site Area = 43.30 ac
Wt. CN = 73.4
Site Soils: (Hydrologic Soil 40% Group B - 20% GROUP C - 40% Group D)

Wooded Area:	26.30 ac	CN=	67
R 1/8 acre	0.00 ac	CN=	78
R 1/2 acre	5.00 ac	CN=	81
Land Fill	12.00 ac	CN=	84

Weighted CN: 73.4

STORMWATER PRE/POST DEVELOPMENT ANALYSIS	DATE 2/11/2021	
PROJECT NAME H-12 Felton Grove HS	PROJECT NO 19-168	
LOCATION Apex, NC	BY KAL	

STORMWATER ANALYSIS POINT: Middle Creek Area To Point 'I'

Runoff Calculations

Site Area = 2637.00 ac
Wt. CN = 67.9
Site Soils: (Hydrologic Soil 80% Group B - 5% GROUP C - 15% Group D)

Industrial	580.00	ac	CN=	93
Commercial/Business	75.00	ac	CN=	89
Wooded Area:	2151.00	ac	CN=	59
R 1/8 acre	275.00	ac	CN=	73
R 1/2 acre	195.00	ac	CN=	77
Land Fill	16.00	ac	CN=	81
Golf Course/Lawn	190.00	ac	CN=	65
Water Surface	18.00	ac	CN=	98
Weighted CN:				67.9

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.216	2	726	2,401	------	------	------	Area A Onsite Pre
2	SCS Runoff	0.134	2	726	1,496	------	------	------	Area A Off-site Pre
3	Combine	0.350	2	726	3,897	1, 2	------	------	Total Area A Pre
4	SCS Runoff	0.086	2	732	1,032	------	------	------	Area B Onsite Pre
5	SCS Runoff	0.168	2	726	1,877	------	------	------	Area C Onsite Pre
6	SCS Runoff	5.589	2	732	36,001	------	------	------	Area D Onsite Pre
7	SCS Runoff	64.33	2	730	267,434	------	------	------	Area D Offsite Pre
8	Combine	69.74	2	730	303,434	6, 7	------	------	Total Area D Pre
9	SCS Runoff	0.214	2	728	1,634	------	------	------	Area E Onsite Pre
10	SCS Runoff	0.730	2	736	9,444	------	------	------	Area F Onsite Pre
11	SCS Runoff	5.824	2	726	20,314	------	------	------	Area F Off-site Pre
12	Combine	6.354	2	726	29,758	10, 11	------	------	Total Area F Pre
13	SCS Runoff	2.358	2	732	15,189	------	------	------	Area G Onsite Pre
14	SCS Runoff	48.47	2	730	202,342	------	------	------	Area G Off-site Pre
15	Combine	50.75	2	730	217,531	13, 14	------	------	Toital Area G Pre
17	SCS Runoff	0.205	2	724	1,049	------	------	------	Area A Onsite Post
18	SCS Runoff	0.134	2	726	1,496	------	------	------	Area A Off-site Post
19	Combine	0.331	2	726	2,545	17, 18	------	------	Total Area A Post
20	SCS Runoff	0.026	2	720	144	------	------	------	Area B Onsite Post
21	SCS Runoff	0.161	2	720	550	------	------	------	Area C Onsite Post
22	SCS Runoff	41.12	2	730	155,699	------	------	------	Area D Onsite Post
23	SCS Runoff	64.92	2	730	269,318	------	------	------	Area D Offsite Post
24	Combine	106.04	2	730	425,017	22, 23	------	------	Total Area D Post
25	SCS Runoff	0.184	2	722	1,088	------	------	------	Area E Onsite Post
26	SCS Runoff	1.597	2	722	4,732	------	------	------	Area F Onsite Post
27	SCS Runoff	8.999	2	722	24,905	------	------	------	Area F Off-site Post
28	Combine	10.60	2	722	29,637	26, 27	------	------	Total Area F Post
29	SCS Runoff	39.49	2	722	103,578	------	------	------	Area G Onsite Post
30	SCS Runoff	47.43	2	730	198,458	------	------	------	Area G Off-site Post
31	Combine	76.26	2	724	305,920	14, 29,	------	------	Total Area G Post
33	SCS Runoff	23.56	2	722	66,609	------	------	------	Area to SCM D1 Onsite
34	SCS Runoff	0.165	2	726	723	------	------	------	Area to SCM D1 Off-site
35	Combine	23.70	2	722	67,332	33, 34	------	------	Total Area to SCM D1

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
36	Reservoir	0.318	2	1444	58,494	35	383.90	54,068	Route SCM D1
37	SCS Runoff	22.91	2	722	64,219	------	------	------	Area to SCM D2 Onsite
38	SCS Runoff	0.037	2	726	170	------	------	------	Area to SCM D2 Offsite
39	Combine	22.94	2	722	64,388	37, 38	------	------	Total Area to SCM D2
40	Reservoir	0.264	2	1444	50,834	39	392.20	53,261	Route SCM D2
41	SCS Runoff	5.342	2	722	14,983	------	------	------	Area to SCM D3 Onsite
42	Reservoir	0.070	2	1442	13,116	41	384.46	11,987	Route SCM D3
43	SCS Runoff	3.348	2	732	17,002	------	------	------	Area D Bypassing SCMs
44	SCS Runoff	64.48	2	730	267,485	------	------	------	Area D Offsite Post
45	Combine	68.22	2	730	406,932	36, 40, 42, 43, 44	------	------	Total Managed Area D Post
47	SCS Runoff	1.693	2	722	4,679	------	------	------	Area F Onsite Post
48	Combine	10.69	2	722	29,584	27, 47	------	------	Total to SCM F
49	Reservoir	3.948	2	734	29,574	48	388.90	7,295	Route SCM F
50	SCS Runoff	0.044	2	724	325	------	------	------	Area F Bypassing SCM
51	Combine	3.971	2	732	29,899	49, 50	------	------	Total Managed Area F Post
53	SCS Runoff	39.35	2	720	102,926	------	------	------	Area to SCM G Onsite
54	SCS Runoff	0.047	2	720	122	------	------	------	Area to SCM G Offsite
55	Combine	39.40	2	720	103,048	53, 54	------	------	Total Area to SCM G
56	Reservoir	0.360	2	1444	77,110	55	388.31	87,596	Route SCM G
57	SCS Runoff	1.365	2	734	9,827	------	------	------	Area G Bypassing SCM
58	Combine	49.00	2	730	285,395	30, 56, 57	------	------	Total Managed Area G Post
60	SCS Runoff	126.84	2	734	660,044	------	------	------	Additional Area to Point D-E
61	Combine	70.41	2	730	310,377	1, 4, 5, 8, 9,	------	------	Total Area A-E Pre
62	Combine	193.33	2	734	970,420	60, 61	------	------	Total A-E Post & Upstream
63	Reach	187.87	2	738	970,419	62	------	------	A-E Travel to H Landfill Culverts
64	Combine	56.66	2	730	247,289	12, 15,	------	------	Total Area F & G Pre
65	Reach	54.76	2	734	247,288	64	------	------	F&G Travel to H Landfill Culverts
66	SCS Runoff	24.85	2	736	125,838	------	------	------	Area H at Culverts
67	Combine	265.16	2	736	1,343,545	63, 65, 66	------	------	Total Flow H At Culverts Pre
69	SCS Runoff	484.42	2	772	5,397,708	------	------	------	Area I - Apex
70	Reach	483.07	2	776	5,397,708	69	------	------	Culverts Travel to I
71	Combine	966.04	2	774	10,795,419	69, 70	------	------	Total Area I Pre

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

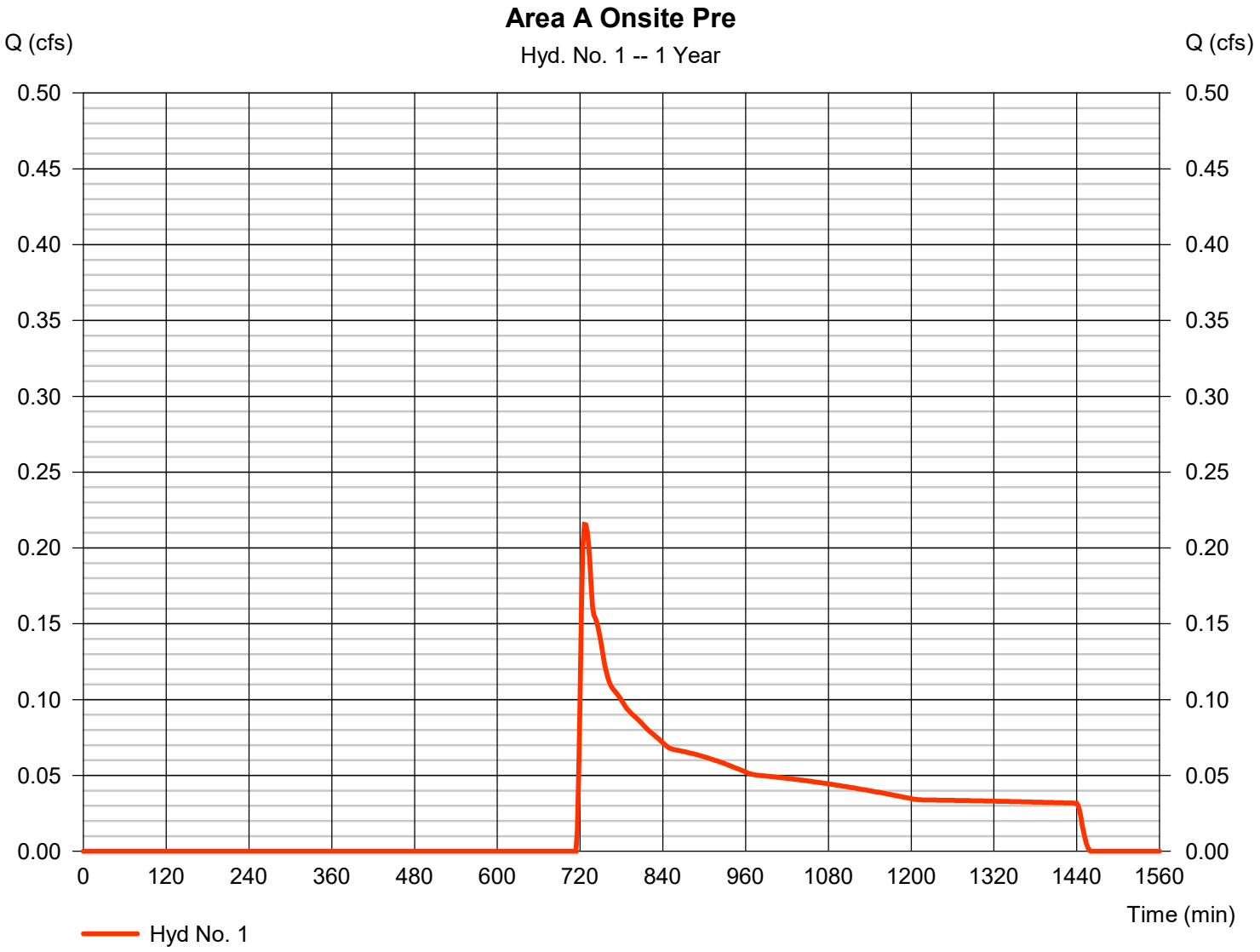
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
73	SCS Runoff	126.84	2	734	660,044	------	------	------	Additional Area to Point D-E
74	Combine	68.53	2	730	409,763	17, 20, 21, 25, 45,	------	------	Total Area A-E Post
75	Combine	191.24	2	734	1,069,806	73, 74	------	------	Total A-E Post & Upstream
76	Reach	185.85	2	738	1,069,762	75	------	------	A-E Travel to H Landfill Culverts
77	Combine	52.91	2	730	315,294	51, 58,	------	------	Total Area F & G Post
78	Reach	51.13	2	734	315,262	77	------	------	F&G Travel to H Landfill Culverts
79	SCS Runoff	24.85	2	736	125,838	------	------	------	Area H at Culverts
80	Combine	260.08	2	736	1,510,861	76, 78, 79	------	------	Total Area H At Culverts Post
82	SCS Runoff	484.42	2	772	5,397,708	------	------	------	Area I - Apex
83	Reach	483.07	2	776	5,397,708	82	------	------	Culverts Travel to I
84	Combine	966.04	2	774	10,795,419	82, 83	------	------	Total Area I Post

Hydrograph Report

Hyd. No. 1

Area A Onsite Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 0.216 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 2,401 cuft
Drainage area	= 3.850 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.10 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 1

Area A Onsite Pre

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 4.00		0.00		0.00		
Travel Time (min)	**= 8.96**	**+**	**0.00**	**+**	**0.00**	**=**	**8.96**
Shallow Concentrated Flow							
Flow length (ft)	= 845.00		0.00		0.00		
Watercourse slope (%)	= 7.70		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=4.48		0.00		0.00		
Travel Time (min)	**= 3.15**	**+**	**0.00**	**+**	**0.00**	**=**	**3.15**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

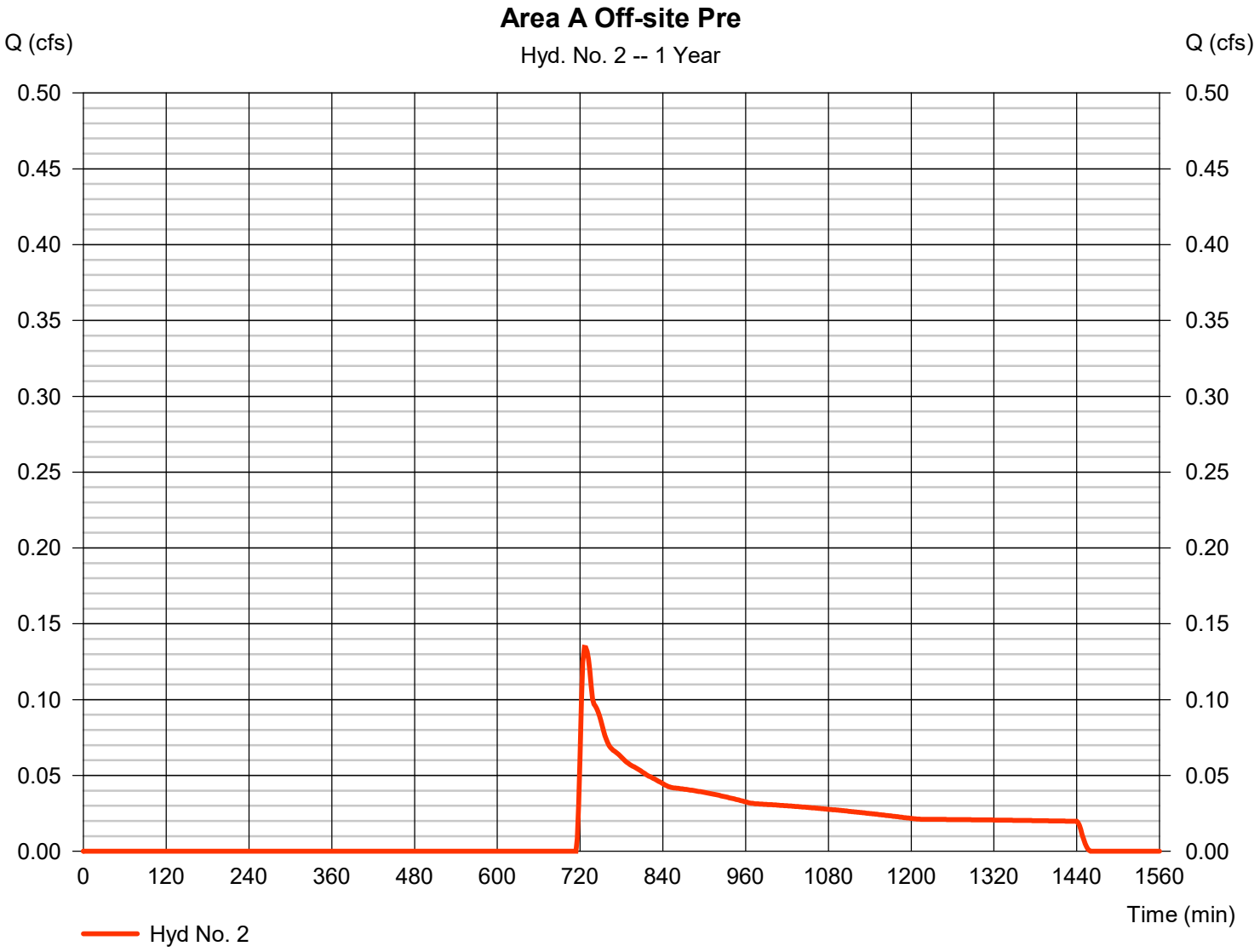
Total Travel Time, Tc ..... 12.10 min

Hydrograph Report

Hyd. No. 2

Area A Off-site Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 0.134 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 1,496 cuft
Drainage area	= 2.400 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 12.10 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

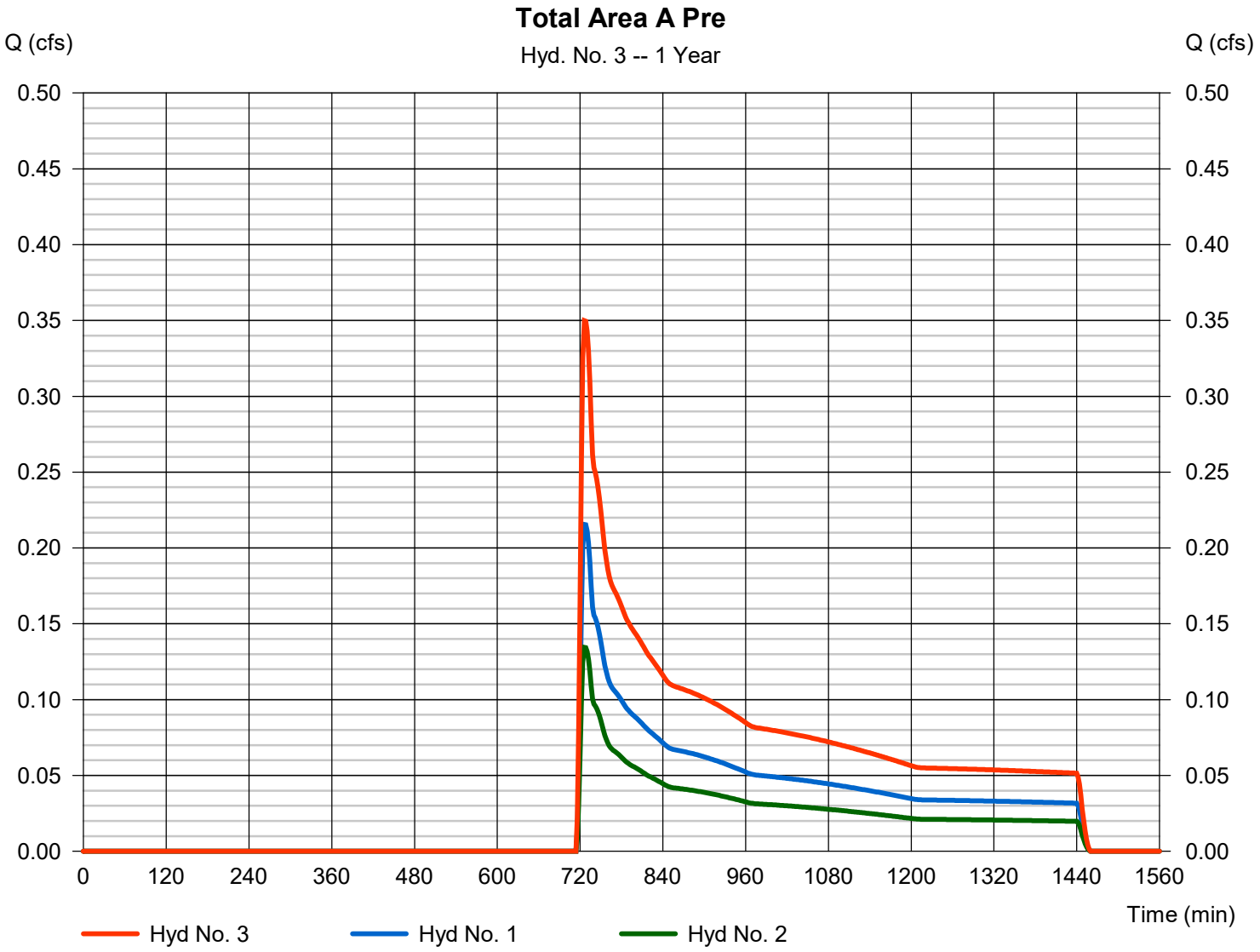


Hydrograph Report

Hyd. No. 3

Total Area A Pre

Hydrograph type	= Combine	Peak discharge	= 0.350 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 3,897 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 6.250 ac

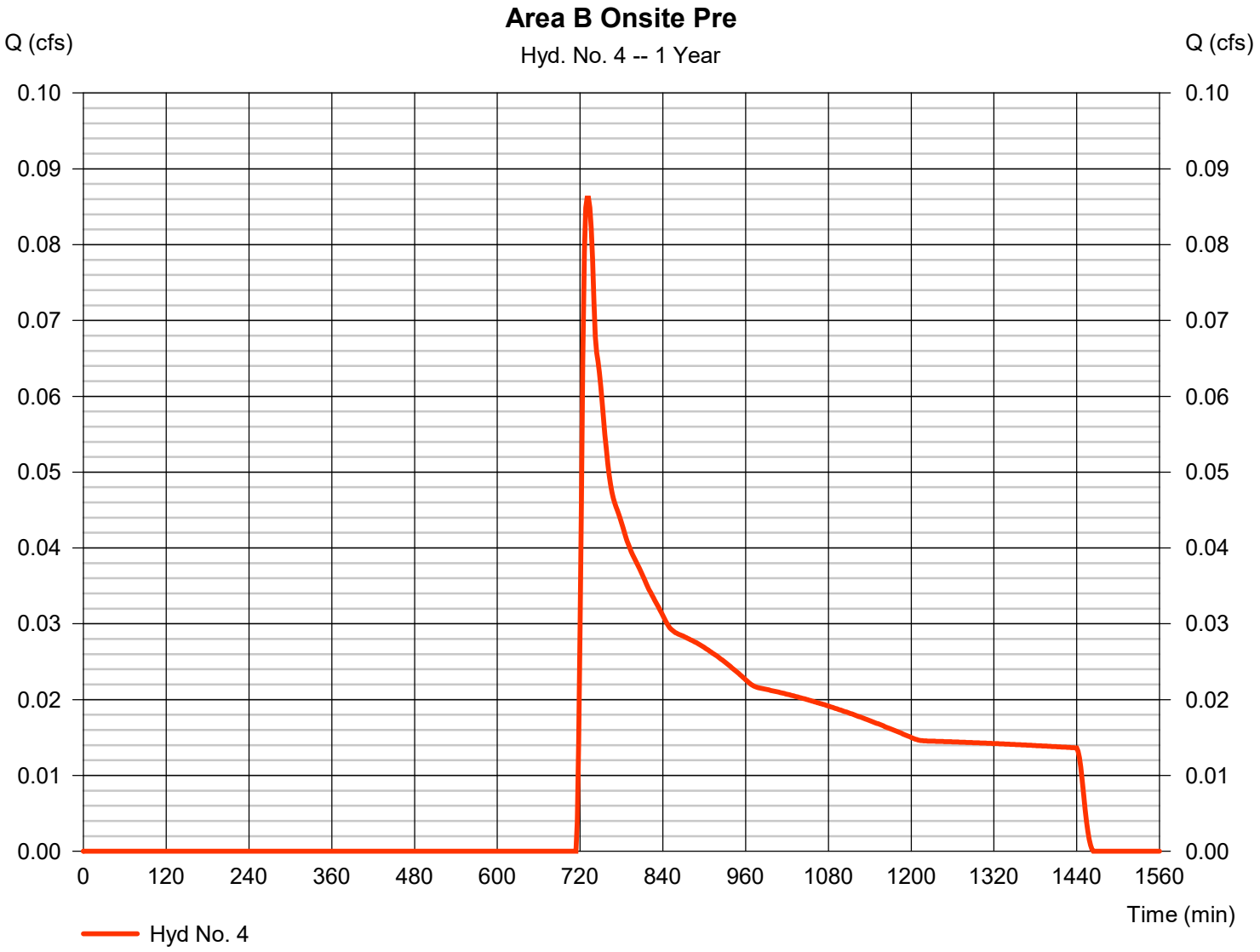


Hydrograph Report

Hyd. No. 4

Area B Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.086 cfs
Storm frequency	=	1 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	1,032 cuft
Drainage area	=	1.750 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.20 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 4

Area B Onsite Pre

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 1.50		0.00		0.00		
Travel Time (min)	**= 13.27**	**+**	**0.00**	**+**	**0.00**	**=**	**13.27**
Shallow Concentrated Flow							
Flow length (ft)	= 550.00		0.00		0.00		
Watercourse slope (%)	= 9.10		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=4.87		0.00		0.00		
Travel Time (min)	**= 1.88**	**+**	**0.00**	**+**	**0.00**	**=**	**1.88**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

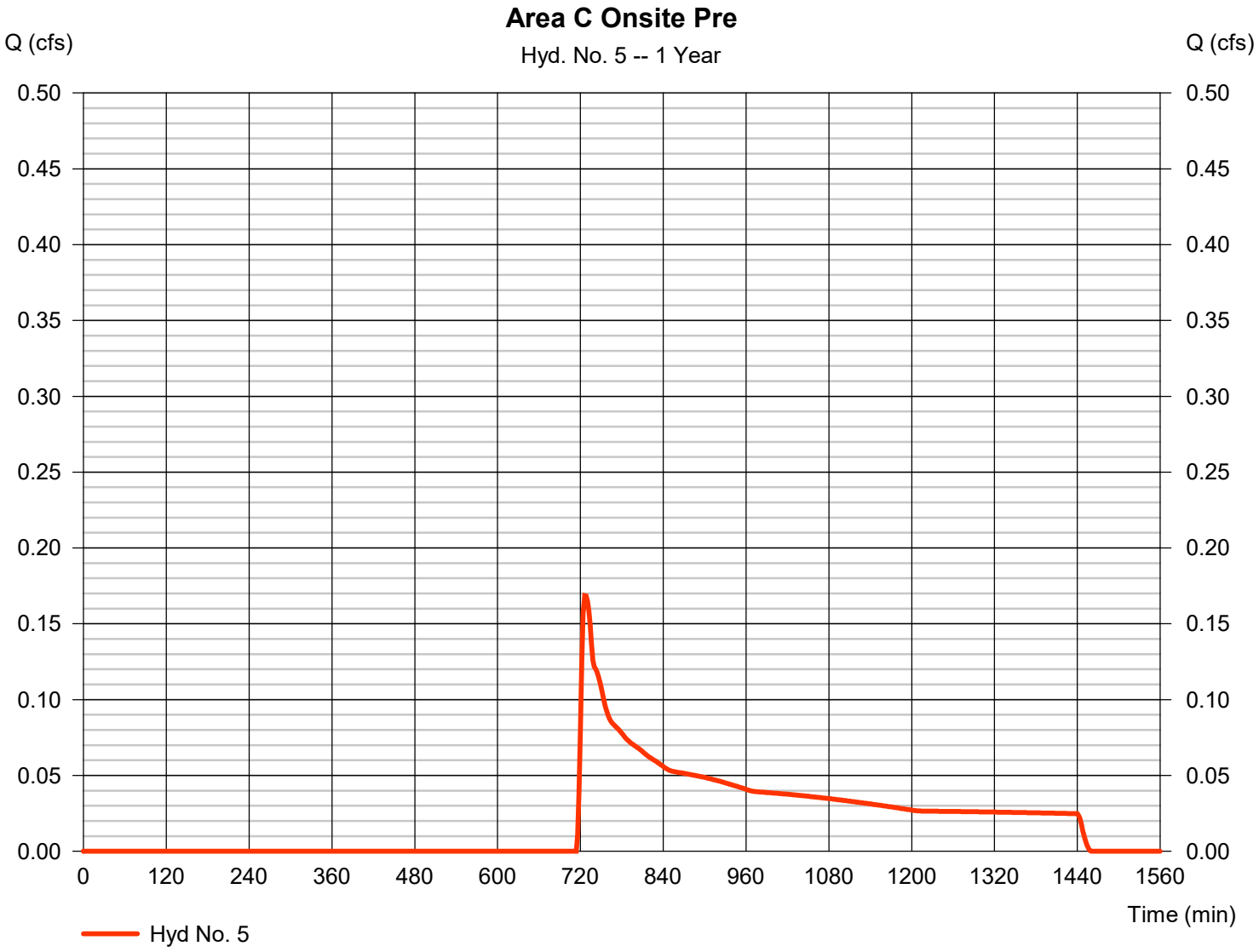
Total Travel Time, Tc ..... 15.20 min

Hydrograph Report

Hyd. No. 5

Area C Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.168 cfs
Storm frequency	=	1 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	1,877 cuft
Drainage area	=	3.010 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.80 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 5

Area C Onsite Pre

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 5.00		0.00		0.00		
Travel Time (min)	**= 8.20**	**+**	**0.00**	**+**	**0.00**	**=**	**8.20**
Shallow Concentrated Flow							
Flow length (ft)	= 690.00		0.00		0.00		
Watercourse slope (%)	= 7.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=4.42		0.00		0.00		
Travel Time (min)	**= 2.60**	**+**	**0.00**	**+**	**0.00**	**=**	**2.60**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

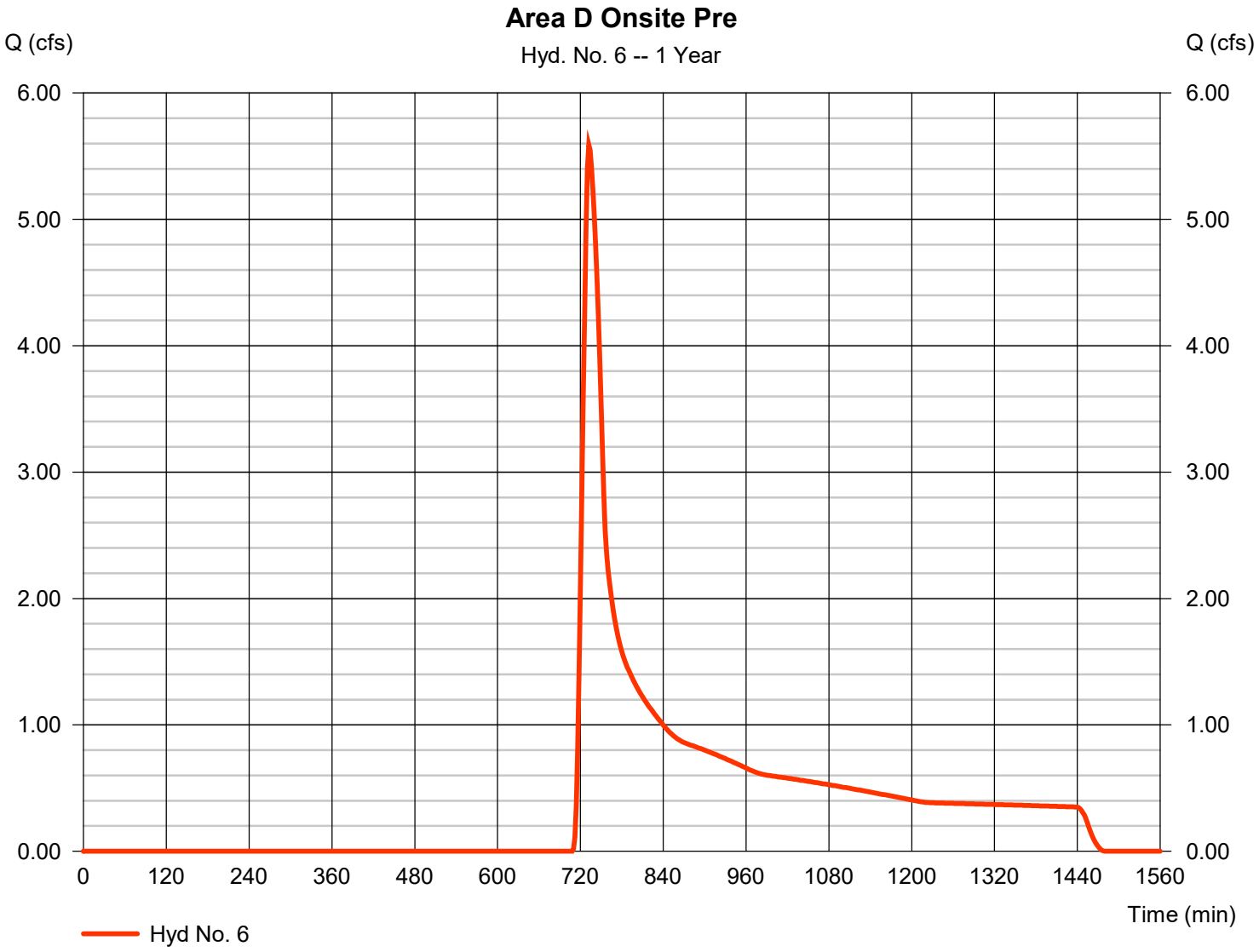
Total Travel Time, Tc ..... 10.80 min

Hydrograph Report

Hyd. No. 6

Area D Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.589 cfs
Storm frequency	=	1 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	36,001 cuft
Drainage area	=	29.390 ac	Curve number	=	61.6
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 6

Area D Onsite Pre

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 15.61**	**+**	**0.00**	**+**	**0.00**	**=**	**15.61**
Shallow Concentrated Flow							
Flow length (ft)	= 830.00		0.00		0.00		
Watercourse slope (%)	= 4.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.23		0.00		0.00		
Travel Time (min)	**= 4.29**	**+**	**0.00**	**+**	**0.00**	**=**	**4.29**
Channel Flow							
X sectional flow area (sqft)	= 27.00		0.00		0.00		
Wetted perimeter (ft)	= 14.50		0.00		0.00		
Channel slope (%)	= 2.50		0.00		0.00		
Manning's n-value	= 0.030		0.015		0.015		
Velocity (ft/s)	=11.91						
			0.00				
					0.00		
Flow length (ft)	({0})2955.0		0.0		0.0		
Travel Time (min)	**= 4.13**	**+**	**0.00**	**+**	**0.00**	**=**	**4.13**

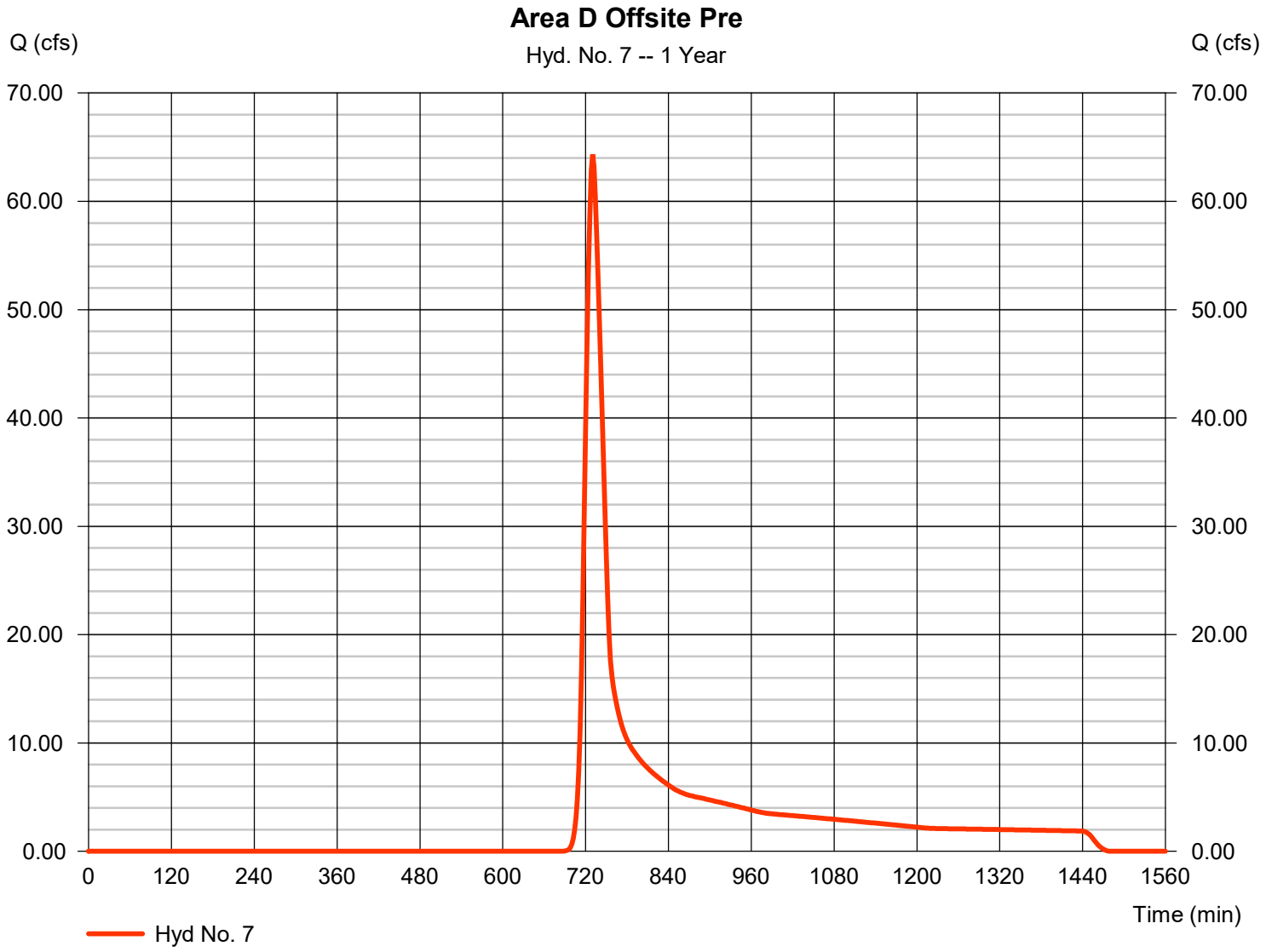
Total Travel Time, Tc ..... 24.00 min

Hydrograph Report

Hyd. No. 7

Area D Offsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	64.33 cfs
Storm frequency	=	1 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	267,434 cuft
Drainage area	=	101.300 ac	Curve number	=	71.9
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 7

Area D Offsite Pre

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 15.61**	**+**	**0.00**	**+**	**0.00**	**=**	**15.61**
Shallow Concentrated Flow							
Flow length (ft)	= 830.00		0.00		0.00		
Watercourse slope (%)	= 4.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.23		0.00		0.00		
Travel Time (min)	**= 4.29**	**+**	**0.00**	**+**	**0.00**	**=**	**4.29**
Channel Flow							
X sectional flow area (sqft)	= 27.00		0.00		0.00		
Wetted perimeter (ft)	= 14.50		0.00		0.00		
Channel slope (%)	= 2.50		0.00		0.00		
Manning's n-value	= 0.030		0.015		0.015		
Velocity (ft/s)	=11.91						
			0.00				
					0.00		
Flow length (ft)	({0})2955.0		0.0		0.0		
Travel Time (min)	**= 4.13**	**+**	**0.00**	**+**	**0.00**	**=**	**4.13**

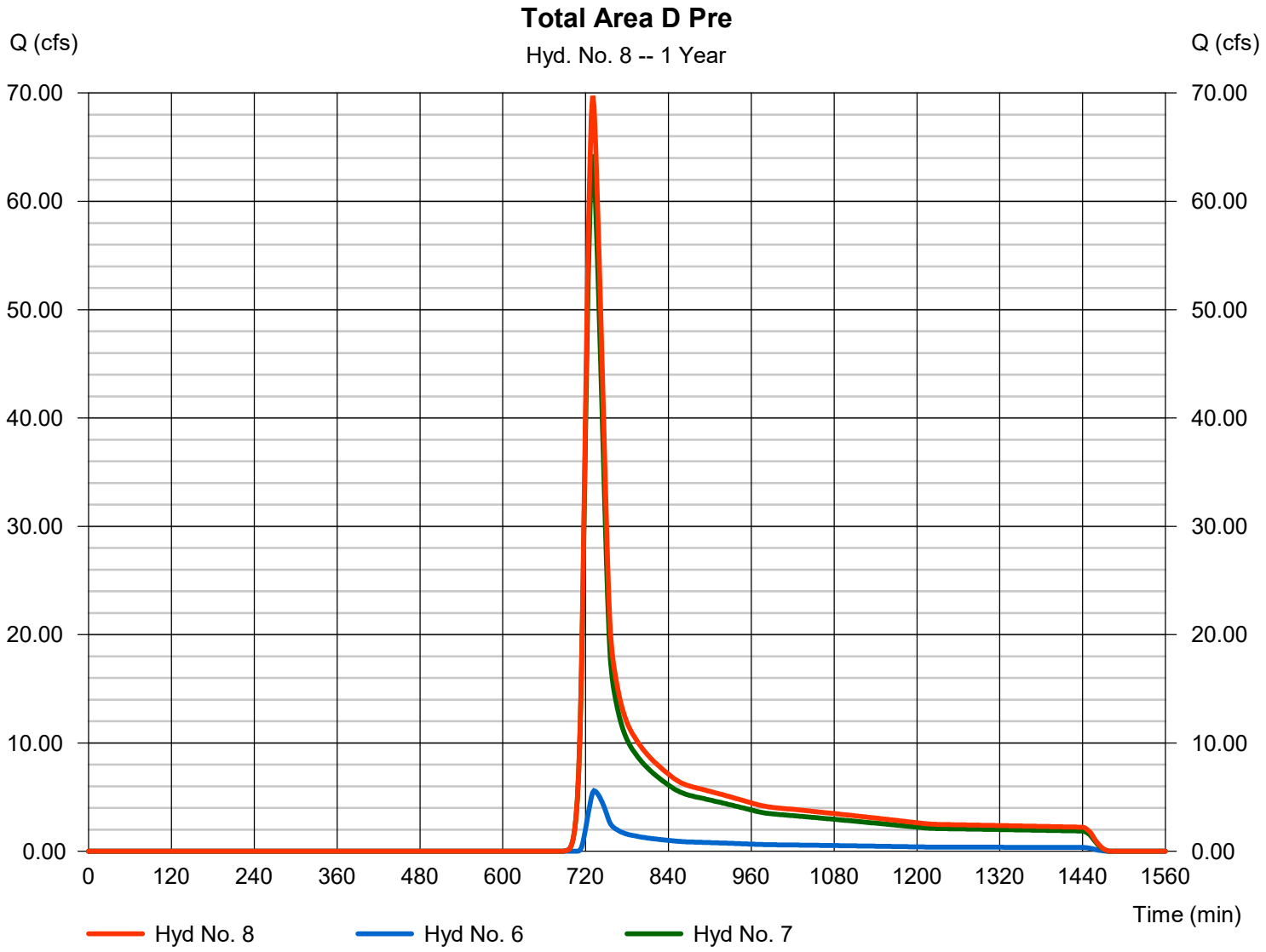
Total Travel Time, Tc ..... 24.00 min

Hydrograph Report

Hyd. No. 8

Total Area D Pre

Hydrograph type	= Combine	Peak discharge	= 69.74 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 303,434 cuft
Inflow hyds.	= 6, 7	Contrib. drain. area	= 130.690 ac

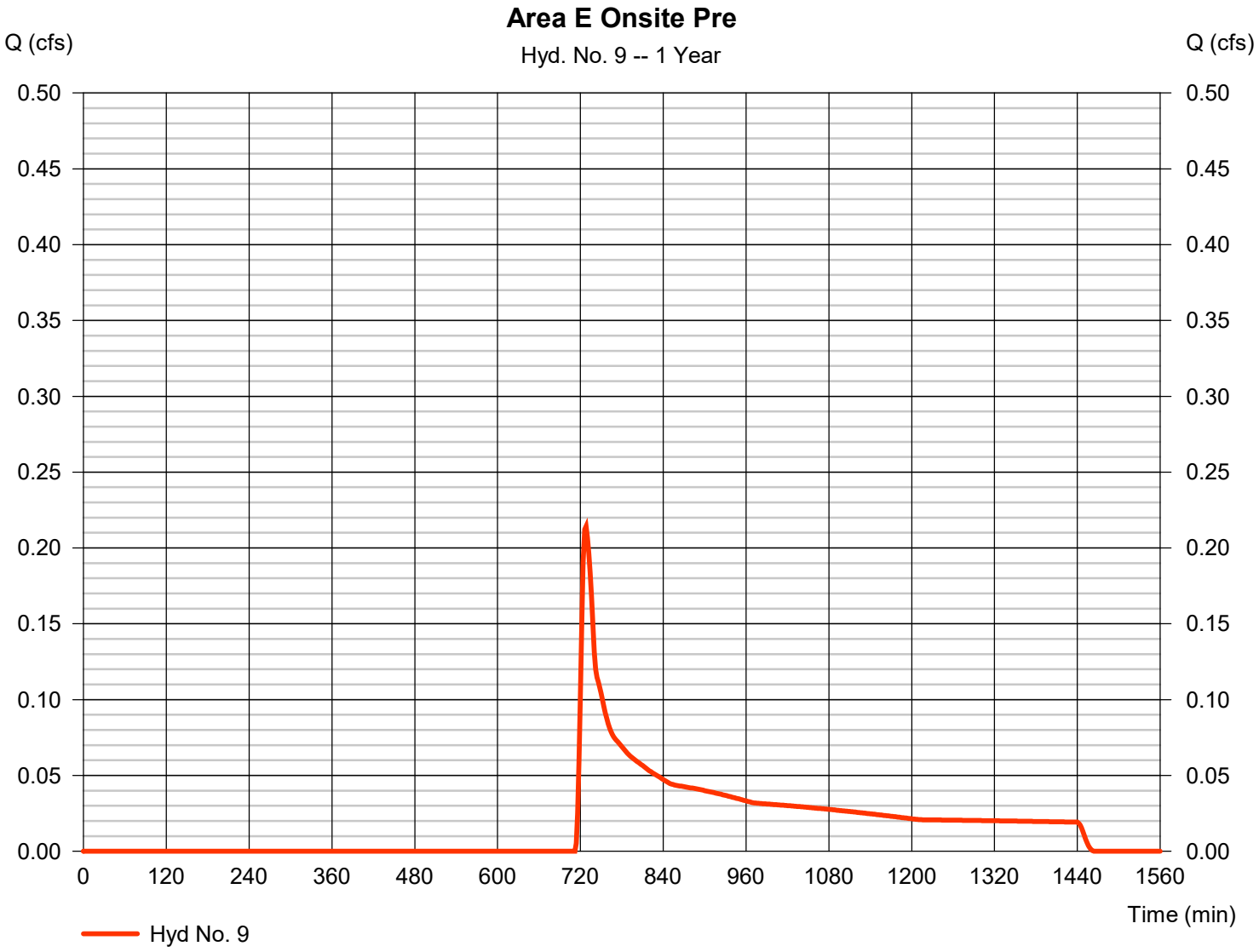


Hydrograph Report

Hyd. No. 9

Area E Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.214 cfs
Storm frequency	=	1 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	1,634 cuft
Drainage area	=	2.110 ac	Curve number	=	57.2
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.30 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 9

Area E Onsite Pre

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 1.50		0.00		0.00		
Travel Time (min)	**= 13.27**	**+**	**0.00**	**+**	**0.00**	**=**	**13.27**
Shallow Concentrated Flow							
Flow length (ft)	= 586.00		0.00		0.00		
Watercourse slope (%)	= 8.60		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=4.73		0.00		0.00		
Travel Time (min)	**= 2.06**	**+**	**0.00**	**+**	**0.00**	**=**	**2.06**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

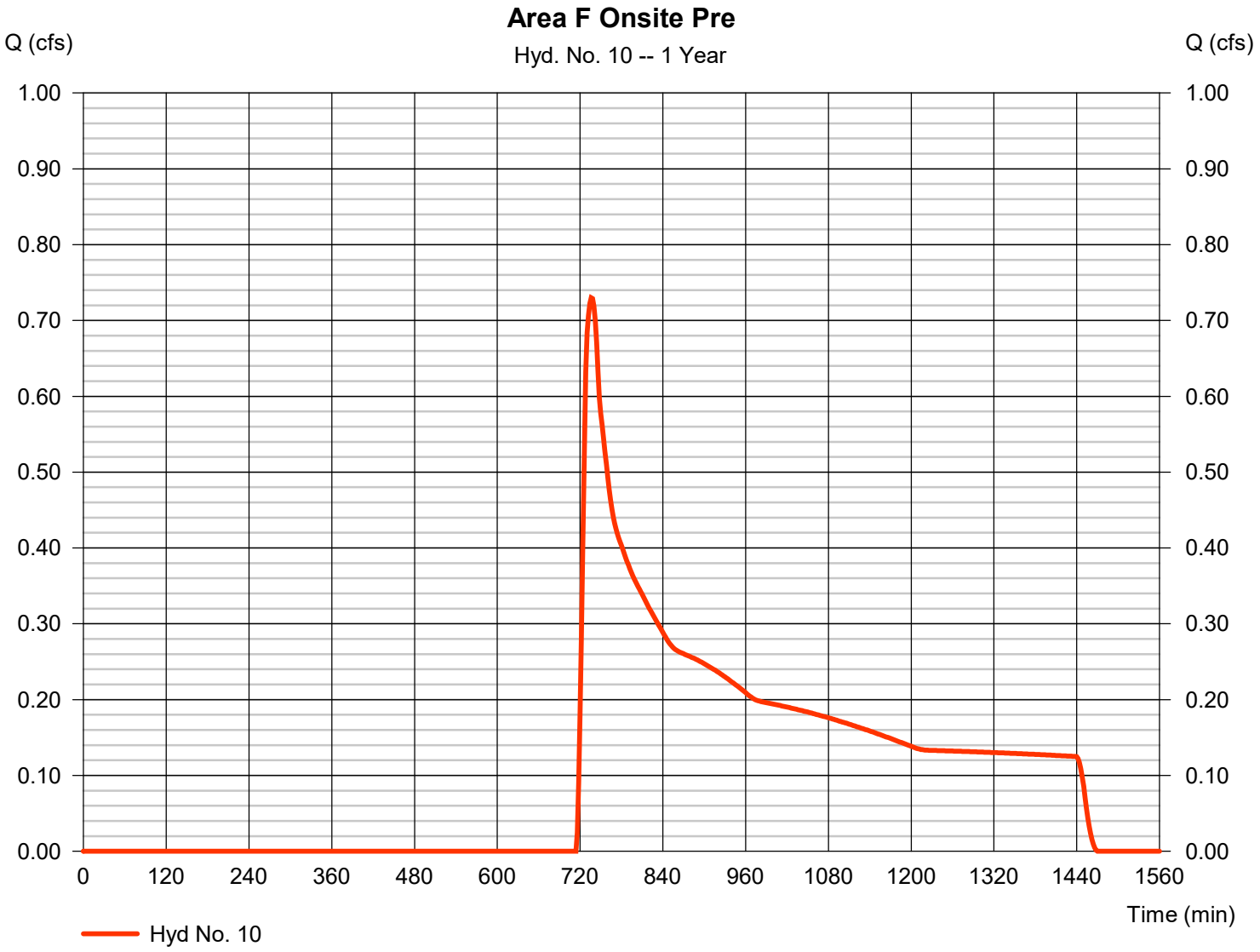
Total Travel Time, Tc ..... 15.30 min

Hydrograph Report

Hyd. No. 10

Area F Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.730 cfs
Storm frequency	=	1 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	9,444 cuft
Drainage area	=	15.620 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	17.60 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 10

Area F Onsite Pre

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 5.00		0.00		0.00		
Travel Time (min)	**= 5.45**	**+**	**0.00**	**+**	**0.00**	**=**	**5.45**
Shallow Concentrated Flow							
Flow length (ft)	= 1965.00		0.00		0.00		
Watercourse slope (%)	= 2.80		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.70		0.00		0.00		
Travel Time (min)	**= 12.13**	**+**	**0.00**	**+**	**0.00**	**=**	**12.13**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

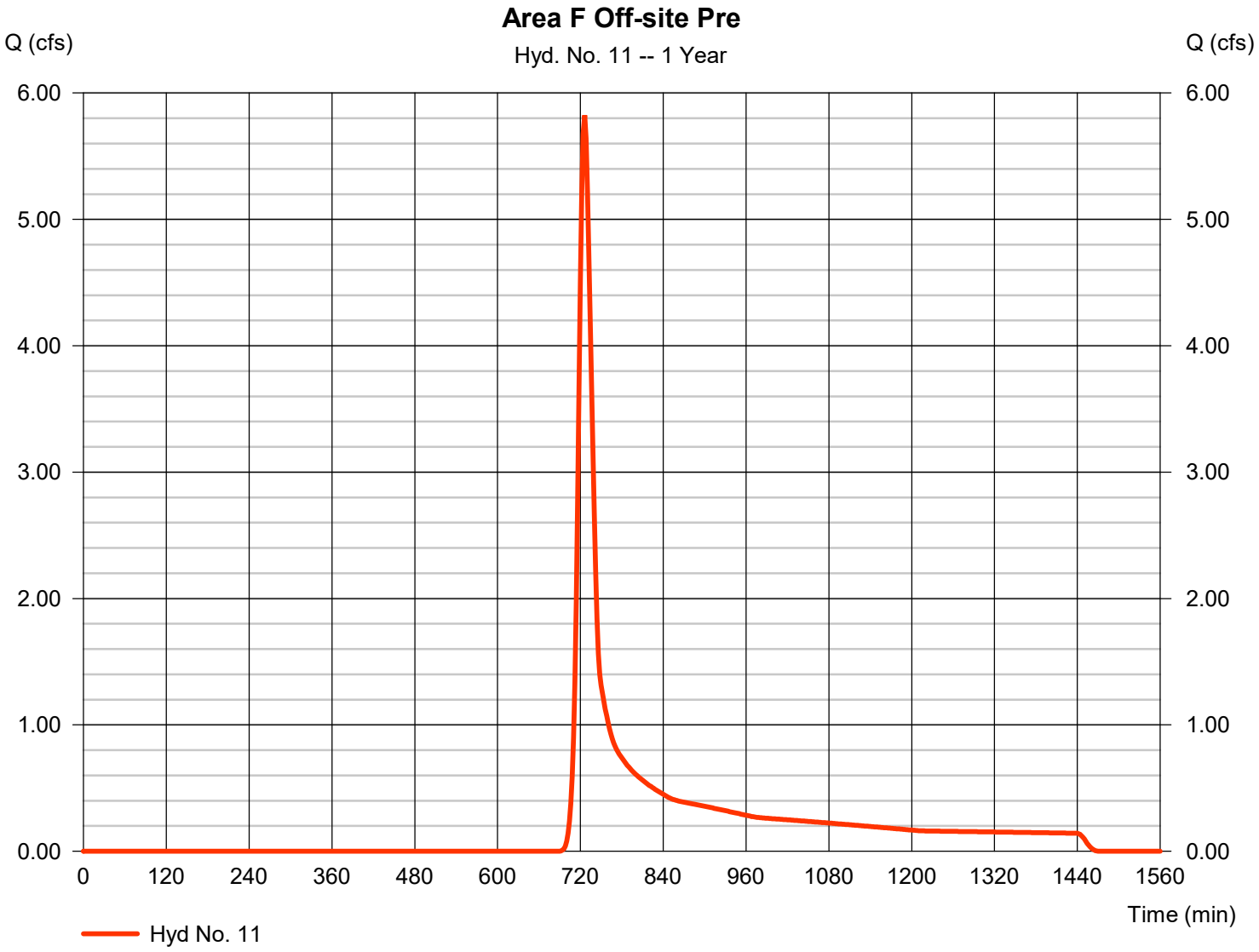
Total Travel Time, Tc ..... 17.60 min

Hydrograph Report

Hyd. No. 11

Area F Off-site Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.824 cfs
Storm frequency	=	1 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	20,314 cuft
Drainage area	=	7.670 ac	Curve number	=	71.7
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	17.60 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 11

Area F Off-site Pre

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 5.00		0.00		0.00		
Travel Time (min)	**= 5.45**	**+**	**0.00**	**+**	**0.00**	**=**	**5.45**
Shallow Concentrated Flow							
Flow length (ft)	= 1965.00		0.00		0.00		
Watercourse slope (%)	= 2.80		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.70		0.00		0.00		
Travel Time (min)	**= 12.13**	**+**	**0.00**	**+**	**0.00**	**=**	**12.13**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

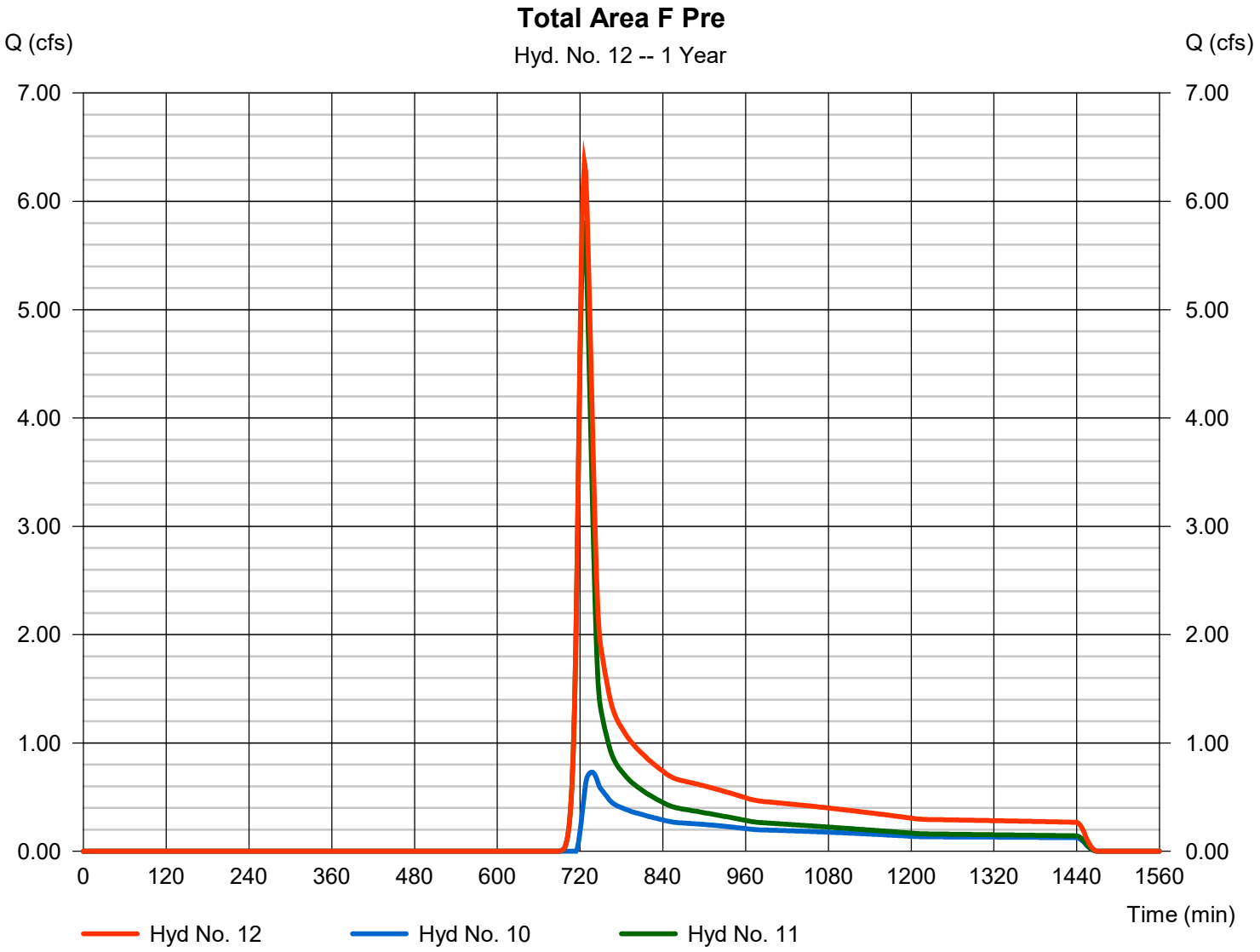
Total Travel Time, Tc ..... 17.60 min

Hydrograph Report

Hyd. No. 12

Total Area F Pre

Hydrograph type	= Combine	Peak discharge	= 6.354 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 29,758 cuft
Inflow hyds.	= 10, 11	Contrib. drain. area	= 23.290 ac

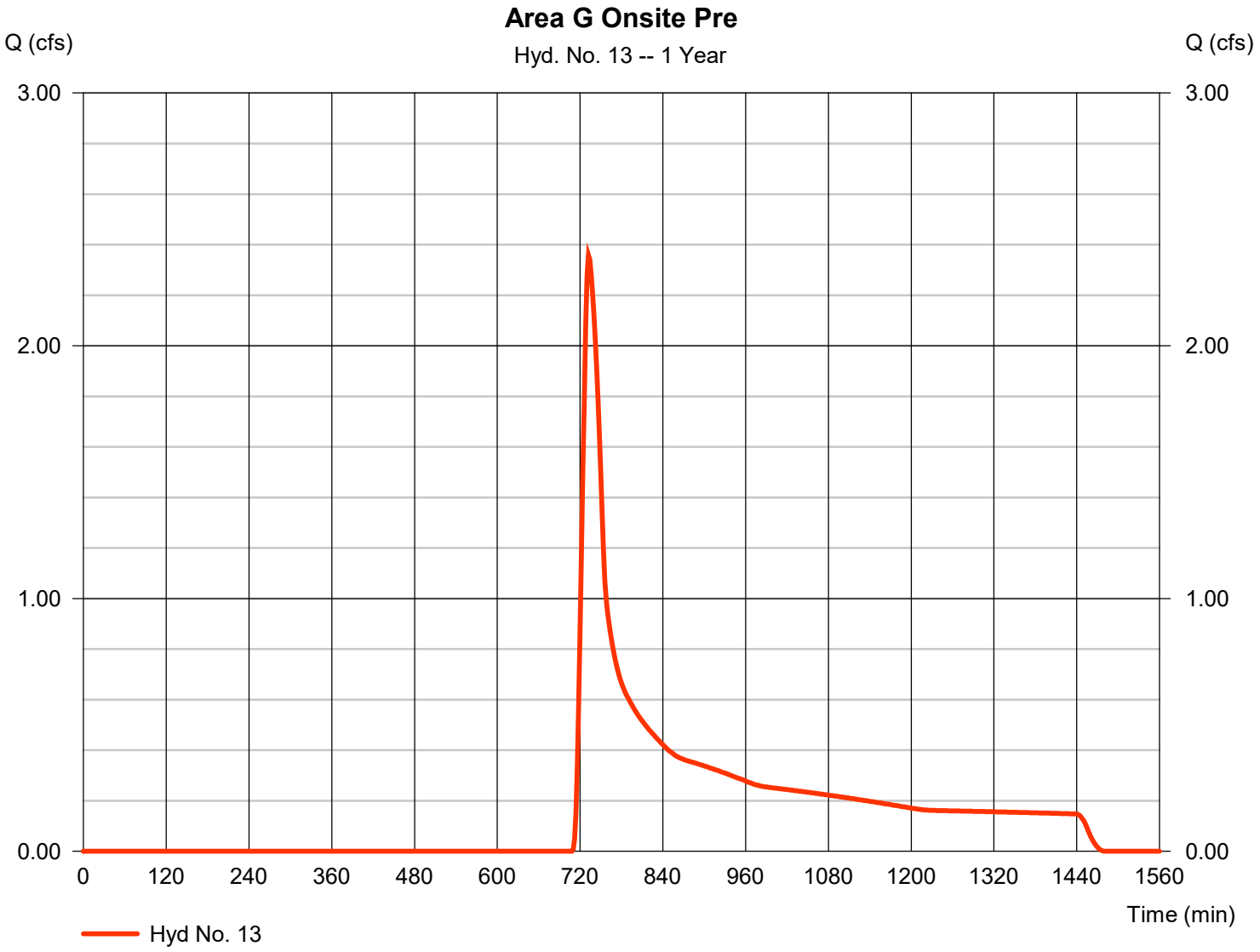


Hydrograph Report

Hyd. No. 13

Area G Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.358 cfs
Storm frequency	=	1 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	15,189 cuft
Drainage area	=	12.400 ac	Curve number	=	61.6
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	23.80 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 13

Area G Onsite Pre

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.50		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 7.84**	**+**	**0.00**	**+**	**0.00**	**=**	**7.84**
Shallow Concentrated Flow							
Flow length (ft)	= 2053.00		0.00		0.00		
Watercourse slope (%)	= 2.80		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.70		0.00		0.00		
Travel Time (min)	**= 12.67**	**+**	**0.00**	**+**	**0.00**	**=**	**12.67**
Channel Flow							
X sectional flow area (sqft)	= 10.00		0.00		0.00		
Wetted perimeter (ft)	= 8.66		0.00		0.00		
Channel slope (%)	= 1.60		0.00		0.00		
Manning's n-value	= 0.025		0.015		0.015		
Velocity (ft/s)	=8.30						
			0.00				
					0.00		
Flow length (ft)	({0})1635.0		0.0		0.0		
Travel Time (min)	**= 3.28**	**+**	**0.00**	**+**	**0.00**	**=**	**3.28**

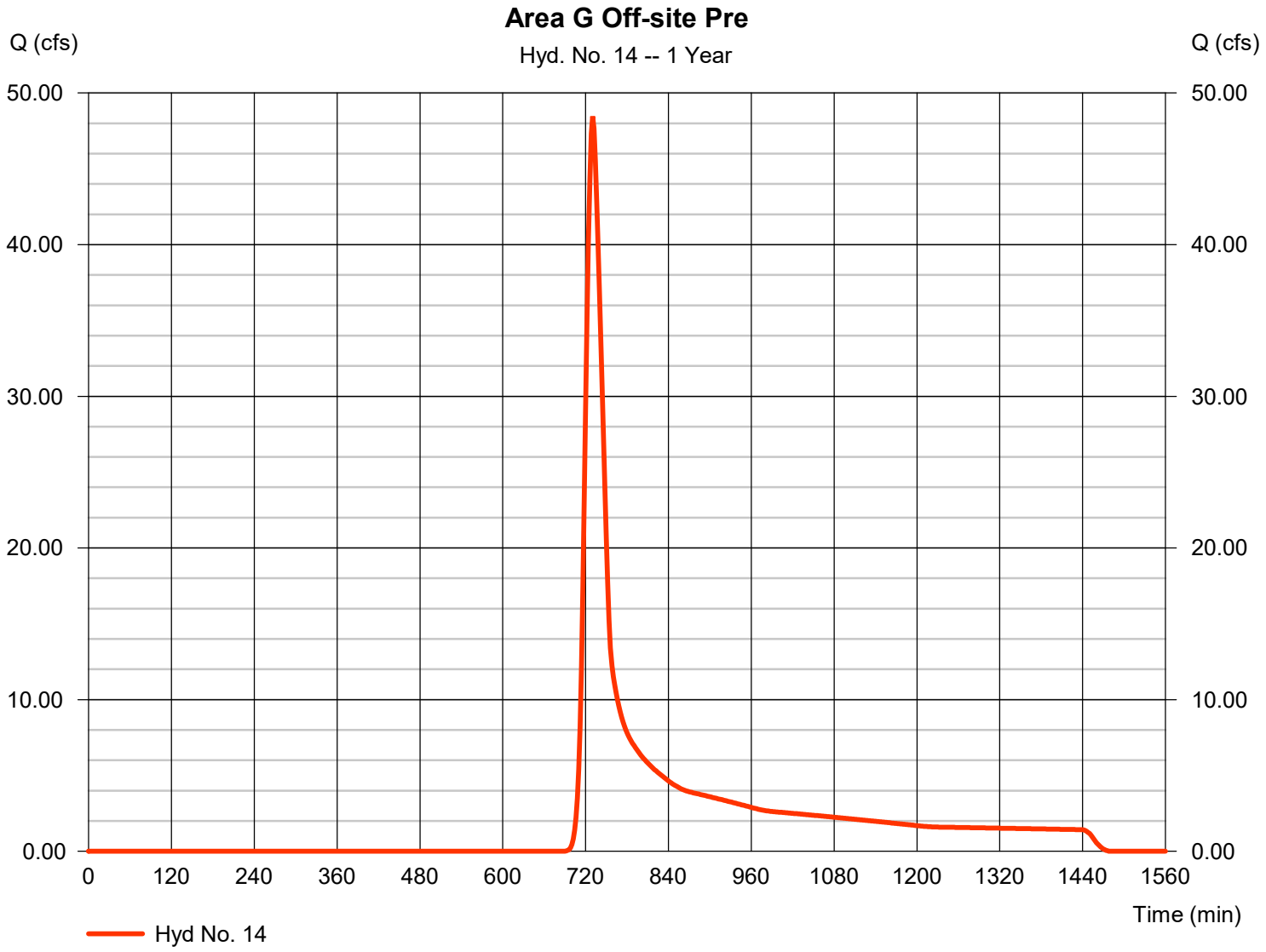
Total Travel Time, Tc ..... 23.80 min

Hydrograph Report

Hyd. No. 14

Area G Off-site Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 48.47 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 202,342 cuft
Drainage area	= 77.610 ac	Curve number	= 71.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 23.80 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 14

Area G Off-site Pre

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.50		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 7.84**	**+**	**0.00**	**+**	**0.00**	**=**	**7.84**
Shallow Concentrated Flow							
Flow length (ft)	= 2053.00		0.00		0.00		
Watercourse slope (%)	= 2.80		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.70		0.00		0.00		
Travel Time (min)	**= 12.67**	**+**	**0.00**	**+**	**0.00**	**=**	**12.67**
Channel Flow							
X sectional flow area (sqft)	= 10.00		0.00		0.00		
Wetted perimeter (ft)	= 8.66		0.00		0.00		
Channel slope (%)	= 1.60		0.00		0.00		
Manning's n-value	= 0.025		0.015		0.015		
Velocity (ft/s)	=8.30						
			0.00				
					0.00		
Flow length (ft)	({0})1635.0		0.0		0.0		
Travel Time (min)	**= 3.28**	**+**	**0.00**	**+**	**0.00**	**=**	**3.28**

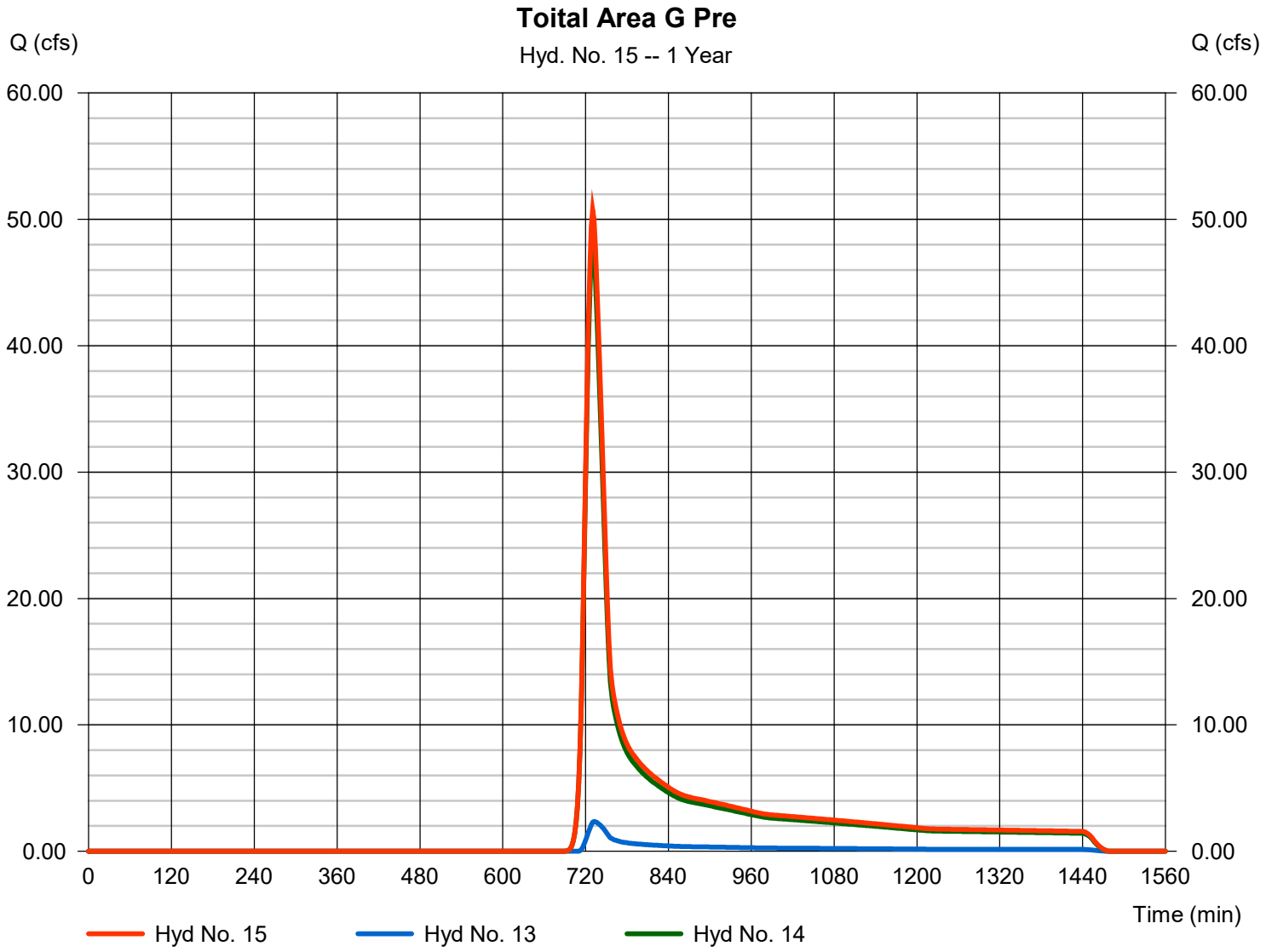
Total Travel Time, Tc ..... 23.80 min

Hydrograph Report

Hyd. No. 15

Toital Area G Pre

Hydrograph type	= Combine	Peak discharge	= 50.75 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 217,531 cuft
Inflow hyds.	= 13, 14	Contrib. drain. area	= 90.010 ac

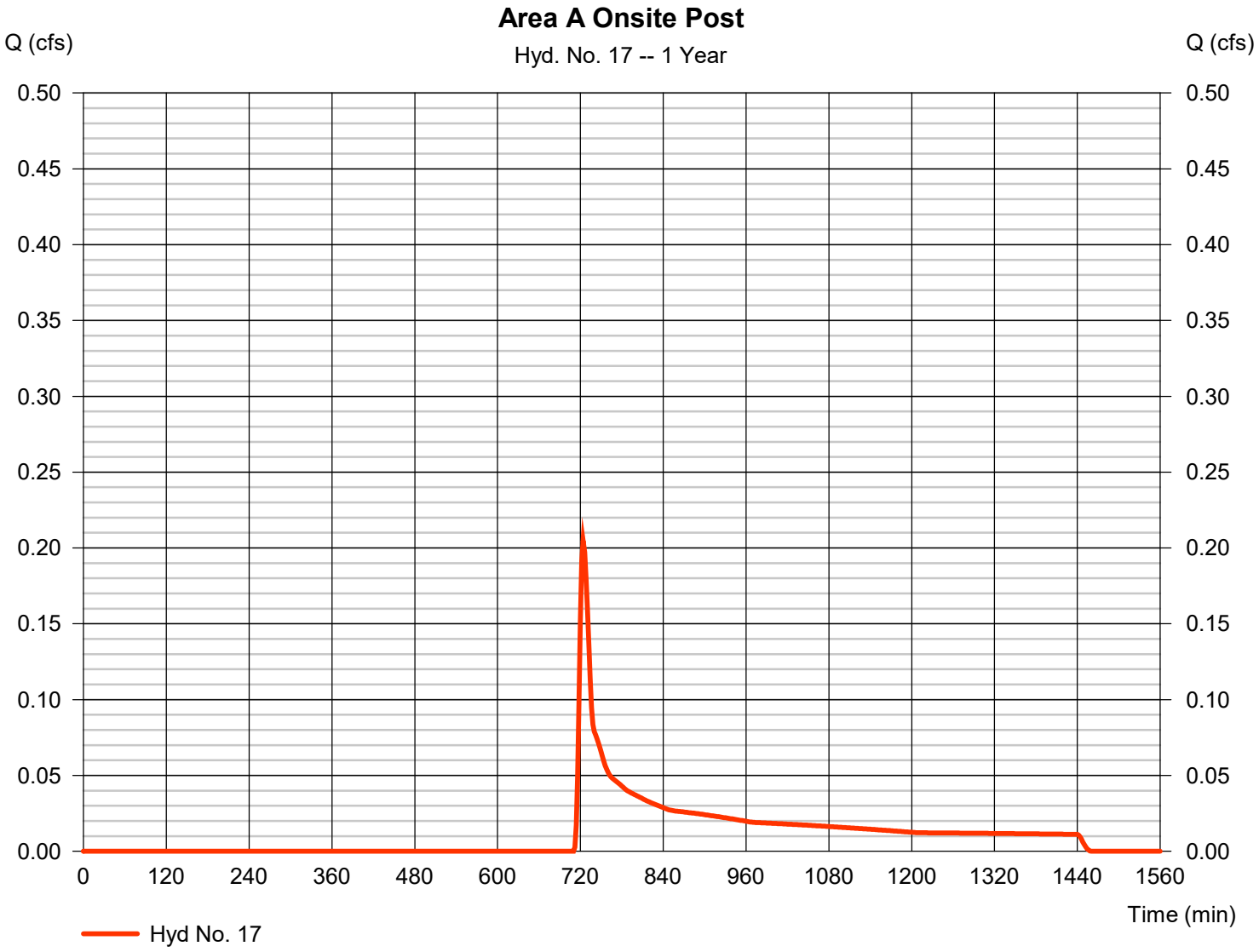


Hydrograph Report

Hyd. No. 17

Area A Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.205 cfs
Storm frequency	=	1 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,049 cuft
Drainage area	=	1.020 ac	Curve number	=	59.3
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.10 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

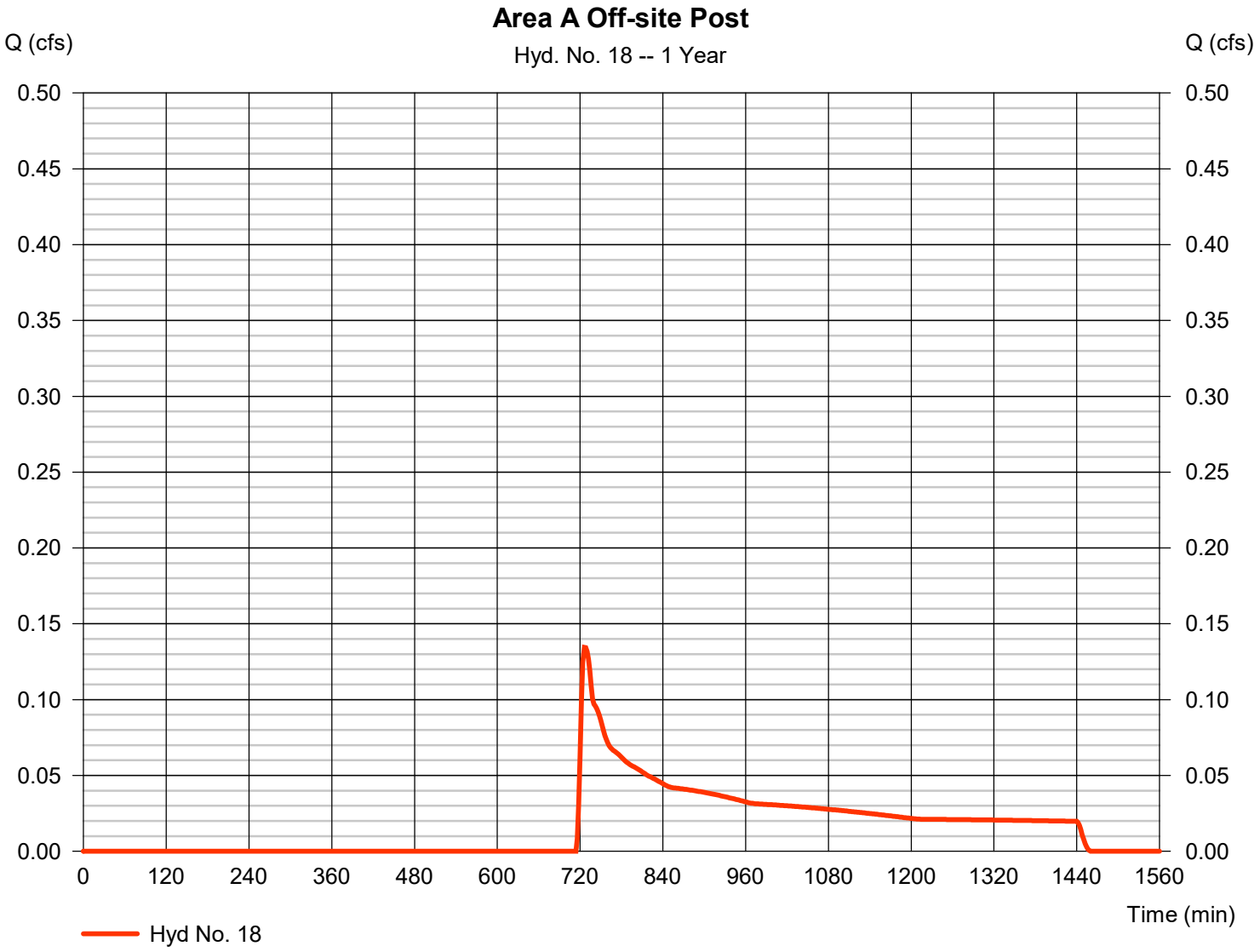


Hydrograph Report

Hyd. No. 18

Area A Off-site Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.134 cfs
Storm frequency	=	1 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	1,496 cuft
Drainage area	=	2.400 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.10 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

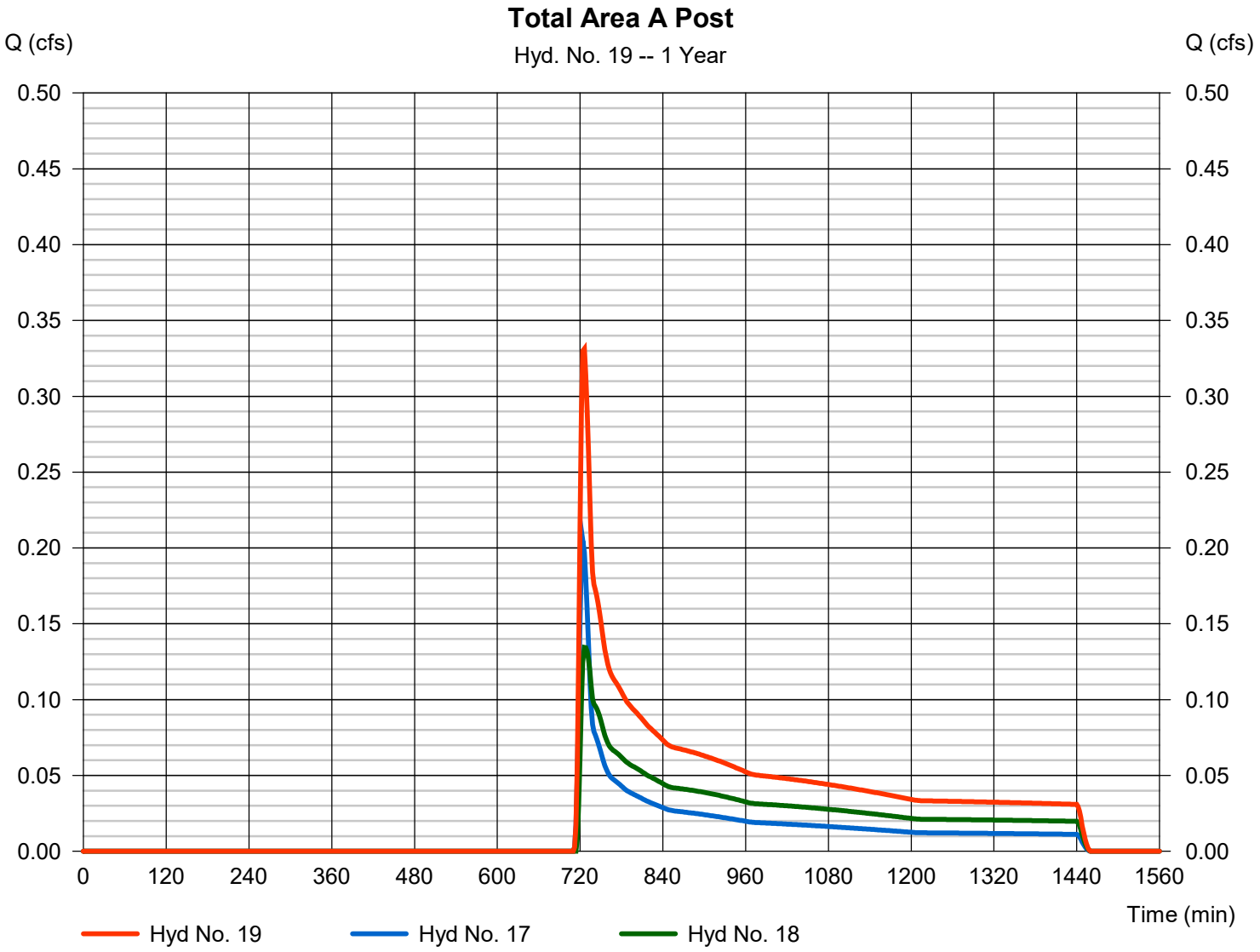


Hydrograph Report

Hyd. No. 19

Total Area A Post

Hydrograph type	= Combine	Peak discharge	= 0.331 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 2,545 cuft
Inflow hyds.	= 17, 18	Contrib. drain. area	= 3.420 ac

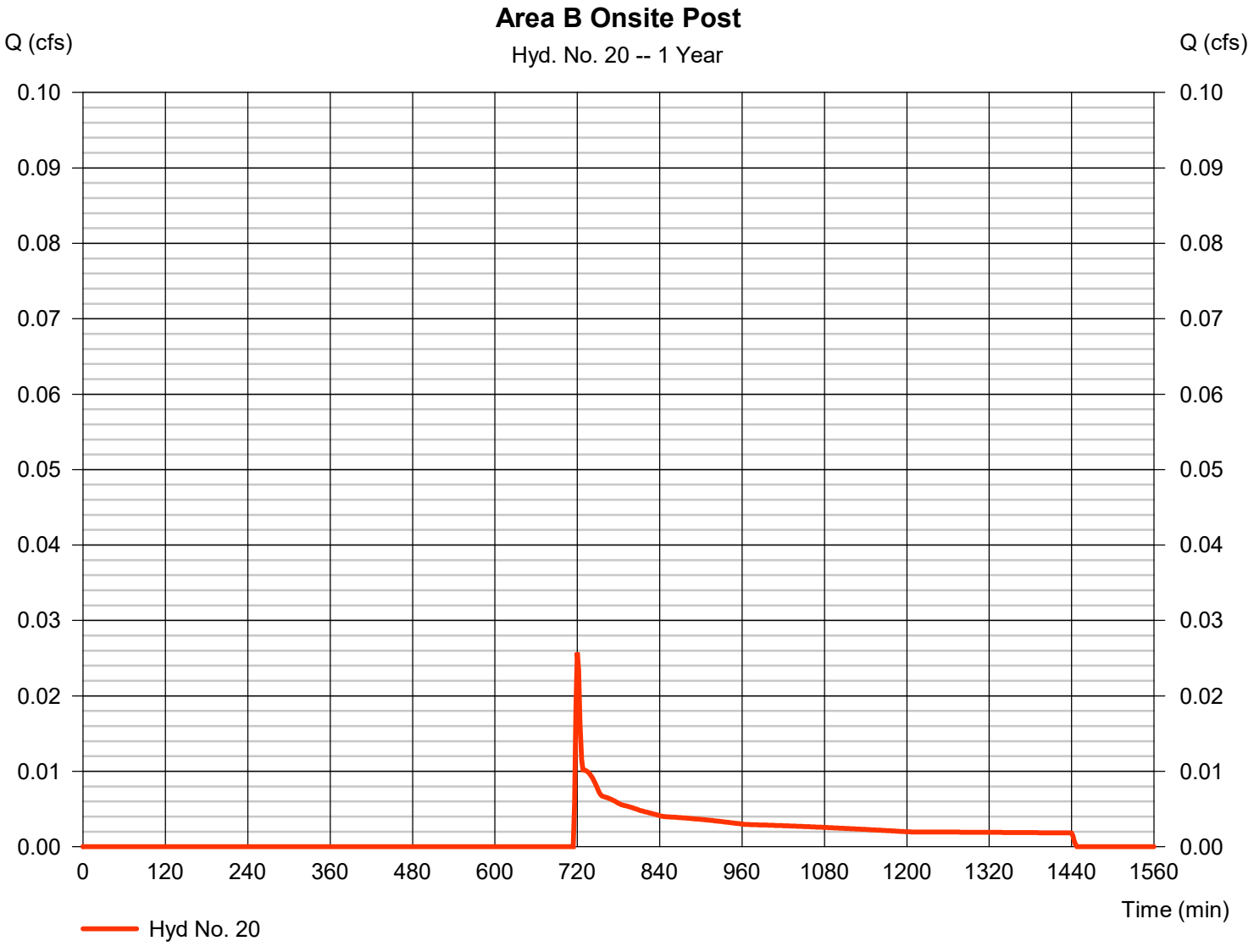


Hydrograph Report

Hyd. No. 20

Area B Onsite Post

Hydrograph type	= SCS Runoff	Peak discharge	= 0.026 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 144 cuft
Drainage area	= 0.230 ac	Curve number	= 55.8
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

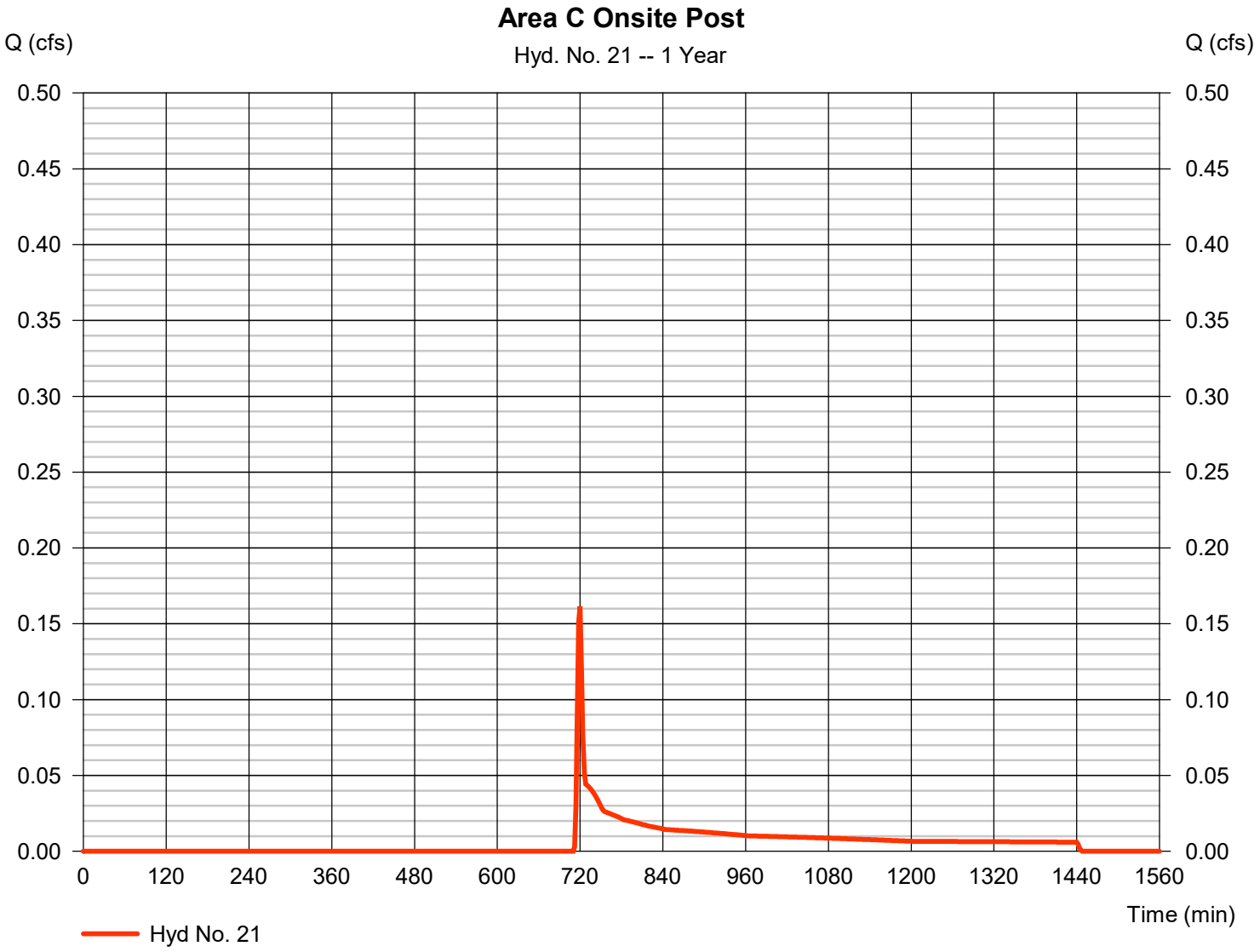


Hydrograph Report

Hyd. No. 21

Area C Onsite Post

Hydrograph type	= SCS Runoff	Peak discharge	= 0.161 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 550 cuft
Drainage area	= 0.620 ac	Curve number	= 58.8
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

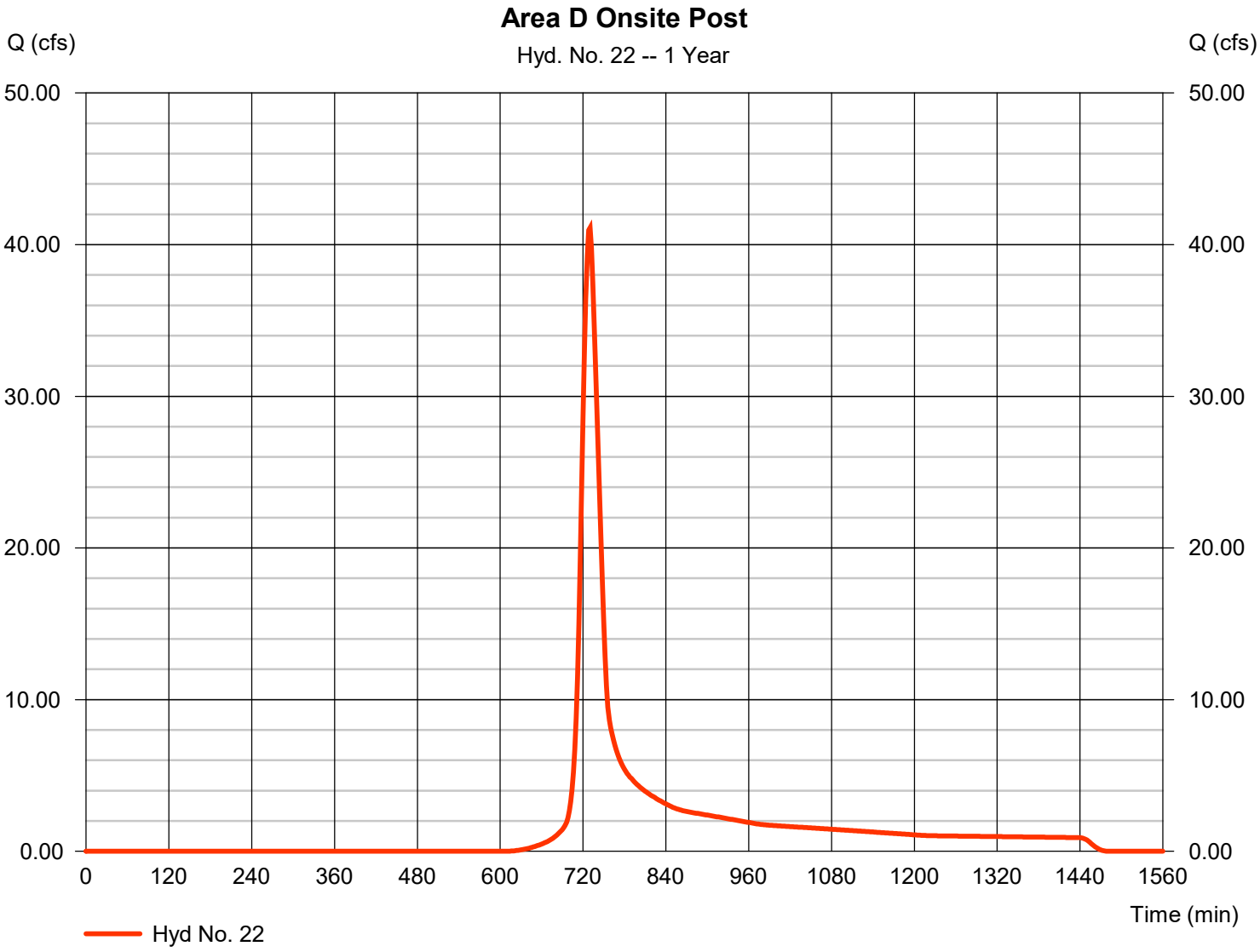


Hydrograph Report

Hyd. No. 22

Area D Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	41.12 cfs
Storm frequency	=	1 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	155,699 cuft
Drainage area	=	38.890 ac	Curve number	=	79.2
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 22

Area D Onsite Post

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 15.61**	**+**	**0.00**	**+**	**0.00**	**=**	**15.61**
Shallow Concentrated Flow							
Flow length (ft)	= 830.00		0.00		0.00		
Watercourse slope (%)	= 4.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.23		0.00		0.00		
Travel Time (min)	**= 4.29**	**+**	**0.00**	**+**	**0.00**	**=**	**4.29**
Channel Flow							
X sectional flow area (sqft)	= 27.00		0.00		0.00		
Wetted perimeter (ft)	= 14.50		0.00		0.00		
Channel slope (%)	= 2.50		0.00		0.00		
Manning's n-value	= 0.030		0.015		0.015		
Velocity (ft/s)	=11.91						
			0.00				
					0.00		
Flow length (ft)	({0})2955.0		0.0		0.0		
Travel Time (min)	**= 4.13**	**+**	**0.00**	**+**	**0.00**	**=**	**4.13**

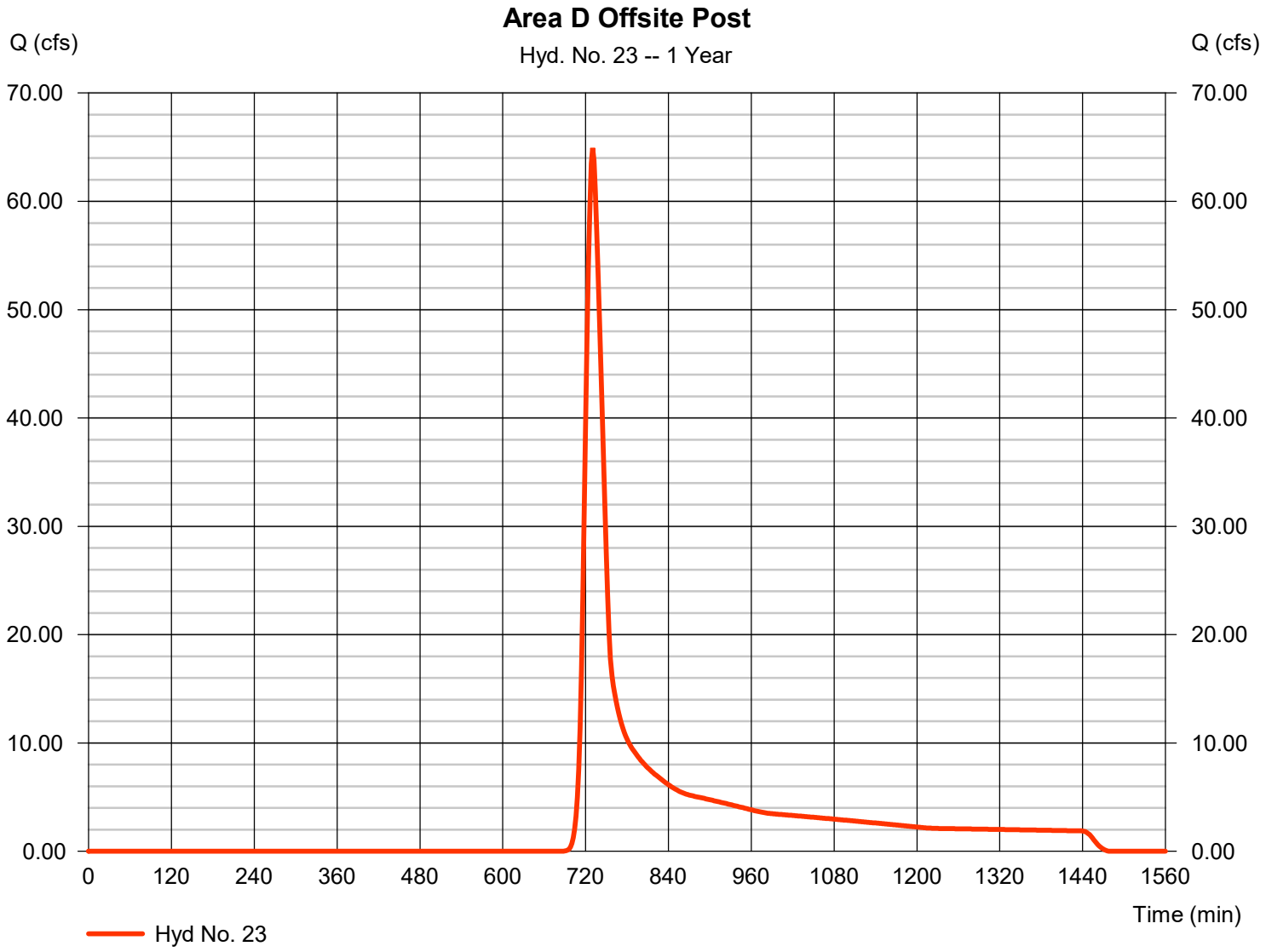
Total Travel Time, Tc ..... 24.00 min

Hydrograph Report

Hyd. No. 23

Area D Offsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	64.92 cfs
Storm frequency	=	1 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	269,318 cuft
Drainage area	=	101.380 ac	Curve number	=	72
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 23

Area D Offsite Post

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 15.61**	**+**	**0.00**	**+**	**0.00**	**=**	**15.61**
Shallow Concentrated Flow							
Flow length (ft)	= 830.00		0.00		0.00		
Watercourse slope (%)	= 4.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.23		0.00		0.00		
Travel Time (min)	**= 4.29**	**+**	**0.00**	**+**	**0.00**	**=**	**4.29**
Channel Flow							
X sectional flow area (sqft)	= 27.00		0.00		0.00		
Wetted perimeter (ft)	= 14.50		0.00		0.00		
Channel slope (%)	= 2.50		0.00		0.00		
Manning's n-value	= 0.030		0.015		0.015		
Velocity (ft/s)	=11.91						
			0.00				
					0.00		
Flow length (ft)	({0})2955.0		0.0		0.0		
Travel Time (min)	**= 4.13**	**+**	**0.00**	**+**	**0.00**	**=**	**4.13**

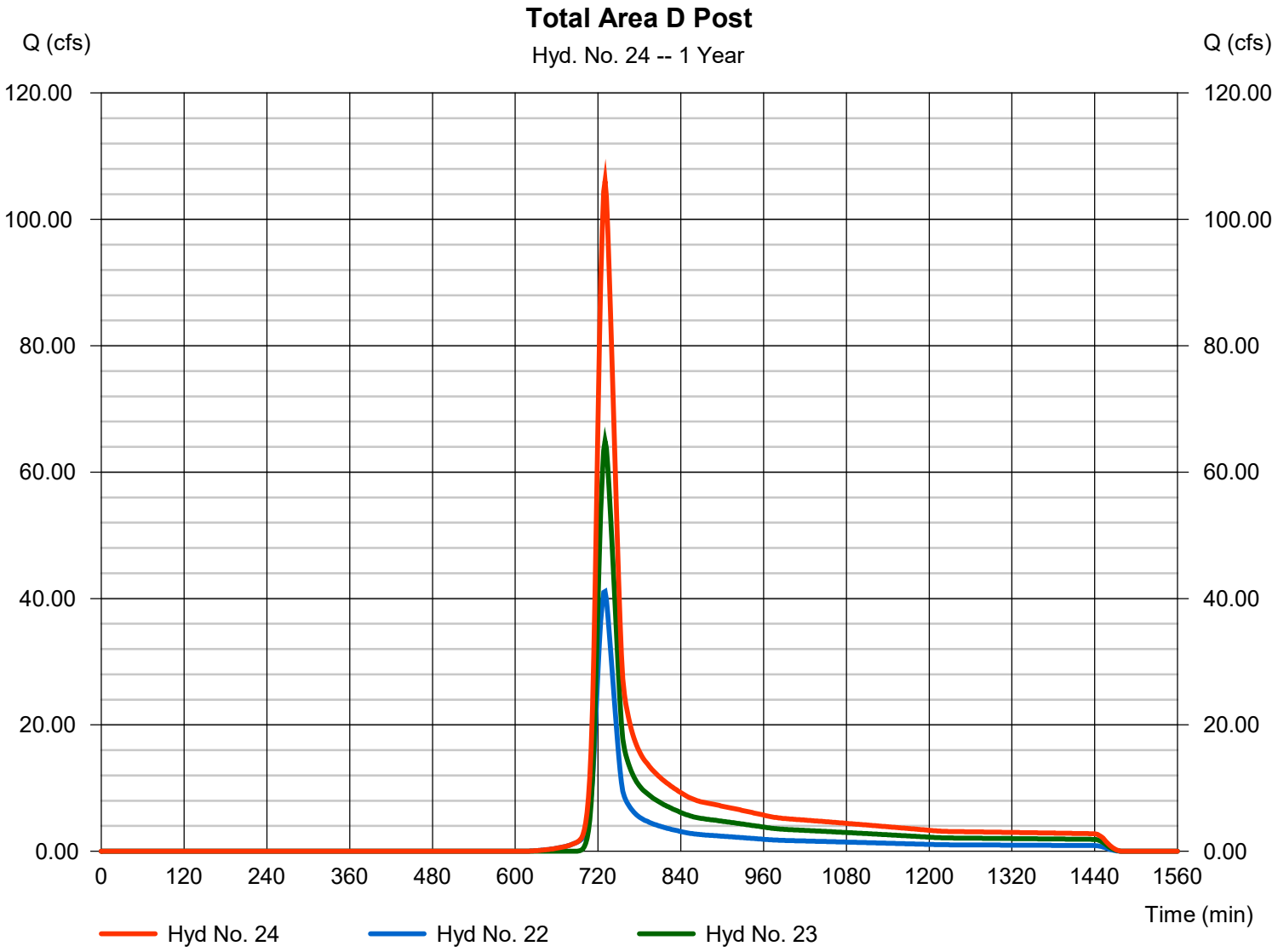
Total Travel Time, Tc ..... 24.00 min

Hydrograph Report

Hyd. No. 24

Total Area D Post

Hydrograph type	= Combine	Peak discharge	= 106.04 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 425,017 cuft
Inflow hyds.	= 22, 23	Contrib. drain. area	= 140.270 ac

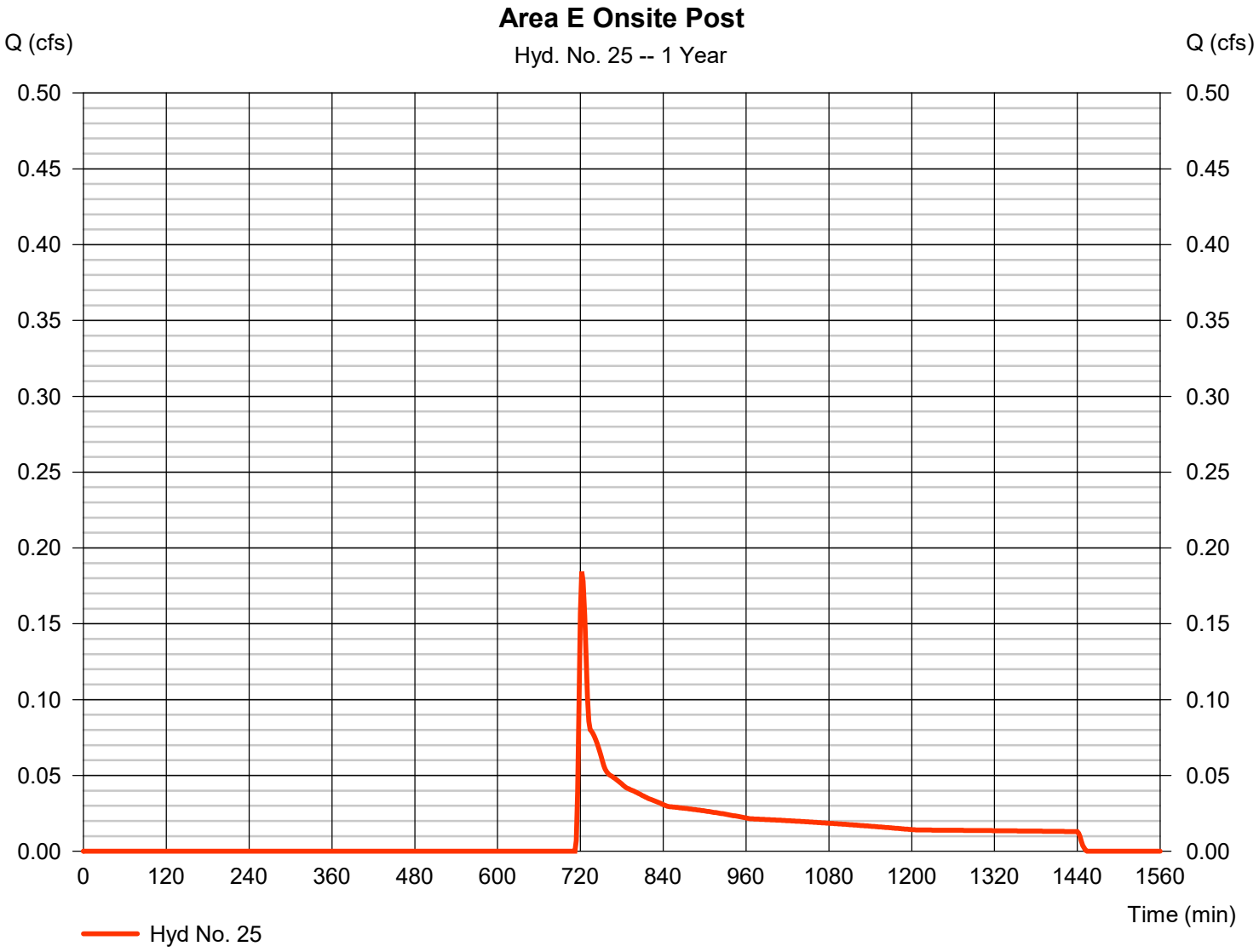


Hydrograph Report

Hyd. No. 25

Area E Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.184 cfs
Storm frequency	=	1 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	1,088 cuft
Drainage area	=	1.420 ac	Curve number	=	56.9
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.20 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 25

Area E Onsite Post

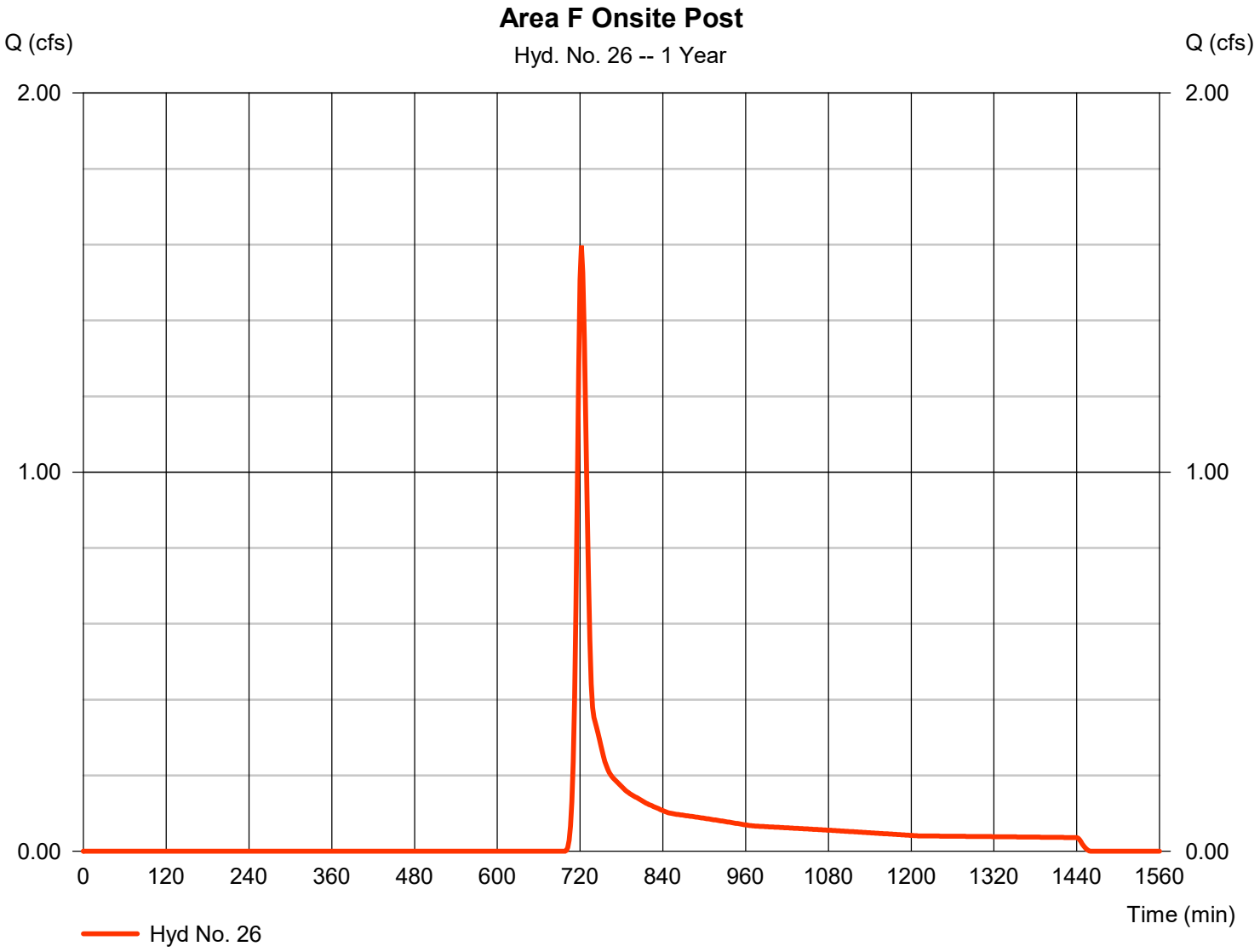
Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.410		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 6.00		0.00		0.00		
Travel Time (min)	**= 7.77**	**+**	**0.00**	**+**	**0.00**	**=**	**7.77**
Shallow Concentrated Flow							
Flow length (ft)	= 177.00		0.00		0.00		
Watercourse slope (%)	= 17.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=6.65		0.00		0.00		
Travel Time (min)	**= 0.44**	**+**	**0.00**	**+**	**0.00**	**=**	**0.44**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Total Travel Time, Tc							**8.20 min**

Hydrograph Report

Hyd. No. 26

Area F Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.597 cfs
Storm frequency	=	1 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	4,732 cuft
Drainage area	=	2.110 ac	Curve number	=	68.7
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.60 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 26

Area F Onsite Post

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 5.00		0.00		0.00		
Travel Time (min)	**= 5.45**	**+**	**0.00**	**+**	**0.00**	**=**	**5.45**
Shallow Concentrated Flow							
Flow length (ft)	= 760.00		0.00		0.00		
Watercourse slope (%)	= 2.80		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.70		0.00		0.00		
Travel Time (min)	**= 4.69**	**+**	**0.00**	**+**	**0.00**	**=**	**4.69**
Channel Flow							
X sectional flow area (sqft)	= 3.14		0.00		0.00		
Wetted perimeter (ft)	= 6.28		0.00		0.00		
Channel slope (%)	= 1.80		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=8.38						
			0.00				
					0.00		
Flow length (ft)	({0})1220.0		0.0		0.0		
Travel Time (min)	**= 2.43**	**+**	**0.00**	**+**	**0.00**	**=**	**2.43**

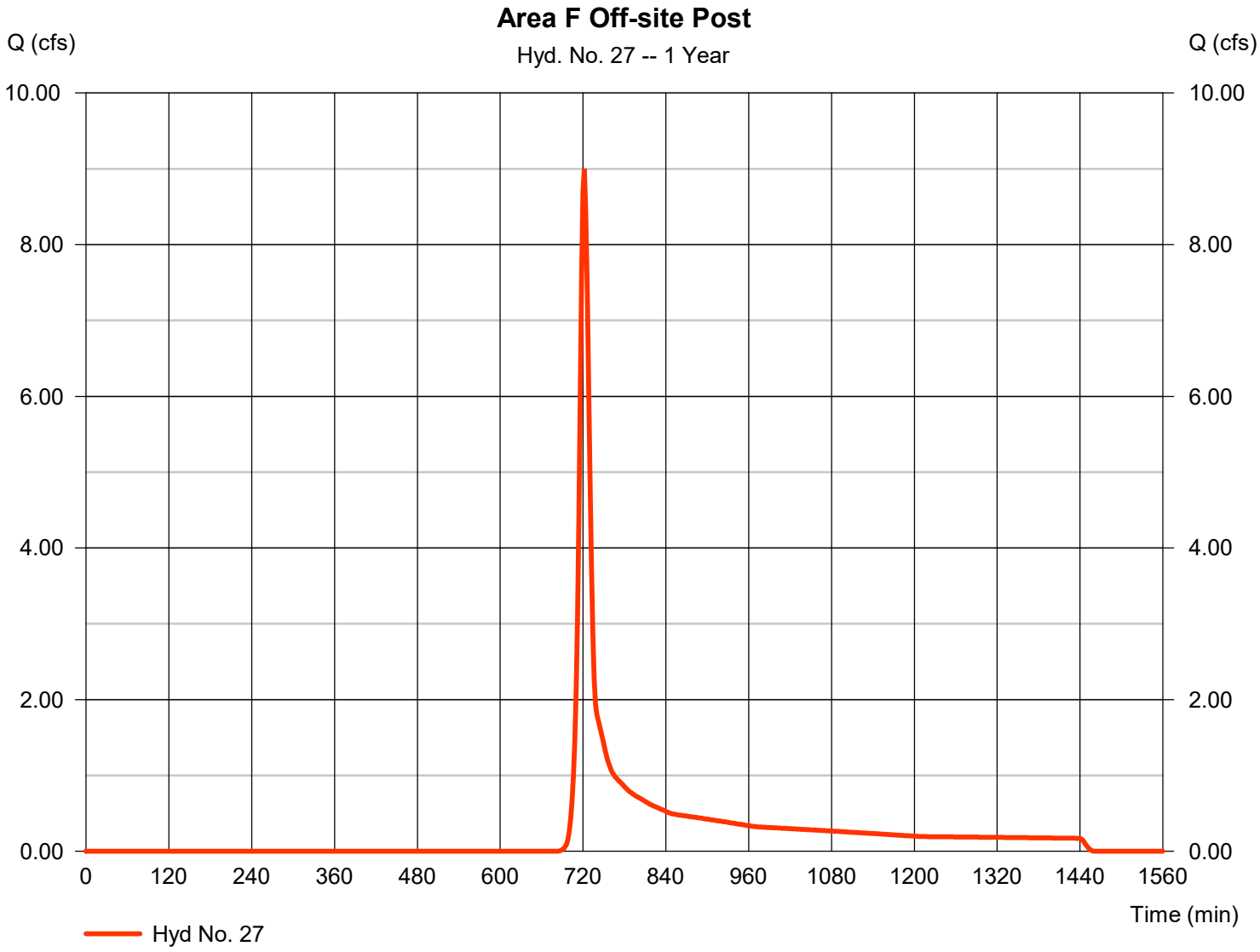
Total Travel Time, Tc ..... 12.60 min

Hydrograph Report

Hyd. No. 27

Area F Off-site Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.999 cfs
Storm frequency	=	1 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	24,905 cuft
Drainage area	=	8.730 ac	Curve number	=	72.4
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.60 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

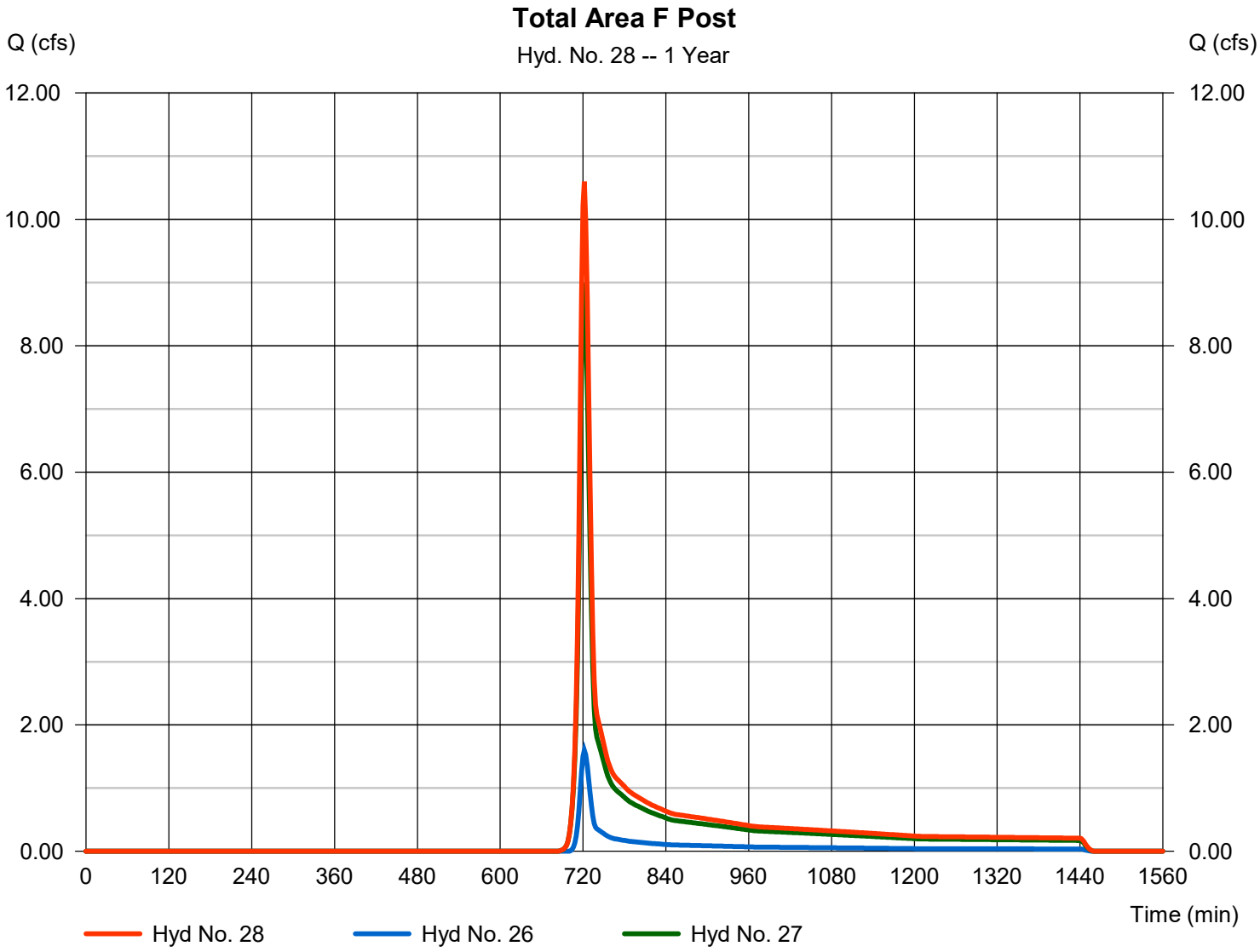


Hydrograph Report

Hyd. No. 28

Total Area F Post

Hydrograph type	= Combine	Peak discharge	= 10.60 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 29,637 cuft
Inflow hyds.	= 26, 27	Contrib. drain. area	= 10.840 ac

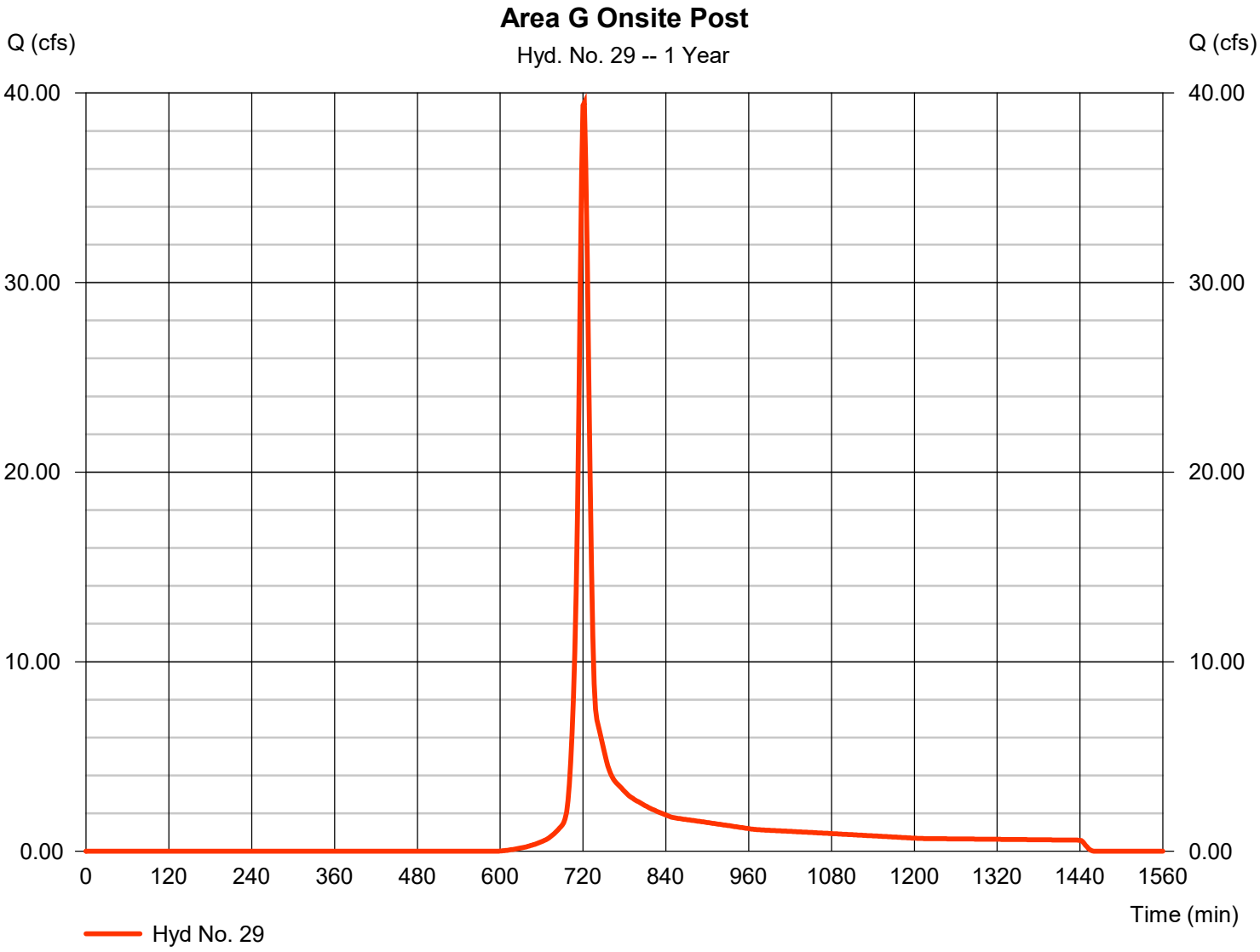


Hydrograph Report

Hyd. No. 29

Area G Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	39.49 cfs
Storm frequency	=	1 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	103,578 cuft
Drainage area	=	23.810 ac	Curve number	=	79.9
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.40 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 29

Area G Onsite Post

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.410		0.011		0.011		
Flow length (ft)	= 30.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.50		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 7.99**	**+**	**0.00**	**+**	**0.00**	**=**	**7.99**
Shallow Concentrated Flow							
Flow length (ft)	= 178.00		0.00		0.00		
Watercourse slope (%)	= 1.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.98		0.00		0.00		
Travel Time (min)	**= 1.50**	**+**	**0.00**	**+**	**0.00**	**=**	**1.50**
Channel Flow							
X sectional flow area (sqft)	= 3.14		0.00		0.00		
Wetted perimeter (ft)	= 6.28		0.00		0.00		
Channel slope (%)	= 3.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=10.81						
			0.00				
					0.00		
Flow length (ft)	({0})615.0		0.0		0.0		
Travel Time (min)	**= 0.95**	**+**	**0.00**	**+**	**0.00**	**=**	**0.95**

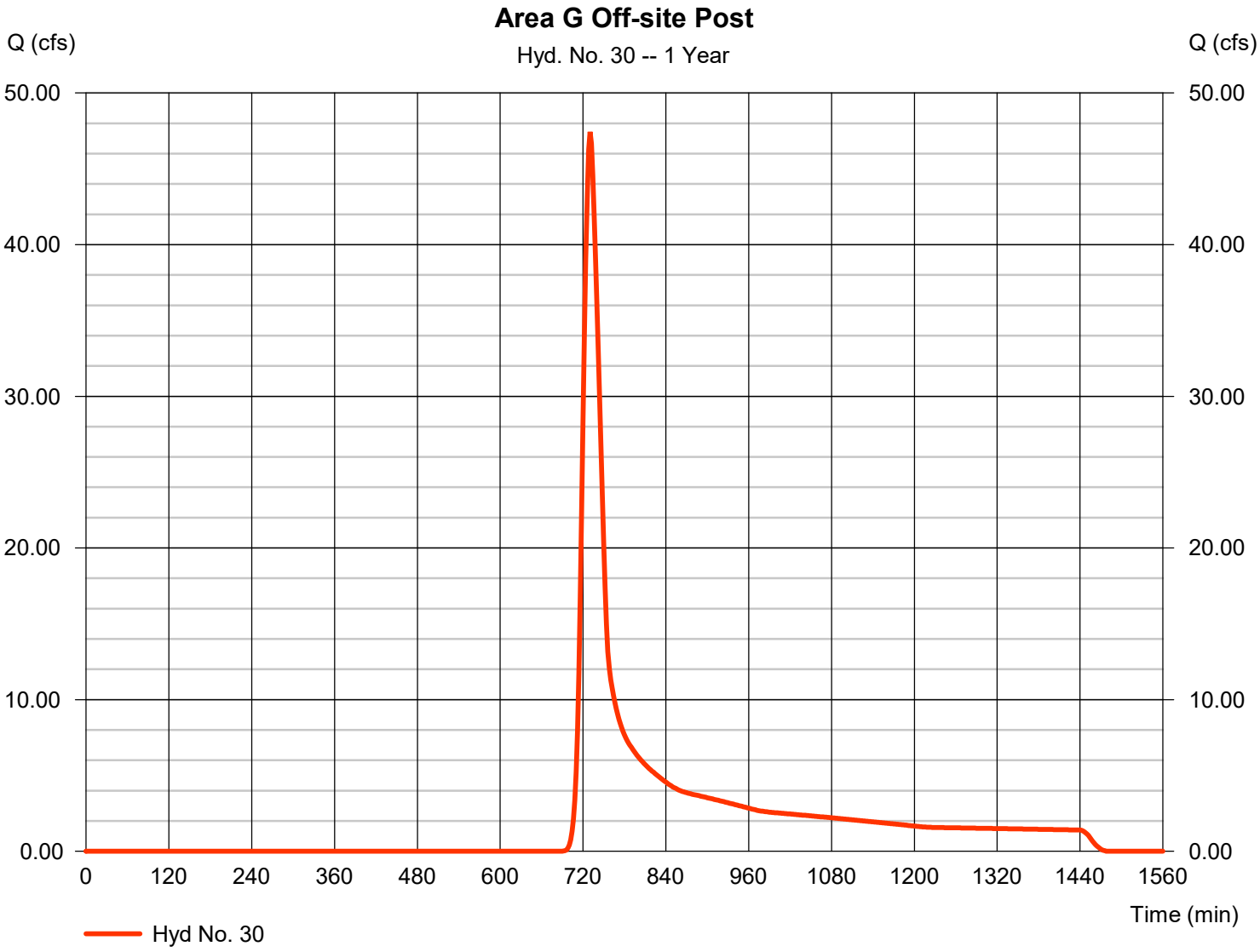
Total Travel Time, Tc ..... 10.40 min

Hydrograph Report

Hyd. No. 30

Area G Off-site Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	47.43 cfs
Storm frequency	=	1 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	198,458 cuft
Drainage area	=	76.600 ac	Curve number	=	71.6
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	23.80 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 30

Area G Off-site Post

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.50		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 7.84**	**+**	**0.00**	**+**	**0.00**	**=**	**7.84**
Shallow Concentrated Flow							
Flow length (ft)	= 2053.00		0.00		0.00		
Watercourse slope (%)	= 2.80		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.70		0.00		0.00		
Travel Time (min)	**= 12.67**	**+**	**0.00**	**+**	**0.00**	**=**	**12.67**
Channel Flow							
X sectional flow area (sqft)	= 10.00		0.00		0.00		
Wetted perimeter (ft)	= 8.66		0.00		0.00		
Channel slope (%)	= 1.60		0.00		0.00		
Manning's n-value	= 0.025		0.015		0.015		
Velocity (ft/s)	=8.30						
			0.00				
					0.00		
Flow length (ft)	({0})1635.0		0.0		0.0		
Travel Time (min)	**= 3.28**	**+**	**0.00**	**+**	**0.00**	**=**	**3.28**

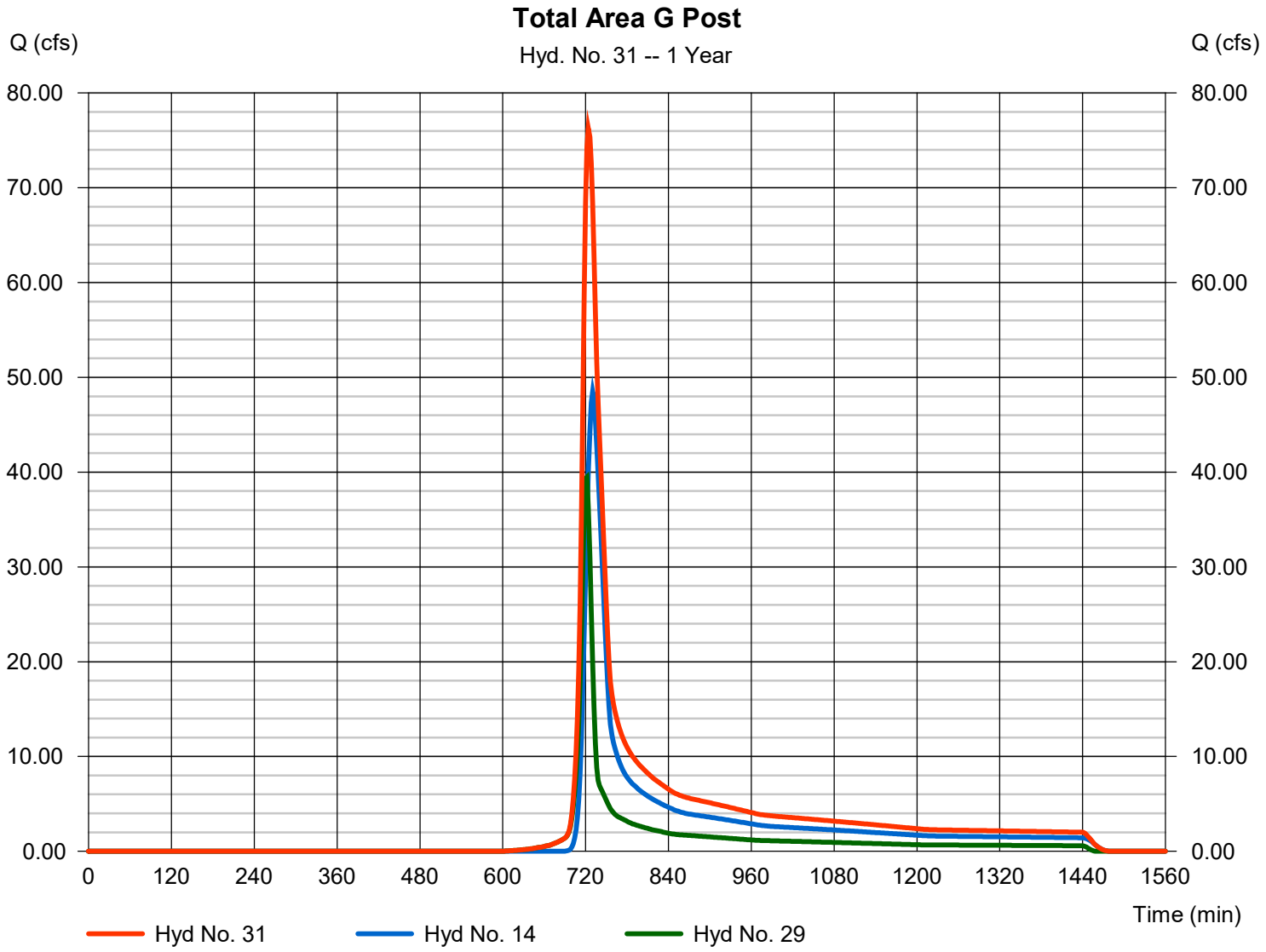
Total Travel Time, Tc ..... 23.80 min

Hydrograph Report

Hyd. No. 31

Total Area G Post

Hydrograph type	= Combine	Peak discharge	= 76.26 cfs
Storm frequency	= 1 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 305,920 cuft
Inflow hyds.	= 14, 29	Contrib. drain. area	= 101.420 ac

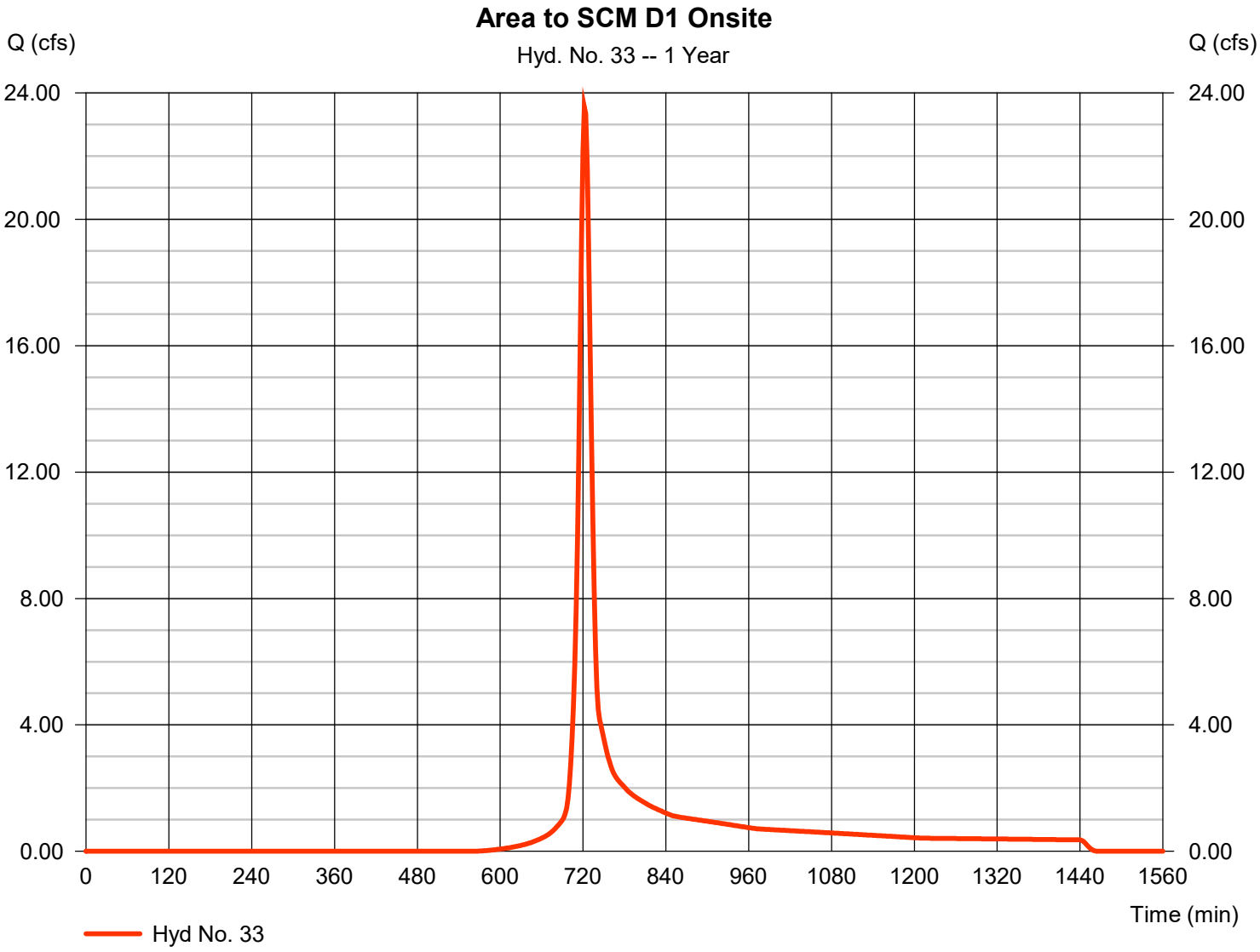


Hydrograph Report

Hyd. No. 33

Area to SCM D1 Onsite

Hydrograph type	= SCS Runoff	Peak discharge	= 23.56 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 66,609 cuft
Drainage area	= 14.850 ac	Curve number	= 81.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 16.30 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 33

Area to SCM D1 Onsite

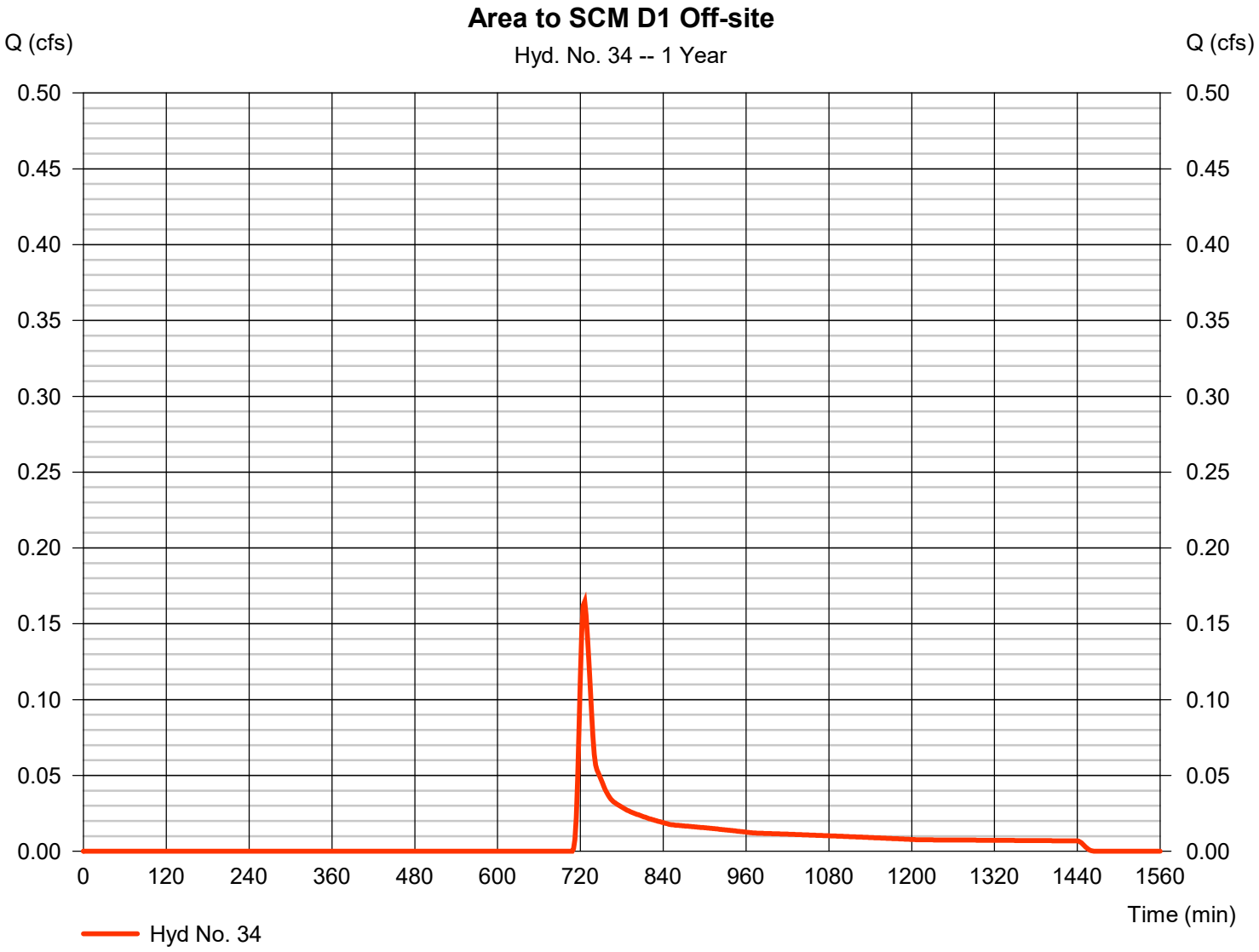
Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.410		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 1.70		0.00		0.00		
Travel Time (min)	**= 12.87**	**+**	**0.00**	**+**	**0.00**	**=**	**12.87**
Shallow Concentrated Flow							
Flow length (ft)	= 140.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		0.00		0.00		
Travel Time (min)	**= 1.02**	**+**	**0.00**	**+**	**0.00**	**=**	**1.02**
Channel Flow							
X sectional flow area (sqft)	= 3.14		0.00		0.00		
Wetted perimeter (ft)	= 6.28		0.00		0.00		
Channel slope (%)	= 2.50		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=9.87						
			0.00				
					0.00		
Flow length (ft)	({0})1445.0		0.0		0.0		
Travel Time (min)	**= 2.44**	**+**	**0.00**	**+**	**0.00**	**=**	**2.44**
Total Travel Time, Tc							**16.30 min**

Hydrograph Report

Hyd. No. 34

Area to SCM D1 Off-site

Hydrograph type	= SCS Runoff	Peak discharge	= 0.165 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 723 cuft
Drainage area	= 0.560 ac	Curve number	= 62.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.30 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

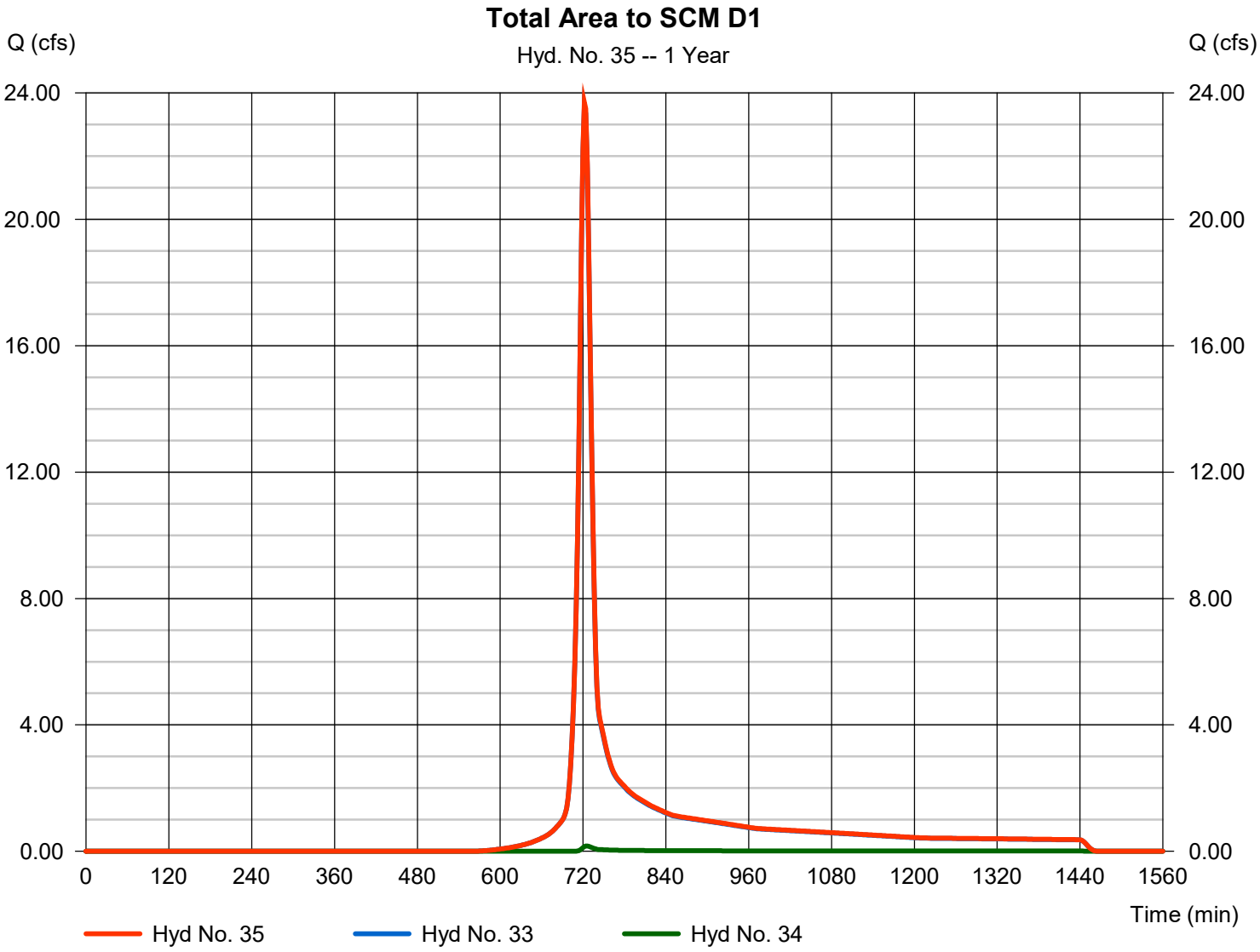


Hydrograph Report

Hyd. No. 35

Total Area to SCM D1

Hydrograph type	= Combine	Peak discharge	= 23.70 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 67,332 cuft
Inflow hyds.	= 33, 34	Contrib. drain. area	= 15.410 ac



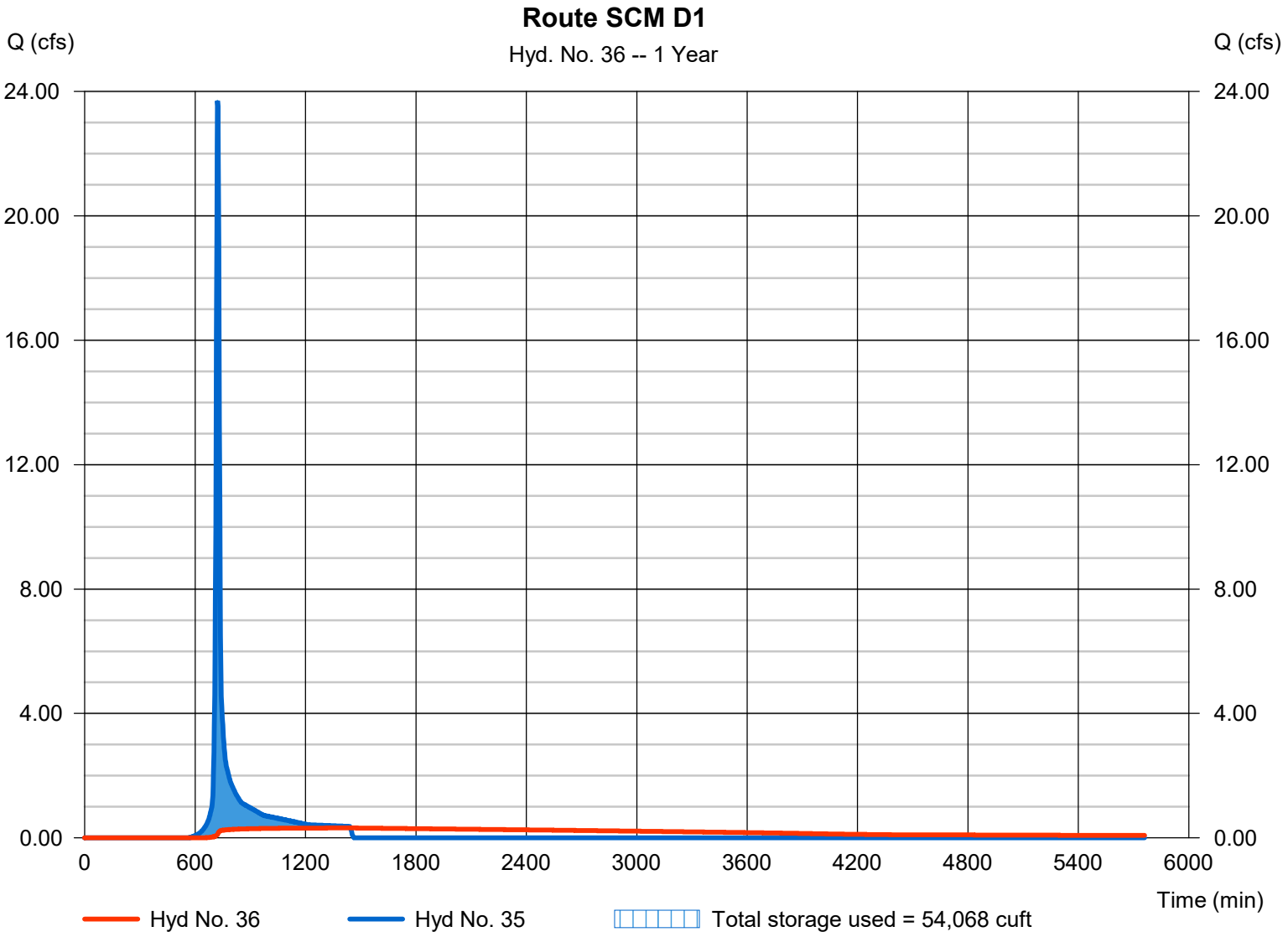
Hydrograph Report

Hyd. No. 36

Route SCM D1

Hydrograph type	=	Reservoir	Peak discharge	=	0.318 cfs
Storm frequency	=	1 yrs	Time to peak	=	1444 min
Time interval	=	2 min	Hyd. volume	=	58,494 cuft
Inflow hyd. No.	=	35 - Total Area to SCM D1	Max. Elevation	=	383.90 ft
Reservoir name	=	SCM D1	Max. Storage	=	54,068 cuft

Storage Indication method used.



Pond No. 1 - SCM D1

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 381.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	381.00	11,600	0	0
0.50	381.50	17,400	7,200	7,200
1.00	382.00	18,250	8,911	16,111
2.00	383.00	19,980	19,107	35,218
3.00	384.00	21,770	20,867	56,084
4.00	385.00	23,620	22,686	78,771
5.00	386.00	25,520	24,561	103,332
6.00	387.00	27,480	26,491	129,824
7.00	388.00	29,500	28,481	158,305
8.00	389.00	31,570	30,526	188,831

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	2.00	2.00	0.00
Span (in)	= 15.00	2.00	2.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 378.00	381.00	382.00	0.00
Length (ft)	= 118.00	0.50	0.50	0.00
Slope (%)	= 0.80	0.10	0.10	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.50	0.50	8.00	0.00
Crest El. (ft)	= 386.50	385.00	387.50	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	381.00	0.00	0.00	0.00	---	0.00	0.00	0.00	---	---	---	0.000
0.05	720	381.05	7.87 oc	0.00 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.004
0.10	1,440	381.10	7.87 oc	0.01 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.015
0.15	2,160	381.15	7.87 oc	0.03 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.027
0.20	2,880	381.20	7.87 oc	0.04 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.036
0.25	3,600	381.25	7.87 oc	0.04 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.043
0.30	4,320	381.30	7.87 oc	0.05 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.049
0.35	5,040	381.35	7.87 oc	0.05 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.054
0.40	5,760	381.40	7.87 oc	0.06 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.059
0.45	6,480	381.45	7.87 oc	0.06 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.064
0.50	7,200	381.50	7.87 oc	0.07 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.068
0.55	8,092	381.55	7.87 oc	0.07 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.072
0.60	8,983	381.60	7.87 oc	0.08 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.075
0.65	9,874	381.65	7.87 oc	0.08 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.079
0.70	10,765	381.70	7.87 oc	0.08 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.082
0.75	11,656	381.75	7.87 oc	0.09 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.086
0.80	12,547	381.80	7.87 oc	0.09 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.089
0.85	13,438	381.85	7.87 oc	0.09 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.092
0.90	14,329	381.90	7.87 oc	0.09 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.095
0.95	15,220	381.95	7.87 oc	0.10 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.098
1.00	16,111	382.00	7.87 oc	0.10 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.101
1.10	18,022	382.10	7.87 oc	0.11 ic	0.01 ic	---	0.00	0.00	0.00	---	---	---	0.121
1.20	19,933	382.20	7.87 oc	0.11 ic	0.04 ic	---	0.00	0.00	0.00	---	---	---	0.147
1.30	21,843	382.30	7.87 oc	0.12 ic	0.05 ic	---	0.00	0.00	0.00	---	---	---	0.165
1.40	23,754	382.40	7.87 oc	0.12 ic	0.06 ic	---	0.00	0.00	0.00	---	---	---	0.180
1.50	25,665	382.50	7.87 oc	0.13 ic	0.07 ic	---	0.00	0.00	0.00	---	---	---	0.193
1.60	27,575	382.60	7.87 oc	0.13 ic	0.08 ic	---	0.00	0.00	0.00	---	---	---	0.205
1.70	29,486	382.70	7.87 oc	0.13 ic	0.08 ic	---	0.00	0.00	0.00	---	---	---	0.216
1.80	31,396	382.80	7.87 oc	0.14 ic	0.09 ic	---	0.00	0.00	0.00	---	---	---	0.227
1.90	33,307	382.90	7.87 oc	0.14 ic	0.09 ic	---	0.00	0.00	0.00	---	---	---	0.236
2.00	35,218	383.00	7.87 oc	0.15 ic	0.10 ic	---	0.00	0.00	0.00	---	---	---	0.246
2.10	37,304	383.10	7.87 oc	0.15 ic	0.11 ic	---	0.00	0.00	0.00	---	---	---	0.255
2.20	39,391	383.20	7.87 oc	0.15 ic	0.1		0.00	0.00	0.00	---	---	---	0.264

Continues on next page...

SCM D1

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.30	41,478	383.30	7.87 oc	0.16 ic	0.12 ic	---	0.00	0.00	0.00	---	---	---	0.272
2.40	43,564	383.40	7.87 oc	0.16 ic	0.12 ic	---	0.00	0.00	0.00	---	---	---	0.280
2.50	45,651	383.50	7.87 oc	0.16 ic	0.13 ic	---	0.00	0.00	0.00	---	---	---	0.288
2.60	47,738	383.60	7.87 oc	0.17 ic	0.13 ic	---	0.00	0.00	0.00	---	---	---	0.296
2.70	49,824	383.70	7.87 oc	0.17 ic	0.13 ic	---	0.00	0.00	0.00	---	---	---	0.303
2.80	51,911	383.80	7.87 oc	0.17 ic	0.14 ic	---	0.00	0.00	0.00	---	---	---	0.311
2.90	53,998	383.90	7.87 oc	0.18 ic	0.14 ic	---	0.00	0.00	0.00	---	---	---	0.318
3.00	56,084	384.00	7.87 oc	0.18 ic	0.15 ic	---	0.00	0.00	0.00	---	---	---	0.325
3.10	58,353	384.10	7.87 oc	0.18 ic	0.15 ic	---	0.00	0.00	0.00	---	---	---	0.332
3.20	60,622	384.20	7.87 oc	0.19 ic	0.15 ic	---	0.00	0.00	0.00	---	---	---	0.338
3.30	62,890	384.30	7.87 oc	0.19 ic	0.16 ic	---	0.00	0.00	0.00	---	---	---	0.345
3.40	65,159	384.40	7.87 oc	0.19 ic	0.16 ic	---	0.00	0.00	0.00	---	---	---	0.351
3.50	67,428	384.50	7.87 oc	0.19 ic	0.16 ic	---	0.00	0.00	0.00	---	---	---	0.357
3.60	69,696	384.60	7.87 oc	0.20 ic	0.17 ic	---	0.00	0.00	0.00	---	---	---	0.364
3.70	71,965	384.70	7.87 oc	0.20 ic	0.17 ic	---	0.00	0.00	0.00	---	---	---	0.370
3.80	74,233	384.80	7.87 oc	0.20 ic	0.17 ic	---	0.00	0.00	0.00	---	---	---	0.376
3.90	76,502	384.90	7.87 oc	0.21 ic	0.18 ic	---	0.00	0.00	0.00	---	---	---	0.381
4.00	78,771	385.00	7.87 oc	0.21 ic	0.18 ic	---	0.00	0.00	0.00	---	---	---	0.387
4.10	81,227	385.10	7.87 oc	0.21 ic	0.18 ic	---	0.00	0.05	0.00	---	---	---	0.446
4.20	83,683	385.20	7.87 oc	0.21 ic	0.19 ic	---	0.00	0.15	0.00	---	---	---	0.547
4.30	86,139	385.30	7.87 oc	0.22 ic	0.19 ic	---	0.00	0.27	0.00	---	---	---	0.678
4.40	88,595	385.40	7.87 oc	0.22 ic	0.19 ic	---	0.00	0.42	0.00	---	---	---	0.831
4.50	91,051	385.50	7.87 oc	0.22 ic	0.19 ic	---	0.00	0.59	0.00	---	---	---	1.004
4.60	93,508	385.60	7.87 oc	0.22 ic	0.20 ic	---	0.00	0.77	0.00	---	---	---	1.194
4.70	95,964	385.70	7.87 oc	0.23 ic	0.20 ic	---	0.00	0.98	0.00	---	---	---	1.401
4.80	98,420	385.80	7.87 oc	0.23 ic	0.20 ic	---	0.00	1.19	0.00	---	---	---	1.622
4.90	100,876	385.90	7.87 oc	0.23 ic	0.21 ic	---	0.00	1.42	0.00	---	---	---	1.857
5.00	103,332	386.00	7.87 oc	0.23 ic	0.21 ic	---	0.00	1.66	0.00	---	---	---	2.106
5.10	105,981	386.10	7.87 oc	0.24 ic	0.21 ic	---	0.00	1.92	0.00	---	---	---	2.367
5.20	108,630	386.20	7.87 oc	0.24 ic	0.21 ic	---	0.00	2.19	0.00	---	---	---	2.639
5.30	111,280	386.30	7.87 oc	0.24 ic	0.22 ic	---	0.00	2.47	0.00	---	---	---	2.924
5.40	113,929	386.40	7.87 oc	0.24 ic	0.22 ic	---	0.00	2.76	0.00	---	---	---	3.219
5.50	116,578	386.50	7.87 oc	0.24 ic	0.22 ic	---	0.00	3.06	0.00	---	---	---	3.524
5.60	119,227	386.60	7.87 oc	0.25 ic	0.22 ic	---	1.63	3.37	0.00	---	---	---	5.473
5.70	121,876	386.70	8.77 oc	0.24 ic	0.23 ic	---	4.62	3.69	0.00	---	---	---	8.770
5.80	124,525	386.80	12.67 oc	0.13 ic	0.13 ic	---	8.48	3.92 s	0.00	---	---	---	12.67
5.90	127,174	386.90	13.87 oc	0.05 ic	0.05 ic	---	11.53 s	2.23 s	0.00	---	---	---	13.87
6.00	129,824	387.00	14.04 oc	0.04 ic	0.04 ic	---	12.10 s	1.87 s	0.00	---	---	---	14.04
6.10	132,672	387.10	14.16 oc	0.03 ic	0.03 ic	---	12.46 s	1.64 s	0.00	---	---	---	14.16
6.20	135,520	387.20	14.26 oc	0.02 ic	0.02 ic	---	12.73 s	1.48 s	0.00	---	---	---	14.26
6.30	138,368	387.30	14.35 oc	0.02 ic	0.02 ic	---	12.94 s	1.36 s	0.00	---	---	---	14.34
6.40	141,216	387.40	14.44 oc	0.02 ic	0.02 ic	---	13.13 s	1.27 s	0.00	---	---	---	14.43
6.50	144,064	387.50	14.52 oc	0.01 ic	0.01 ic	---	13.28 s	1.19 s	0.00	---	---	---	14.50
6.60	146,912	387.60	14.61 oc	0.01 ic	0.01 ic	---	13.45 s	1.13 s	0.66	---	---	---	15.26
6.70	149,760	387.70	14.69 oc	0.01 ic	0.01 ic	---	13.56 s	1.08 s	1.86	---	---	---	16.52
6.80	152,609	387.80	14.77 oc	0.01 ic	0.01 ic	---	13.69 s	1.04 s	3.42	---	---	---	18.17
6.90	155,457	387.90	14.85 oc	0.01 ic	0.01 ic	---	13.76 s	1.00 s	5.26	---	---	---	20.05
7.00	158,305	388.00	14.92 oc	0.01 ic	0.01 ic	---	13.92 s	0.97 s	7.35	---	---	---	22.26
7.10	161,357	388.10	15.00 oc	0.01 ic	0.01 ic	---	13.98 s	0.94 s	9.67	---	---	---	24.61
7.20	164,410	388.20	15.08 oc	0.01 ic	0.01 ic	---	14.12 s	0.92 s	12.18	---	---	---	27.24
7.30	167,463	388.30	15.16 oc	0.01 ic	0.01 ic	---	14.18 s	0.90 s	14.88	---	---	---	29.98
7.40	170,515	388.40	15.23 oc	0.01 ic	0.01 ic	---	14.20 s	0.88 s	17.76	---	---	---	32.85
7.50	173,568	388.50	15.31 oc	0.01 ic	0.01 ic	---	14.37 s	0.87 s	20.80	---	---	---	36.05
7.60	176,620	388.60	15.38 oc	0.01 ic	0.01 ic	---	14.41 s	0.85 s	24.00	---	---	---	39.27
7.70	179,673	388.70	15.46 oc	0.01 ic	0.01 ic	---	14.54 s	0.84 s	27.34	---	---	---	42.73
7.80	182,726	388.80	15.53 oc	0.00 ic	0.00 ic	---	14.55 s	0.82 s	30.83	---	---	---	46.22
7.90	185,778	388.90	15.61 oc	0.00 ic	0.00 ic	---	14.72 s	0.82 s	34.46	---	---	---	50.00
8.00	188,831	389.00	15.68 oc	0.00 ic	0.00 ic	---	14.59 s	0.79 s	38.21	---	---	---	53.60

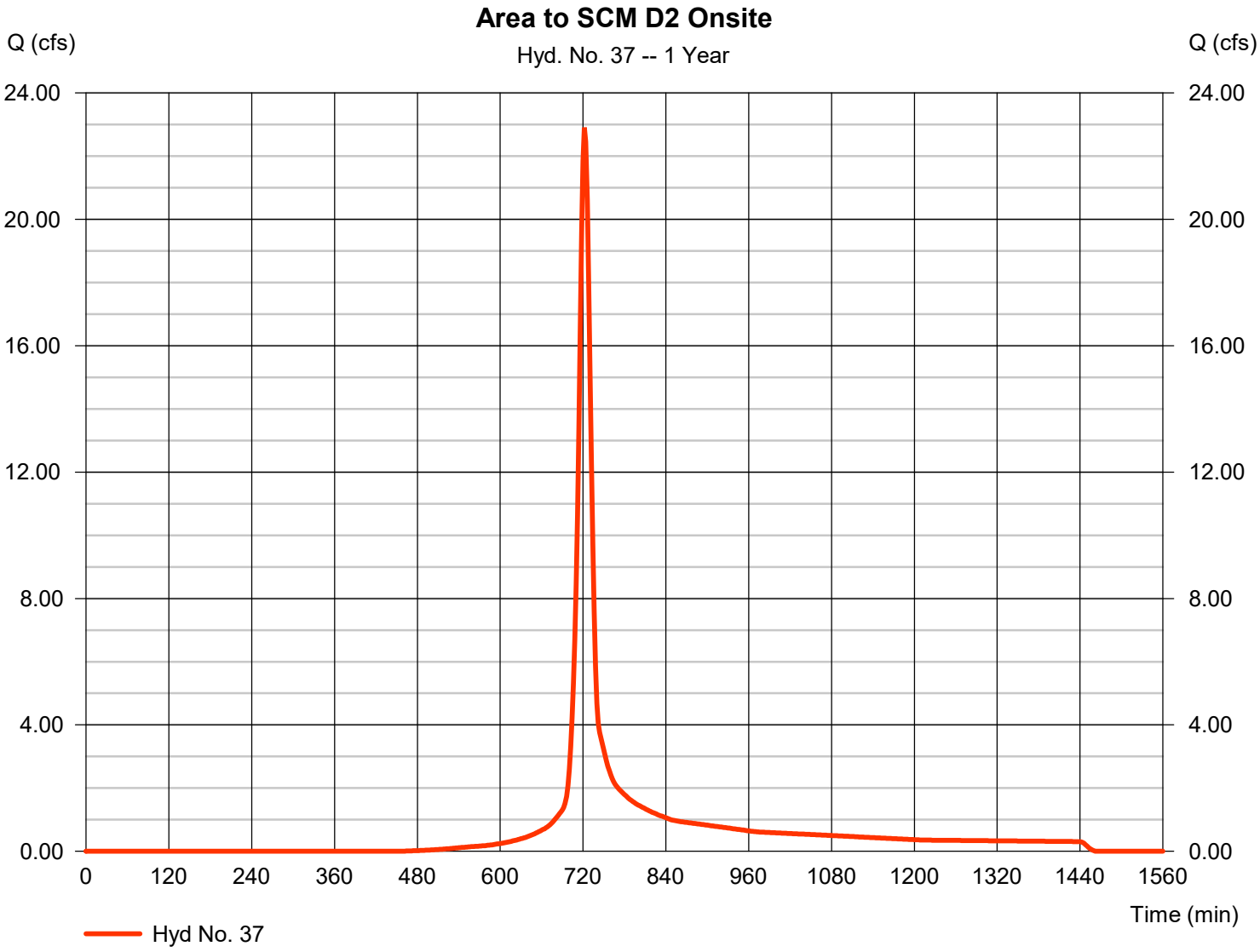
...End

Hydrograph Report

Hyd. No. 37

Area to SCM D2 Onsite

Hydrograph type	= SCS Runoff	Peak discharge	= 22.91 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 64,219 cuft
Drainage area	= 11.300 ac	Curve number	= 86.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.80 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 37

Area to SCM D2 Onsite

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.410		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 12.06**	**+**	**0.00**	**+**	**0.00**	**=**	**12.06**
Shallow Concentrated Flow							
Flow length (ft)	= 190.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		0.00		0.00		
Travel Time (min)	**= 1.39**	**+**	**0.00**	**+**	**0.00**	**=**	**1.39**
Channel Flow							
X sectional flow area (sqft)	= 3.14		0.00		0.00		
Wetted perimeter (ft)	= 6.28		0.00		0.00		
Channel slope (%)	= 5.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=13.96						
			0.00				
					0.00		
Flow length (ft)	({0})305.0		0.0		0.0		
Travel Time (min)	**= 0.36**	**+**	**0.00**	**+**	**0.00**	**=**	**0.36**

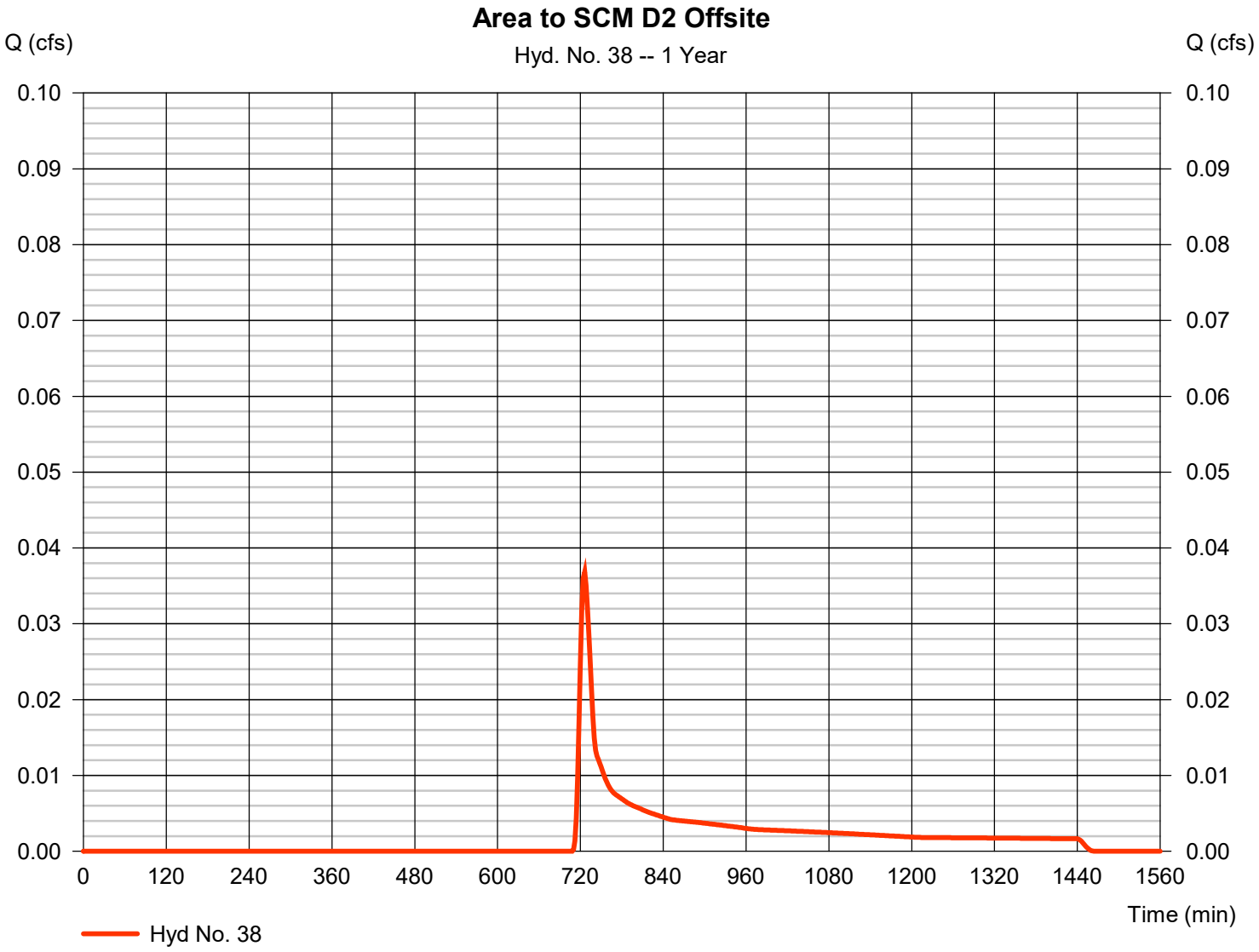
Total Travel Time, Tc ..... 13.80 min

Hydrograph Report

Hyd. No. 38

Area to SCM D2 Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 0.037 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 170 cuft
Drainage area	= 0.140 ac	Curve number	= 61.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 13.80 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

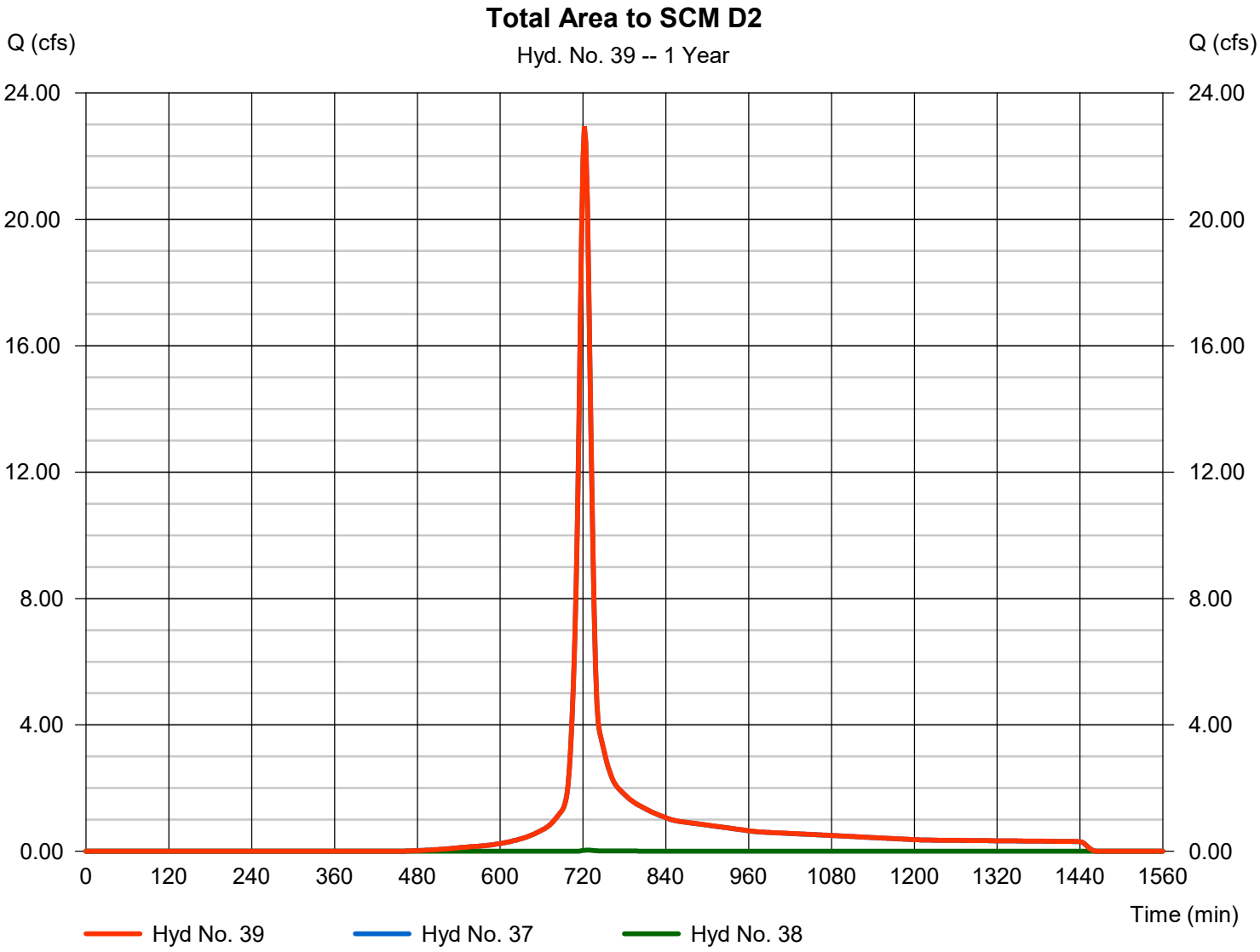


Hydrograph Report

Hyd. No. 39

Total Area to SCM D2

Hydrograph type	= Combine	Peak discharge	= 22.94 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 64,388 cuft
Inflow hyds.	= 37, 38	Contrib. drain. area	= 11.440 ac



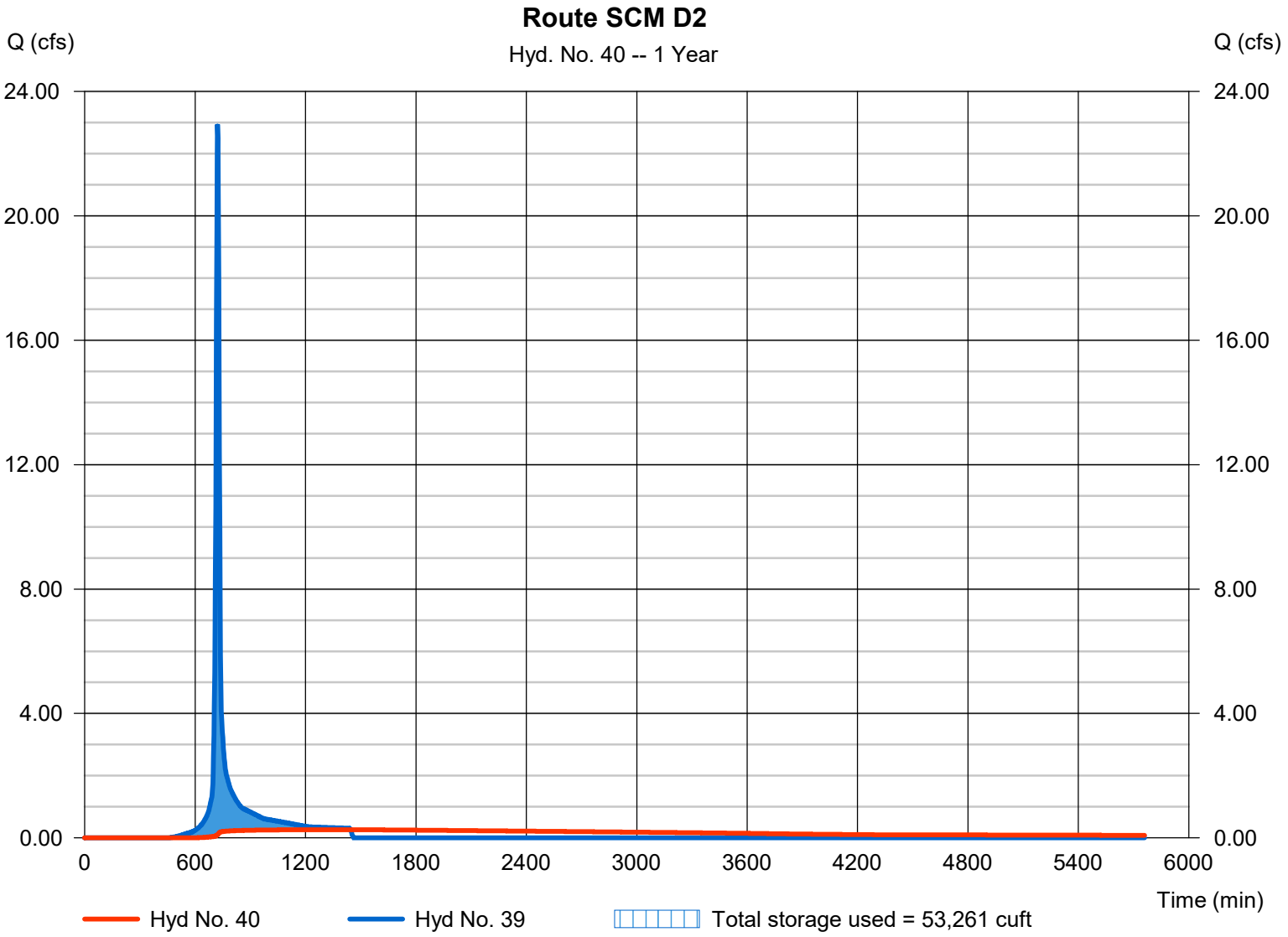
Hydrograph Report

Hyd. No. 40

Route SCM D2

Hydrograph type	=	Reservoir	Peak discharge	=	0.264 cfs
Storm frequency	=	1 yrs	Time to peak	=	1444 min
Time interval	=	2 min	Hyd. volume	=	50,834 cuft
Inflow hyd. No.	=	39 - Total Area to SCM D2	Max. Elevation	=	392.20 ft
Reservoir name	=	SCM D2	Max. Storage	=	53,261 cuft

Storage Indication method used.



Pond No. 2 - SCM D2

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 390.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	390.00	15,350	0	0
0.50	390.50	23,240	9,579	9,579
1.00	391.00	24,550	11,945	21,523
2.00	392.00	27,240	25,881	47,404
3.00	393.00	30,020	28,616	76,020
4.00	394.00	32,870	31,431	107,451
5.00	395.00	35,790	34,316	141,767
6.00	396.00	38,770	37,266	179,034

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	2.00	2.00	0.00
Span (in)	= 18.00	2.00	2.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 387.00	390.00	391.00	0.00
Length (ft)	= 104.00	0.50	0.50	0.00
Slope (%)	= 0.50	0.01	0.01	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.00	1.00	8.00	0.00
Crest El. (ft)	= 393.50	392.50	394.50	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	390.00	0.00	0.00	0.00	---	0.00	0.00	0.00	---	---	---	0.000
0.05	958	390.05	10.96 oc	0.00 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.004
0.10	1,916	390.10	10.96 oc	0.01 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.015
0.15	2,874	390.15	10.96 oc	0.03 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.027
0.20	3,831	390.20	10.96 oc	0.04 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.036
0.25	4,789	390.25	10.96 oc	0.04 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.043
0.30	5,747	390.30	10.96 oc	0.05 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.049
0.35	6,705	390.35	10.96 oc	0.05 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.054
0.40	7,663	390.40	10.96 oc	0.06 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.059
0.45	8,621	390.45	10.96 oc	0.06 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.064
0.50	9,579	390.50	10.96 oc	0.07 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.068
0.55	10,773	390.55	10.96 oc	0.07 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.072
0.60	11,968	390.60	10.96 oc	0.08 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.075
0.65	13,162	390.65	10.96 oc	0.08 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.079
0.70	14,357	390.70	10.96 oc	0.08 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.082
0.75	15,551	390.75	10.96 oc	0.09 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.086
0.80	16,745	390.80	10.96 oc	0.09 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.089
0.85	17,940	390.85	10.96 oc	0.09 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.092
0.90	19,134	390.90	10.96 oc	0.09 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.095
0.95	20,329	390.95	10.96 oc	0.10 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.098
1.00	21,523	391.00	10.96 oc	0.10 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.101
1.10	24,111	391.10	10.96 oc	0.11 ic	0.01 ic	---	0.00	0.00	0.00	---	---	---	0.121
1.20	26,700	391.20	10.96 oc	0.11 ic	0.04 ic	---	0.00	0.00	0.00	---	---	---	0.147
1.30	29,288	391.30	10.96 oc	0.12 ic	0.05 ic	---	0.00	0.00	0.00	---	---	---	0.165
1.40	31,876	391.40	10.96 oc	0.12 ic	0.06 ic	---	0.00	0.00	0.00	---	---	---	0.180
1.50	34,464	391.50	10.96 oc	0.13 ic	0.07 ic	---	0.00	0.00	0.00	---	---	---	0.193
1.60	37,052	391.60	10.96 oc	0.13 ic	0.08 ic	---	0.00	0.00	0.00	---	---	---	0.205
1.70	39,640	391.70	10.96 oc	0.13 ic	0.08 ic	---	0.00	0.00	0.00	---	---	---	0.216
1.80	42,228	391.80	10.96 oc	0.14 ic	0.09 ic	---	0.00	0.00	0.00	---	---	---	0.227
1.90	44,816	391.90	10.96 oc	0.14 ic	0.09 ic	---	0.00	0.00	0.00	---	---	---	0.236
2.00	47,404	392.00	10.96 oc	0.15 ic	0.10 ic	---	0.00	0.00	0.00	---	---	---	0.246
2.10	50,266	392.10	10.96 oc	0.15 ic	0.11 ic	---	0.00	0.00	0.00	---	---	---	0.255
2.20	53,127	392.20	10.96 oc	0.15 ic	0.11 ic	---	0.00	0.00	0.00	---	---	---	0.264
2.30	55,989	392.30	10.96 oc	0.16 ic	0.12 ic	---	0.00	0.00	0.00	---	---	---	0.272
2.40	58,851	392.40	10.96 oc	0.16 ic	0.[illegible]	---	0.00	0.00	0.00	---	---	---	0.280

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SCM D2

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.50	61,712	392.50	10.96 oc	0.16 ic	0.13 ic	---	0.00	0.00	0.00	---	---	---	0.288
2.60	64,574	392.60	10.96 oc	0.17 ic	0.13 ic	---	0.00	0.11	0.00	---	---	---	0.401
2.70	67,435	392.70	10.96 oc	0.17 ic	0.13 ic	---	0.00	0.30	0.00	---	---	---	0.601
2.80	70,297	392.80	10.96 oc	0.17 ic	0.14 ic	---	0.00	0.55	0.00	---	---	---	0.858
2.90	73,158	392.90	10.96 oc	0.18 ic	0.14 ic	---	0.00	0.84	0.00	---	---	---	1.160
3.00	76,020	393.00	10.96 oc	0.18 ic	0.15 ic	---	0.00	1.18	0.00	---	---	---	1.502
3.10	79,163	393.10	10.96 oc	0.18 ic	0.15 ic	---	0.00	1.55	0.00	---	---	---	1.879
3.20	82,306	393.20	10.96 oc	0.19 ic	0.15 ic	---	0.00	1.95	0.00	---	---	---	2.289
3.30	85,449	393.30	10.96 oc	0.19 ic	0.16 ic	---	0.00	2.38	0.00	---	---	---	2.728
3.40	88,593	393.40	10.96 oc	0.19 ic	0.16 ic	---	0.00	2.84	0.00	---	---	---	3.194
3.50	91,736	393.50	10.96 oc	0.19 ic	0.16 ic	---	0.00	3.33	0.00	---	---	---	3.688
3.60	94,879	393.60	10.96 oc	0.20 ic	0.17 ic	---	1.58	3.84	0.00	---	---	---	5.786
3.70	98,022	393.70	10.96 oc	0.20 ic	0.17 ic	---	4.47	4.38	0.00	---	---	---	9.216
3.80	101,165	393.80	13.49 oc	0.17 ic	0.17 ic	---	8.21	4.94	0.00	---	---	---	13.49
3.90	104,308	393.90	17.56 oc	0.09 ic	0.09 ic	---	12.64	4.74 s	0.00	---	---	---	17.56
4.00	107,451	394.00	18.53 oc	0.05 ic	0.05 ic	---	14.91 s	3.52 s	0.00	---	---	---	18.53
4.10	110,883	394.10	18.84 oc	0.04 ic	0.04 ic	---	15.60 s	3.16 s	0.00	---	---	---	18.84
4.20	114,314	394.20	19.08 oc	0.03 ic	0.03 ic	---	16.10 s	2.91 s	0.00	---	---	---	19.07
4.30	117,746	394.30	19.28 oc	0.03 ic	0.03 ic	---	16.49 s	2.73 s	0.00	---	---	---	19.28
4.40	121,178	394.40	19.46 oc	0.02 ic	0.02 ic	---	16.82 s	2.59 s	0.00	---	---	---	19.46
4.50	124,609	394.50	19.63 oc	0.02 ic	0.02 ic	---	17.11 s	2.48 s	0.00	---	---	---	19.63
4.60	128,041	394.60	19.80 oc	0.02 ic	0.02 ic	---	17.37 s	2.38 s	0.66	---	---	---	20.45
4.70	131,473	394.70	19.96 oc	0.02 ic	0.02 ic	---	17.59 s	2.31 s	1.86	---	---	---	21.79
4.80	134,904	394.80	20.11 oc	0.02 ic	0.02 ic	---	17.83 s	2.25 s	3.42	---	---	---	23.53
4.90	138,336	394.90	20.27 oc	0.01 ic	0.01 ic	---	18.02 s	2.19 s	5.26	---	---	---	25.50
5.00	141,767	395.00	20.42 oc	0.01 ic	0.01 ic	---	18.19 s	2.14 s	7.35	---	---	---	27.72
5.10	145,494	395.10	20.56 oc	0.01 ic	0.01 ic	---	18.40 s	2.11 s	9.67	---	---	---	30.20
5.20	149,221	395.20	20.71 oc	0.01 ic	0.01 ic	---	18.57 s	2.07 s	12.18	---	---	---	32.85
5.30	152,947	395.30	20.86 oc	0.01 ic	0.01 ic	---	18.77 s	2.05 s	14.88	---	---	---	35.73
5.40	156,674	395.40	21.00 oc	0.01 ic	0.01 ic	---	18.93 s	2.02 s	17.76	---	---	---	38.74
5.50	160,401	395.50	21.14 oc	0.01 ic	0.01 ic	---	19.09 s	2.00 s	20.80	---	---	---	41.90
5.60	164,127	395.60	21.28 oc	0.01 ic	0.01 ic	---	19.27 s	1.98 s	24.00	---	---	---	45.27
5.70	167,854	395.70	21.42 oc	0.01 ic	0.01 ic	---	19.43 s	1.97 s	27.34	---	---	---	48.75
5.80	171,581	395.80	21.56 oc	0.01 ic	0.01 ic	---	19.58 s	1.95 s	30.83	---	---	---	52.38
5.90	175,307	395.90	21.70 oc	0.01 ic	0.01 ic	---	19.59 s	1.93 s	34.46	---	---	---	55.98
6.00	179,034	396.00	21.84 oc	0.01 ic	0.01 ic	---	19.87 s	1.93 s	38.21	---	---	---	60.02

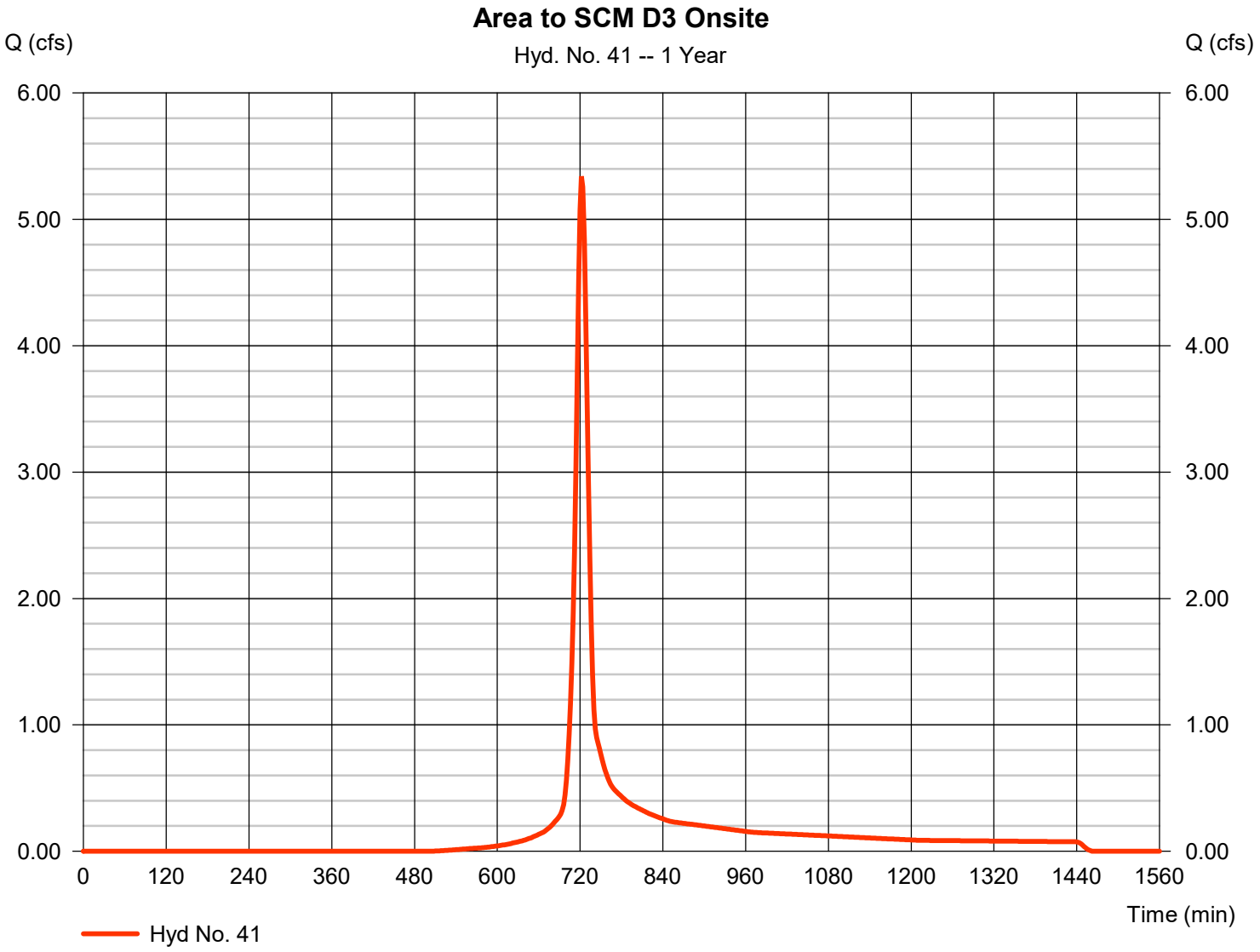
...End

Hydrograph Report

Hyd. No. 41

Area to SCM D3 Onsite

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.342 cfs
Storm frequency	=	1 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	14,983 cuft
Drainage area	=	2.870 ac	Curve number	=	84.7
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.20 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 41

Area to SCM D3 Onsite

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.410		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 12.06**	**+**	**0.00**	**+**	**0.00**	**=**	**12.06**
Shallow Concentrated Flow							
Flow length (ft)	= 25.00		270.00		0.00		
Watercourse slope (%)	= 2.00		1.50		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		2.49		0.00		
Travel Time (min)	**= 0.18**	**+**	**1.81**	**+**	**0.00**	**=**	**1.99**
Channel Flow							
X sectional flow area (sqft)	= 3.14		0.00		0.00		
Wetted perimeter (ft)	= 6.28		0.00		0.00		
Channel slope (%)	= 10.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=19.74						
			0.00				
					0.00		
Flow length (ft)	({0})190.0		0.0		0.0		
Travel Time (min)	**= 0.16**	**+**	**0.00**	**+**	**0.00**	**=**	**0.16**

Total Travel Time, Tc ..... 14.20 min

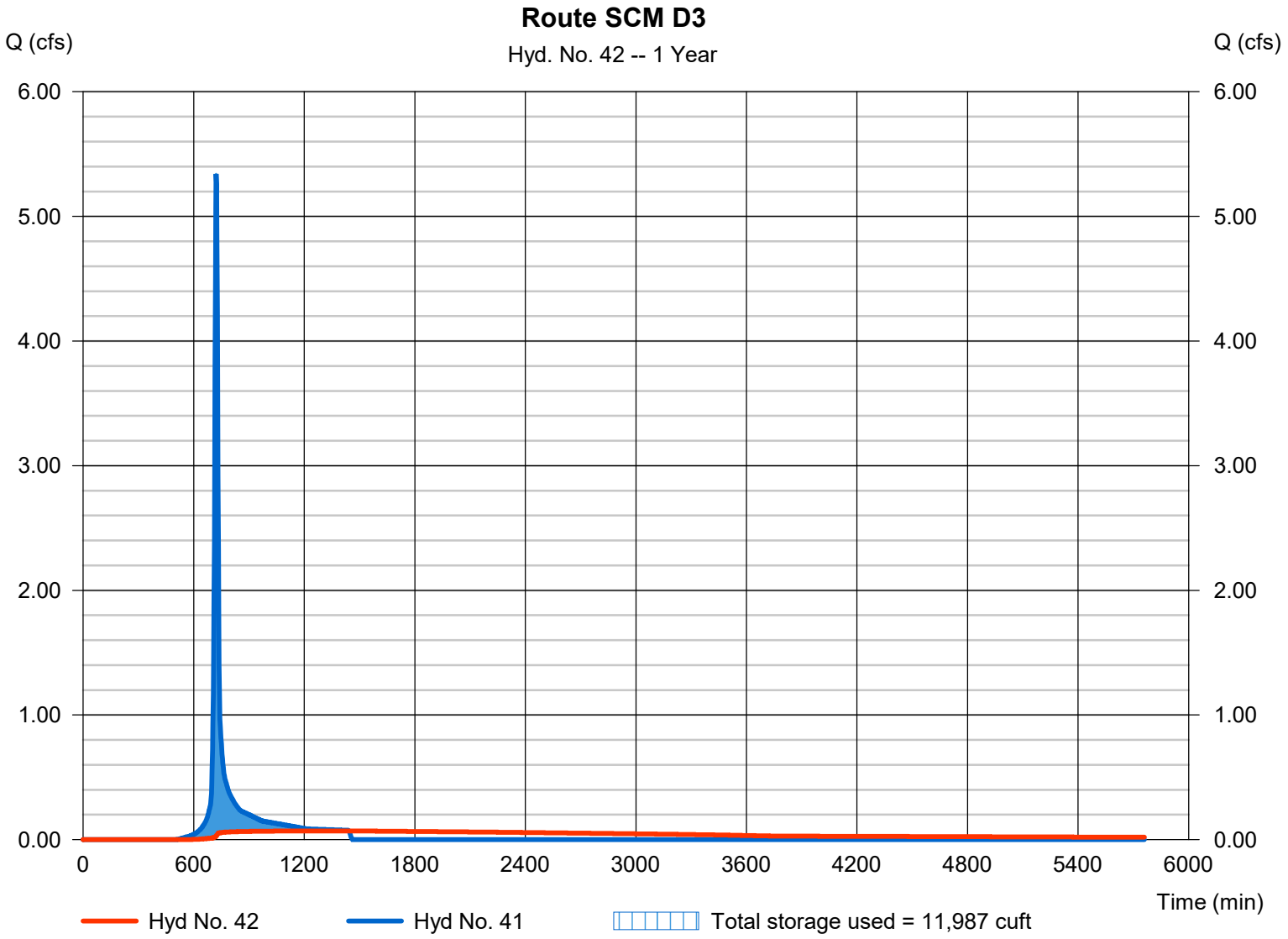
Hydrograph Report

Hyd. No. 42

Route SCM D3

Hydrograph type	=	Reservoir	Peak discharge	=	0.070 cfs
Storm frequency	=	1 yrs	Time to peak	=	1442 min
Time interval	=	2 min	Hyd. volume	=	13,116 cuft
Inflow hyd. No.	=	41 - Area to SCM D3 Onsite	Max. Elevation	=	384.46 ft
Reservoir name	=	SCM D3	Max. Storage	=	11,987 cuft

Storage Indication method used.



Pond No. 3 - SCM D3

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 382.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	382.00	2,410	0	0
0.50	382.50	4,000	1,586	1,586
1.00	383.00	4,590	2,146	3,731
2.00	384.00	5,900	5,231	8,962
3.00	385.00	7,390	6,630	15,592
4.00	386.00	9,090	8,225	23,817
5.00	387.00	10,690	9,878	33,695
6.00	388.00	12,770	11,713	45,409

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	1.00	1.00	0.00
Span (in)	= 15.00	1.00	1.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 379.00	382.00	383.17	0.00
Length (ft)	= 110.00	0.50	0.50	0.00
Slope (%)	= 3.60	0.01	0.01	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.00	1.00	8.00	0.00
Crest El. (ft)	= 385.50	384.75	386.50	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	382.00	0.00	0.00	0.00	---	0.00	0.00	0.00	---	---	---	0.000
0.05	159	382.05	9.11 ic	0.00 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.003
0.10	317	382.10	9.11 ic	0.01 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.006
0.15	476	382.15	9.11 ic	0.01 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.009
0.20	634	382.20	9.11 ic	0.01 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.010
0.25	793	382.25	9.11 ic	0.01 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.012
0.30	951	382.30	9.11 ic	0.01 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.013
0.35	1,110	382.35	9.11 ic	0.01 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.015
0.40	1,269	382.40	9.11 ic	0.02 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.016
0.45	1,427	382.45	9.11 ic	0.02 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.017
0.50	1,586	382.50	9.11 ic	0.02 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.018
0.55	1,800	382.55	9.11 ic	0.02 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.019
0.60	2,015	382.60	9.11 ic	0.02 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.020
0.65	2,229	382.65	9.11 ic	0.02 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.020
0.70	2,444	382.70	9.11 ic	0.02 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.021
0.75	2,658	382.75	9.11 ic	0.02 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.022
0.80	2,873	382.80	9.11 ic	0.02 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.023
0.85	3,088	382.85	9.11 ic	0.02 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.024
0.90	3,302	382.90	9.11 ic	0.02 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.024
0.95	3,517	382.95	9.11 ic	0.03 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.025
1.00	3,731	383.00	9.11 ic	0.03 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.026
1.10	4,254	383.10	9.11 ic	0.03 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.027
1.20	4,777	383.20	9.11 ic	0.03 ic	0.00 ic	---	0.00	0.00	0.00	---	---	---	0.029
1.30	5,300	383.30	9.11 ic	0.03 ic	0.01 ic	---	0.00	0.00	0.00	---	---	---	0.037
1.40	5,824	383.40	9.11 ic	0.03 ic	0.01 ic	---	0.00	0.00	0.00	---	---	---	0.042
1.50	6,347	383.50	9.11 ic	0.03 ic	0.01 ic	---	0.00	0.00	0.00	---	---	---	0.046
1.60	6,870	383.60	9.11 ic	0.03 ic	0.02 ic	---	0.00	0.00	0.00	---	---	---	0.049
1.70	7,393	383.70	9.11 ic	0.03 ic	0.02 ic	---	0.00	0.00	0.00	---	---	---	0.052
1.80	7,916	383.80	9.11 ic	0.03 ic	0.02 ic	---	0.00	0.00	0.00	---	---	---	0.055
1.90	8,439	383.90	9.11 ic	0.04 ic	0.02 ic	---	0.00	0.00	0.00	---	---	---	0.058
2.00	8,962	384.00	9.11 ic	0.04 ic	0.02 ic	---	0.00	0.00	0.00	---	---	---	0.060
2.10	9,625	384.10	9.11 ic	0.04 ic	0.02 ic	---	0.00	0.00	0.00	---	---	---	0.062
2.20	10,288	384.20	9.11 ic	0.04 ic	0.03 ic	---	0.00	0.00	0.00	---	---	---	0.065
2.30	10,951	384.30	9.11 ic	0.04 ic	0.03 ic	---	0.00	0.00	0.00	---	---	---	0.067
2.40	11,614	384.40	9.11 ic	0.04 ic	0.0		0.00	0.00	0.00	---	---	---	0.069

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SCM D3

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.50	12,277	384.50	9.11 ic	0.04 ic	0.03 ic	---	0.00	0.00	0.00	---	---	---	0.071
2.60	12,940	384.60	9.11 ic	0.04 ic	0.03 ic	---	0.00	0.00	0.00	---	---	---	0.073
2.70	13,603	384.70	9.11 ic	0.04 ic	0.03 ic	---	0.00	0.00	0.00	---	---	---	0.075
2.80	14,266	384.80	9.11 ic	0.04 ic	0.03 ic	---	0.00	0.04	0.00	---	---	---	0.114
2.90	14,929	384.90	9.11 ic	0.04 ic	0.03 ic	---	0.00	0.19	0.00	---	---	---	0.272
3.00	15,592	385.00	9.11 ic	0.05 ic	0.04 ic	---	0.00	0.42	0.00	---	---	---	0.497
3.10	16,415	385.10	9.11 ic	0.05 ic	0.04 ic	---	0.00	0.69	0.00	---	---	---	0.772
3.20	17,237	385.20	9.11 ic	0.05 ic	0.04 ic	---	0.00	1.01	0.00	---	---	---	1.089
3.30	18,060	385.30	9.11 ic	0.05 ic	0.04 ic	---	0.00	1.36	0.00	---	---	---	1.444
3.40	18,882	385.40	9.11 ic	0.05 ic	0.04 ic	---	0.00	1.75	0.00	---	---	---	1.832
3.50	19,705	385.50	9.11 ic	0.05 ic	0.04 ic	---	0.00	2.16	0.00	---	---	---	2.251
3.60	20,527	385.60	9.11 ic	0.05 ic	0.04 ic	---	1.58	2.61	0.00	---	---	---	4.279
3.70	21,350	385.70	9.11 ic	0.05 ic	0.04 ic	---	4.47	3.08	0.00	---	---	---	7.643
3.80	22,172	385.80	11.87 ic	0.04 ic	0.04 ic	---	8.21	3.58	0.00	---	---	---	11.87
3.90	22,994	385.90	14.47 ic	0.01 ic	0.01 ic	---	11.74 s	2.70 s	0.00	---	---	---	14.47
4.00	23,817	386.00	14.75 ic	0.01 ic	0.01 ic	---	12.39 s	2.34 s	0.00	---	---	---	14.75
4.10	24,805	386.10	14.93 ic	0.01 ic	0.01 ic	---	12.79 s	2.12 s	0.00	---	---	---	14.93
4.20	25,793	386.20	15.08 ic	0.01 ic	0.01 ic	---	13.09 s	1.97 s	0.00	---	---	---	15.08
4.30	26,780	386.30	15.22 ic	0.01 ic	0.01 ic	---	13.34 s	1.86 s	0.00	---	---	---	15.22
4.40	27,768	386.40	15.34 ic	0.00 ic	0.00 ic	---	13.55 s	1.78 s	0.00	---	---	---	15.34
4.50	28,756	386.50	15.46 ic	0.00 ic	0.00 ic	---	13.73 s	1.71 s	0.00	---	---	---	15.45
4.60	29,744	386.60	15.58 ic	0.00 ic	0.00 ic	---	13.90 s	1.66 s	0.66	---	---	---	16.22
4.70	30,732	386.70	15.70 ic	0.00 ic	0.00 ic	---	14.05 s	1.61 s	1.86	---	---	---	17.52
4.80	31,719	386.80	15.81 ic	0.00 ic	0.00 ic	---	14.19 s	1.57 s	3.42	---	---	---	19.19
4.90	32,707	386.90	15.92 ic	0.00 ic	0.00 ic	---	14.35 s	1.54 s	5.26	---	---	---	21.16
5.00	33,695	387.00	16.04 ic	0.00 ic	0.00 ic	---	14.48 s	1.52 s	7.35	---	---	---	23.35
5.10	34,866	387.10	16.12 oc	0.00 ic	0.00 ic	---	14.56 s	1.49 s	9.67	---	---	---	25.73
5.20	36,038	387.20	16.19 oc	0.00 ic	0.00 ic	---	14.67 s	1.47 s	12.18	---	---	---	28.33
5.30	37,209	387.30	16.27 oc	0.00 ic	0.00 ic	---	14.75 s	1.45 s	14.88	---	---	---	31.09
5.40	38,381	387.40	16.34 oc	0.00 ic	0.00 ic	---	14.80 s	1.43 s	17.76	---	---	---	33.99
5.50	39,552	387.50	16.41 oc	0.00 ic	0.00 ic	---	14.96 s	1.42 s	20.80	---	---	---	37.19
5.60	40,723	387.60	16.49 oc	0.00 ic	0.00 ic	---	14.98 s	1.40 s	24.00	---	---	---	40.38
5.70	41,895	387.70	16.56 oc	0.00 ic	0.00 ic	---	15.04 s	1.39 s	27.34	---	---	---	43.77
5.80	43,066	387.80	16.63 oc	0.00 ic	0.00 ic	---	15.09 s	1.38 s	30.83	---	---	---	47.30
5.90	44,237	387.90	16.71 oc	0.00 ic	0.00 ic	---	15.09 s	1.36 s	34.46	---	---	---	50.92
6.00	45,409	388.00	16.78 oc	0.00 ic	0.00 ic	---	15.29 s	1.37 s	38.21	---	---	---	54.87

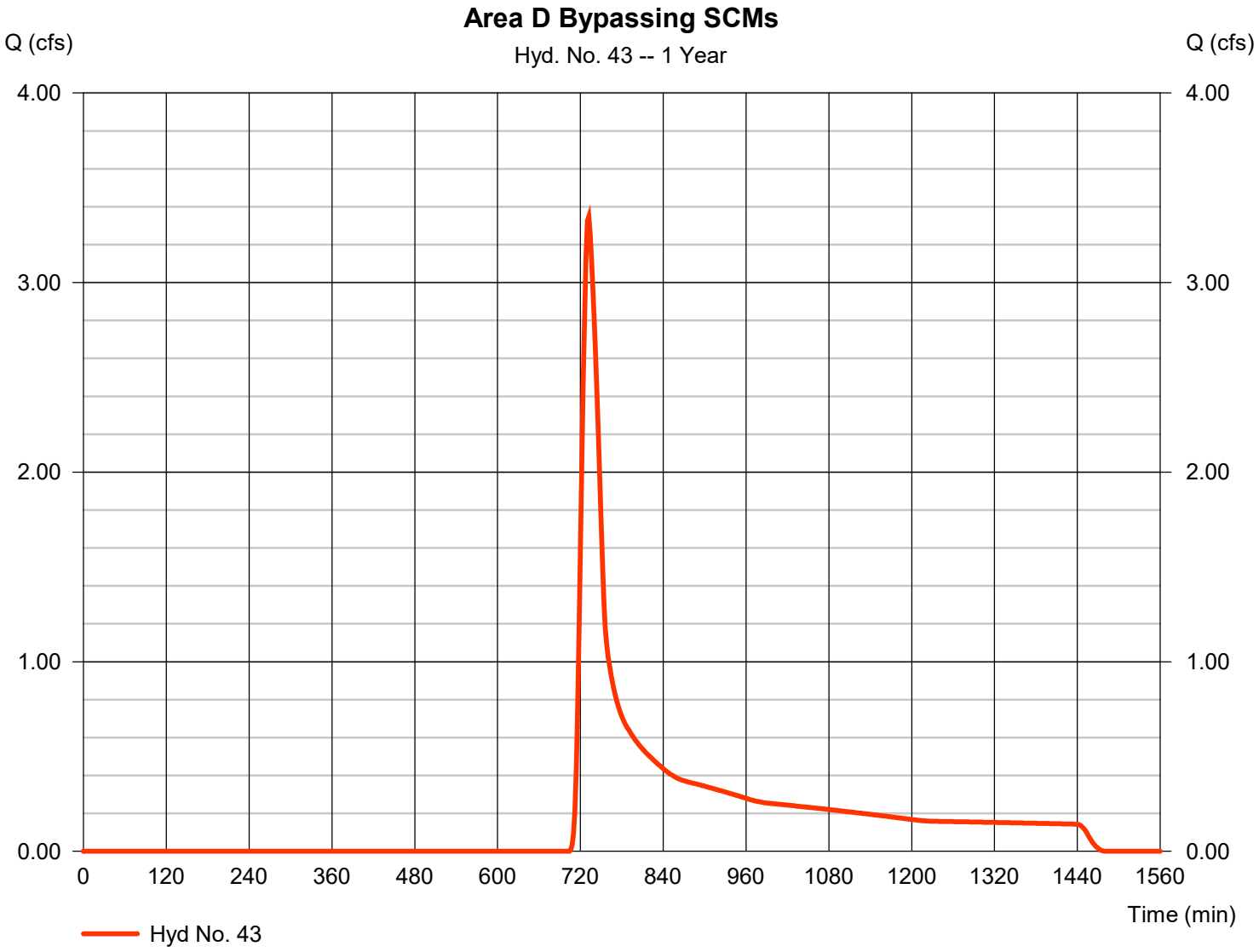
...End

Hydrograph Report

Hyd. No. 43

Area D Bypassing SCMs

Hydrograph type	= SCS Runoff	Peak discharge	= 3.348 cfs
Storm frequency	= 1 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 17,002 cuft
Drainage area	= 9.870 ac	Curve number	= 65.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 24.00 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

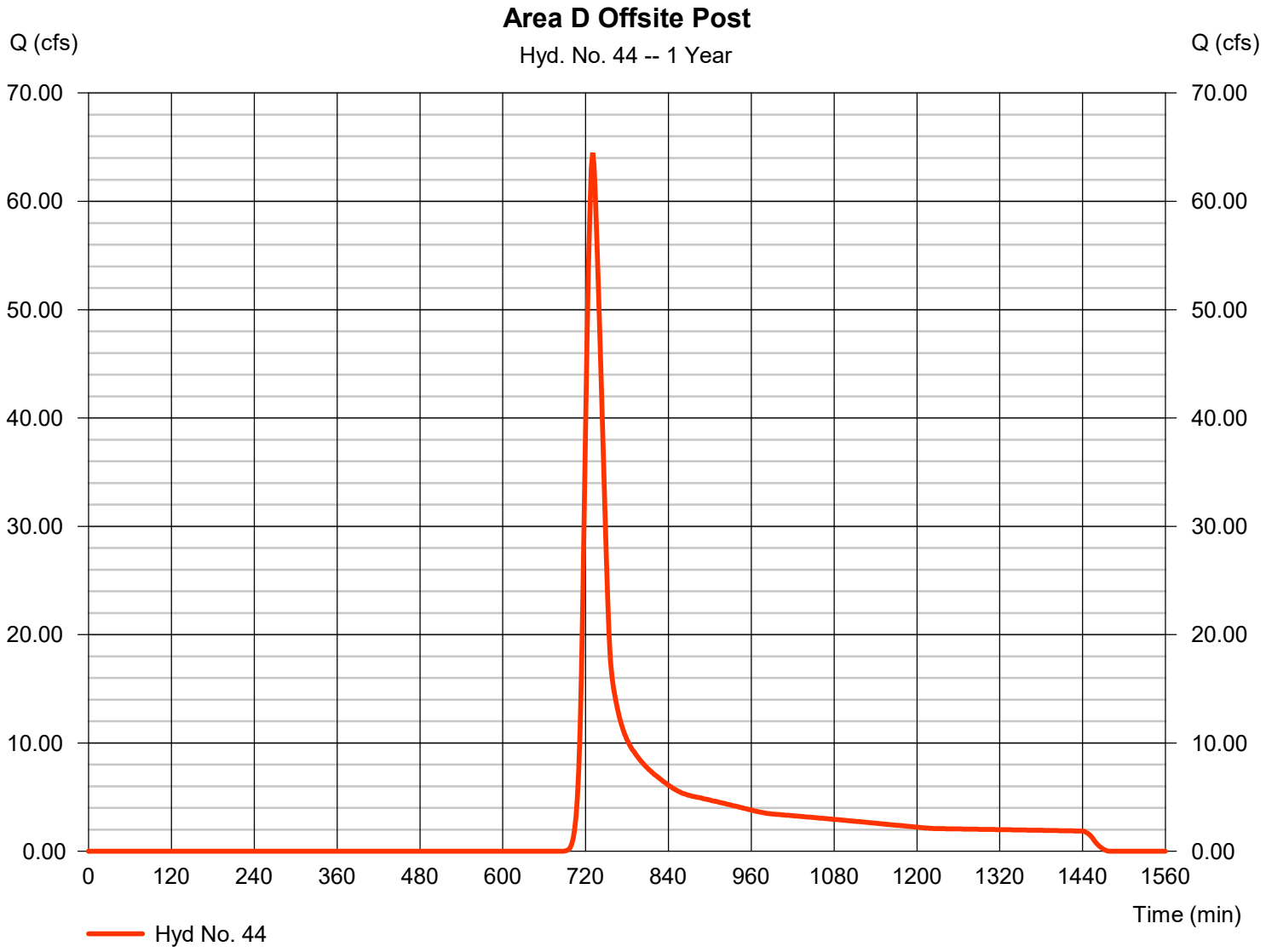


Hydrograph Report

Hyd. No. 44

Area D Offsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	64.48 cfs
Storm frequency	=	1 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	267,485 cuft
Drainage area	=	100.690 ac	Curve number	=	72
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 44

Area D Offsite Post

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 15.61**	**+**	**0.00**	**+**	**0.00**	**=**	**15.61**
Shallow Concentrated Flow							
Flow length (ft)	= 830.00		0.00		0.00		
Watercourse slope (%)	= 4.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.23		0.00		0.00		
Travel Time (min)	**= 4.29**	**+**	**0.00**	**+**	**0.00**	**=**	**4.29**
Channel Flow							
X sectional flow area (sqft)	= 27.00		0.00		0.00		
Wetted perimeter (ft)	= 14.50		0.00		0.00		
Channel slope (%)	= 2.50		0.00		0.00		
Manning's n-value	= 0.030		0.015		0.015		
Velocity (ft/s)	=11.91						
			0.00				
					0.00		
Flow length (ft)	({0})2955.0		0.0		0.0		
Travel Time (min)	**= 4.13**	**+**	**0.00**	**+**	**0.00**	**=**	**4.13**

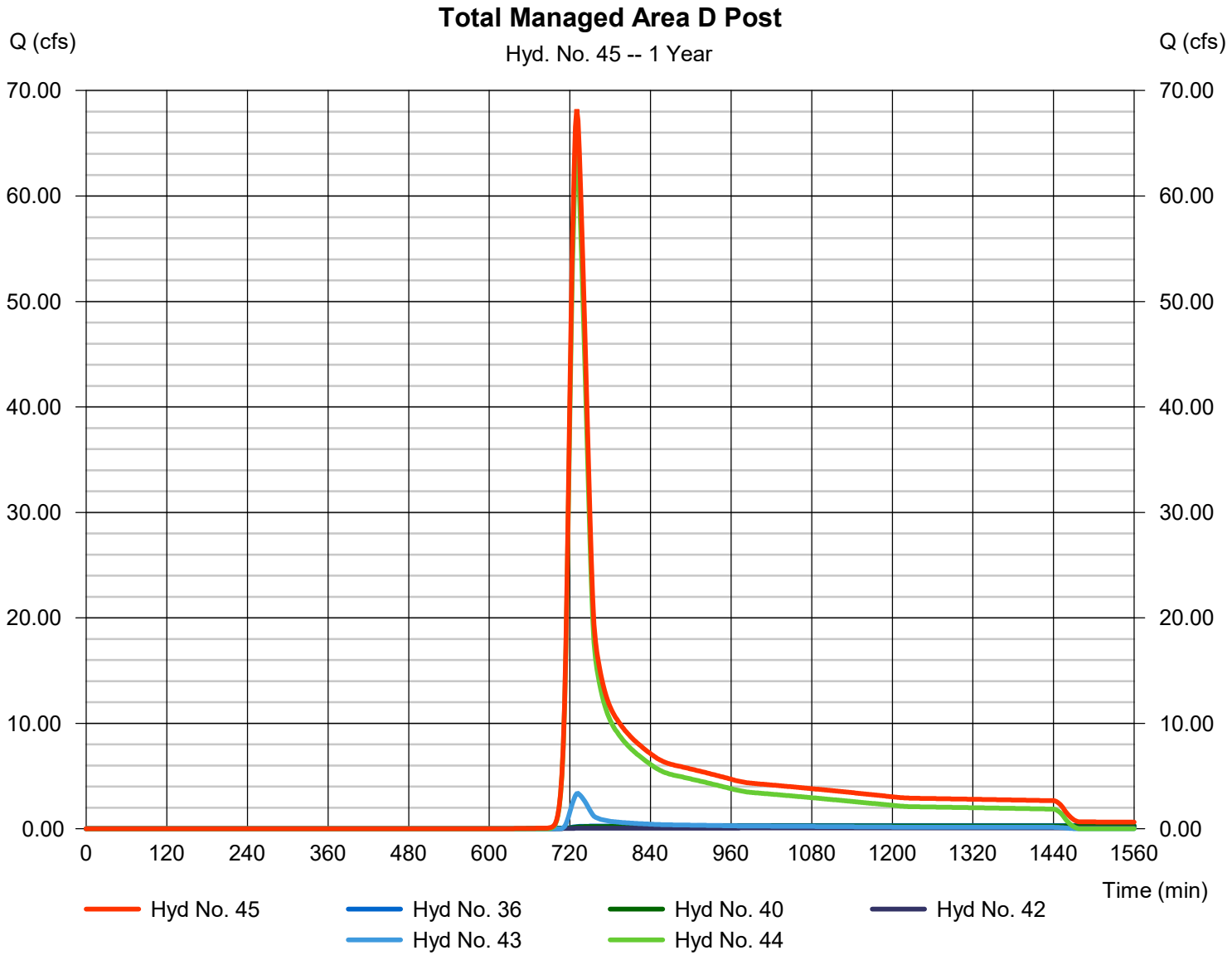
Total Travel Time, Tc ..... 24.00 min

Hydrograph Report

Hyd. No. 45

Total Managed Area D Post

Hydrograph type	= Combine	Peak discharge	= 68.22 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 406,932 cuft
Inflow hyds.	= 36, 40, 42, 43, 44	Contrib. drain. area	= 110.560 ac

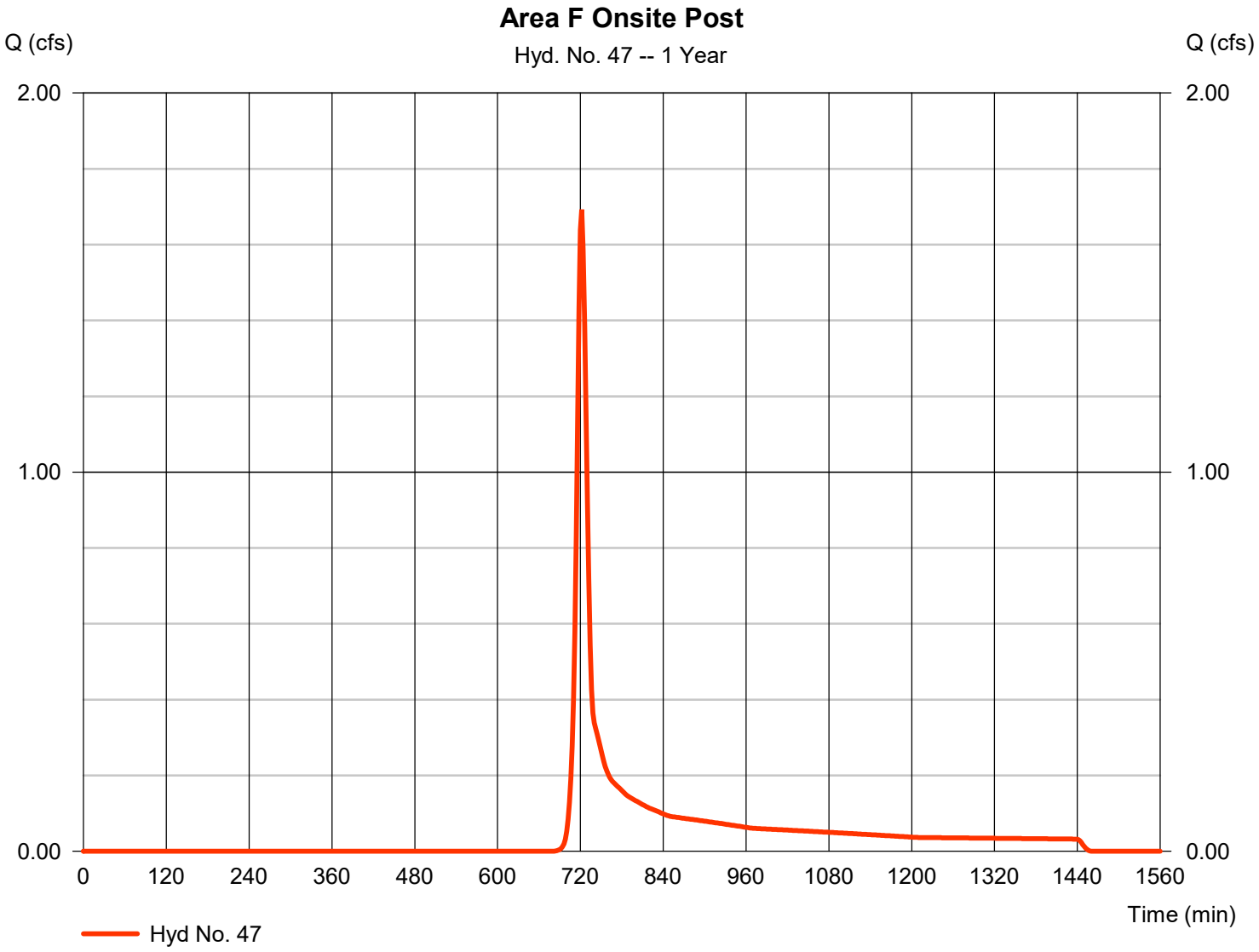


Hydrograph Report

Hyd. No. 47

Area F Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.693 cfs
Storm frequency	=	1 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	4,679 cuft
Drainage area	=	1.630 ac	Curve number	=	72.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.60 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 47

Area F Onsite Post

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 5.00		0.00		0.00		
Travel Time (min)	**= 5.45**	**+**	**0.00**	**+**	**0.00**	**=**	**5.45**
Shallow Concentrated Flow							
Flow length (ft)	= 760.00		0.00		0.00		
Watercourse slope (%)	= 2.80		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.70		0.00		0.00		
Travel Time (min)	**= 4.69**	**+**	**0.00**	**+**	**0.00**	**=**	**4.69**
Channel Flow							
X sectional flow area (sqft)	= 3.14		0.00		0.00		
Wetted perimeter (ft)	= 6.28		0.00		0.00		
Channel slope (%)	= 1.80		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=8.38						
			0.00				
					0.00		
Flow length (ft)	({0})1220.0		0.0		0.0		
Travel Time (min)	**= 2.43**	**+**	**0.00**	**+**	**0.00**	**=**	**2.43**

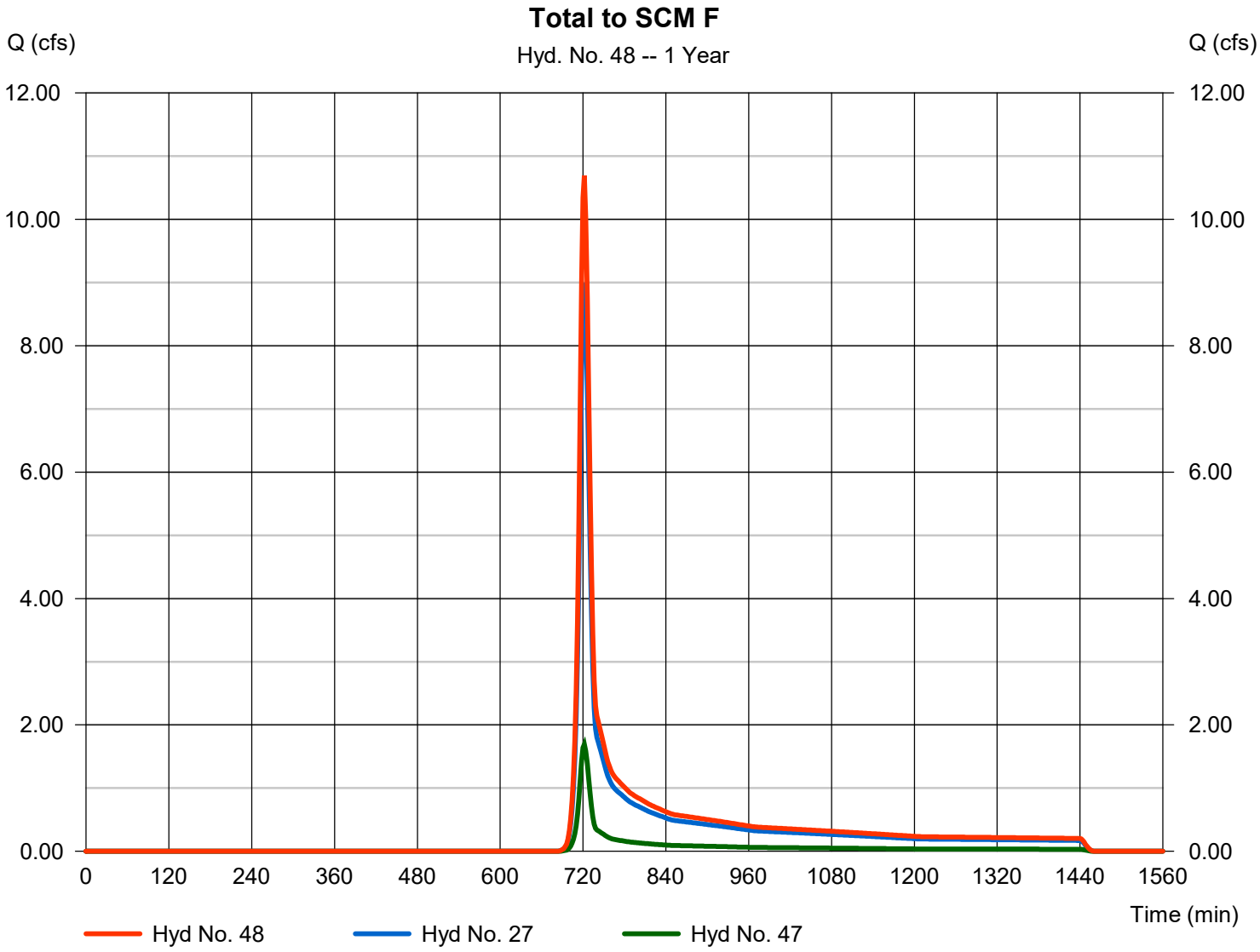
Total Travel Time, Tc ..... 12.60 min

Hydrograph Report

Hyd. No. 48

Total to SCM F

Hydrograph type	= Combine	Peak discharge	= 10.69 cfs
Storm frequency	= 1 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 29,584 cuft
Inflow hyds.	= 27, 47	Contrib. drain. area	= 10.360 ac



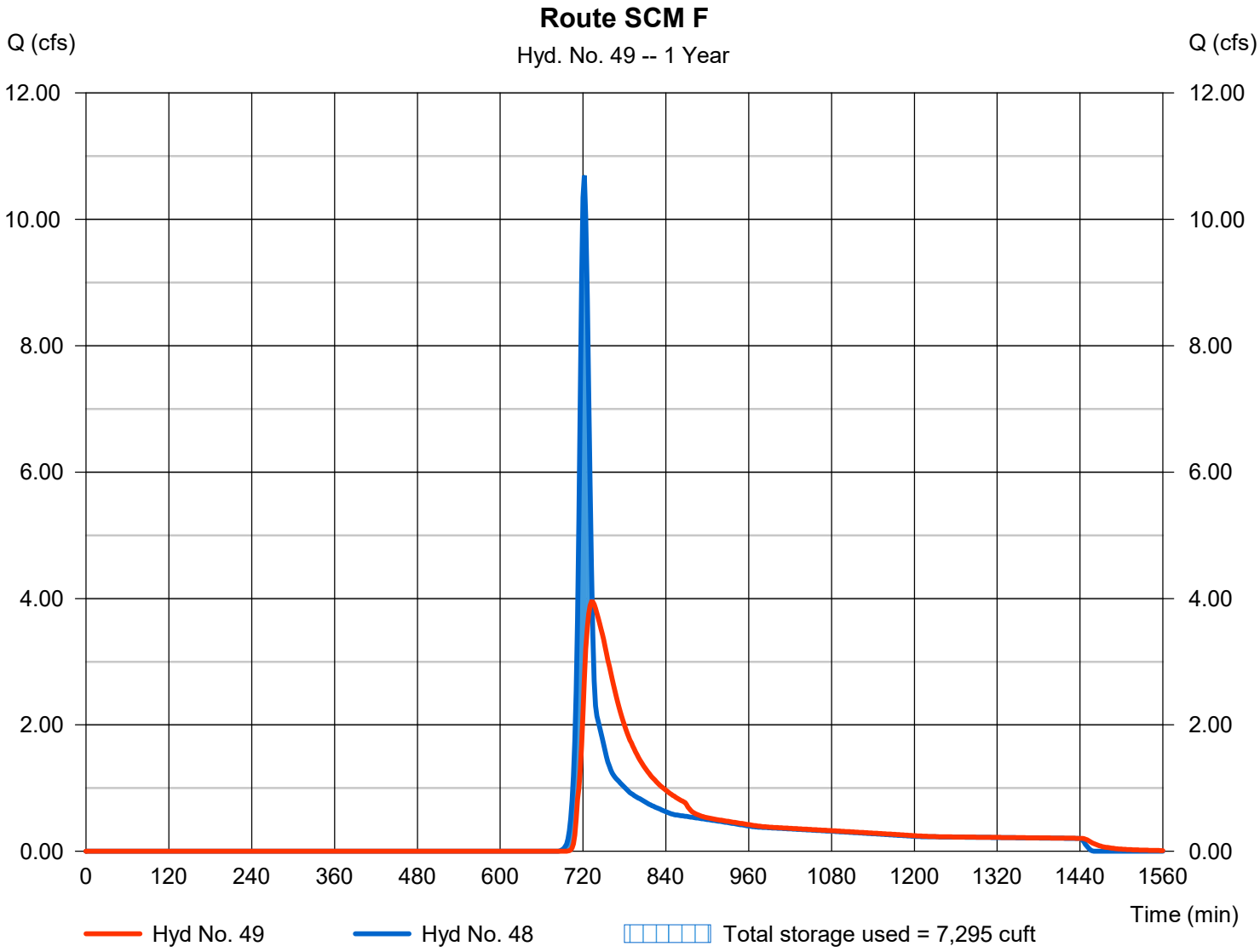
Hydrograph Report

Hyd. No. 49

Route SCM F

Hydrograph type	=	Reservoir	Peak discharge	=	3.948 cfs
Storm frequency	=	1 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	29,574 cuft
Inflow hyd. No.	=	48 - Total to SCM F	Max. Elevation	=	388.90 ft
Reservoir name	=	SCM F	Max. Storage	=	7,295 cuft

Storage Indication method used.



Pond Report

Pond No. 4 - SCM F

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 387.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	387.50	20	0	0
0.50	388.00	4,640	827	827
1.50	389.00	10,160	7,221	8,049
2.50	390.00	11,540	10,842	18,890
3.50	391.00	13,010	12,266	31,157
4.50	392.00	14,550	13,771	44,928
5.50	393.00	16,140	15,337	60,265

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	15.00	0.00	0.00
Span (in)	= 18.00	15.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 387.50	387.50	0.00	0.00
Length (ft)	= 46.00	0.50	0.00	0.00
Slope (%)	= 1.00	0.01	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.00	12.00	Inactive	0.00
Crest El. (ft)	= 389.50	391.00	389.50	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	Rect	---
Multi-Stage	= Yes	No	Yes	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	387.50	0.00	0.00	---	---	0.00	0.00	0.00	---	---	---	0.000
0.05	83	387.55	0.01 ic	0.01 ic	---	---	0.00	0.00	0.00	---	---	---	0.009
0.10	165	387.60	0.04 ic	0.04 ic	---	---	0.00	0.00	0.00	---	---	---	0.035
0.15	248	387.65	0.08 ic	0.08 ic	---	---	0.00	0.00	0.00	---	---	---	0.078
0.20	331	387.70	0.13 ic	0.13 ic	---	---	0.00	0.00	0.00	---	---	---	0.132
0.25	414	387.75	0.22 ic	0.21 ic	---	---	0.00	0.00	0.00	---	---	---	0.205
0.30	496	387.80	0.29 ic	0.29 ic	---	---	0.00	0.00	0.00	---	---	---	0.293
0.35	579	387.85	0.39 ic	0.39 ic	---	---	0.00	0.00	0.00	---	---	---	0.386
0.40	662	387.90	0.52 ic	0.50 ic	---	---	0.00	0.00	0.00	---	---	---	0.498
0.45	745	387.95	0.62 ic	0.62 ic	---	---	0.00	0.00	0.00	---	---	---	0.622
0.50	827	388.00	0.77 ic	0.77 ic	---	---	0.00	0.00	0.00	---	---	---	0.767
0.60	1,549	388.10	1.07 ic	1.07 ic	---	---	0.00	0.00	0.00	---	---	---	1.069
0.70	2,272	388.20	1.42 ic	1.41 ic	---	---	0.00	0.00	0.00	---	---	---	1.414
0.80	2,994	388.30	1.79 ic	1.78 ic	---	---	0.00	0.00	0.00	---	---	---	1.785
0.90	3,716	388.40	2.18 ic	2.18 ic	---	---	0.00	0.00	0.00	---	---	---	2.178
1.00	4,438	388.50	2.59 ic	2.59 ic	---	---	0.00	0.00	0.00	---	---	---	2.587
1.10	5,160	388.60	2.97 ic	2.97 ic	---	---	0.00	0.00	0.00	---	---	---	2.974
1.20	5,882	388.70	3.41 ic	3.37 ic	---	---	0.00	0.00	0.00	---	---	---	3.366
1.30	6,604	388.80	3.72 ic	3.67 ic	---	---	0.00	0.00	0.00	---	---	---	3.672
1.40	7,327	388.90	3.96 ic	3.96 ic	---	---	0.00	0.00	0.00	---	---	---	3.961
1.50	8,049	389.00	4.21 ic	4.21 ic	---	---	0.00	0.00	0.00	---	---	---	4.210
1.60	9,133	389.10	4.50 ic	4.48 ic	---	---	0.00	0.00	0.00	---	---	---	4.475
1.70	10,217	389.20	4.73 ic	4.72 ic	---	---	0.00	0.00	0.00	---	---	---	4.725
1.80	11,301	389.30	4.96 ic	4.96 ic	---	---	0.00	0.00	0.00	---	---	---	4.956
1.90	12,385	389.40	5.18 ic	5.18 ic	---	---	0.00	0.00	0.00	---	---	---	5.180
2.00	13,469	389.50	5.43 ic	5.41 ic	---	---	0.00	0.00	0.00	---	---	---	5.409
2.10	14,554	389.60	6.29 oc	5.02 ic	---	---	1.26	0.00	0.00	---	---	---	6.288
2.20	15,638	389.70	7.66 oc	4.09 ic	---	---	3.58	0.00	0.00	---	---	---	7.664
2.30	16,722	389.80	9.34 oc	2.95 ic	---	---	6.39 s	0.00	0.00	---	---	---	9.336
2.40	17,806	389.90	10.19 oc	2.33 ic	---	---	7.87 s	0.00	0.00	---	---	---	10.19
2.50	18,890	390.00	10.81 oc	1.92 ic	---	---	8.88 s	0.00	0.00	---	---	---	10.81
2.60	20,117	390.10	11.31 oc	1.63 ic	---	---	9.68 s	0.00	0.00	---	---	---	11.31
2.70	21,344	390.20	11.71 ic	1.40 ic	---	---	10.30 s	0.00	0.00	---	---	---	11.70
2.80	22,570	390.30	12.05 ic	1.23 ic	---	---	10.82 s	0.00	0.00	---	---	---	12.04
2.90	23,797	390.40	12.38 ic	1.09 ic	---	---	11.28 s	0.00	0.00	---	---	---	12.37
3.00	25,023	390.50	12.68 ic	0.98 ic	---	---	11.69 s	0.00	0.00	---	---	---	12.67

Continues on next page...

SCM F

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.10	26,250	390.60	12.98 ic	0.89 ic	---	---	12.07 s	0.00	0.00	---	---	---	12.96
3.20	27,477	390.70	13.27 ic	0.81 ic	---	---	12.42 s	0.00	0.00	---	---	---	13.24
3.30	28,703	390.80	13.54 ic	0.75 ic	---	---	12.78 s	0.00	0.00	---	---	---	13.53
3.40	29,930	390.90	13.81 ic	0.70 ic	---	---	13.10 s	0.00	0.00	---	---	---	13.79
3.50	31,157	391.00	14.08 ic	0.65 ic	---	---	13.42 s	0.00	0.00	---	---	---	14.07
3.60	32,534	391.10	14.34 ic	0.61 ic	---	---	13.70 s	0.99	0.00	---	---	---	15.30
3.70	33,911	391.20	14.59 ic	0.57 ic	---	---	14.00 s	2.79	0.00	---	---	---	17.36
3.80	35,288	391.30	14.84 ic	0.54 ic	---	---	14.29 s	5.13	0.00	---	---	---	19.96
3.90	36,665	391.40	15.08 ic	0.51 ic	---	---	14.52 s	7.89	0.00	---	---	---	22.93
4.00	38,042	391.50	15.32 ic	0.49 ic	---	---	14.80 s	11.03	0.00	---	---	---	26.32
4.10	39,420	391.60	15.56 ic	0.47 ic	---	---	15.09 s	14.50	0.00	---	---	---	30.05
4.20	40,797	391.70	15.79 ic	0.44 ic	---	---	15.27 s	18.27	0.00	---	---	---	33.99
4.30	42,174	391.80	16.02 ic	0.42 ic	---	---	15.48 s	22.33	0.00	---	---	---	38.23
4.40	43,551	391.90	16.24 ic	0.40 ic	---	---	15.72 s	26.64	0.00	---	---	---	42.76
4.50	44,928	392.00	16.47 ic	0.39 ic	---	---	15.95 s	31.20	0.00	---	---	---	47.54
4.60	46,462	392.10	16.68 ic	0.37 ic	---	---	16.21 s	36.00	0.00	---	---	---	52.58
4.70	47,995	392.20	16.90 ic	0.36 ic	---	---	16.40 s	41.01	0.00	---	---	---	57.77
4.80	49,529	392.30	17.11 ic	0.35 ic	---	---	16.72 s	46.25	0.00	---	---	---	63.31
4.90	51,063	392.40	17.32 ic	0.33 ic	---	---	16.80 s	51.68	0.00	---	---	---	68.81
5.00	52,596	392.50	17.53 ic	0.32 ic	---	---	17.02 s	57.32	0.00	---	---	---	74.66
5.10	54,130	392.60	17.74 ic	0.31 ic	---	---	17.19 s	63.15	0.00	---	---	---	80.65
5.20	55,664	392.70	17.94 ic	0.31 ic	---	---	17.55 s	69.16	0.00	---	---	---	87.01
5.30	57,197	392.80	18.14 ic	0.30 ic	---	---	17.63 s	75.35	0.00	---	---	---	93.28
5.40	58,731	392.90	18.34 ic	0.29 ic	---	---	17.94 s	81.72	0.00	---	---	---	99.95
5.50	60,265	393.00	18.54 ic	0.28 ic	---	---	18.05 s	88.25	0.00	---	---	---	106.57

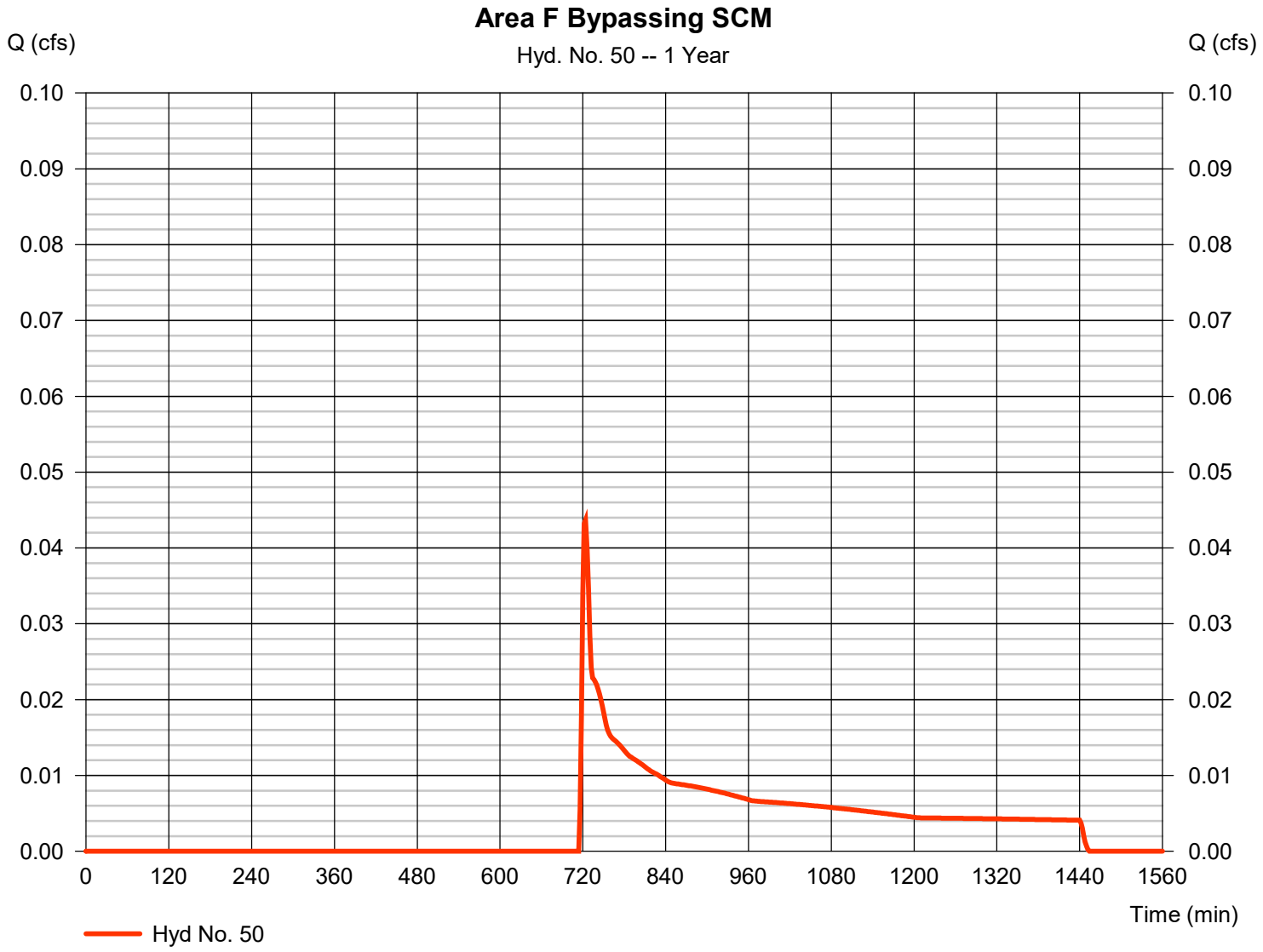
...End

Hydrograph Report

Hyd. No. 50

Area F Bypassing SCM

Hydrograph type	= SCS Runoff	Peak discharge	= 0.044 cfs
Storm frequency	= 1 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 325 cuft
Drainage area	= 0.480 ac	Curve number	= 55.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.60 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 50

Area F Bypassing SCM

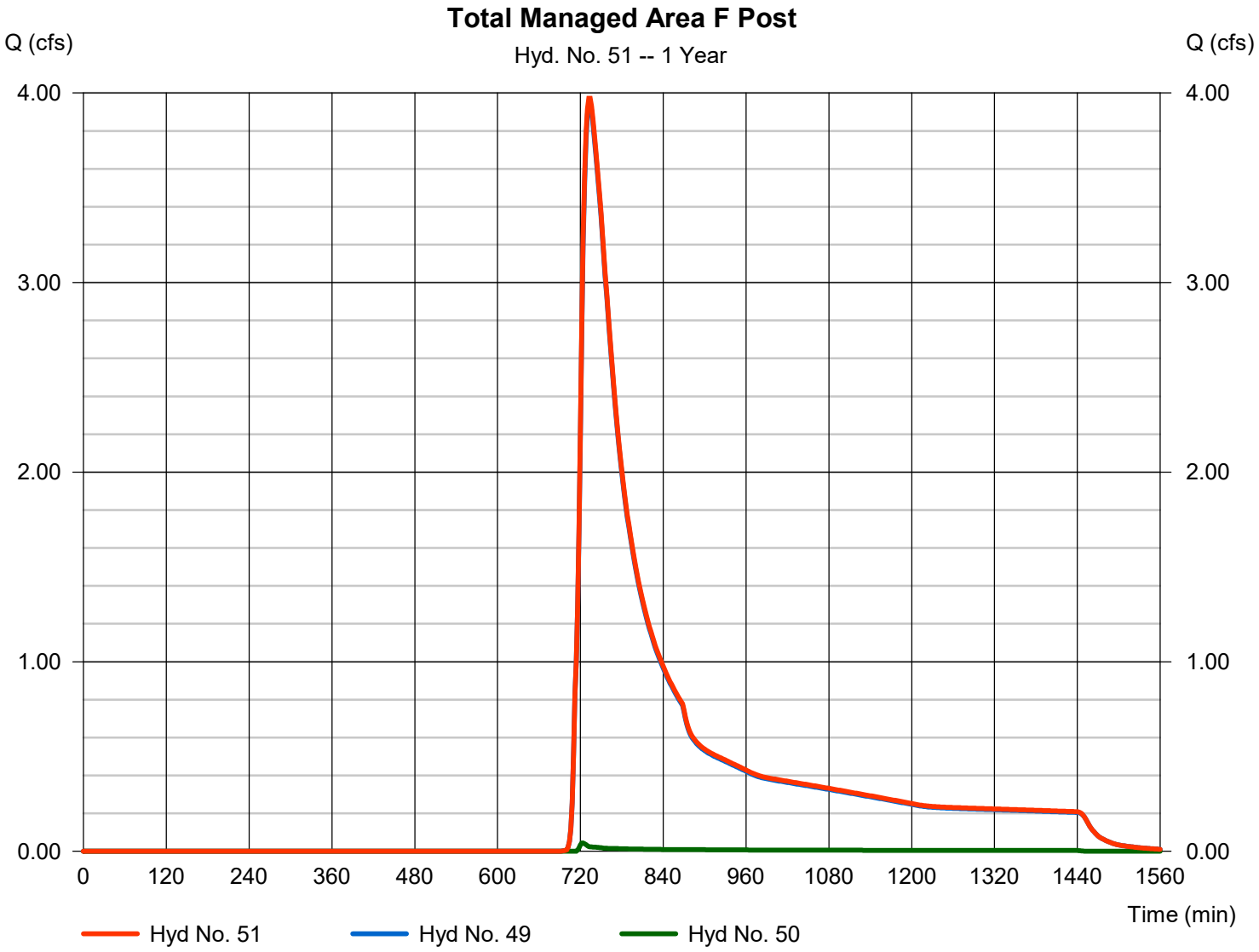
Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.410		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 6.00		0.00		0.00		
Travel Time (min)	**= 7.77**	**+**	**0.00**	**+**	**0.00**	**=**	**7.77**
Shallow Concentrated Flow							
Flow length (ft)	= 215.00		0.00		0.00		
Watercourse slope (%)	= 7.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=4.27		0.00		0.00		
Travel Time (min)	**= 0.84**	**+**	**0.00**	**+**	**0.00**	**=**	**0.84**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Total Travel Time, Tc							**8.60 min**

Hydrograph Report

Hyd. No. 51

Total Managed Area F Post

Hydrograph type	= Combine	Peak discharge	= 3.971 cfs
Storm frequency	= 1 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 29,899 cuft
Inflow hyds.	= 49, 50	Contrib. drain. area	= 0.480 ac

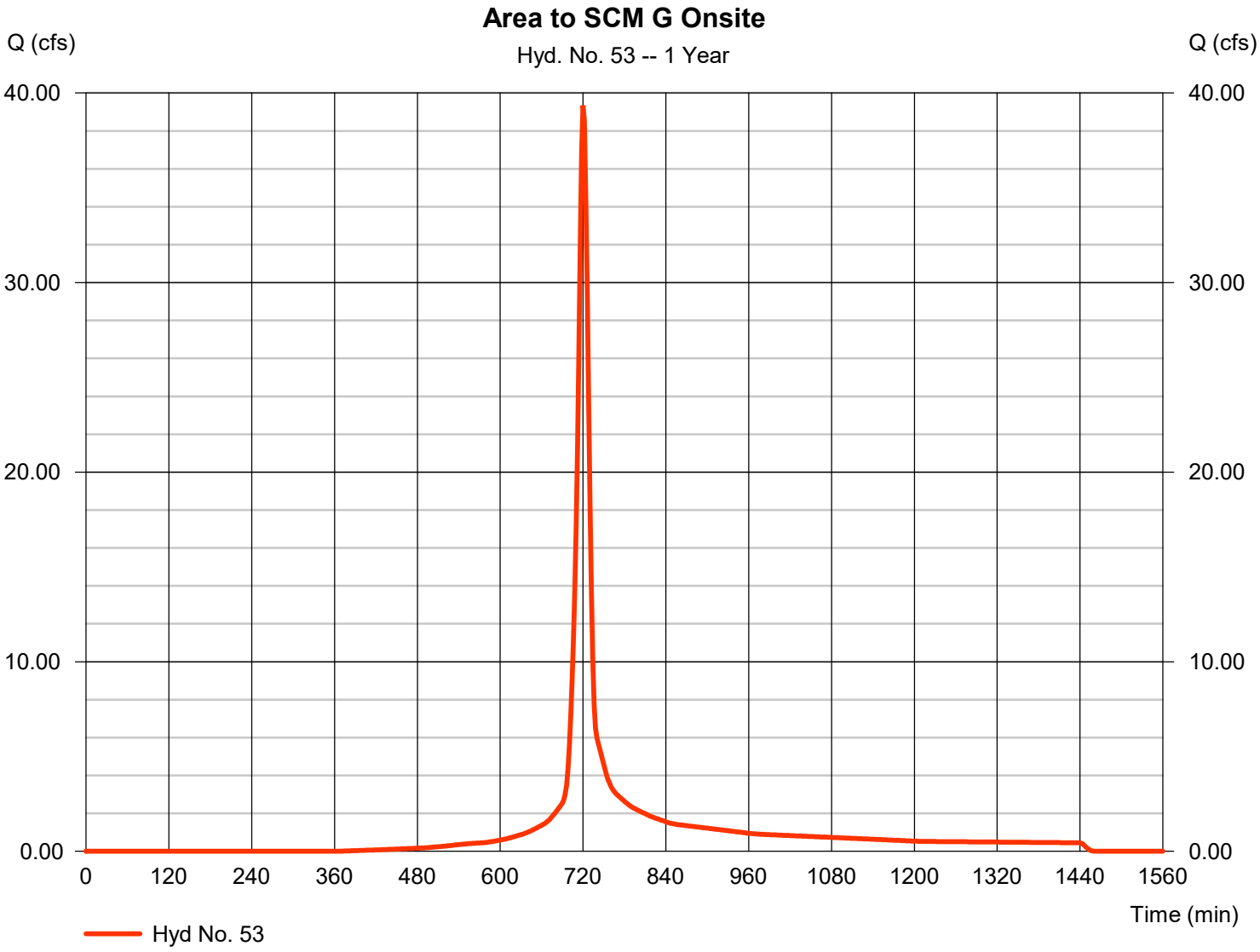


Hydrograph Report

Hyd. No. 53

Area to SCM G Onsite

Hydrograph type	= SCS Runoff	Peak discharge	= 39.35 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 102,926 cuft
Drainage area	= 14.730 ac	Curve number	= 89.8
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.40 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

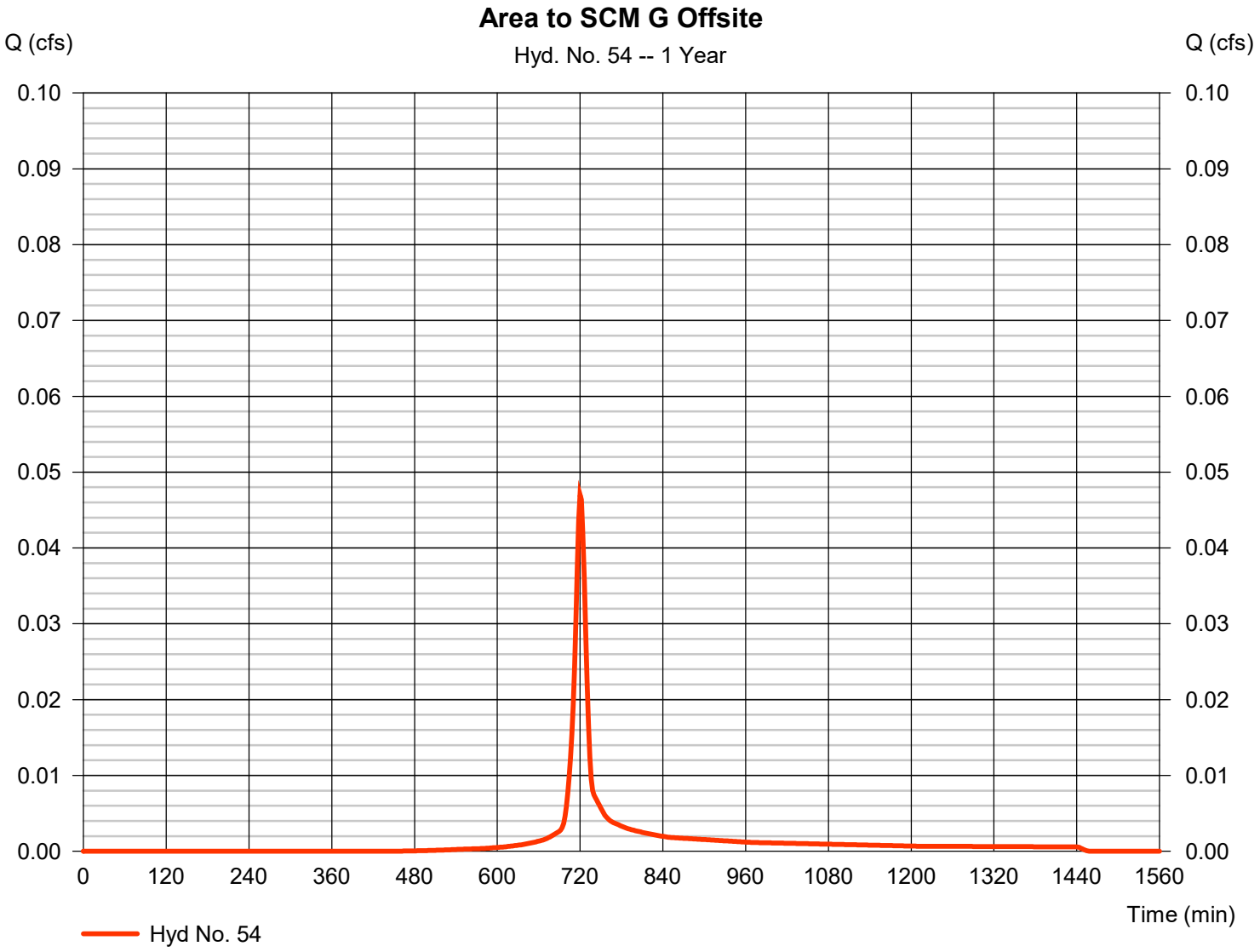


Hydrograph Report

Hyd. No. 54

Area to SCM G Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 0.047 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 122 cuft
Drainage area	= 0.020 ac	Curve number	= 86.8
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.40 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

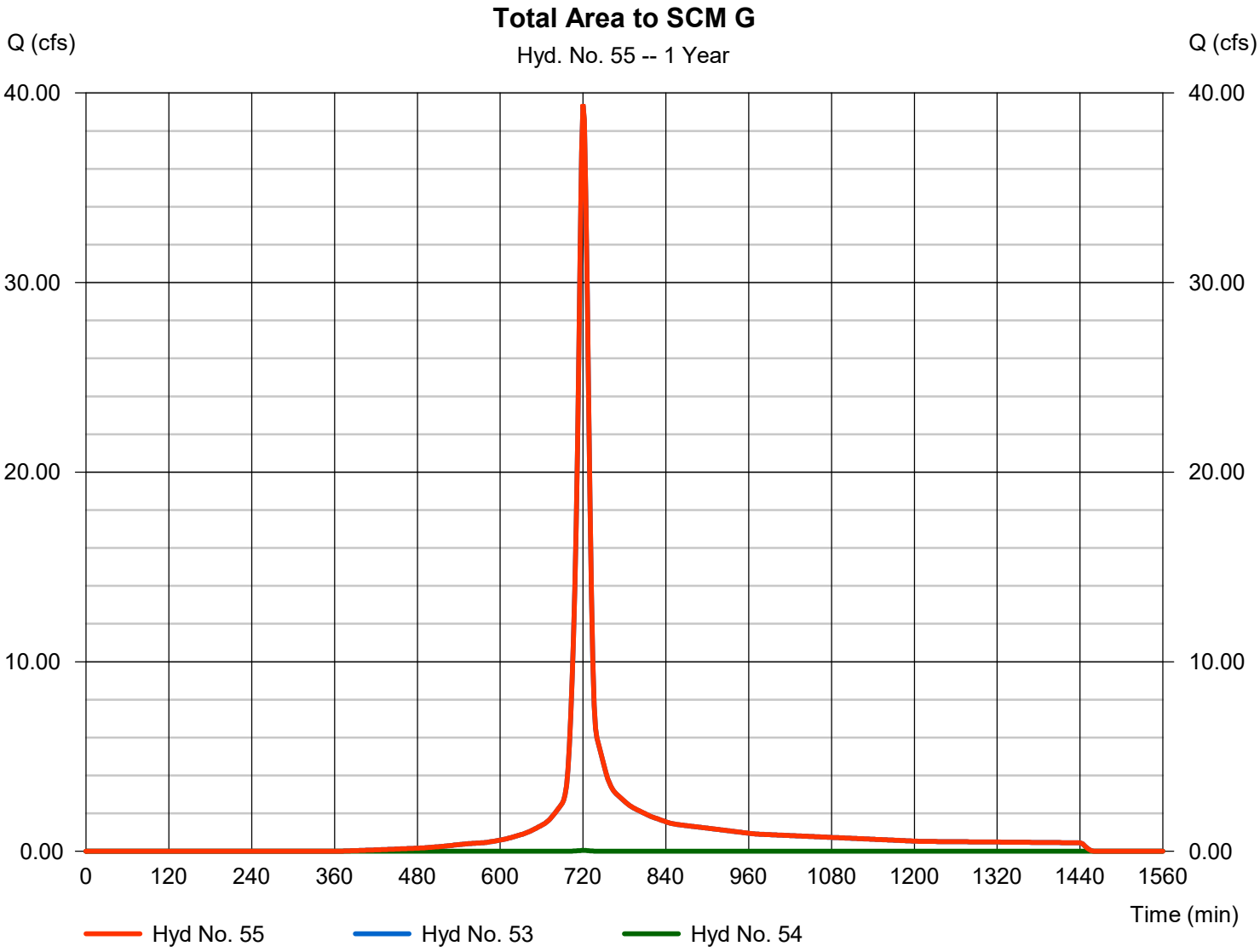


Hydrograph Report

Hyd. No. 55

Total Area to SCM G

Hydrograph type	= Combine	Peak discharge	= 39.40 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 103,048 cuft
Inflow hyds.	= 53, 54	Contrib. drain. area	= 14.750 ac



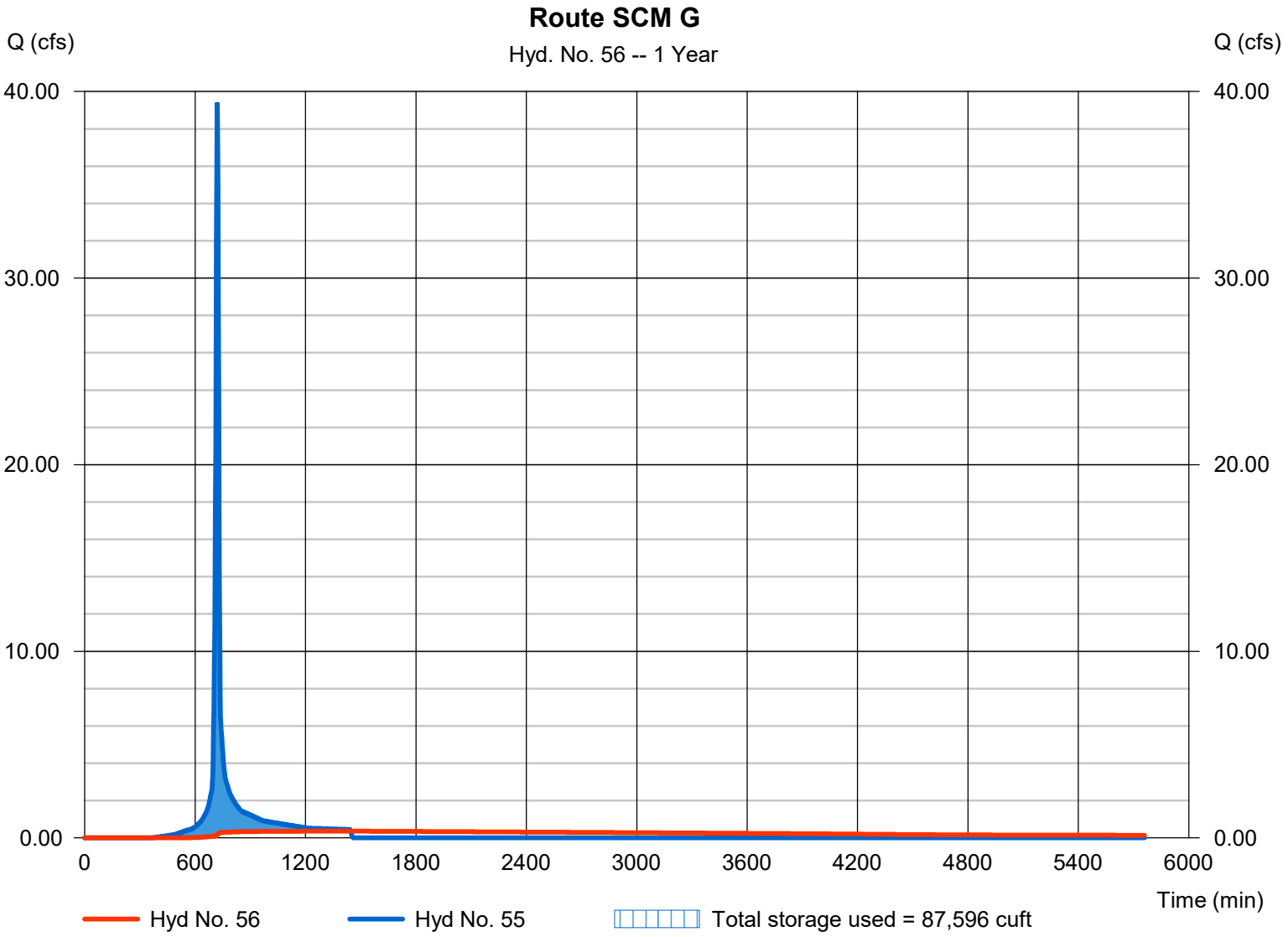
Hydrograph Report

Hyd. No. 56

Route SCM G

Hydrograph type	=	Reservoir	Peak discharge	=	0.360 cfs
Storm frequency	=	1 yrs	Time to peak	=	1444 min
Time interval	=	2 min	Hyd. volume	=	77,110 cuft
Inflow hyd. No.	=	55 - Total Area to SCM G	Max. Elevation	=	388.31 ft
Reservoir name	=	SCM G	Max. Storage	=	87,596 cuft

Storage Indication method used.



Pond No. 5 - SCM G

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 386.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	386.00	24,430	0	0
0.50	386.50	36,650	15,166	15,166
1.00	387.00	38,400	18,759	33,925
2.00	388.00	41,960	40,163	74,087
3.00	389.00	45,580	43,753	117,841
4.00	390.00	49,250	47,398	165,239
5.00	391.00	52,970	51,094	216,333
6.00	392.00	60,600	56,737	273,069

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	2.50	2.00	0.00
Span (in)	= 18.00	2.50	2.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 383.00	386.00	387.00	0.00
Length (ft)	= 140.00	0.50	0.50	0.00
Slope (%)	= 0.50	0.01	0.01	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 15.00	1.00	8.00	0.00
Crest El. (ft)	= 390.50	389.50	391.50	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= 1	Rect	Broad	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	386.00	0.00	0.00	0.00	---	0.00	0.00	0.00	---	---	---	0.000
0.05	1,517	386.05	10.48 oc	0.00 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.005
0.10	3,033	386.10	10.48 oc	0.02 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.018
0.15	4,550	386.15	10.48 oc	0.04 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.035
0.20	6,066	386.20	10.48 oc	0.05 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.051
0.25	7,583	386.25	10.48 oc	0.06 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.063
0.30	9,099	386.30	10.48 oc	0.07 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.073
0.35	10,616	386.35	10.48 oc	0.08 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.081
0.40	12,132	386.40	10.48 oc	0.09 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.089
0.45	13,649	386.45	10.48 oc	0.10 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.096
0.50	15,166	386.50	10.48 oc	0.10 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.103
0.55	17,041	386.55	10.48 oc	0.11 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.110
0.60	18,917	386.60	10.48 oc	0.12 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.116
0.65	20,793	386.65	10.48 oc	0.12 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.121
0.70	22,669	386.70	10.48 oc	0.13 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.127
0.75	24,545	386.75	10.48 oc	0.13 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.132
0.80	26,421	386.80	10.48 oc	0.14 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.137
0.85	28,297	386.85	10.48 oc	0.14 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.142
0.90	30,173	386.90	10.48 oc	0.15 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.146
0.95	32,049	386.95	10.48 oc	0.15 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.151
1.00	33,925	387.00	10.48 oc	0.16 ic	0.00	---	0.00	0.00	0.00	---	---	---	0.155
1.10	37,941	387.10	10.48 oc	0.16 ic	0.01 ic	---	0.00	0.00	0.00	---	---	---	0.179
1.20	41,957	387.20	10.48 oc	0.17 ic	0.04 ic	---	0.00	0.00	0.00	---	---	---	0.208
1.30	45,973	387.30	10.48 oc	0.18 ic	0.05 ic	---	0.00	0.00	0.00	---	---	---	0.228
1.40	49,990	387.40	10.48 oc	0.19 ic	0.06 ic	---	0.00	0.00	0.00	---	---	---	0.246
1.50	54,006	387.50	10.48 oc	0.19 ic	0.07 ic	---	0.00	0.00	0.00	---	---	---	0.262
1.60	58,022	387.60	10.48 oc	0.20 ic	0.08 ic	---	0.00	0.00	0.00	---	---	---	0.276
1.70	62,039	387.70	10.48 oc	0.21 ic	0.08 ic	---	0.00	0.00	0.00	---	---	---	0.290
1.80	66,055	387.80	10.48 oc	0.21 ic	0.09 ic	---	0.00	0.00	0.00	---	---	---	0.303
1.90	70,071	387.90	10.48 oc	0.22 ic	0.09 ic	---	0.00	0.00	0.00	---	---	---	0.315
2.00	74,087	388.00	10.48 oc	0.23 ic	0.10 ic	---	0.00	0.00	0.00	---	---	---	0.327
2.10	78,463	388.10	10.48 oc	0.23 ic	0.11 ic	---	0.00	0.00	0.00	---	---	---	0.338
2.20	82,838	388.20	10.48 oc	0.24 ic	0.11 ic	---	0.00	0.00	0.00	---	---	---	0.349
2.30	87,213	388.30	10.48 oc	0.24 ic	0.12 ic	---	0.00	0.00	0.00	---	---	---	0.359
2.40	91,589	388.40	10.48 oc	0.25 ic	0.[illegible]		0.00	0.00	0.00	---	---	---	0.369

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SCM G

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
2.50	95,964	388.50	10.48 oc	0.25 ic	0.13 ic	---	0.00	0.00	0.00	---	---	---	0.379
2.60	100,339	388.60	10.48 oc	0.26 ic	0.13 ic	---	0.00	0.00	0.00	---	---	---	0.389
2.70	104,715	388.70	10.48 oc	0.26 ic	0.13 ic	---	0.00	0.00	0.00	---	---	---	0.398
2.80	109,090	388.80	10.48 oc	0.27 ic	0.14 ic	---	0.00	0.00	0.00	---	---	---	0.407
2.90	113,465	388.90	10.48 oc	0.27 ic	0.14 ic	---	0.00	0.00	0.00	---	---	---	0.416
3.00	117,841	389.00	10.48 oc	0.28 ic	0.15 ic	---	0.00	0.00	0.00	---	---	---	0.425
3.10	122,580	389.10	10.48 oc	0.28 ic	0.15 ic	---	0.00	0.00	0.00	---	---	---	0.433
3.20	127,320	389.20	10.48 oc	0.29 ic	0.15 ic	---	0.00	0.00	0.00	---	---	---	0.442
3.30	132,060	389.30	10.48 oc	0.29 ic	0.16 ic	---	0.00	0.00	0.00	---	---	---	0.450
3.40	136,800	389.40	10.48 oc	0.30 ic	0.16 ic	---	0.00	0.00	0.00	---	---	---	0.458
3.50	141,540	389.50	10.48 oc	0.30 ic	0.16 ic	---	0.00	0.00	0.00	---	---	---	0.466
3.60	146,280	389.60	10.48 oc	0.31 ic	0.17 ic	---	0.00	0.11	0.00	---	---	---	0.579
3.70	151,019	389.70	10.48 oc	0.31 ic	0.17 ic	---	0.00	0.30	0.00	---	---	---	0.779
3.80	155,759	389.80	10.48 oc	0.32 ic	0.17 ic	---	0.00	0.55	0.00	---	---	---	1.036
3.90	160,499	389.90	10.48 oc	0.32 ic	0.18 ic	---	0.00	0.84	0.00	---	---	---	1.339
4.00	165,239	390.00	10.48 oc	0.32 ic	0.18 ic	---	0.00	1.18	0.00	---	---	---	1.681
4.10	170,348	390.10	10.48 oc	0.33 ic	0.18 ic	---	0.00	1.55	0.00	---	---	---	2.058
4.20	175,458	390.20	10.48 oc	0.33 ic	0.19 ic	---	0.00	1.95	0.00	---	---	---	2.468
4.30	180,567	390.30	10.48 oc	0.34 ic	0.19 ic	---	0.00	2.38	0.00	---	---	---	2.907
4.40	185,676	390.40	10.48 oc	0.34 ic	0.19 ic	---	0.00	2.84	0.00	---	---	---	3.375
4.50	190,786	390.50	10.48 oc	0.34 ic	0.19 ic	---	0.00	3.33	0.00	---	---	---	3.868
4.60	195,895	390.60	10.48 oc	0.35 ic	0.20 ic	---	1.58	3.84	0.00	---	---	---	5.966
4.70	201,004	390.70	10.48 oc	0.35 ic	0.20 ic	---	4.47	4.38	0.00	---	---	---	9.397
4.80	206,114	390.80	13.63 oc	0.30 ic	0.19 ic	---	8.21	4.94	0.00	---	---	---	13.63
4.90	211,223	390.90	17.73 oc	0.15 ic	0.09 ic	---	12.64	4.85 s	0.00	---	---	---	17.73
5.00	216,333	391.00	18.62 oc	0.08 ic	0.05 ic	---	14.95 s	3.53 s	0.00	---	---	---	18.62
5.10	222,006	391.10	18.88 oc	0.06 ic	0.04 ic	---	15.62 s	3.16 s	0.00	---	---	---	18.88
5.20	227,680	391.20	19.08 oc	0.05 ic	0.03 ic	---	16.08 s	2.91 s	0.00	---	---	---	19.08
5.30	233,354	391.30	19.25 oc	0.04 ic	0.03 ic	---	16.45 s	2.72 s	0.00	---	---	---	19.25
5.40	239,027	391.40	19.40 oc	0.04 ic	0.02 ic	---	16.76 s	2.58 s	0.00	---	---	---	19.40
5.50	244,701	391.50	19.55 oc	0.03 ic	0.02 ic	---	17.02 s	2.46 s	0.00	---	---	---	19.54
5.60	250,375	391.60	19.69 oc	0.03 ic	0.02 ic	---	17.25 s	2.37 s	0.66	---	---	---	20.33
5.70	256,048	391.70	19.82 oc	0.03 ic	0.02 ic	---	17.47 s	2.29 s	1.86	---	---	---	21.67
5.80	261,722	391.80	19.95 oc	0.02 ic	0.02 ic	---	17.68 s	2.23 s	3.42	---	---	---	23.37
5.90	267,395	391.90	20.08 oc	0.02 ic	0.01 ic	---	17.84 s	2.17 s	5.26	---	---	---	25.31
6.00	273,069	392.00	20.21 oc	0.02 ic	0.01 ic	---	18.02 s	2.12 s	7.35	---	---	---	27.53

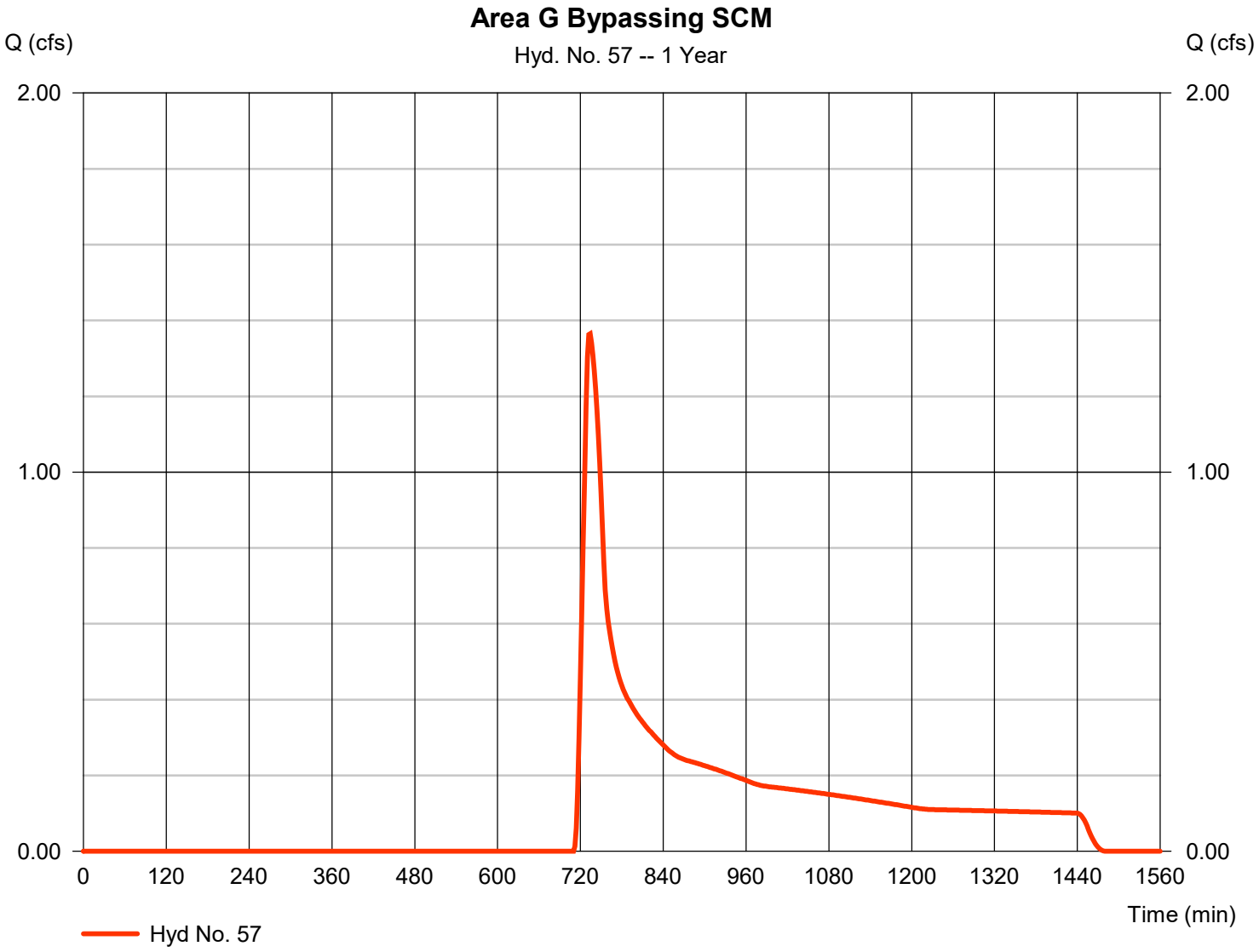
...End

Hydrograph Report

Hyd. No. 57

Area G Bypassing SCM

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.365 cfs
Storm frequency	=	1 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	9,827 cuft
Drainage area	=	9.070 ac	Curve number	=	60.3
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	23.80 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

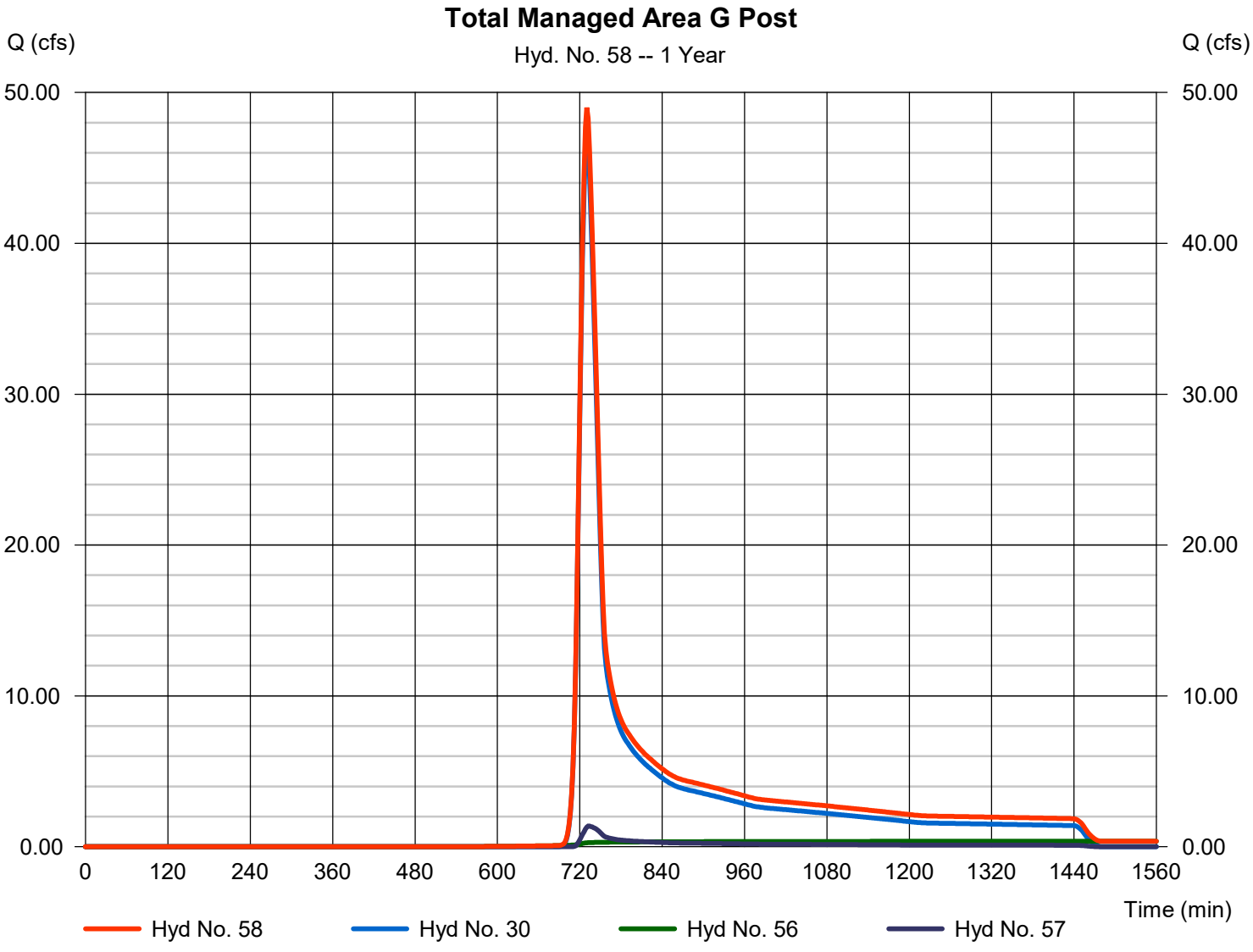


Hydrograph Report

Hyd. No. 58

Total Managed Area G Post

Hydrograph type	= Combine	Peak discharge	= 49.00 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 285,395 cuft
Inflow hyds.	= 30, 56, 57	Contrib. drain. area	= 85.670 ac

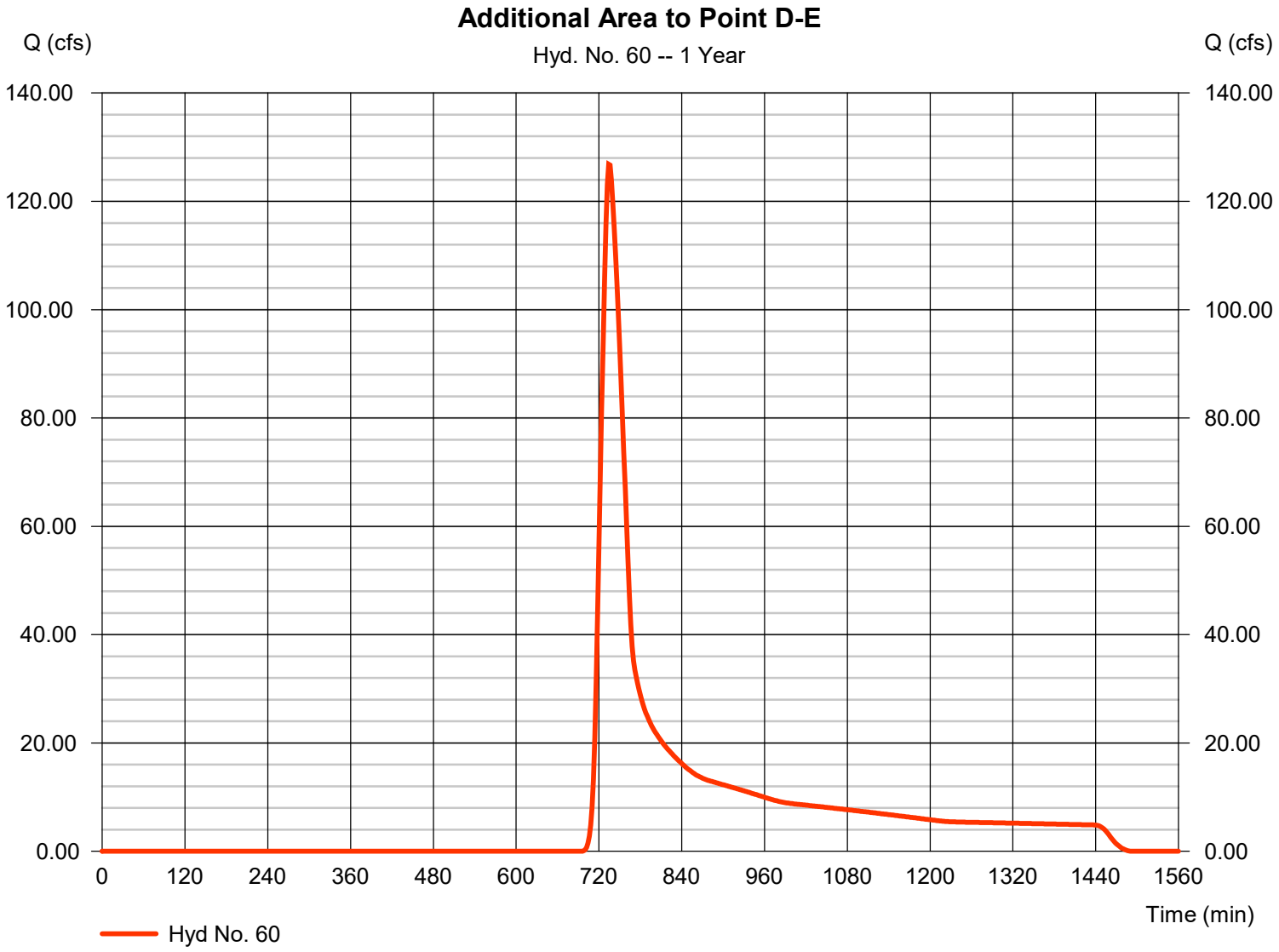


Hydrograph Report

Hyd. No. 60

Additional Area to Point D-E

Hydrograph type	= SCS Runoff	Peak discharge	= 126.84 cfs
Storm frequency	= 1 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 660,044 cuft
Drainage area	= 271.000 ac	Curve number	= 70.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.50 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 60

Additional Area to Point D-E

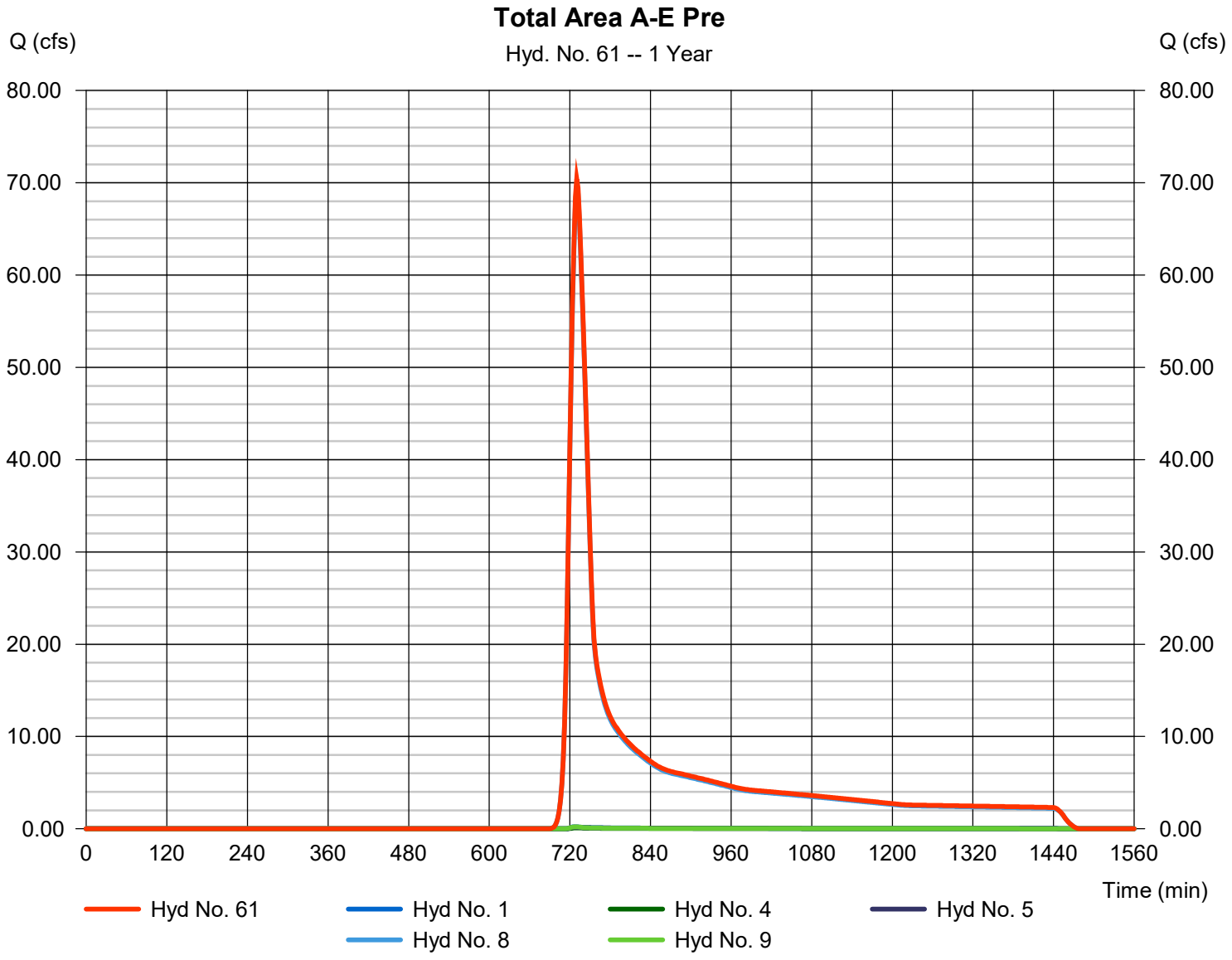
Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 11.83**	**+**	**0.00**	**+**	**0.00**	**=**	**11.83**
Shallow Concentrated Flow							
Flow length (ft)	= 1700.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		0.00		0.00		
Travel Time (min)	**= 12.42**	**+**	**0.00**	**+**	**0.00**	**=**	**12.42**
Channel Flow							
X sectional flow area (sqft)	= 16.00		0.00		0.00		
Wetted perimeter (ft)	= 11.66		0.00		0.00		
Channel slope (%)	= 0.60		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=9.51						
			0.00				
					0.00		
Flow length (ft)	({0})4700.0		0.0		0.0		
Travel Time (min)	**= 8.24**	**+**	**0.00**	**+**	**0.00**	**=**	**8.24**
Total Travel Time, Tc							**32.50 min**

Hydrograph Report

Hyd. No. 61

Total Area A-E Pre

Hydrograph type	= Combine	Peak discharge	= 70.41 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 310,377 cuft
Inflow hyds.	= 1, 4, 5, 8, 9	Contrib. drain. area	= 10.720 ac

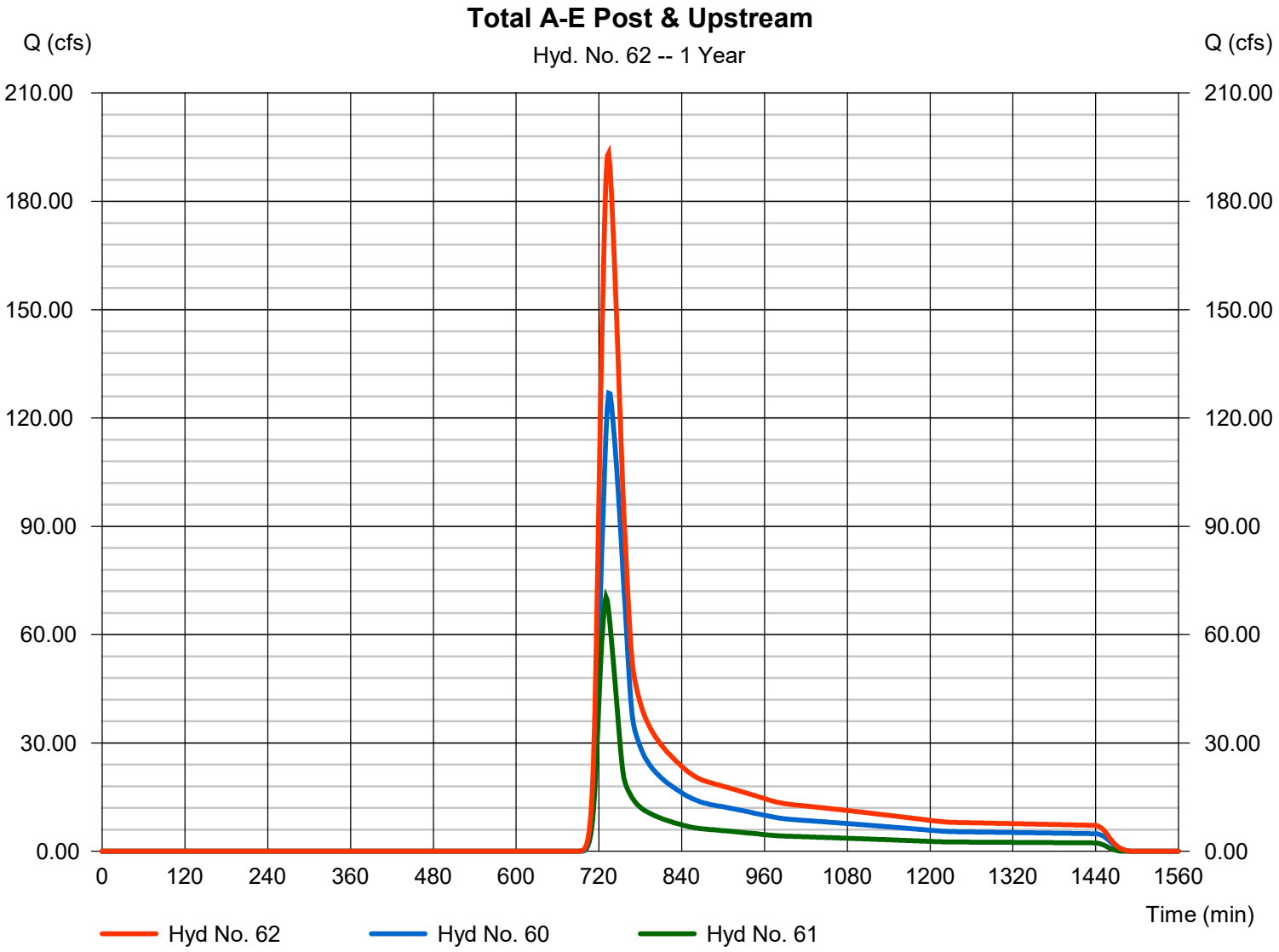


Hydrograph Report

Hyd. No. 62

Total A-E Post & Upstream

Hydrograph type	= Combine	Peak discharge	= 193.33 cfs
Storm frequency	= 1 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 970,420 cuft
Inflow hyds.	= 60, 61	Contrib. drain. area	= 271.000 ac



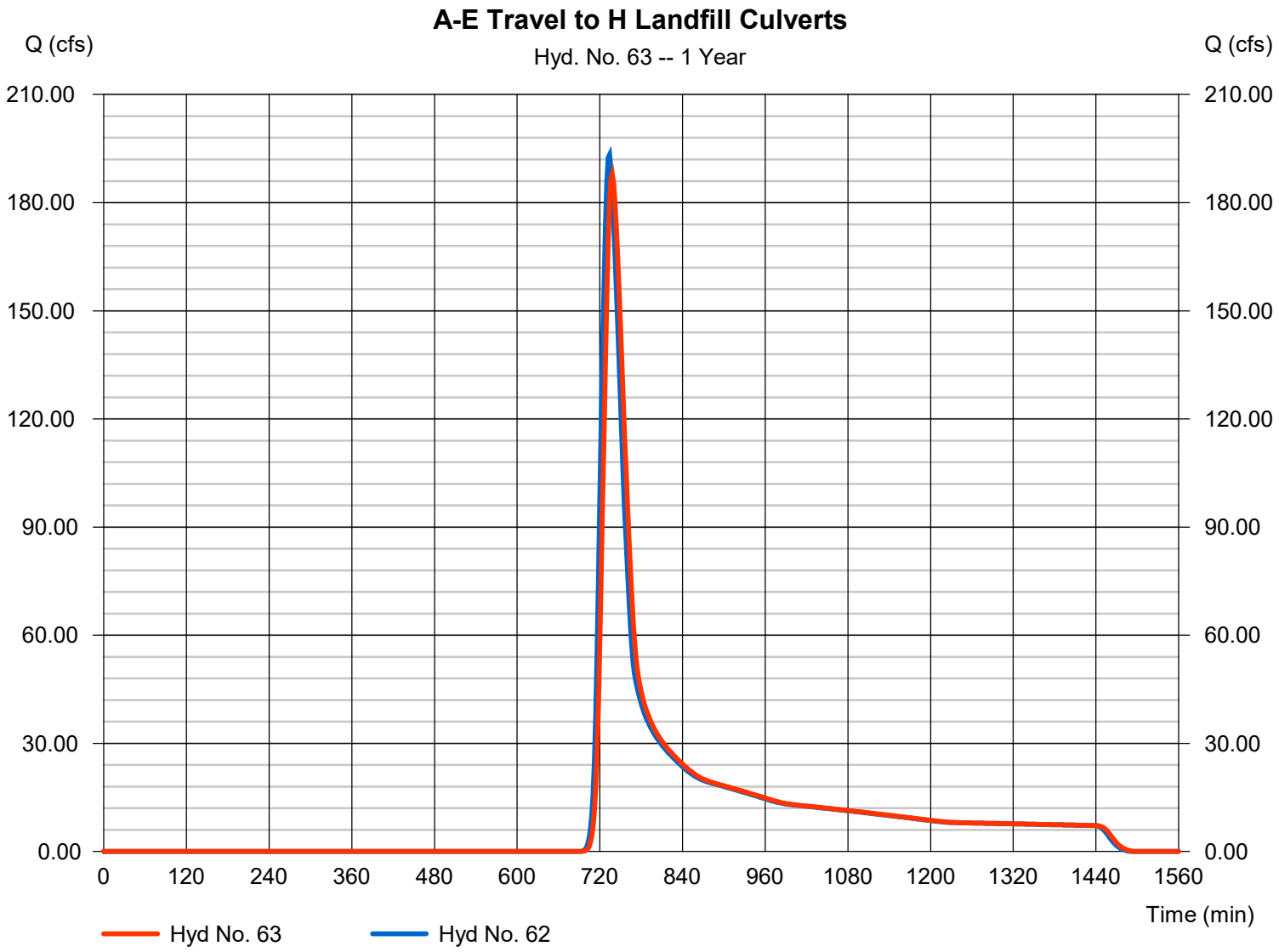
Hydrograph Report

Hyd. No. 63

A-E Travel to H Landfill Culverts

Hydrograph type	=	Reach	Peak discharge	=	187.87 cfs
Storm frequency	=	1 yrs	Time to peak	=	738 min
Time interval	=	2 min	Hyd. volume	=	970,419 cuft
Inflow hyd. No.	=	62 - Total A-E Post & Upstream	Section type	=	Trapezoidal
Reach length	=	1500.0 ft	Channel slope	=	0.7 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	1.509	Rating curve m	=	1.374
Ave. velocity	=	5.66 ft/s	Routing coeff.	=	0.4743

Modified Att-Kin routing method used.

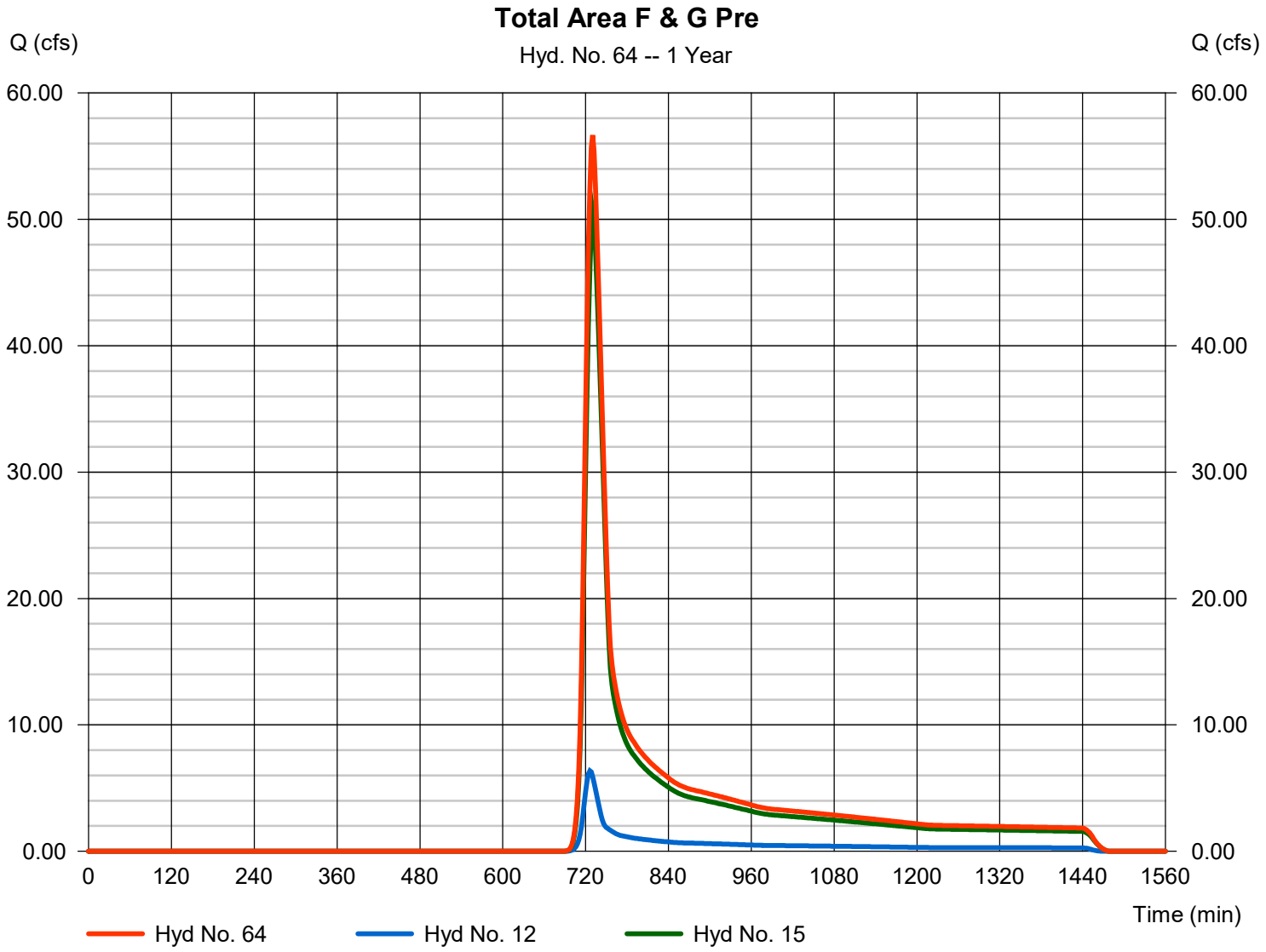


Hydrograph Report

Hyd. No. 64

Total Area F & G Pre

Hydrograph type	= Combine	Peak discharge	= 56.66 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 247,289 cuft
Inflow hyds.	= 12, 15	Contrib. drain. area	= 0.000 ac



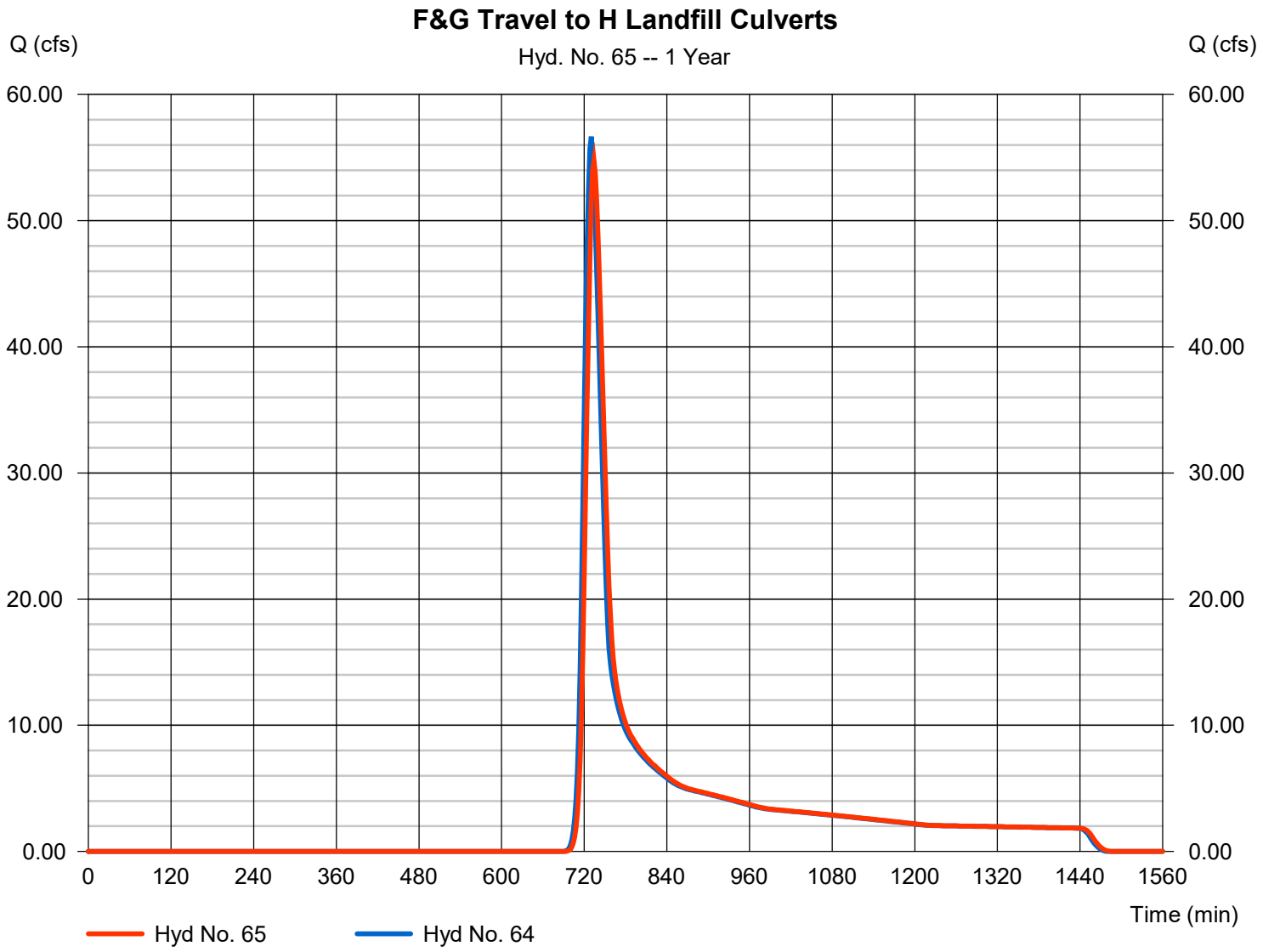
Hydrograph Report

Hyd. No. 65

F&G Travel to H Landfill Culverts

Hydrograph type	=	Reach	Peak discharge	=	54.76 cfs
Storm frequency	=	1 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	247,288 cuft
Inflow hyd. No.	=	64 - Total Area F & G Pre	Section type	=	Trapezoidal
Reach length	=	1300.0 ft	Channel slope	=	1.5 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	2.209	Rating curve m	=	1.374
Ave. velocity	=	5.34 ft/s	Routing coeff.	=	0.5063

Modified Att-Kin routing method used.

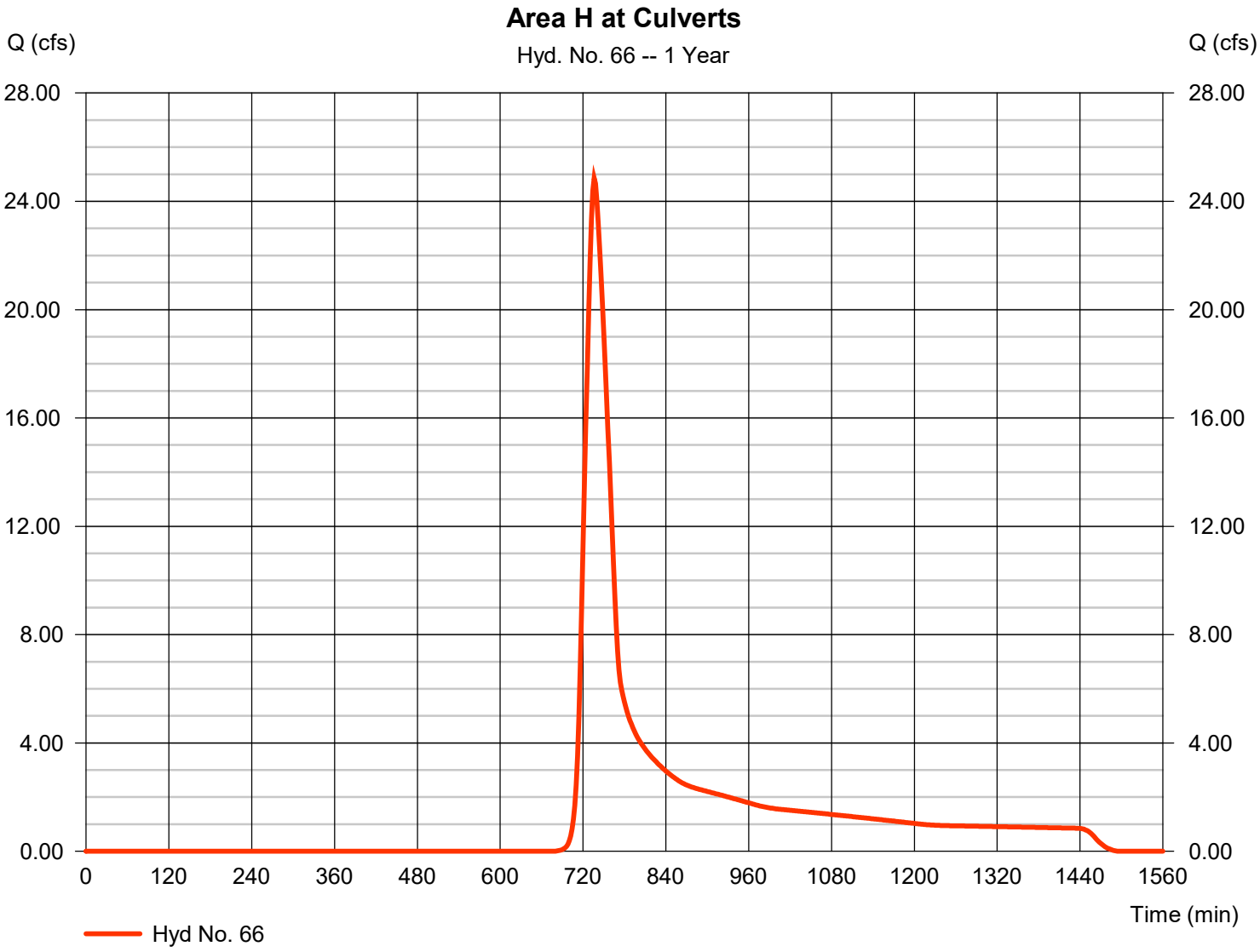


Hydrograph Report

Hyd. No. 66

Area H at Culverts

Hydrograph type	=	SCS Runoff	Peak discharge	=	24.85 cfs
Storm frequency	=	1 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	125,838 cuft
Drainage area	=	43.300 ac	Curve number	=	73.4
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	35.10 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 66

Area H at Culverts

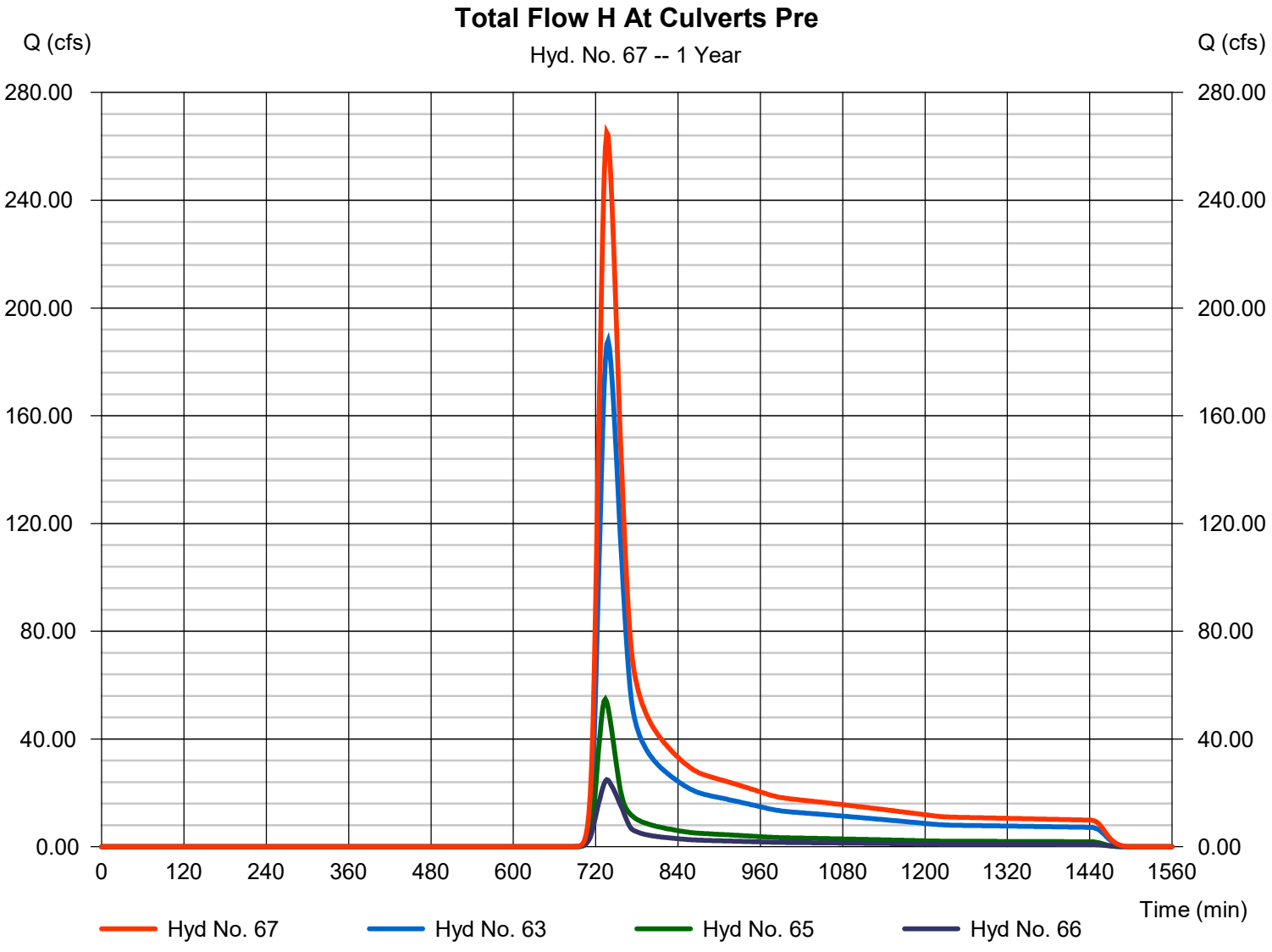
Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 11.83**	**+**	**0.00**	**+**	**0.00**	**=**	**11.83**
Shallow Concentrated Flow							
Flow length (ft)	= 1700.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		0.00		0.00		
Travel Time (min)	**= 12.42**	**+**	**0.00**	**+**	**0.00**	**=**	**12.42**
Channel Flow							
X sectional flow area (sqft)	= 16.00		0.00		0.00		
Wetted perimeter (ft)	= 11.66		0.00		0.00		
Channel slope (%)	= 0.60		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=9.51						
			0.00				
					0.00		
Flow length (ft)	({0})6200.0		0.0		0.0		
Travel Time (min)	**= 10.86**	**+**	**0.00**	**+**	**0.00**	**=**	**10.86**
Total Travel Time, Tc							**35.10 min**

Hydrograph Report

Hyd. No. 67

Total Flow H At Culverts Pre

Hydrograph type	= Combine	Peak discharge	= 265.16 cfs
Storm frequency	= 1 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1,343,545 cuft
Inflow hyds.	= 63, 65, 66	Contrib. drain. area	= 43.300 ac

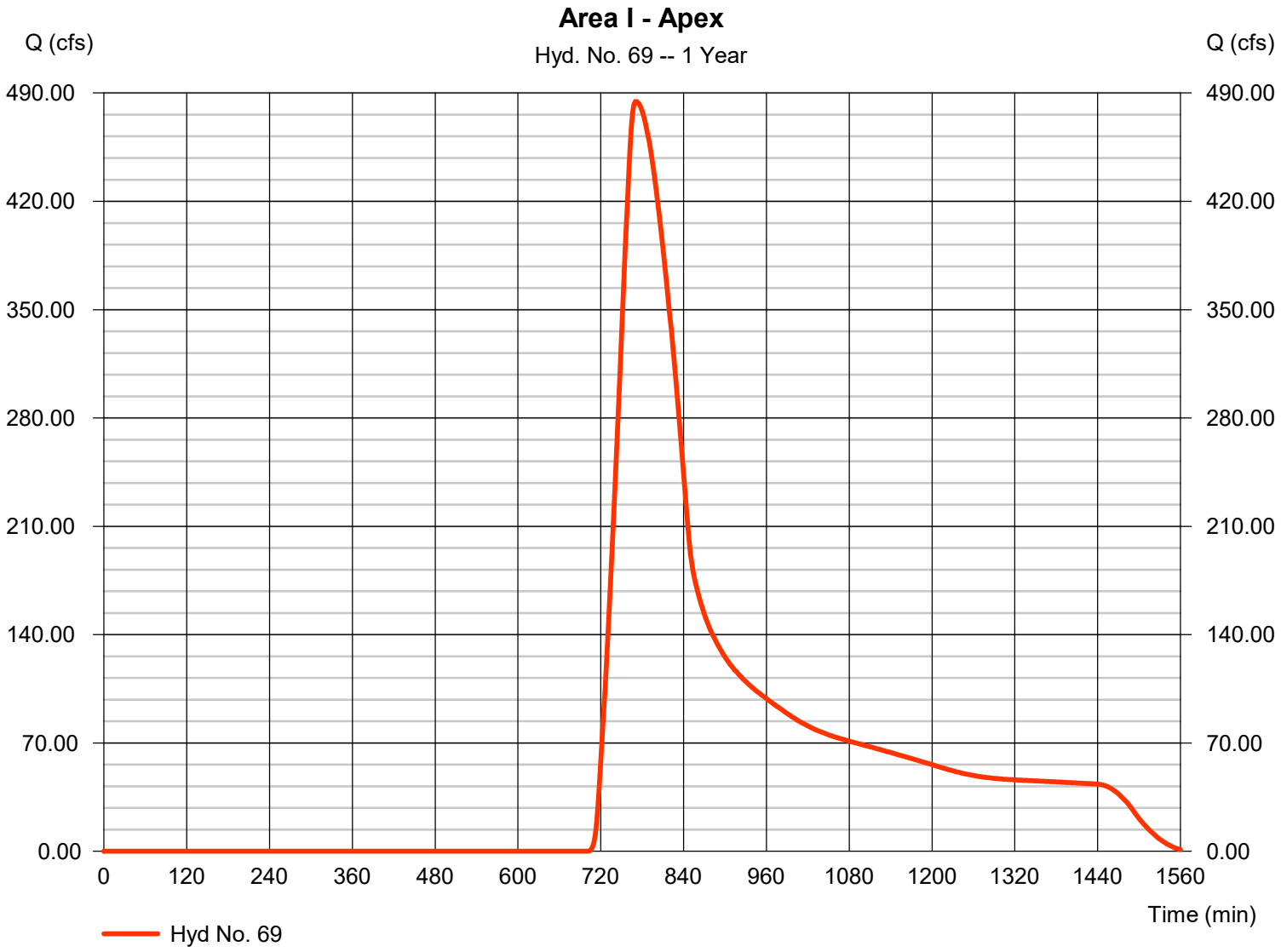


Hydrograph Report

Hyd. No. 69

Area I - Apex

Hydrograph type	= SCS Runoff	Peak discharge	= 484.42 cfs
Storm frequency	= 1 yrs	Time to peak	= 772 min
Time interval	= 2 min	Hyd. volume	= 5,397,708 cuft
Drainage area	= 2637.000 ac	Curve number	= 67.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 87.40 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 69

Area I - Apex

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.410		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 12.06**	**+**	**0.00**	**+**	**0.00**	**=**	**12.06**
Shallow Concentrated Flow							
Flow length (ft)	= 110.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		0.00		0.00		
Travel Time (min)	**= 0.80**	**+**	**0.00**	**+**	**0.00**	**=**	**0.80**
Channel Flow							
X sectional flow area (sqft)	= 7.08		11.66		0.00		
Wetted perimeter (ft)	= 9.43		16.00		0.00		
Channel slope (%)	= 2.00		0.70		0.00		
Manning's n-value	= 0.015		0.025		0.015		
Velocity (ft/s)	=11.59						
			4.03				
					0.00		
Flow length (ft)	({0})3400.0		16850.0		0.0		
Travel Time (min)	**= 4.89**	**+**	**69.62**	**+**	**0.00**	**=**	**74.51**

Total Travel Time, Tc ..... 87.40 min

Hydrograph Report

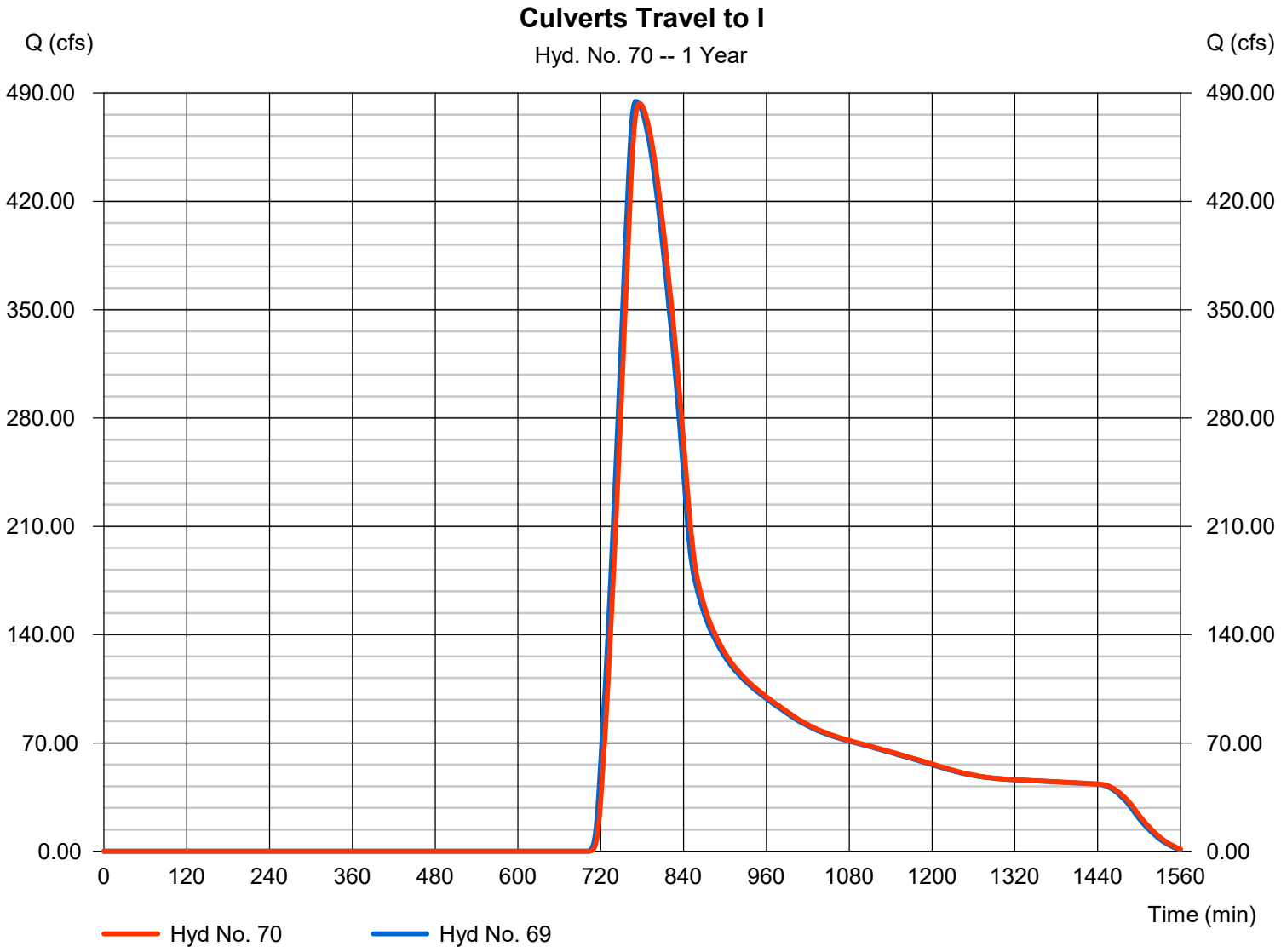
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Friday, 02 / 12 / 2021

Hyd. No. 70

Culverts Travel to I

Hydrograph type	=	Reach	Peak discharge	=	483.07 cfs
Storm frequency	=	1 yrs	Time to peak	=	776 min
Time interval	=	2 min	Hyd. volume	=	5,397,708 cuft
Inflow hyd. No.	=	69 - Area I - Apex	Section type	=	Trapezoidal
Reach length	=	1670.0 ft	Channel slope	=	0.7 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	1.509	Rating curve m	=	1.374
Ave. velocity	=	7.26 ft/s	Routing coeff.	=	0.5279

Modified Att-Kin routing method used.

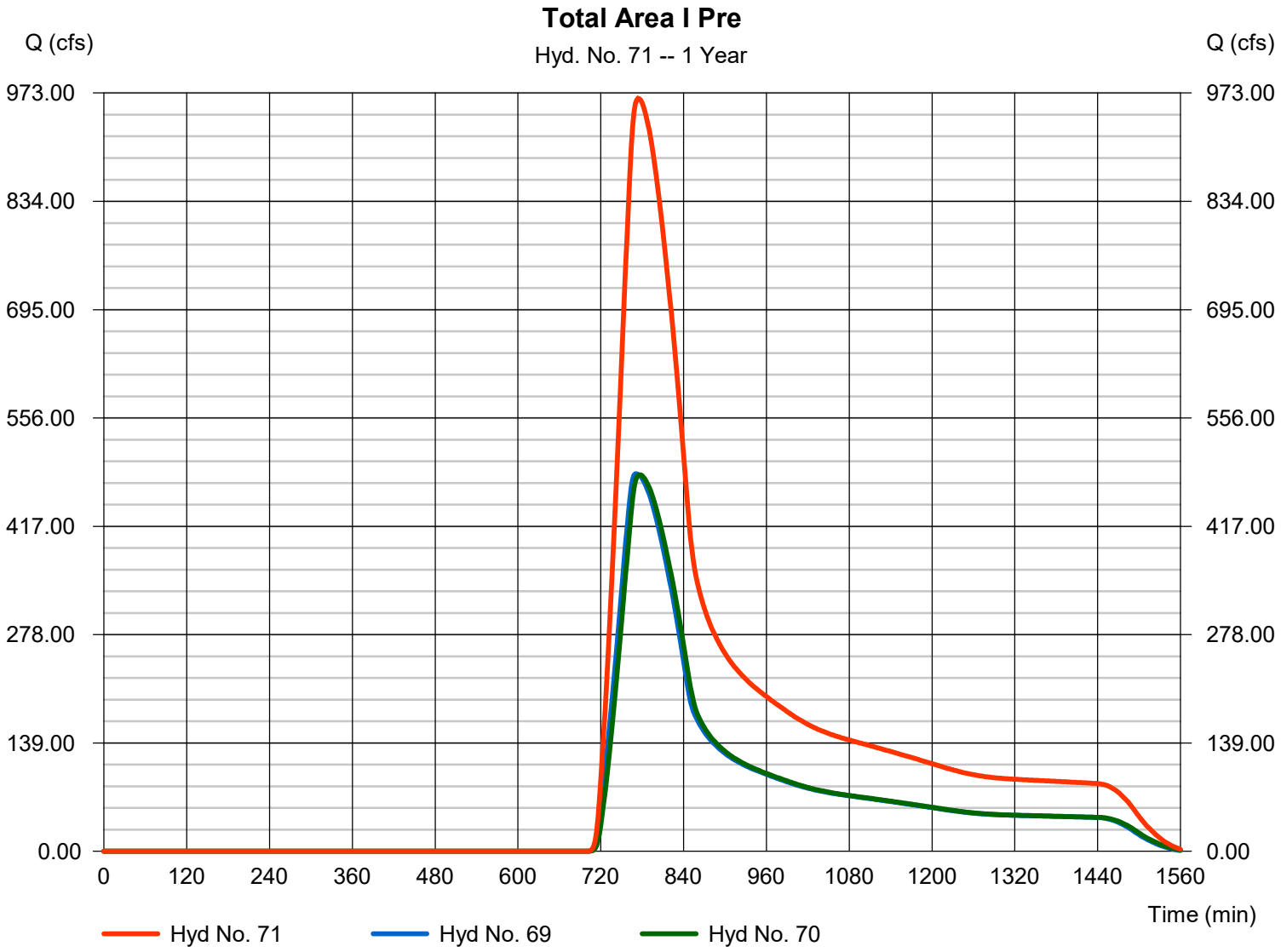


Hydrograph Report

Hyd. No. 71

Total Area I Pre

Hydrograph type	= Combine	Peak discharge	= 966.04 cfs
Storm frequency	= 1 yrs	Time to peak	= 774 min
Time interval	= 2 min	Hyd. volume	= 10,795,419 cuft
Inflow hyds.	= 69, 70	Contrib. drain. area	= 2637.000 ac

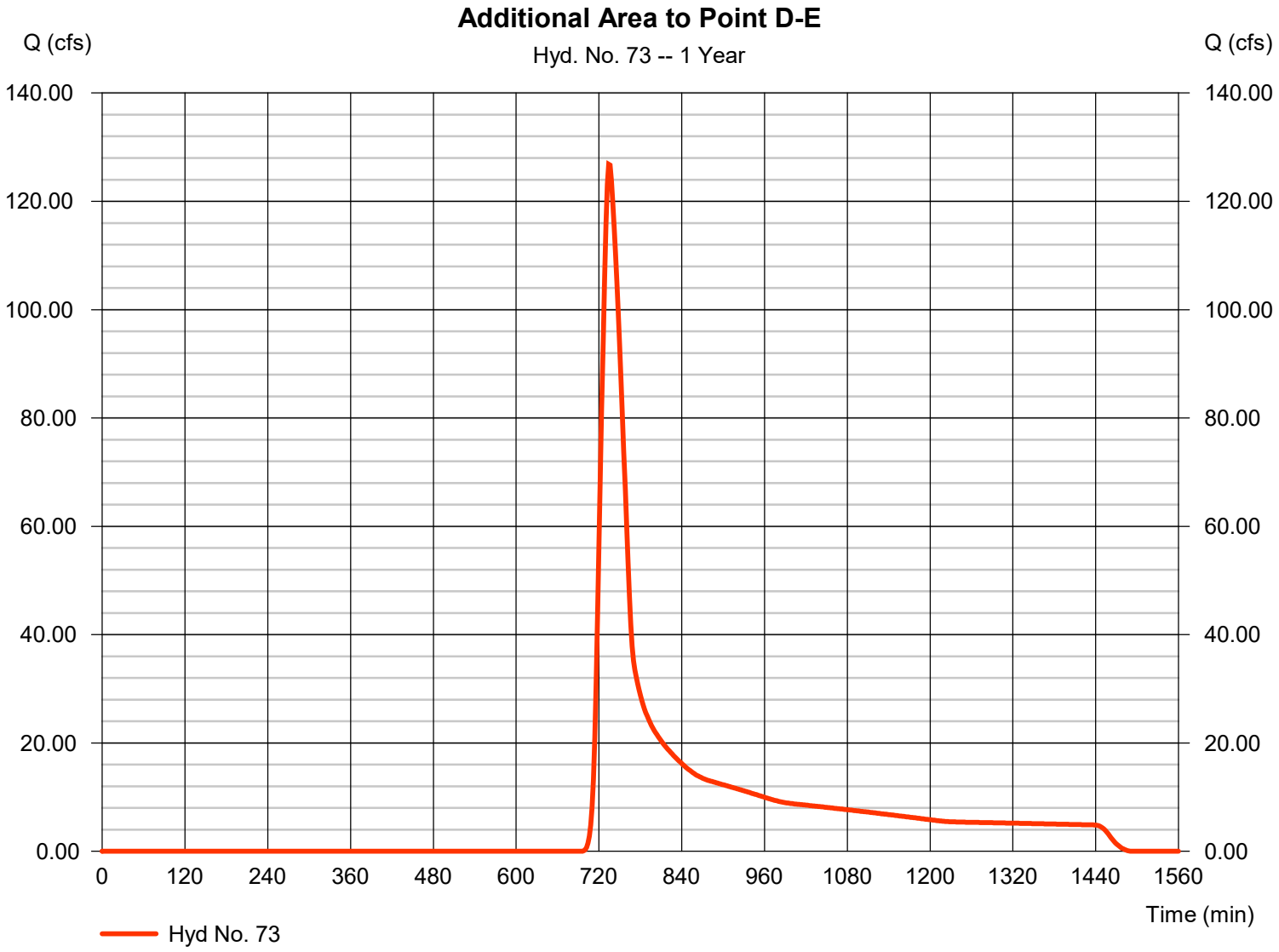


Hydrograph Report

Hyd. No. 73

Additional Area to Point D-E

Hydrograph type	=	SCS Runoff	Peak discharge	=	126.84 cfs
Storm frequency	=	1 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	660,044 cuft
Drainage area	=	271.000 ac	Curve number	=	70.2
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	32.50 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 73

Additional Area to Point D-E

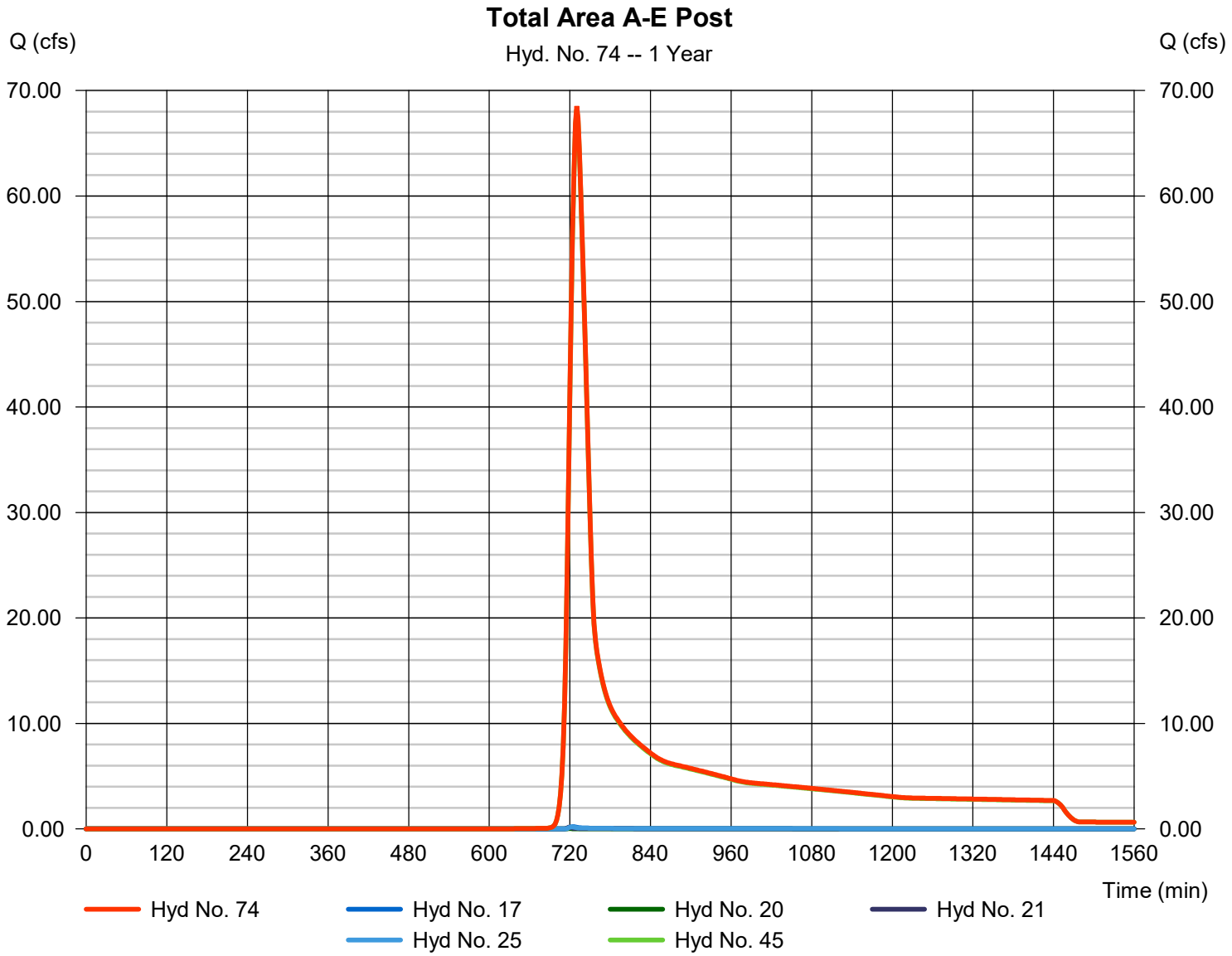
Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 11.83**	**+**	**0.00**	**+**	**0.00**	**=**	**11.83**
Shallow Concentrated Flow							
Flow length (ft)	= 1700.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		0.00		0.00		
Travel Time (min)	**= 12.42**	**+**	**0.00**	**+**	**0.00**	**=**	**12.42**
Channel Flow							
X sectional flow area (sqft)	= 16.00		0.00		0.00		
Wetted perimeter (ft)	= 11.66		0.00		0.00		
Channel slope (%)	= 0.60		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=9.51						
			0.00				
					0.00		
Flow length (ft)	({0})4700.0		0.0		0.0		
Travel Time (min)	**= 8.24**	**+**	**0.00**	**+**	**0.00**	**=**	**8.24**
Total Travel Time, Tc							**32.50 min**

Hydrograph Report

Hyd. No. 74

Total Area A-E Post

Hydrograph type	= Combine	Peak discharge	= 68.53 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 409,763 cuft
Inflow hyds.	= 17, 20, 21, 25, 45	Contrib. drain. area	= 3.290 ac

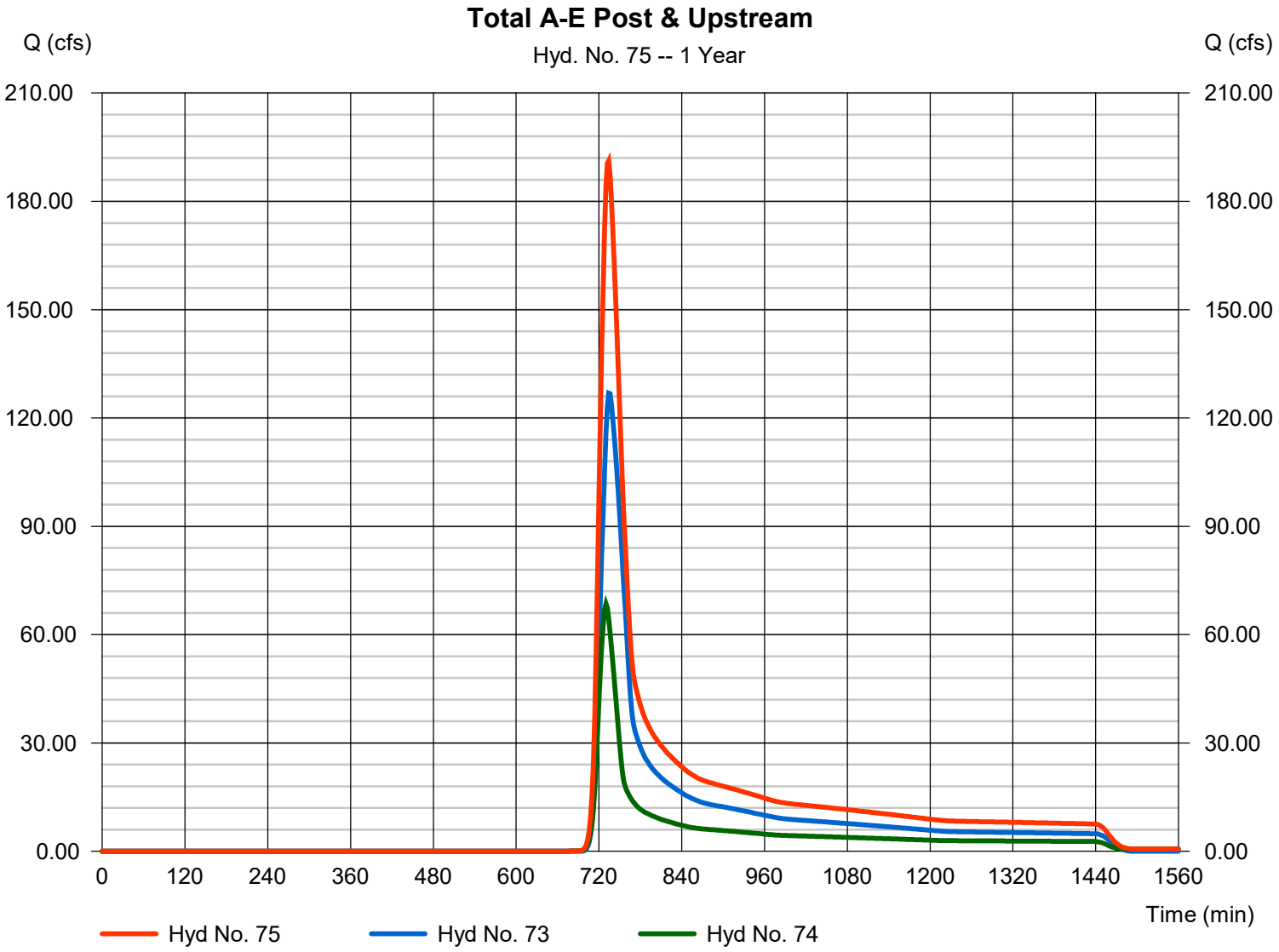


Hydrograph Report

Hyd. No. 75

Total A-E Post & Upstream

Hydrograph type	= Combine	Peak discharge	= 191.24 cfs
Storm frequency	= 1 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 1,069,806 cuft
Inflow hyds.	= 73, 74	Contrib. drain. area	= 271.000 ac



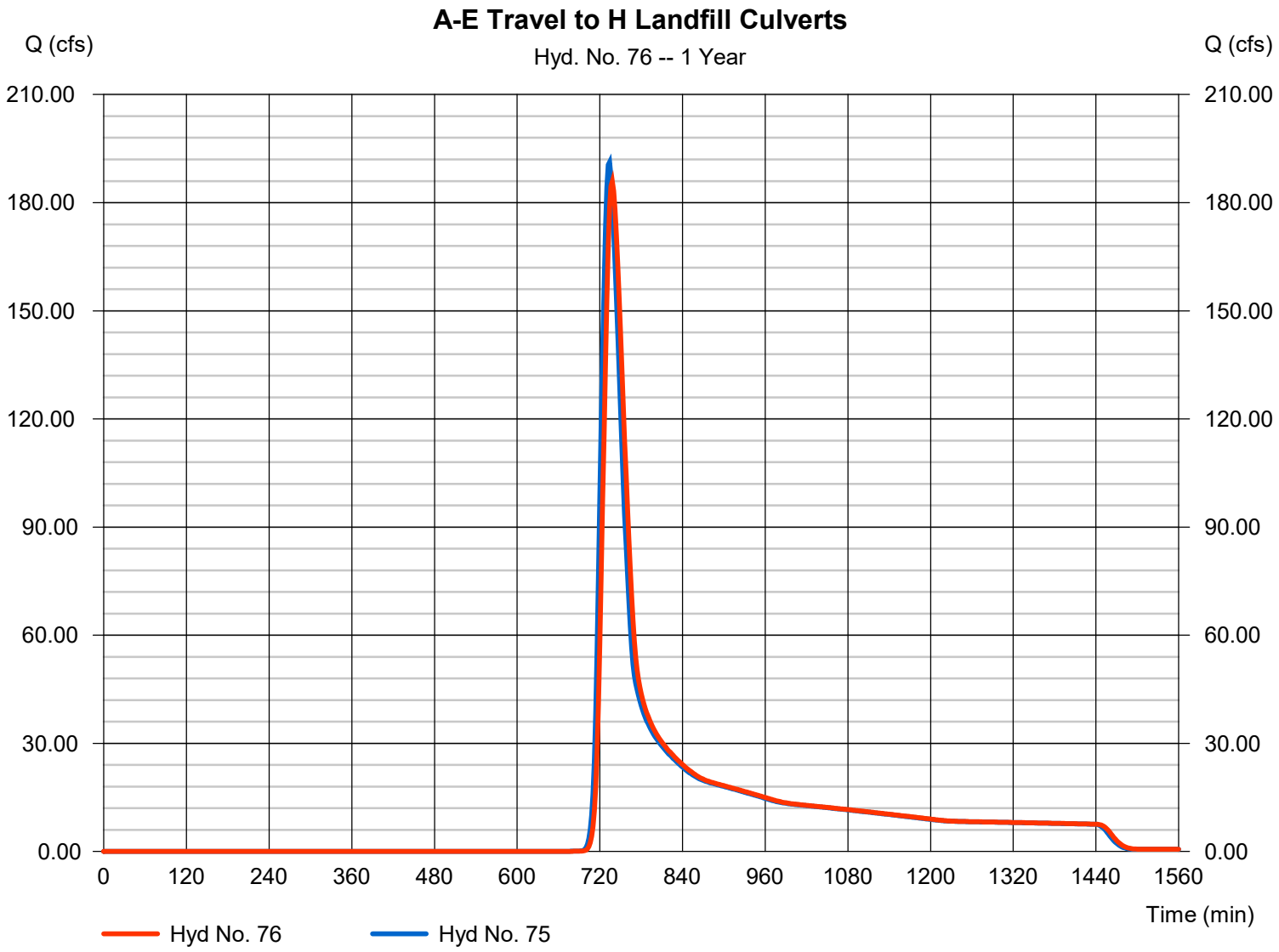
Hydrograph Report

Hyd. No. 76

A-E Travel to H Landfill Culverts

Hydrograph type	=	Reach	Peak discharge	=	185.85 cfs
Storm frequency	=	1 yrs	Time to peak	=	738 min
Time interval	=	2 min	Hyd. volume	=	1,069,762 cuft
Inflow hyd. No.	=	75 - Total A-E Post & Upstream	Section type	=	Trapezoidal
Reach length	=	1500.0 ft	Channel slope	=	0.7 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	1.509	Rating curve m	=	1.374
Ave. velocity	=	5.64 ft/s	Routing coeff.	=	0.4733

Modified Att-Kin routing method used.

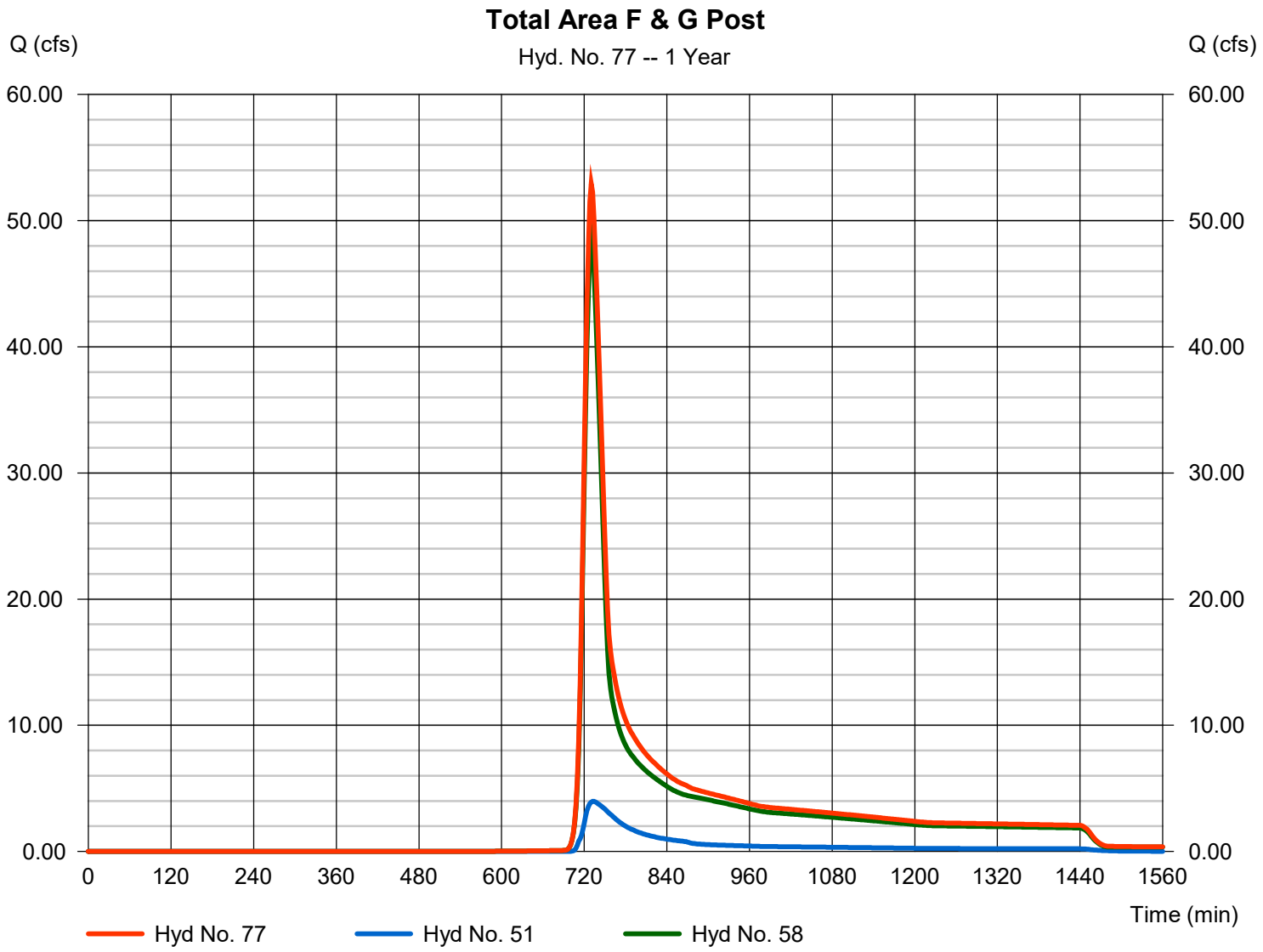


Hydrograph Report

Hyd. No. 77

Total Area F & G Post

Hydrograph type	= Combine	Peak discharge	= 52.91 cfs
Storm frequency	= 1 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 315,294 cuft
Inflow hyds.	= 51, 58	Contrib. drain. area	= 0.000 ac



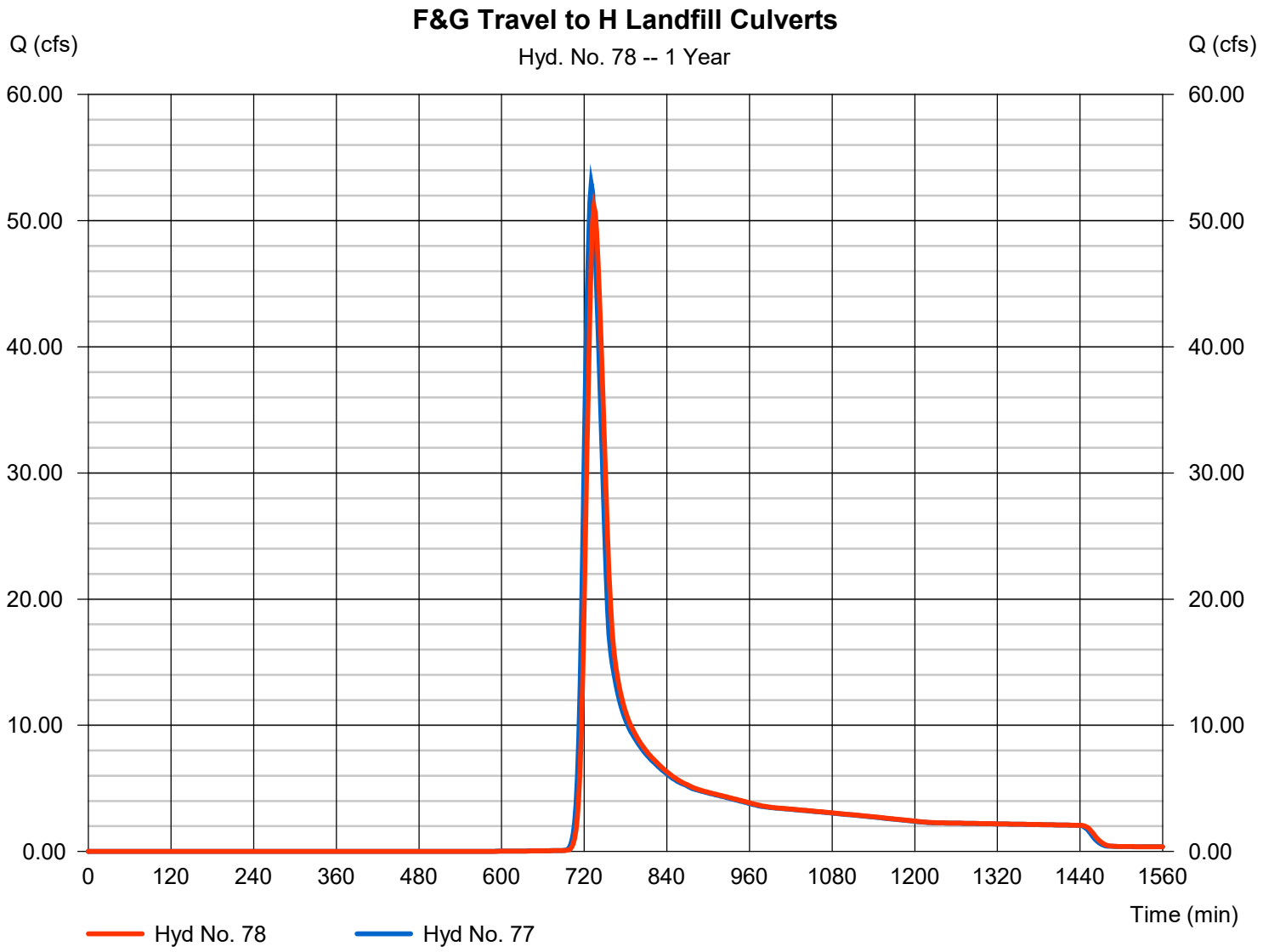
Hydrograph Report

Hyd. No. 78

F&G Travel to H Landfill Culverts

Hydrograph type	=	Reach	Peak discharge	=	51.13 cfs
Storm frequency	=	1 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	315,262 cuft
Inflow hyd. No.	=	77 - Total Area F & G Post	Section type	=	Trapezoidal
Reach length	=	1300.0 ft	Channel slope	=	1.5 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	2.209	Rating curve m	=	1.374
Ave. velocity	=	5.25 ft/s	Routing coeff.	=	0.4992

Modified Att-Kin routing method used.

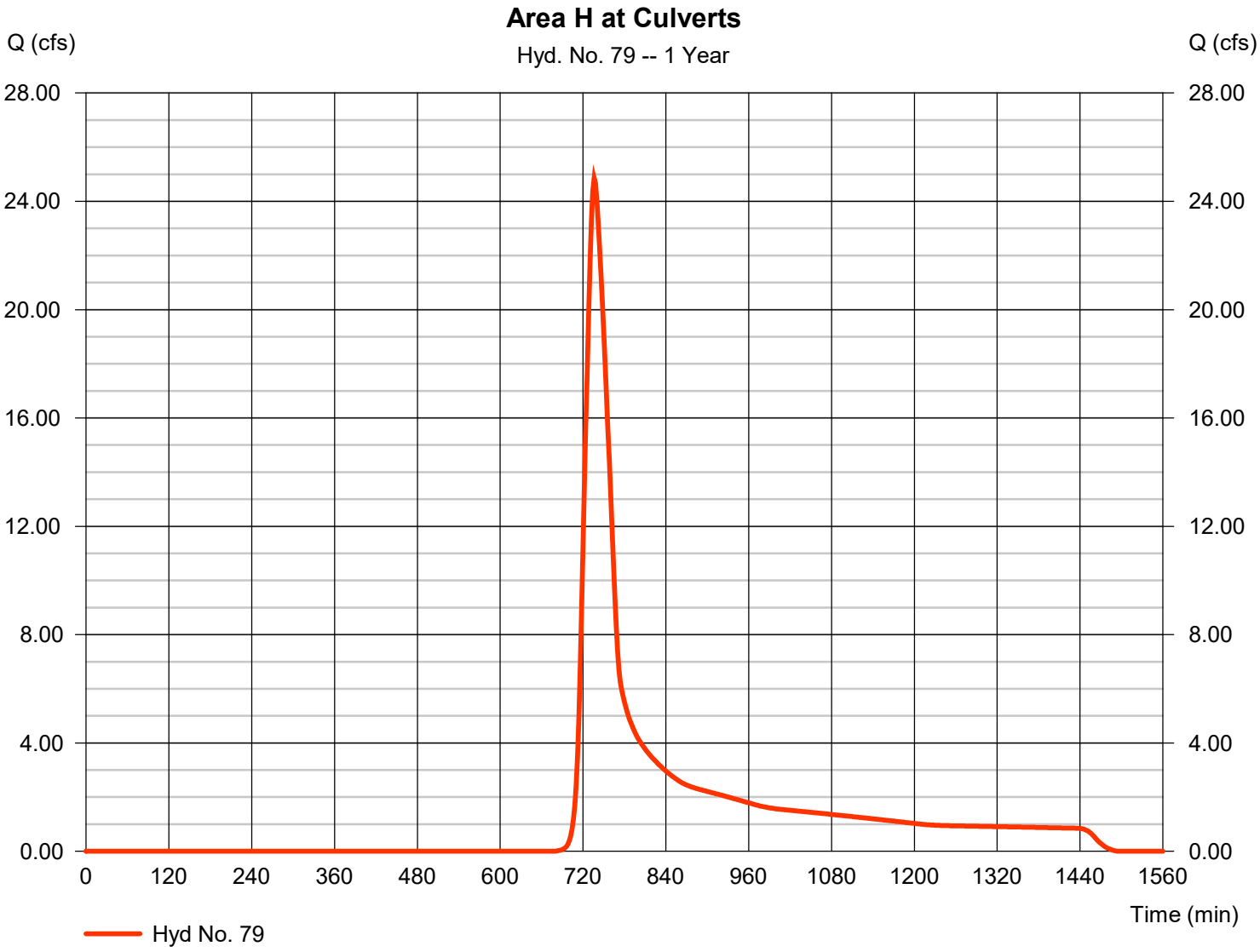


Hydrograph Report

Hyd. No. 79

Area H at Culverts

Hydrograph type	=	SCS Runoff	Peak discharge	=	24.85 cfs
Storm frequency	=	1 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	125,838 cuft
Drainage area	=	43.300 ac	Curve number	=	73.4
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	35.10 min
Total precip.	=	2.89 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 79

Area H at Culverts

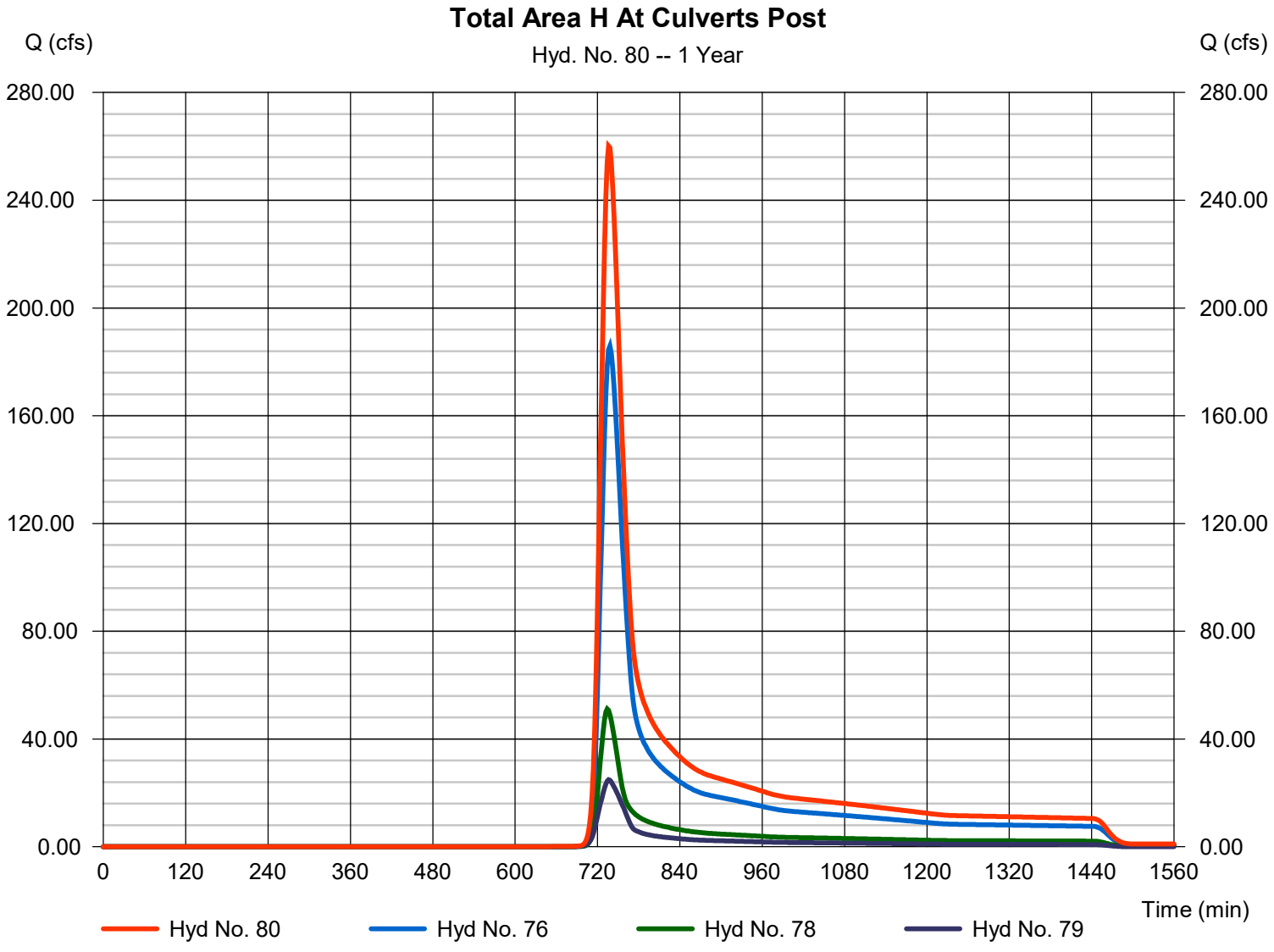
Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 11.83**	**+**	**0.00**	**+**	**0.00**	**=**	**11.83**
Shallow Concentrated Flow							
Flow length (ft)	= 1700.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		0.00		0.00		
Travel Time (min)	**= 12.42**	**+**	**0.00**	**+**	**0.00**	**=**	**12.42**
Channel Flow							
X sectional flow area (sqft)	= 16.00		0.00		0.00		
Wetted perimeter (ft)	= 11.66		0.00		0.00		
Channel slope (%)	= 0.60		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=9.51						
			0.00				
					0.00		
Flow length (ft)	({0})6200.0		0.0		0.0		
Travel Time (min)	**= 10.86**	**+**	**0.00**	**+**	**0.00**	**=**	**10.86**
Total Travel Time, Tc							**35.10 min**

Hydrograph Report

Hyd. No. 80

Total Area H At Culverts Post

Hydrograph type	= Combine	Peak discharge	= 260.08 cfs
Storm frequency	= 1 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 1,510,861 cuft
Inflow hyds.	= 76, 78, 79	Contrib. drain. area	= 43.300 ac

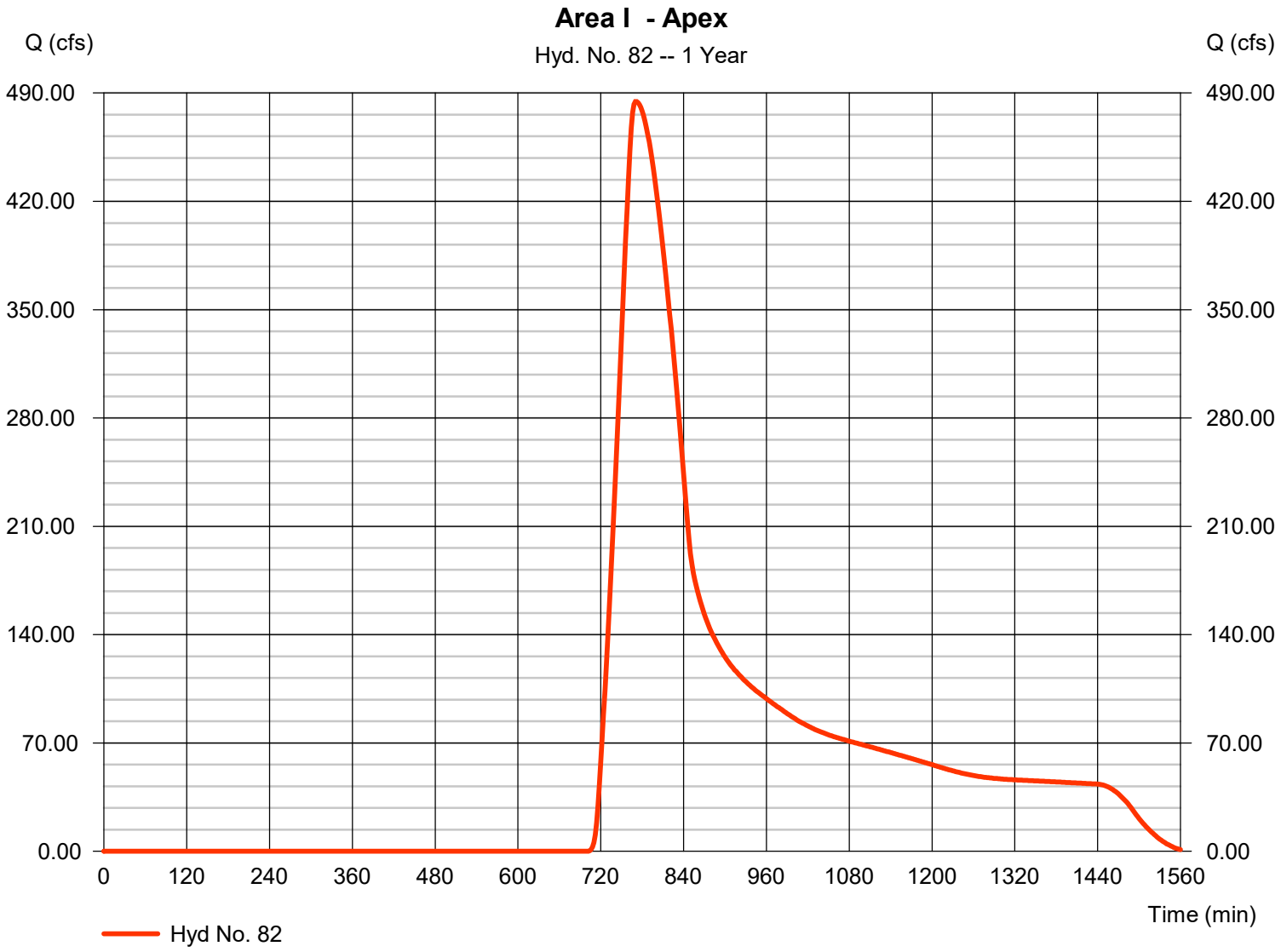


Hydrograph Report

Hyd. No. 82

Area I - Apex

Hydrograph type	= SCS Runoff	Peak discharge	= 484.42 cfs
Storm frequency	= 1 yrs	Time to peak	= 772 min
Time interval	= 2 min	Hyd. volume	= 5,397,708 cuft
Drainage area	= 2637.000 ac	Curve number	= 67.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 87.40 min
Total precip.	= 2.89 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



TR55 Tc Worksheet

Hyd. No. 82

Area I - Apex

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.410		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.48		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 12.06**	**+**	**0.00**	**+**	**0.00**	**=**	**12.06**
Shallow Concentrated Flow							
Flow length (ft)	= 110.00		0.00		0.00		
Watercourse slope (%)	= 2.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.28		0.00		0.00		
Travel Time (min)	**= 0.80**	**+**	**0.00**	**+**	**0.00**	**=**	**0.80**
Channel Flow							
X sectional flow area (sqft)	= 7.08		11.66		0.00		
Wetted perimeter (ft)	= 9.43		16.00		0.00		
Channel slope (%)	= 2.00		0.70		0.00		
Manning's n-value	= 0.015		0.025		0.015		
Velocity (ft/s)	=11.59						
			4.03				
					0.00		
Flow length (ft)	({0})3400.0		16850.0		0.0		
Travel Time (min)	**= 4.89**	**+**	**69.62**	**+**	**0.00**	**=**	**74.51**

Total Travel Time, Tc ..... 87.40 min

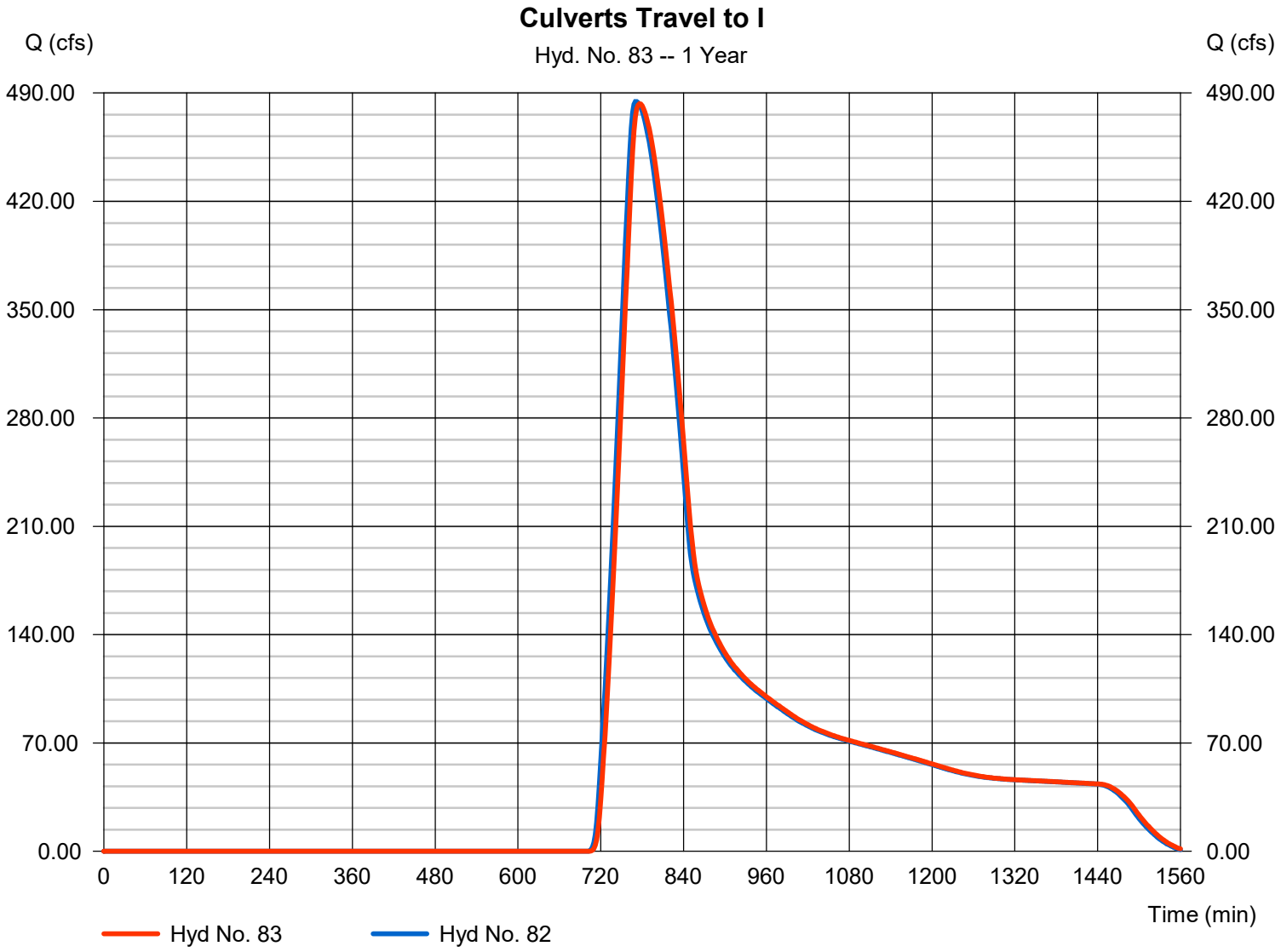
Hydrograph Report

Hyd. No. 83

Culverts Travel to I

Hydrograph type	= Reach	Peak discharge	= 483.07 cfs
Storm frequency	= 1 yrs	Time to peak	= 776 min
Time interval	= 2 min	Hyd. volume	= 5,397,708 cuft
Inflow hyd. No.	= 82 - Area I - Apex	Section type	= Trapezoidal
Reach length	= 1670.0 ft	Channel slope	= 0.7 %
Manning's n	= 0.025	Bottom width	= 6.0 ft
Side slope	= 2.0:1	Max. depth	= 2.0 ft
Rating curve x	= 1.509	Rating curve m	= 1.374
Ave. velocity	= 7.26 ft/s	Routing coeff.	= 0.5279

Modified Att-Kin routing method used.

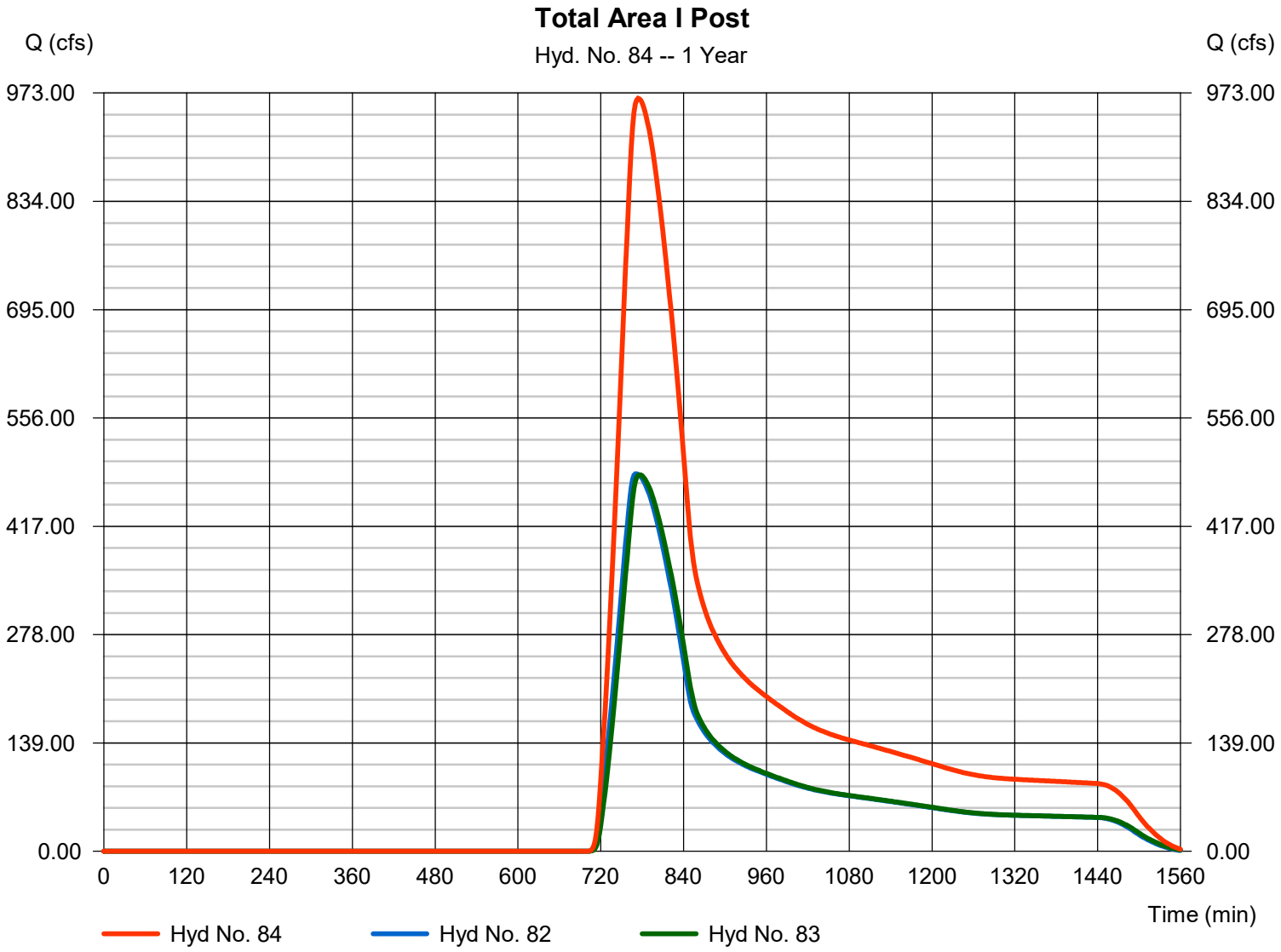


Hydrograph Report

Hyd. No. 84

Total Area I Post

Hydrograph type	= Combine	Peak discharge	= 966.04 cfs
Storm frequency	= 1 yrs	Time to peak	= 774 min
Time interval	= 2 min	Hyd. volume	= 10,795,419 cuft
Inflow hyds.	= 82, 83	Contrib. drain. area	= 2637.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	4.931	2	722	14,774	------	------	------	Area A Onsite Pre
2	SCS Runoff	3.074	2	722	9,210	------	------	------	Area A Off-site Pre
3	Combine	8.005	2	722	23,984	1, 2	------	------	Total Area A Pre
4	SCS Runoff	1.917	2	724	6,349	------	------	------	Area B Onsite Pre
5	SCS Runoff	3.855	2	722	11,551	------	------	------	Area C Onsite Pre
6	SCS Runoff	38.37	2	730	153,933	------	------	------	Area D Onsite Pre
7	SCS Runoff	219.24	2	728	817,730	------	------	------	Area D Offsite Pre
8	Combine	257.45	2	730	971,663	6, 7	------	------	Total Area D Pre
9	SCS Runoff	2.755	2	724	8,706	------	------	------	Area E Onsite Pre
10	SCS Runoff	15.29	2	726	58,124	------	------	------	Area F Onsite Pre
11	SCS Runoff	19.72	2	724	62,436	------	------	------	Area F Off-site Pre
12	Combine	34.93	2	726	120,559	10, 11	------	------	Total Area F Pre
13	SCS Runoff	16.19	2	730	64,946	------	------	------	Area G Onsite Pre
14	SCS Runoff	166.59	2	728	621,892	------	------	------	Area G Off-site Pre
15	Combine	182.70	2	730	686,838	13, 14	------	------	Toital Area G Pre
17	SCS Runoff	1.791	2	722	4,987	------	------	------	Area A Onsite Post
18	SCS Runoff	3.074	2	722	9,210	------	------	------	Area A Off-site Post
19	Combine	4.865	2	722	14,196	17, 18	------	------	Total Area A Post
20	SCS Runoff	0.400	2	718	842	------	------	------	Area B Onsite Post
21	SCS Runoff	1.311	2	718	2,684	------	------	------	Area C Onsite Post
22	SCS Runoff	109.74	2	728	402,669	------	------	------	Area D Onsite Post
23	SCS Runoff	220.31	2	728	821,388	------	------	------	Area D Offsite Post
24	Combine	330.05	2	728	1,224,058	22, 23	------	------	Total Area D Post
25	SCS Runoff	2.410	2	720	5,909	------	------	------	Area E Onsite Post
26	SCS Runoff	6.012	2	722	15,791	------	------	------	Area F Onsite Post
27	SCS Runoff	28.85	2	720	75,191	------	------	------	Area F Off-site Post
28	Combine	34.83	2	720	90,981	26, 27	------	------	Total Area F Post
29	SCS Runoff	101.68	2	720	264,029	------	------	------	Area G Onsite Post
30	SCS Runoff	163.74	2	728	611,531	------	------	------	Area G Off-site Post
31	Combine	240.56	2	724	885,921	14, 29,	------	------	Total Area G Post
33	SCS Runoff	58.31	2	722	164,068	------	------	------	Area to SCM D1 Onsite
34	SCS Runoff	1.012	2	724	3,004	------	------	------	Area to SCM D1 Off-site
35	Combine	59.31	2	722	167,072	33, 34	------	------	Total Area to SCM D1

Hydrograph Summary Report

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Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
36	Reservoir	2.548	2	844	150,149	35	386.17	107,742	Route SCM D1
37	SCS Runoff	50.39	2	722	144,035	------	------	------	Area to SCM D2 Onsite
38	SCS Runoff	0.243	2	724	726	------	------	------	Area to SCM D2 Offsite
39	Combine	50.63	2	722	144,761	37, 38	------	------	Total Area to SCM D2
40	Reservoir	3.340	2	788	127,177	39	393.43	89,523	Route SCM D2
41	SCS Runoff	12.25	2	722	34,756	------	------	------	Area to SCM D3 Onsite
42	Reservoir	1.878	2	744	32,268	41	385.41	18,973	Route SCM D3
43	SCS Runoff	16.18	2	730	62,300	------	------	------	Area D Bypassing SCMs
44	SCS Runoff	218.81	2	728	815,798	------	------	------	Area D Offsite Post
45	Combine	237.42	2	730	1,187,694	36, 40, 42, 43, 44	------	------	Total Managed Area D Post
47	SCS Runoff	5.407	2	720	14,090	------	------	------	Area F Onsite Post
48	Combine	34.25	2	720	89,281	27, 47	------	------	Total to SCM F
49	Reservoir	12.97	2	732	89,271	48	390.61	26,322	Route SCM F
50	SCS Runoff	0.757	2	720	1,885	------	------	------	Area F Bypassing SCM
51	Combine	13.14	2	732	91,156	49, 50	------	------	Total Managed Area F Post
53	SCS Runoff	80.47	2	720	217,368	------	------	------	Area to SCM G Onsite
54	SCS Runoff	0.103	2	720	272	------	------	------	Area to SCM G Offsite
55	Combine	80.58	2	720	217,640	53, 54	------	------	Total Area to SCM G
56	Reservoir	1.712	2	972	163,223	55	390.01	165,657	Route SCM G
57	SCS Runoff	10.91	2	730	44,552	------	------	------	Area G Bypassing SCM
58	Combine	175.02	2	730	819,307	30, 56, 57	------	------	Total Managed Area G Post
60	SCS Runoff	476.83	2	734	2,111,072	------	------	------	Additional Area to Point D-E
61	Combine	267.30	2	728	1,013,043	1, 4, 5, 8, 9,	------	------	Total Area A-E Pre
62	Combine	729.59	2	732	3,124,115	60, 61	------	------	Total A-E Post & Upstream
63	Reach	719.68	2	734	3,124,113	62	------	------	A-E Travel to H Landfill Culverts
64	Combine	216.12	2	728	807,398	12, 15,	------	------	Total Area F & G Pre
65	Reach	212.94	2	732	807,396	64	------	------	F&G Travel to H Landfill Culverts
66	SCS Runoff	80.80	2	736	370,628	------	------	------	Area H at Culverts
67	Combine	1007.55	2	734	4,302,135	63, 65, 66	------	------	Total Flow H At Culverts Pre
69	SCS Runoff	2069.32	2	768	18,443,486	------	------	------	Area I - Apex
70	Reach	2066.04	2	770	18,443,470	69	------	------	Culverts Travel to I
71	Combine	4127.88	2	768	36,886,940	69, 70	------	------	Total Area I Pre

Hydrograph Summary Report

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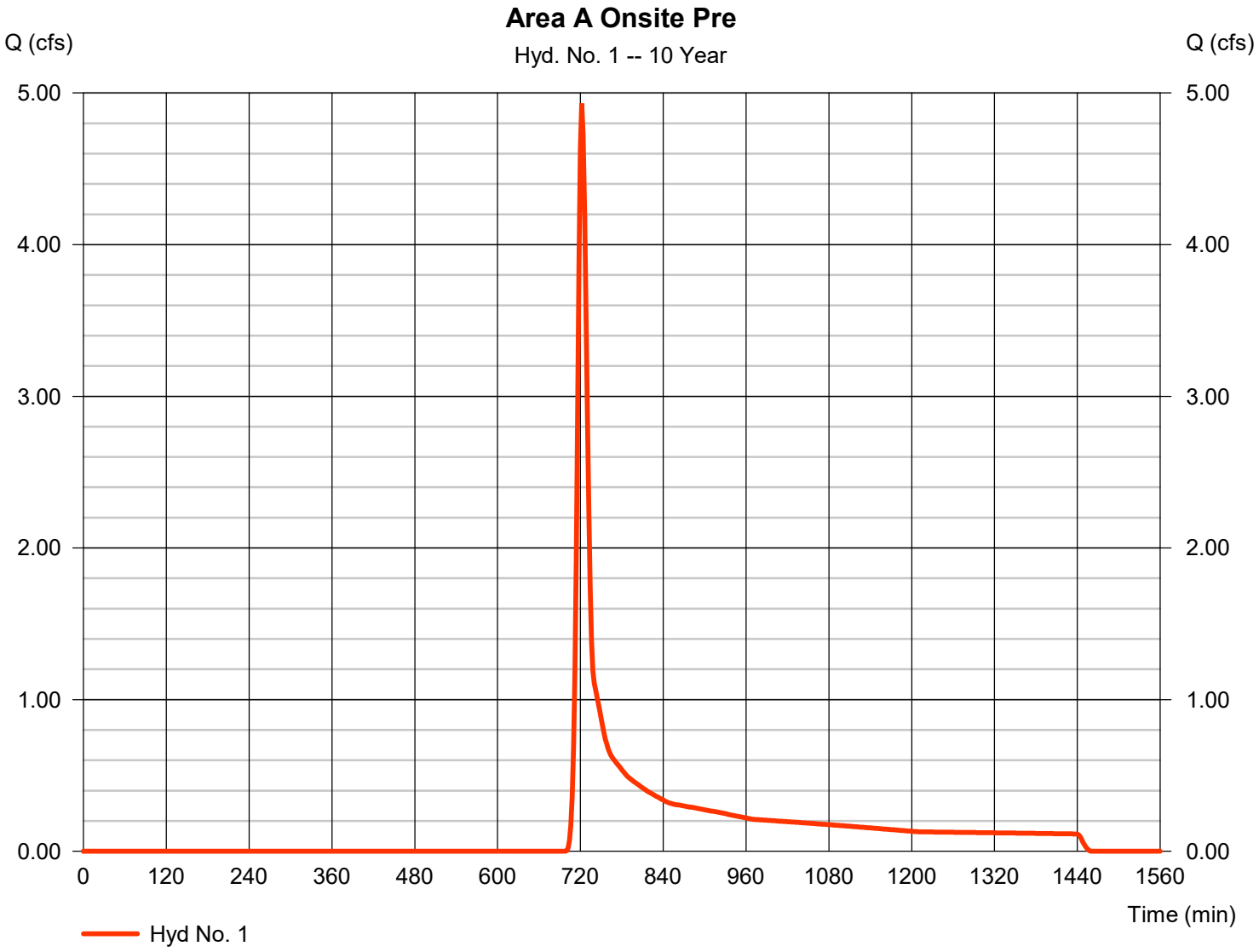
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
73	SCS Runoff	476.83	2	734	2,111,072	------	------	------	Additional Area to Point D-E
74	Combine	239.32	2	730	1,202,116	17, 20, 21, 25, 45,	------	------	Total Area A-E Post
75	Combine	705.29	2	732	3,313,189	73, 74	------	------	Total A-E Post & Upstream
76	Reach	694.57	2	736	3,313,144	75	------	------	A-E Travel to H Landfill Culverts
77	Combine	188.15	2	730	910,464	51, 58,	------	------	Total Area F & G Post
78	Reach	186.16	2	732	910,414	77	------	------	F&G Travel to H Landfill Culverts
79	SCS Runoff	80.80	2	736	370,628	------	------	------	Area H at Culverts
80	Combine	958.19	2	734	4,594,181	76, 78, 79	------	------	Total Area H At Culverts Post
82	SCS Runoff	2069.32	2	768	18,443,486	------	------	------	Area I - Apex
83	Reach	2066.04	2	770	18,443,470	82	------	------	Culverts Travel to I
84	Combine	4127.88	2	768	36,886,940	82, 83	------	------	Total Area I Post

Hydrograph Report

Hyd. No. 1

Area A Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.931 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	14,774 cuft
Drainage area	=	3.850 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.10 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

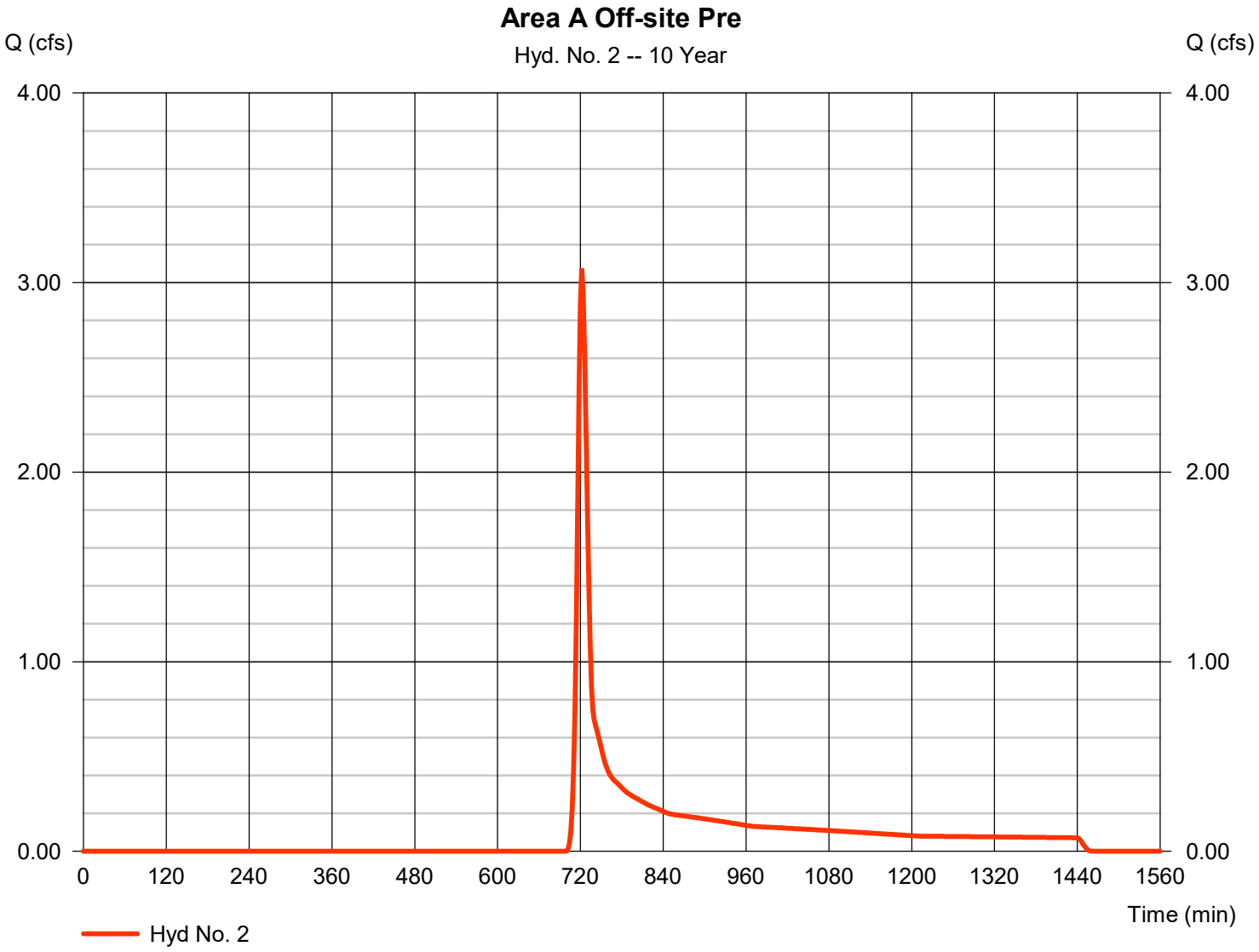


Hydrograph Report

Hyd. No. 2

Area A Off-site Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 3.074 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 9,210 cuft
Drainage area	= 2.400 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 12.10 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

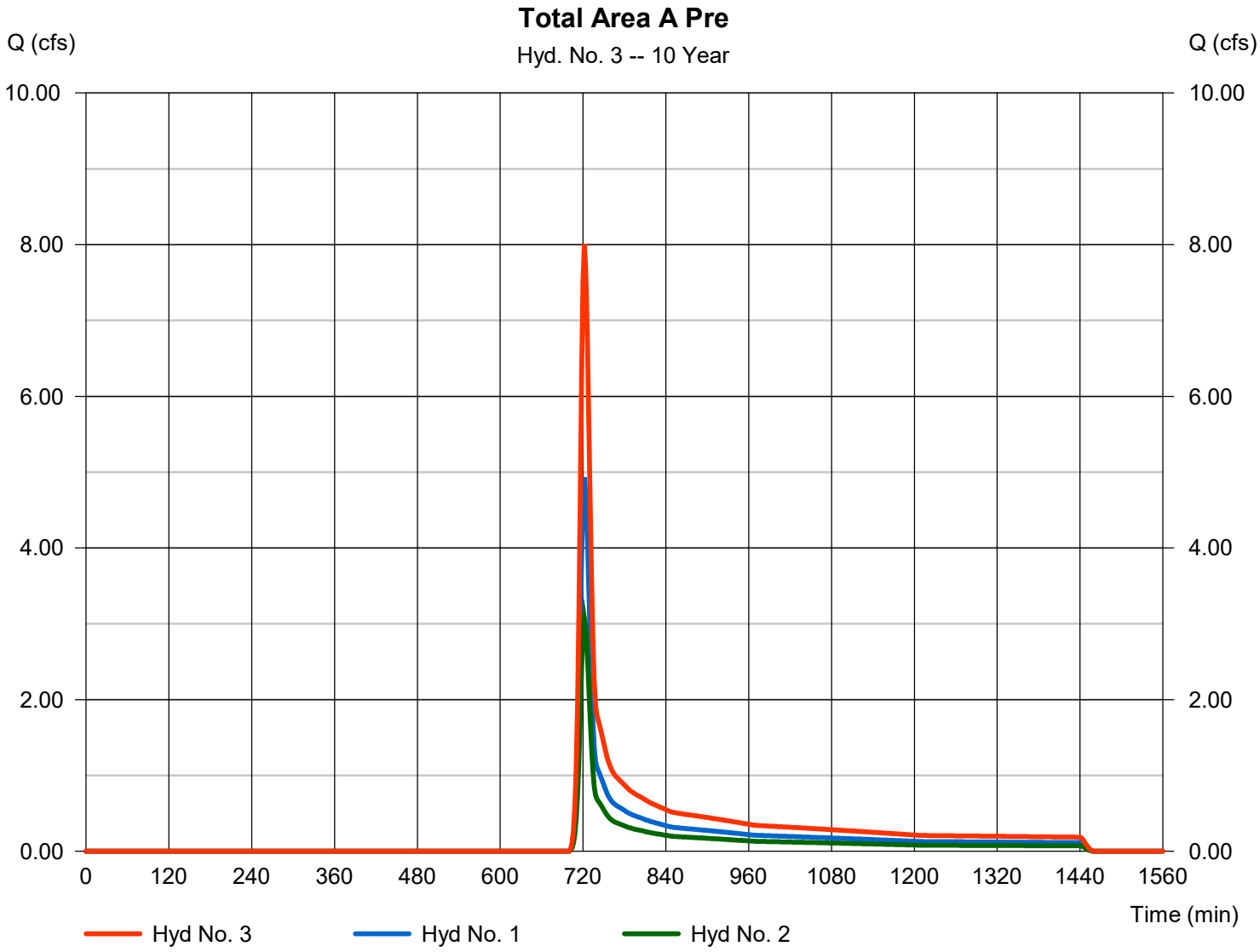


Hydrograph Report

Hyd. No. 3

Total Area A Pre

Hydrograph type	= Combine	Peak discharge	= 8.005 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 23,984 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 6.250 ac

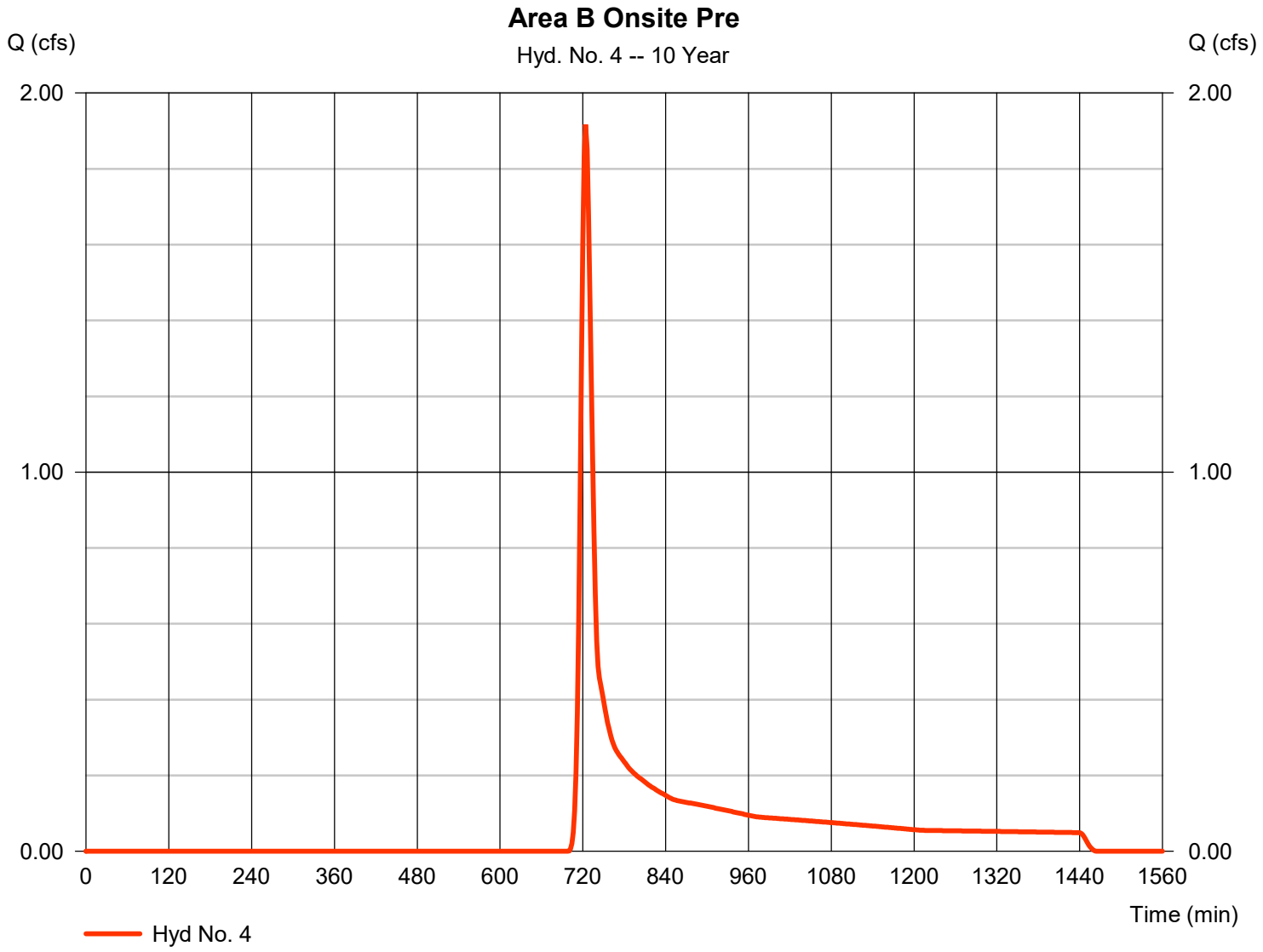


Hydrograph Report

Hyd. No. 4

Area B Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.917 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	6,349 cuft
Drainage area	=	1.750 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.20 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

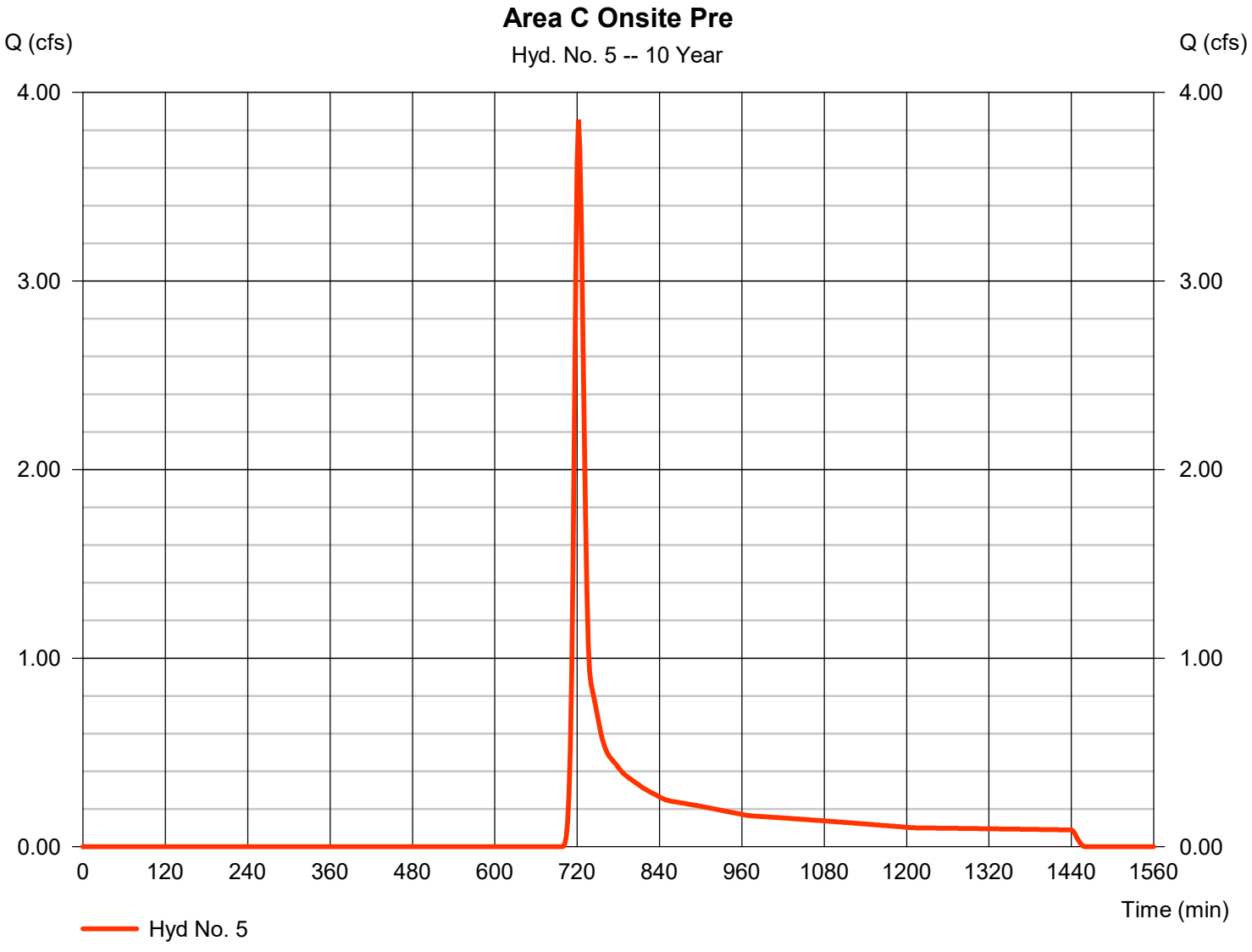


Hydrograph Report

Hyd. No. 5

Area C Onsite Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 3.855 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 11,551 cuft
Drainage area	= 3.010 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.80 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

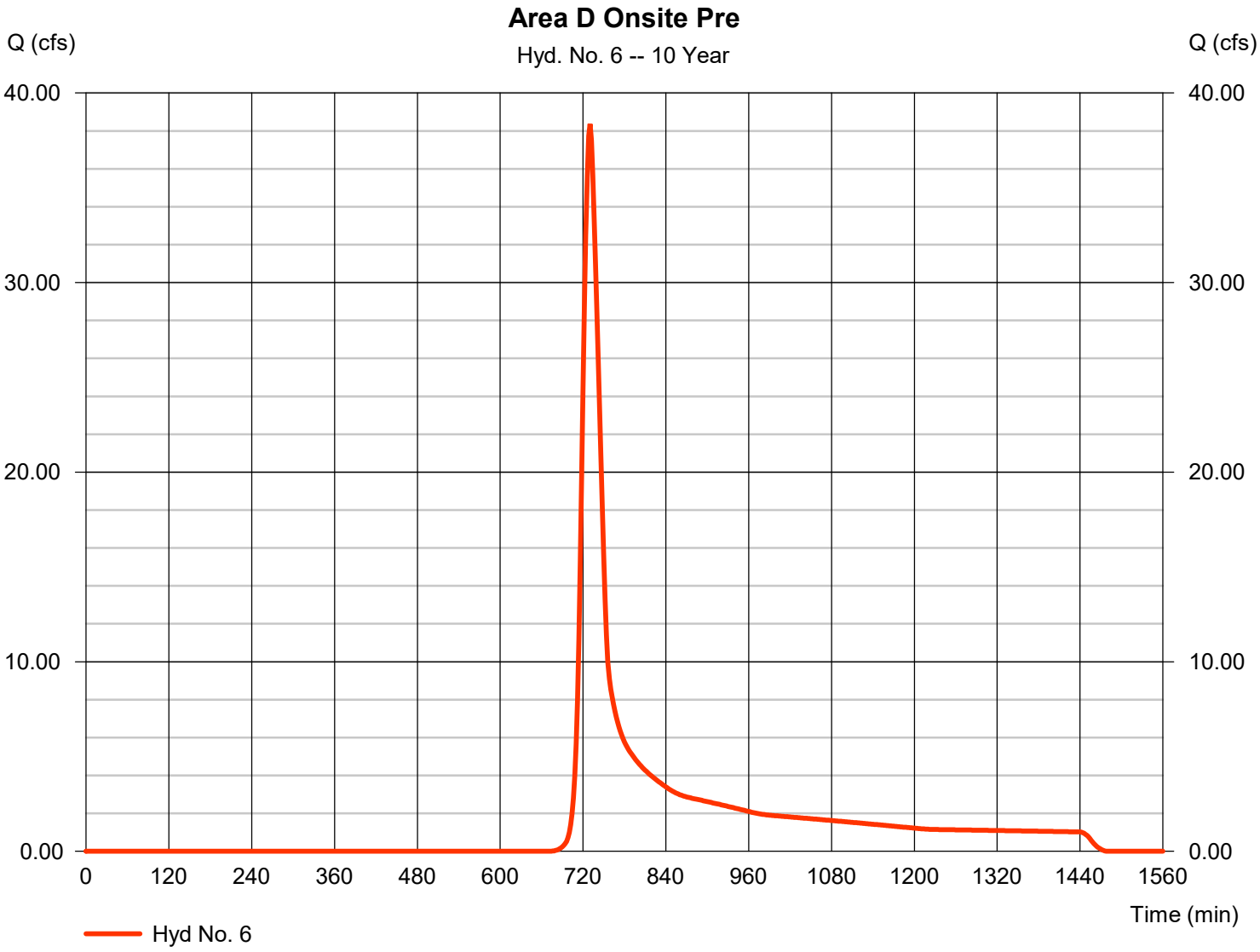


Hydrograph Report

Hyd. No. 6

Area D Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	38.37 cfs
Storm frequency	=	10 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	153,933 cuft
Drainage area	=	29.390 ac	Curve number	=	61.6
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

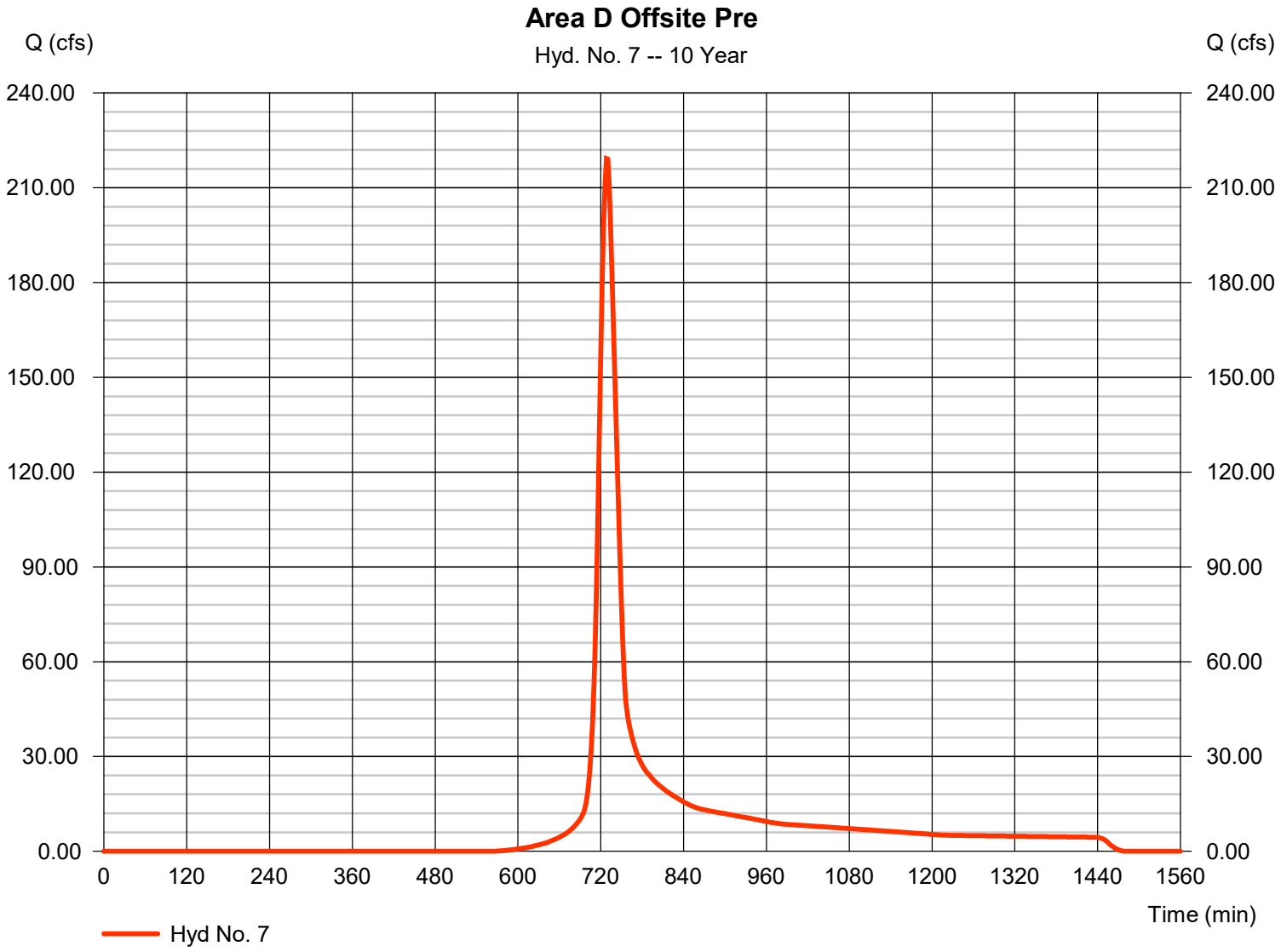


Hydrograph Report

Hyd. No. 7

Area D Offsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	219.24 cfs
Storm frequency	=	10 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	817,730 cuft
Drainage area	=	101.300 ac	Curve number	=	71.9
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

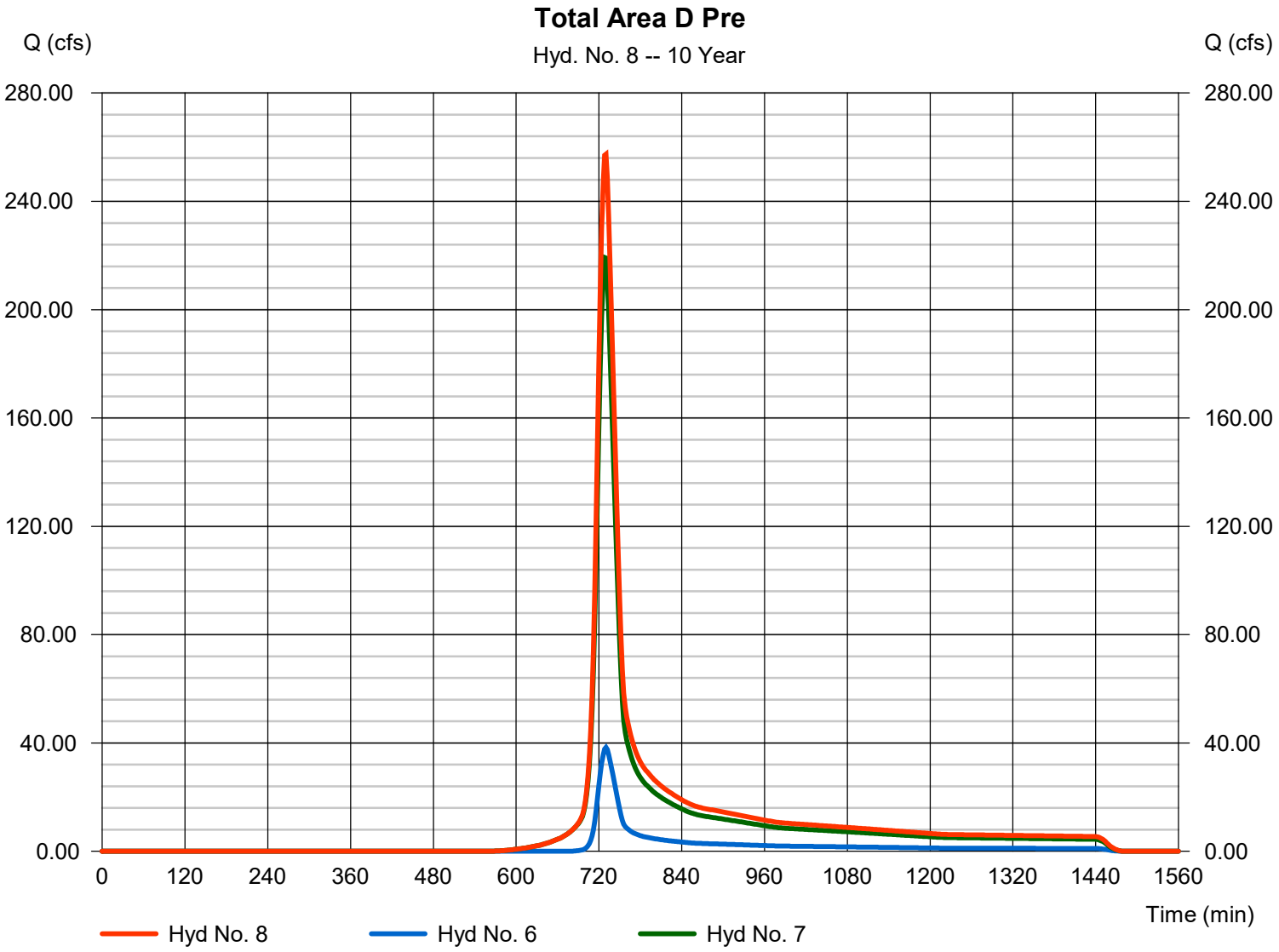


Hydrograph Report

Hyd. No. 8

Total Area D Pre

Hydrograph type	= Combine	Peak discharge	= 257.45 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 971,663 cuft
Inflow hyds.	= 6, 7	Contrib. drain. area	= 130.690 ac

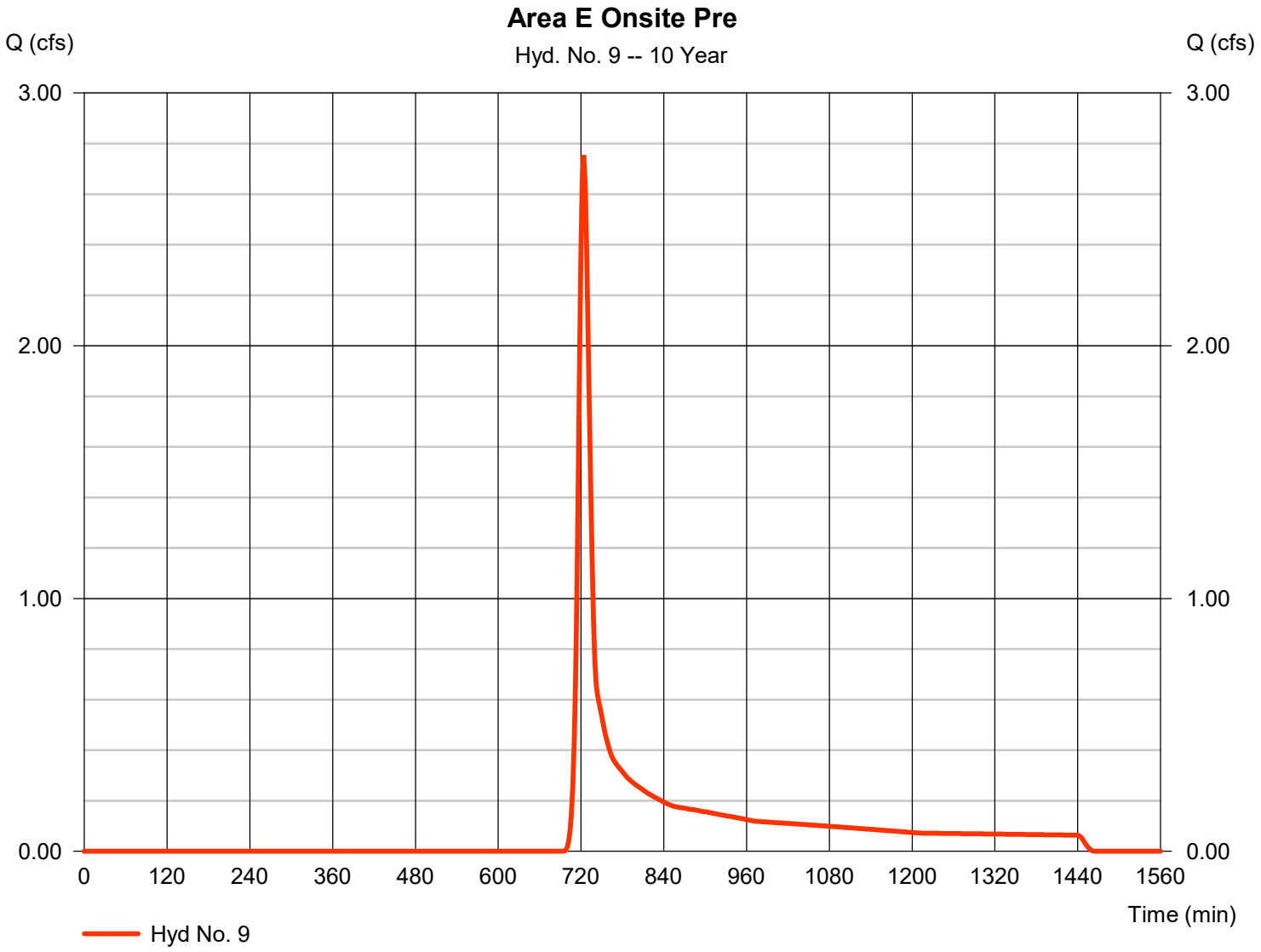


Hydrograph Report

Hyd. No. 9

Area E Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.755 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	8,706 cuft
Drainage area	=	2.110 ac	Curve number	=	57.2
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.30 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

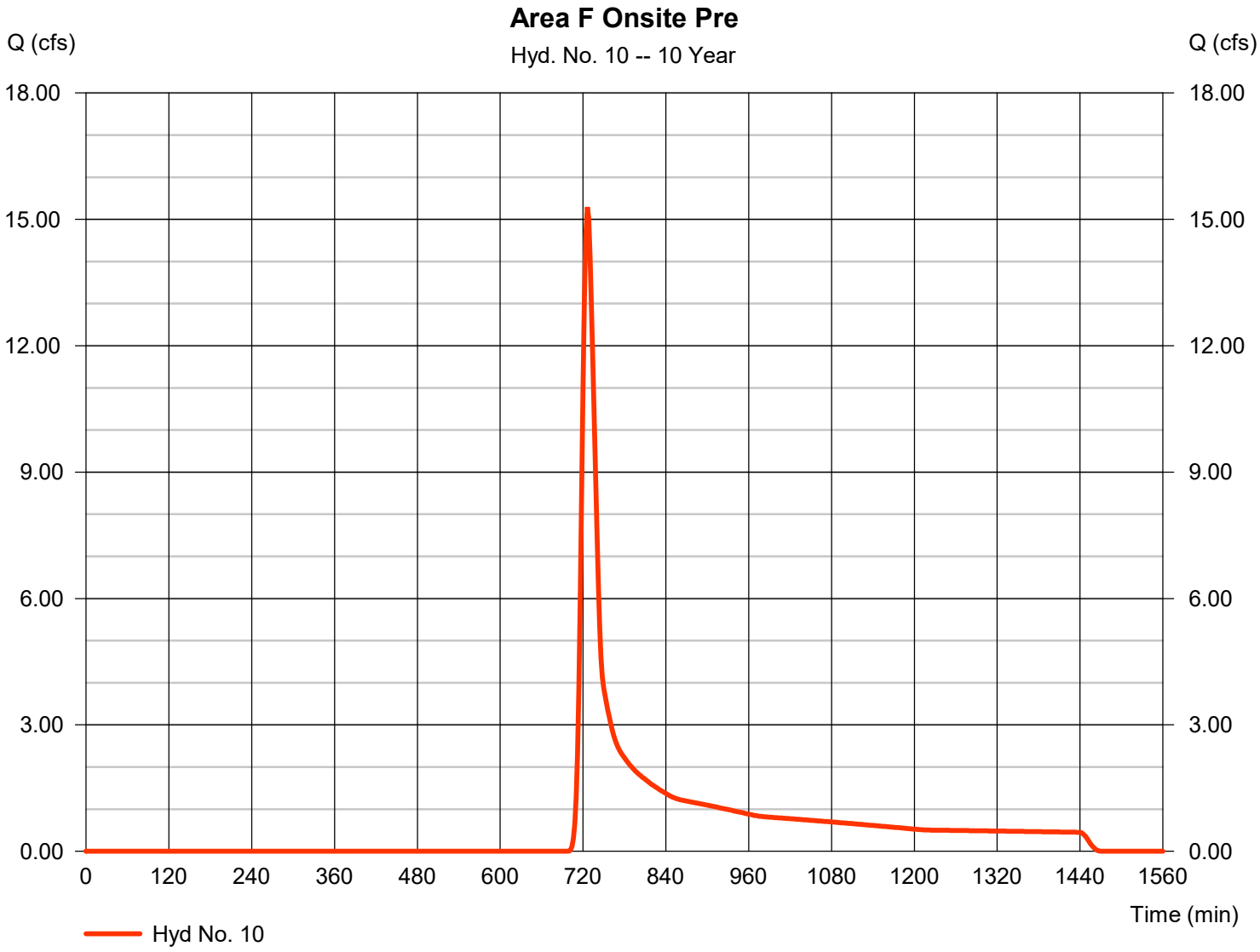


Hydrograph Report

Hyd. No. 10

Area F Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	15.29 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	58,124 cuft
Drainage area	=	15.620 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	17.60 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

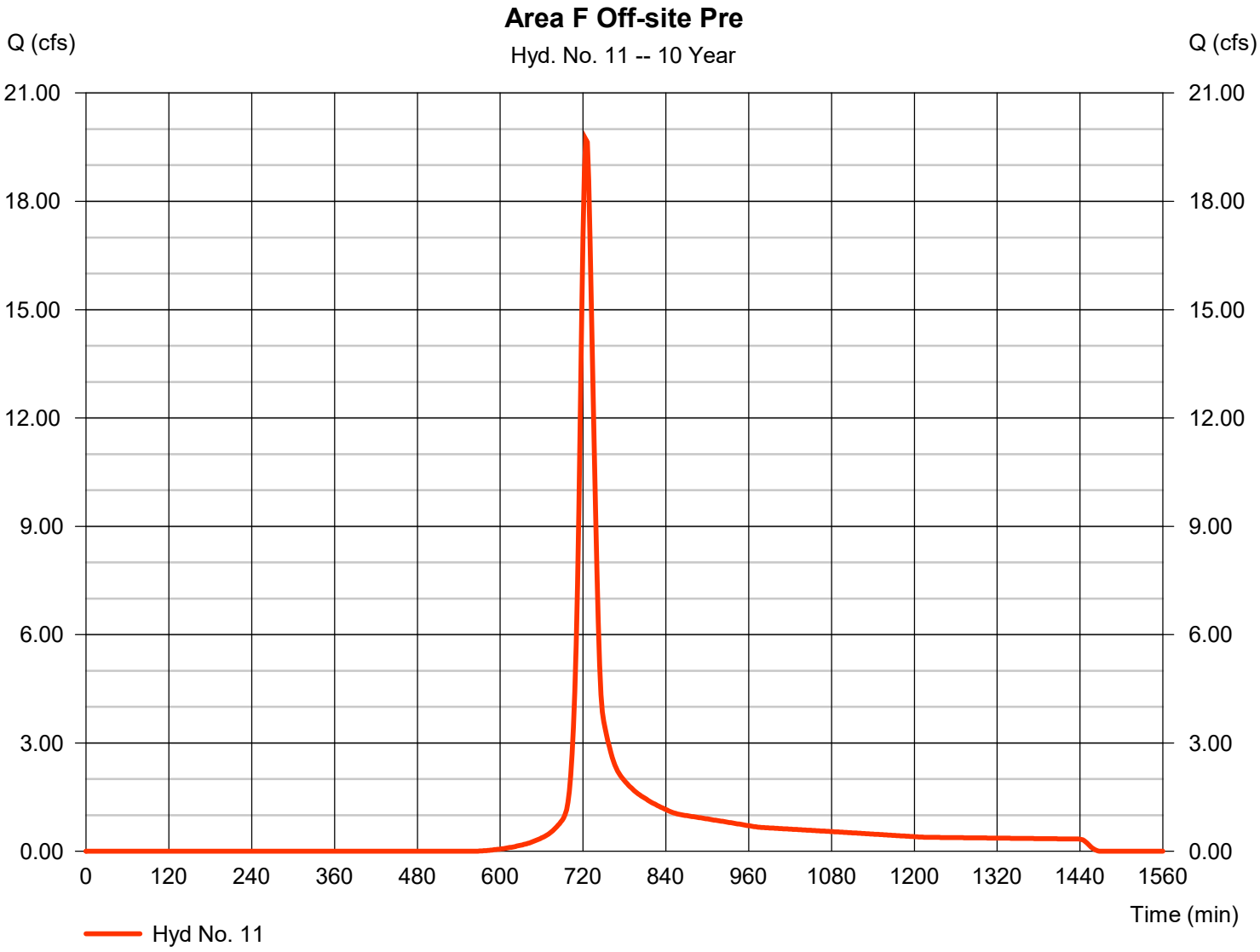


Hydrograph Report

Hyd. No. 11

Area F Off-site Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 19.72 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 62,436 cuft
Drainage area	= 7.670 ac	Curve number	= 71.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 17.60 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

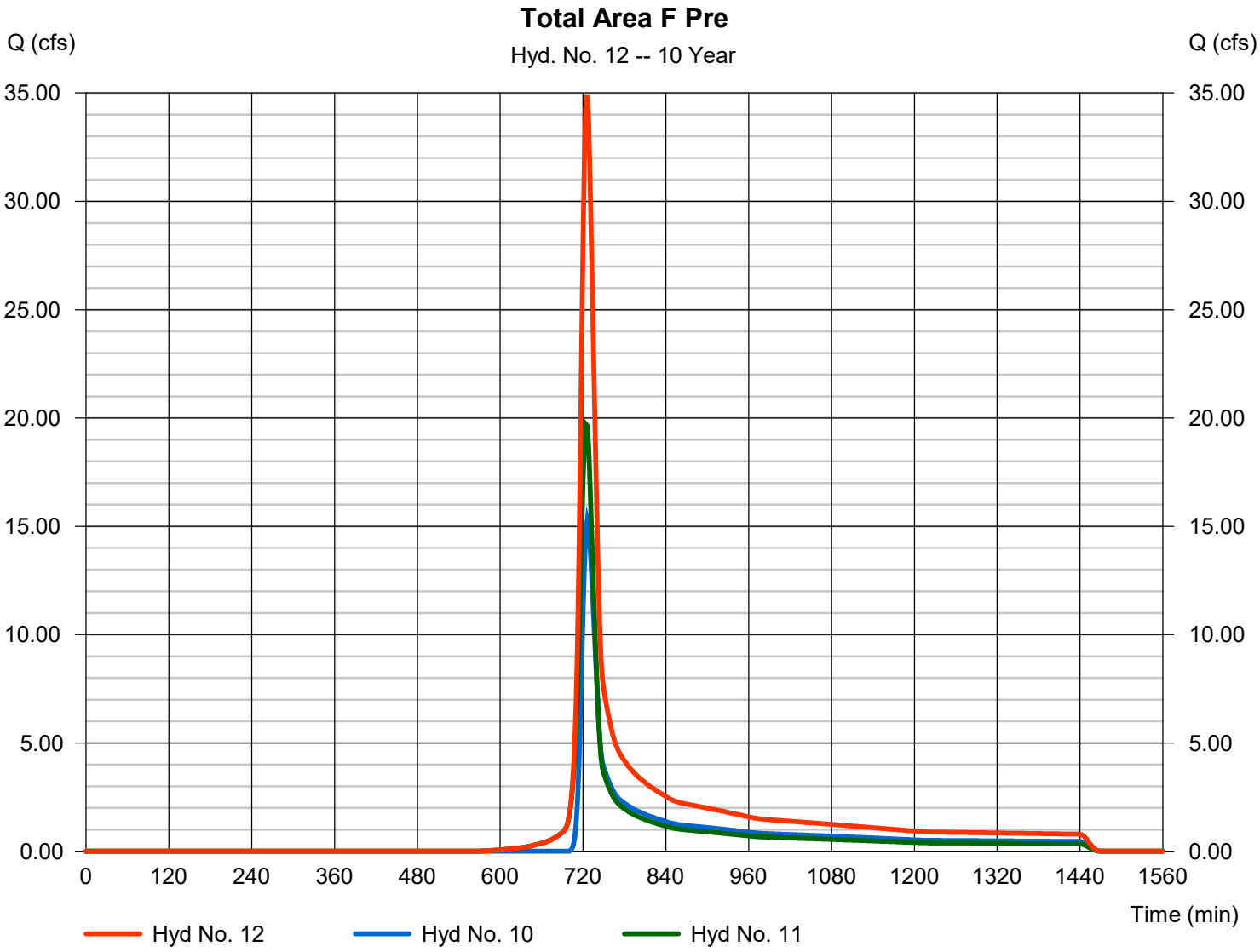


Hydrograph Report

Hyd. No. 12

Total Area F Pre

Hydrograph type	= Combine	Peak discharge	= 34.93 cfs
Storm frequency	= 10 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 120,559 cuft
Inflow hyds.	= 10, 11	Contrib. drain. area	= 23.290 ac

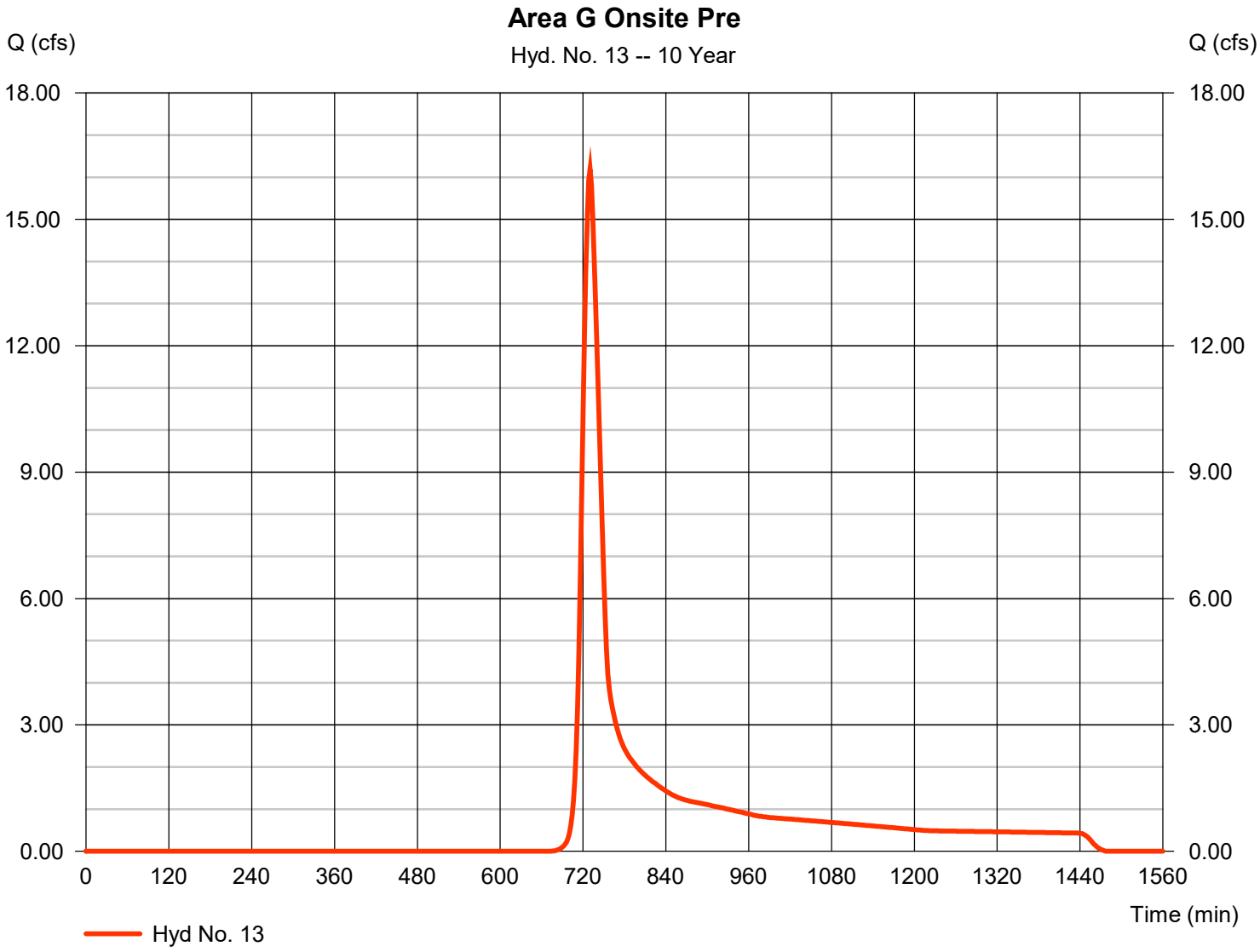


Hydrograph Report

Hyd. No. 13

Area G Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.19 cfs
Storm frequency	=	10 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	64,946 cuft
Drainage area	=	12.400 ac	Curve number	=	61.6
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	23.80 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

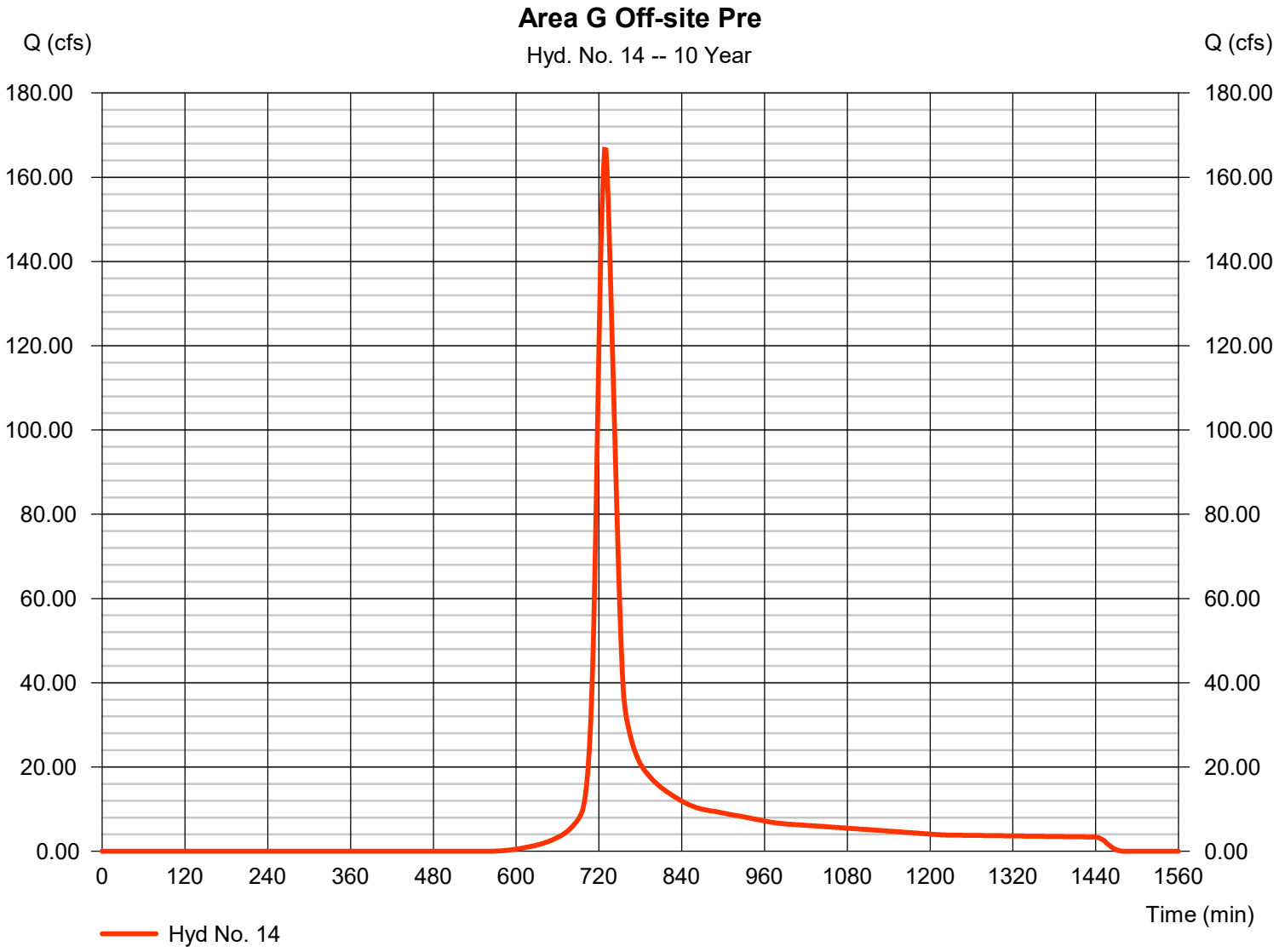


Hydrograph Report

Hyd. No. 14

Area G Off-site Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	166.59 cfs
Storm frequency	=	10 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	621,892 cuft
Drainage area	=	77.610 ac	Curve number	=	71.7
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	23.80 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

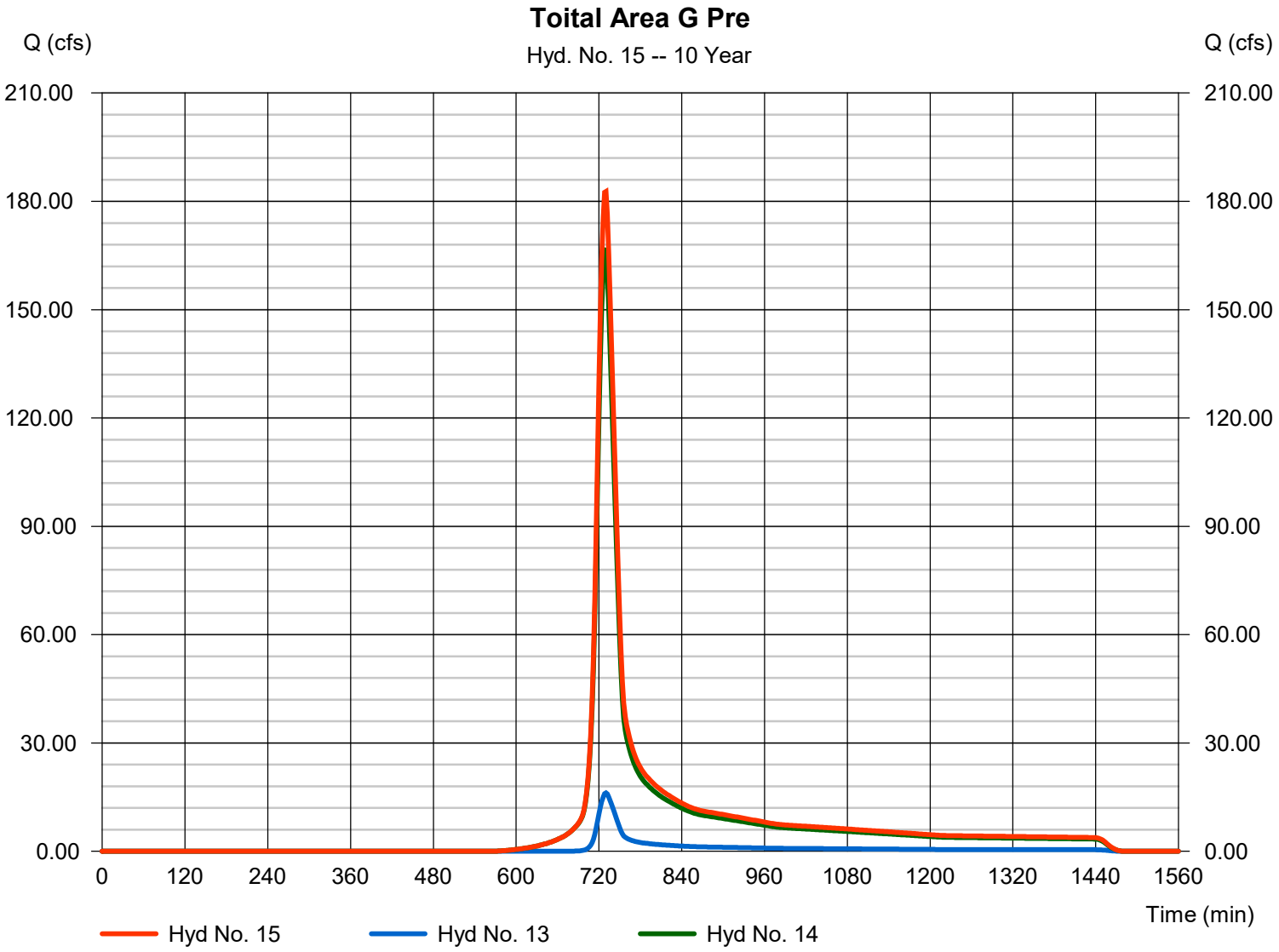


Hydrograph Report

Hyd. No. 15

Toital Area G Pre

Hydrograph type	= Combine	Peak discharge	= 182.70 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 686,838 cuft
Inflow hyds.	= 13, 14	Contrib. drain. area	= 90.010 ac

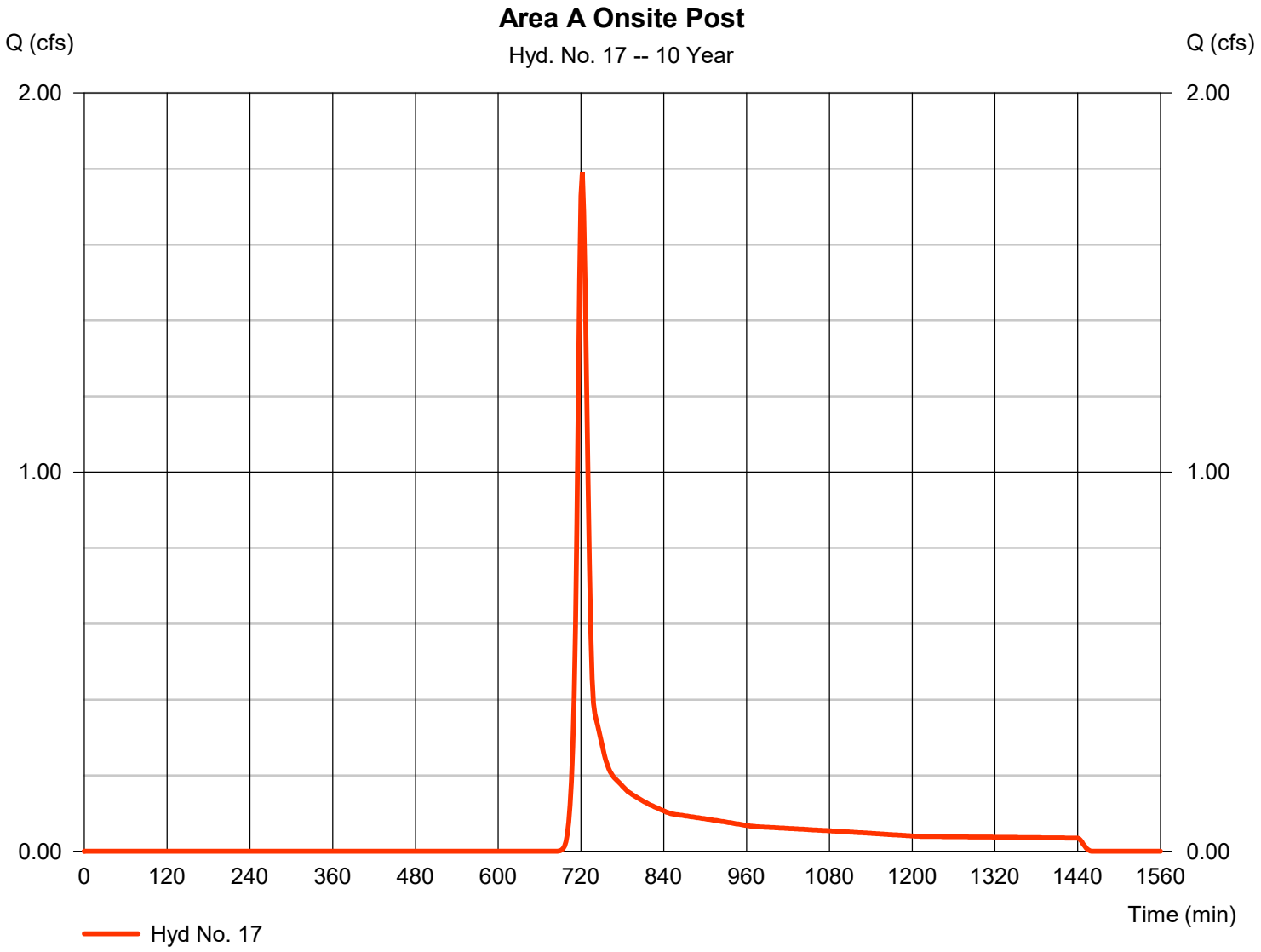


Hydrograph Report

Hyd. No. 17

Area A Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.791 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	4,987 cuft
Drainage area	=	1.020 ac	Curve number	=	59.3
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.10 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

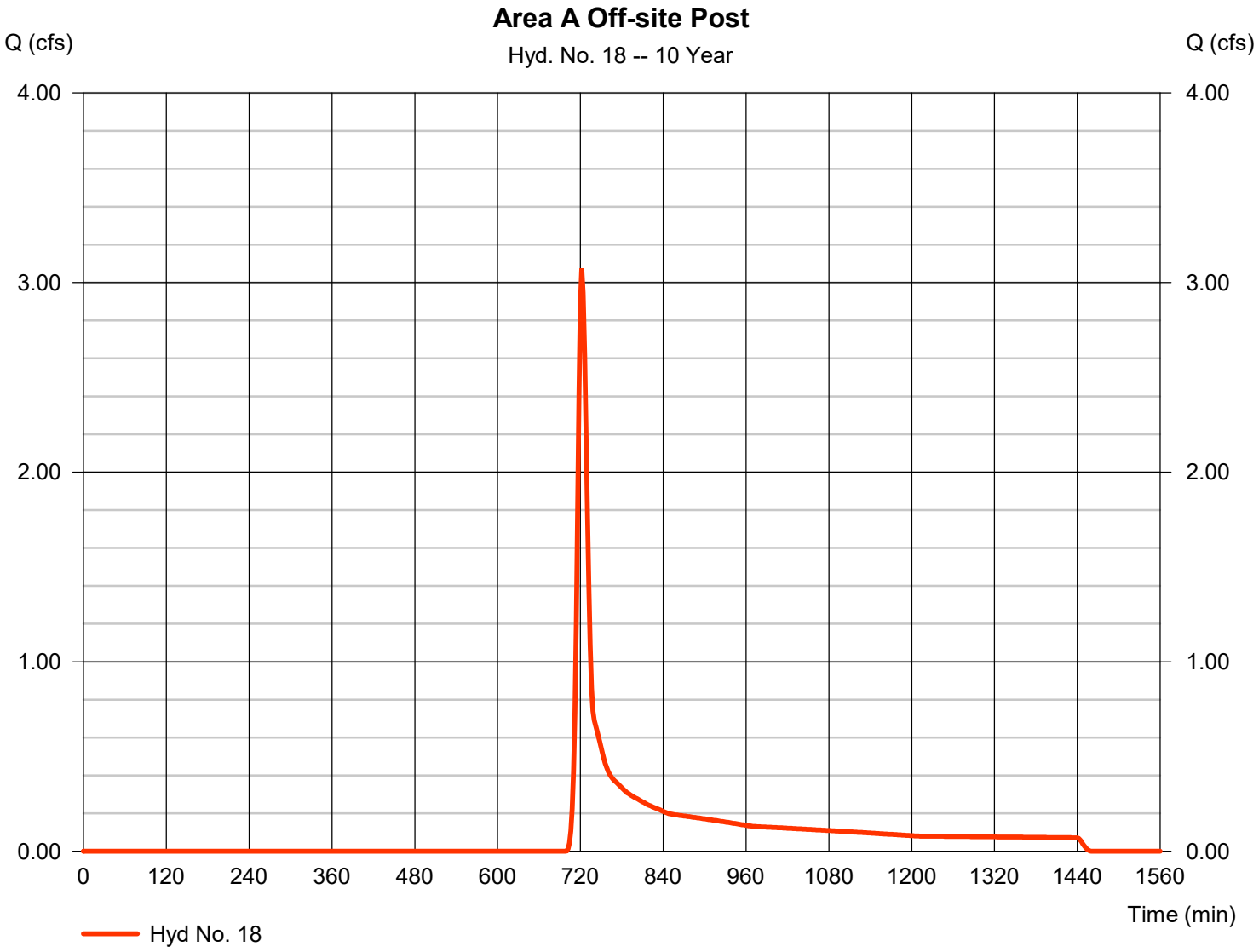


Hydrograph Report

Hyd. No. 18

Area A Off-site Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.074 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	9,210 cuft
Drainage area	=	2.400 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.10 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

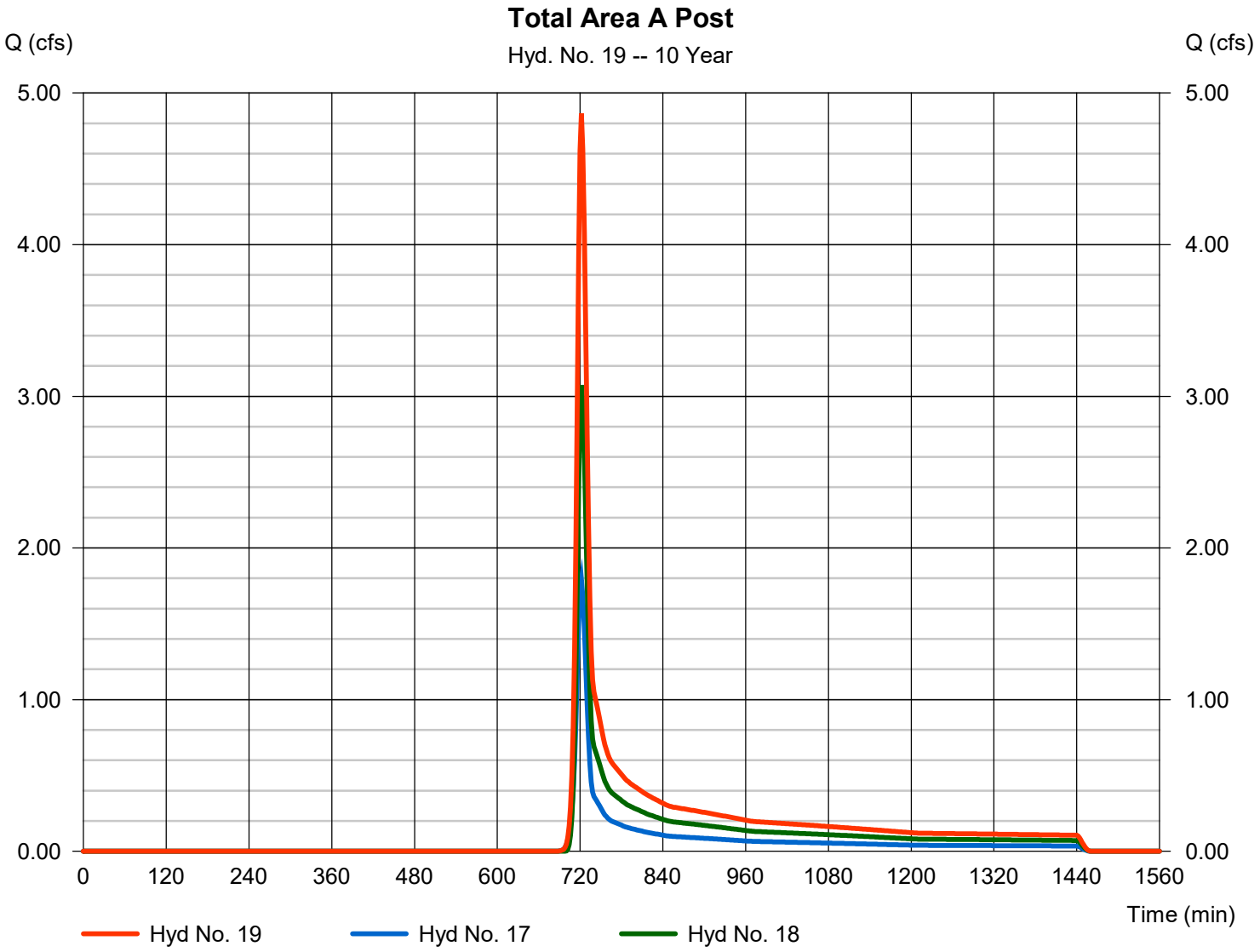


Hydrograph Report

Hyd. No. 19

Total Area A Post

Hydrograph type	= Combine	Peak discharge	= 4.865 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 14,196 cuft
Inflow hyds.	= 17, 18	Contrib. drain. area	= 3.420 ac

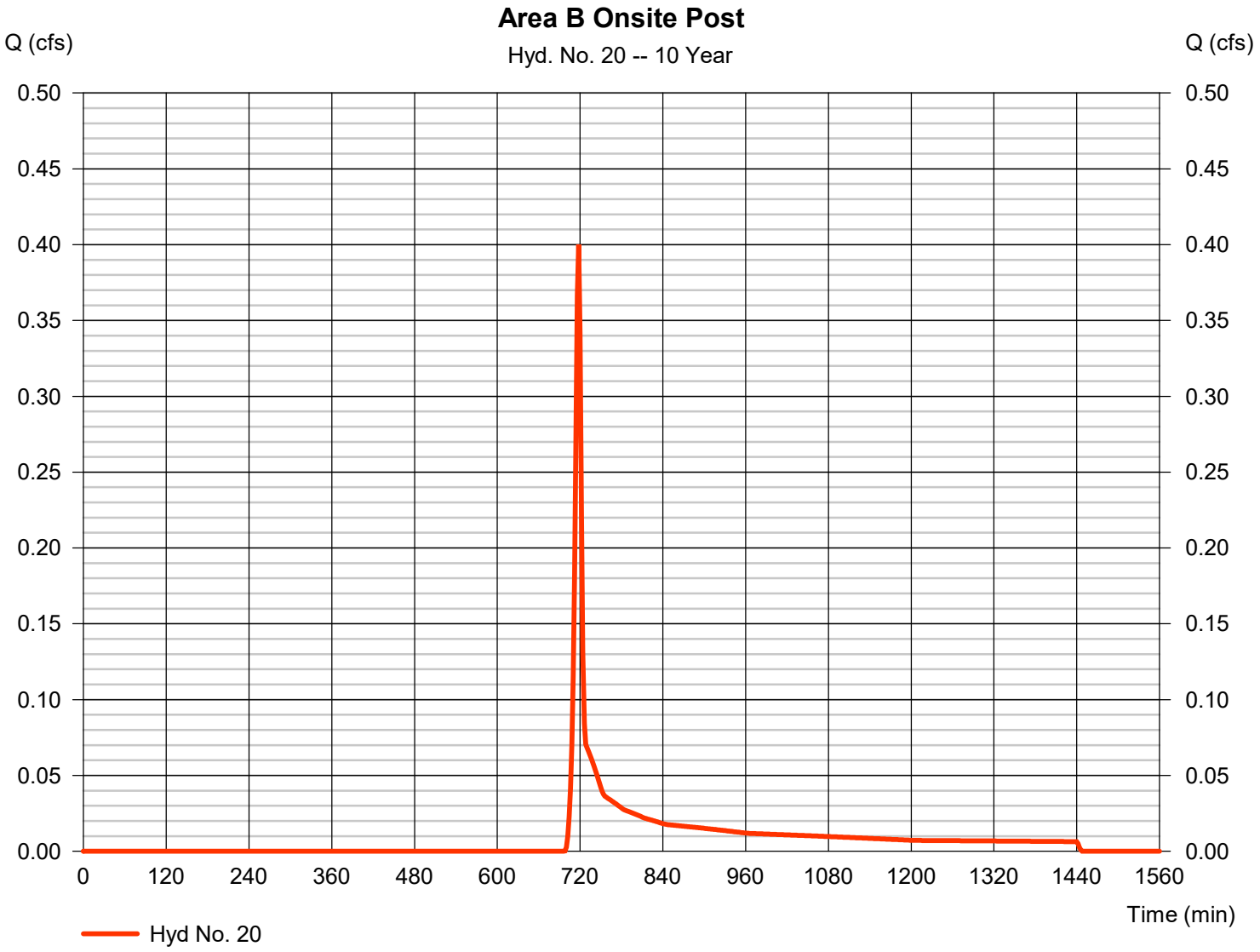


Hydrograph Report

Hyd. No. 20

Area B Onsite Post

Hydrograph type	= SCS Runoff	Peak discharge	= 0.400 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 842 cuft
Drainage area	= 0.230 ac	Curve number	= 55.8
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 5.00 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

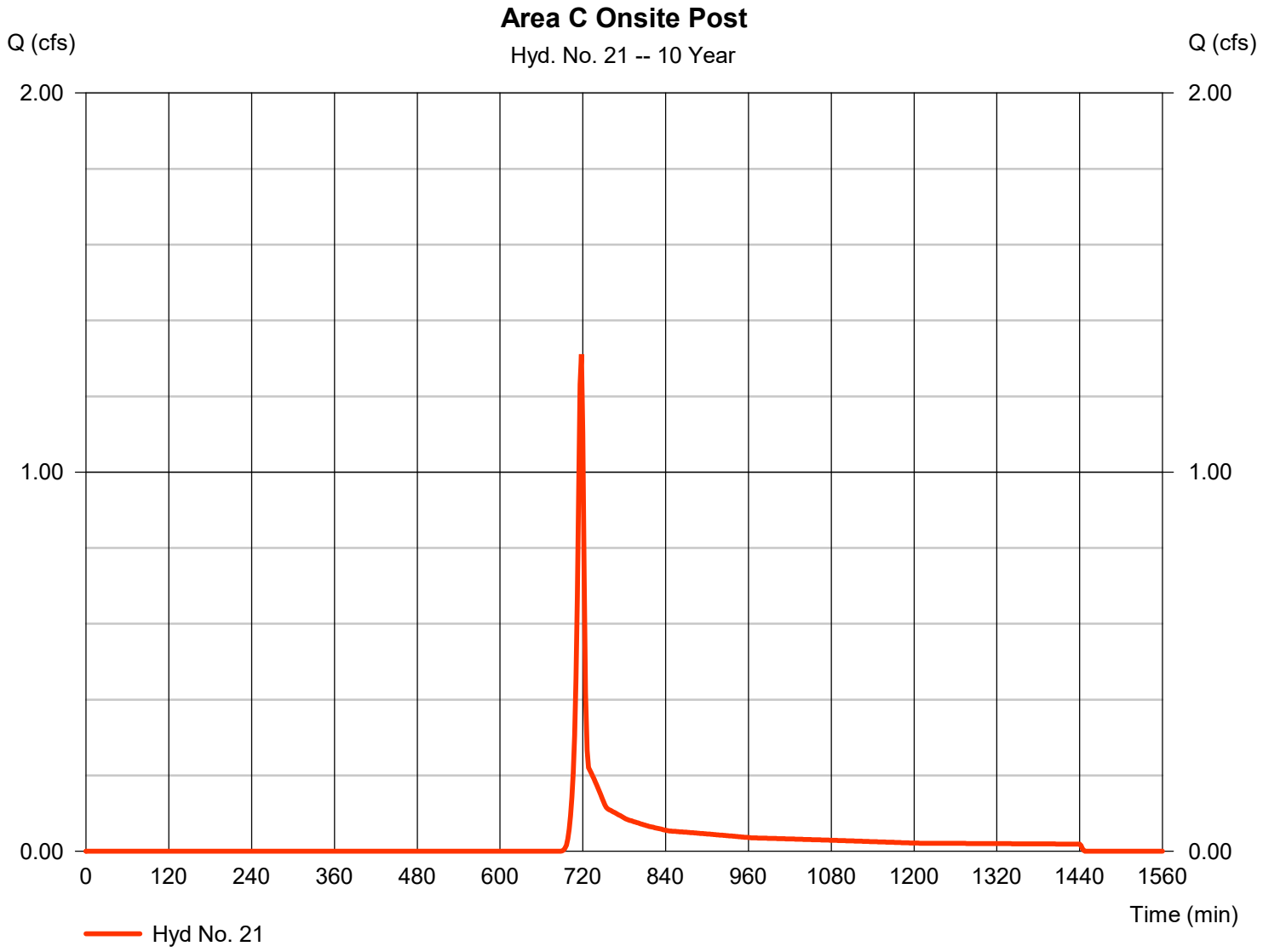


Hydrograph Report

Hyd. No. 21

Area C Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.311 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	2,684 cuft
Drainage area	=	0.620 ac	Curve number	=	58.8
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

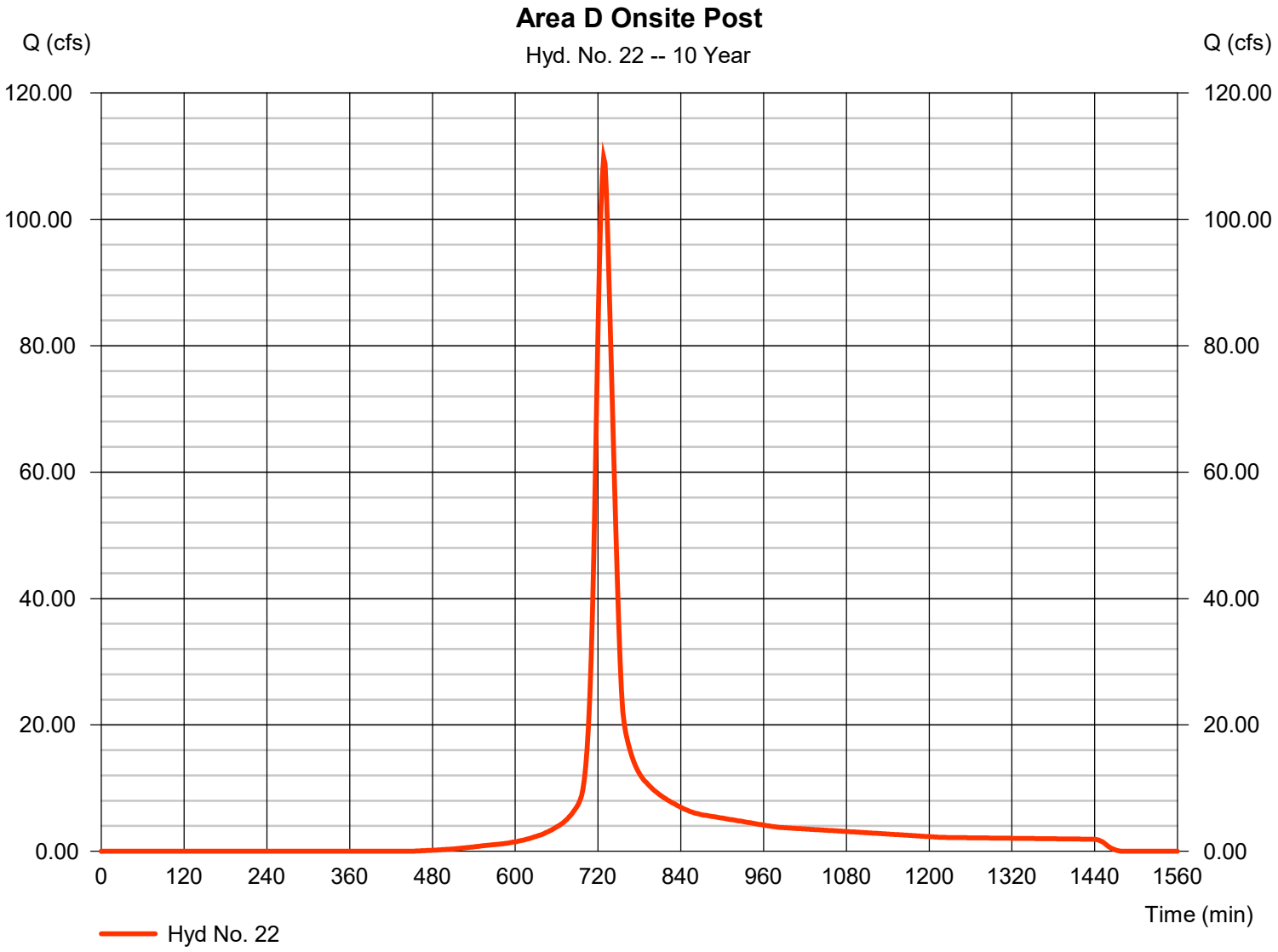


Hydrograph Report

Hyd. No. 22

Area D Onsite Post

Hydrograph type	= SCS Runoff	Peak discharge	= 109.74 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 402,669 cuft
Drainage area	= 38.890 ac	Curve number	= 79.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 24.00 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

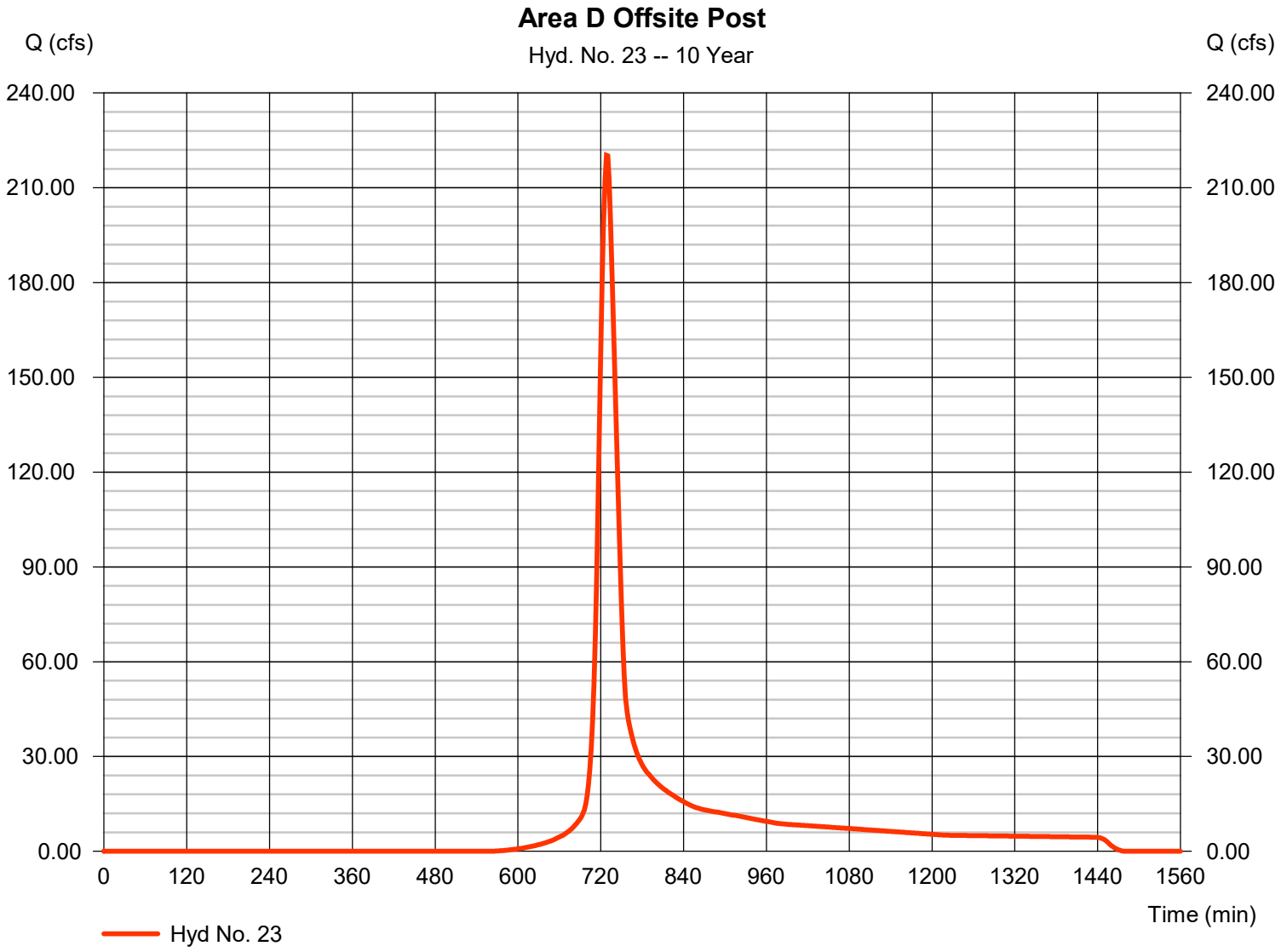


Hydrograph Report

Hyd. No. 23

Area D Offsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	220.31 cfs
Storm frequency	=	10 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	821,388 cuft
Drainage area	=	101.380 ac	Curve number	=	72
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

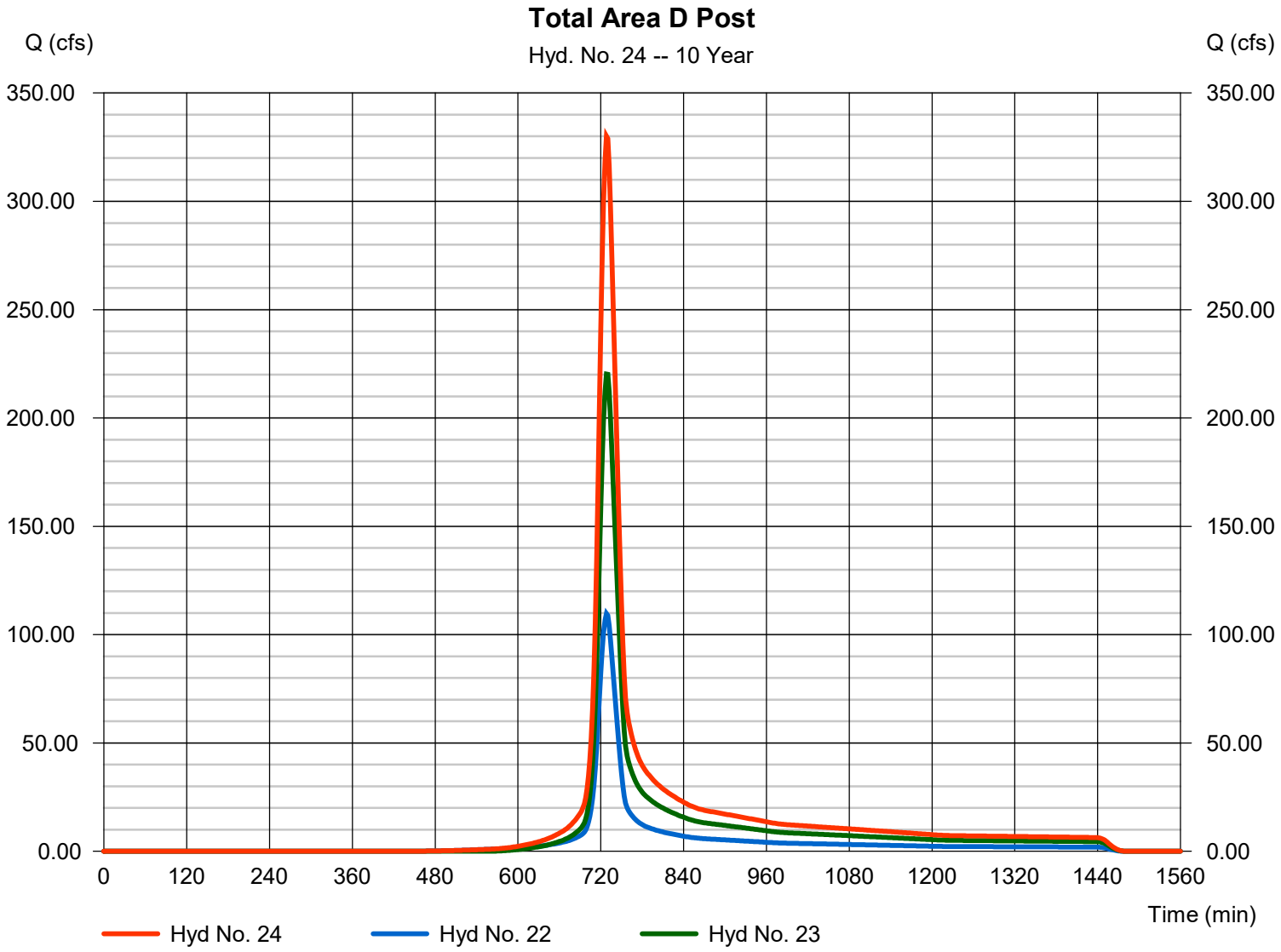


Hydrograph Report

Hyd. No. 24

Total Area D Post

Hydrograph type	= Combine	Peak discharge	= 330.05 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 1,224,058 cuft
Inflow hyds.	= 22, 23	Contrib. drain. area	= 140.270 ac

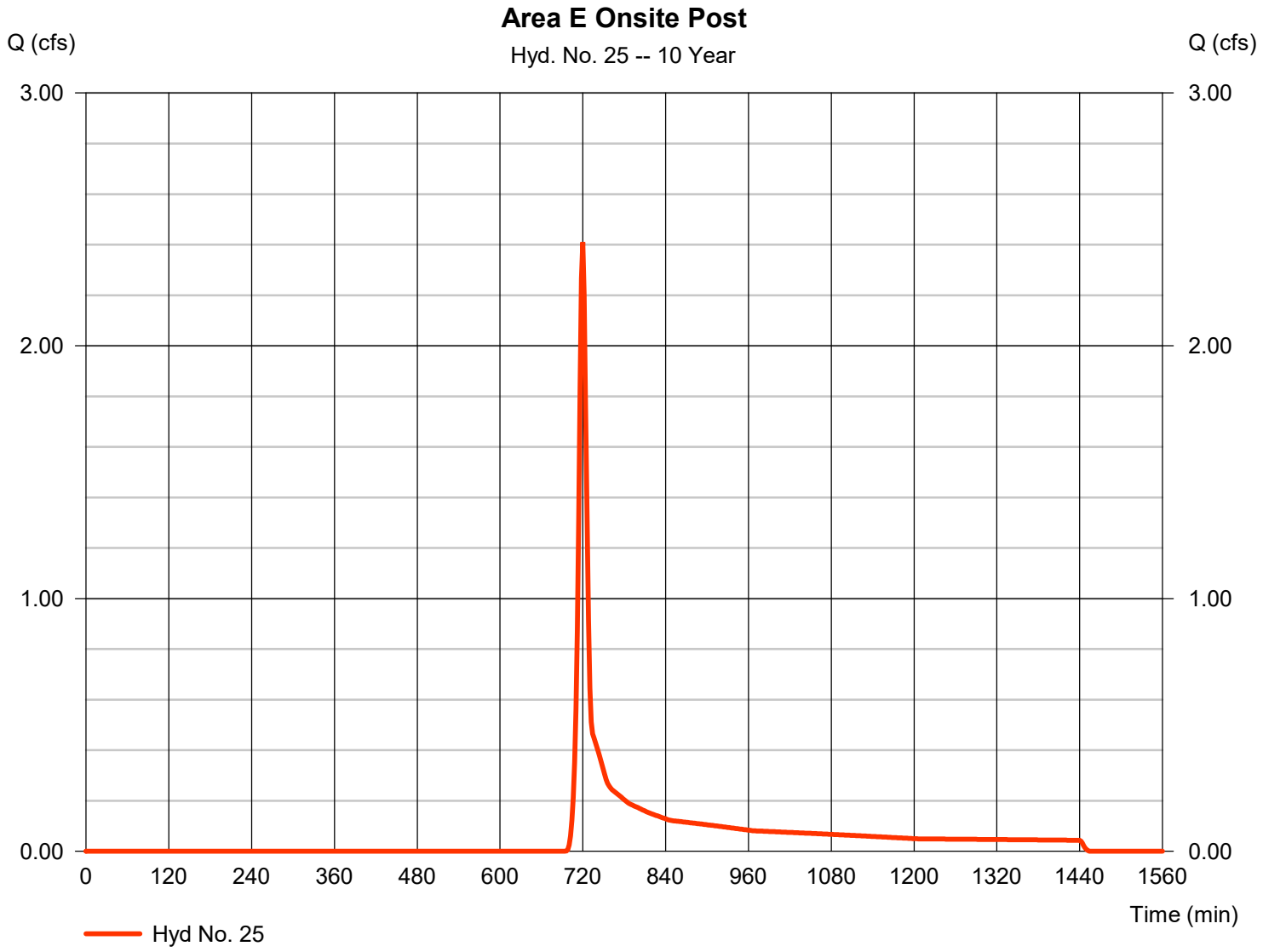


Hydrograph Report

Hyd. No. 25

Area E Onsite Post

Hydrograph type	= SCS Runoff	Peak discharge	= 2.410 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 5,909 cuft
Drainage area	= 1.420 ac	Curve number	= 56.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.20 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

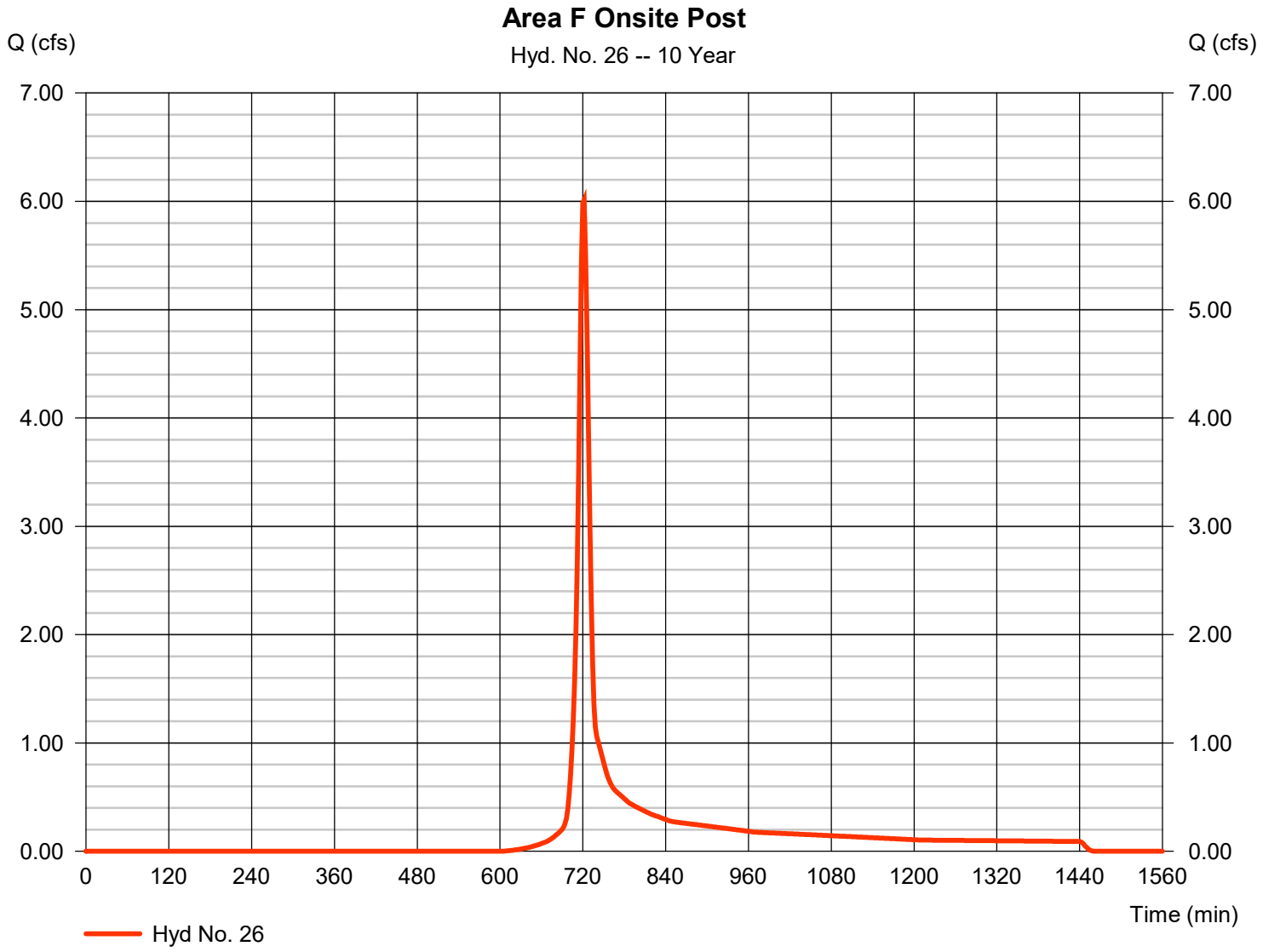


Hydrograph Report

Hyd. No. 26

Area F Onsite Post

Hydrograph type	= SCS Runoff	Peak discharge	= 6.012 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 15,791 cuft
Drainage area	= 2.110 ac	Curve number	= 68.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.60 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

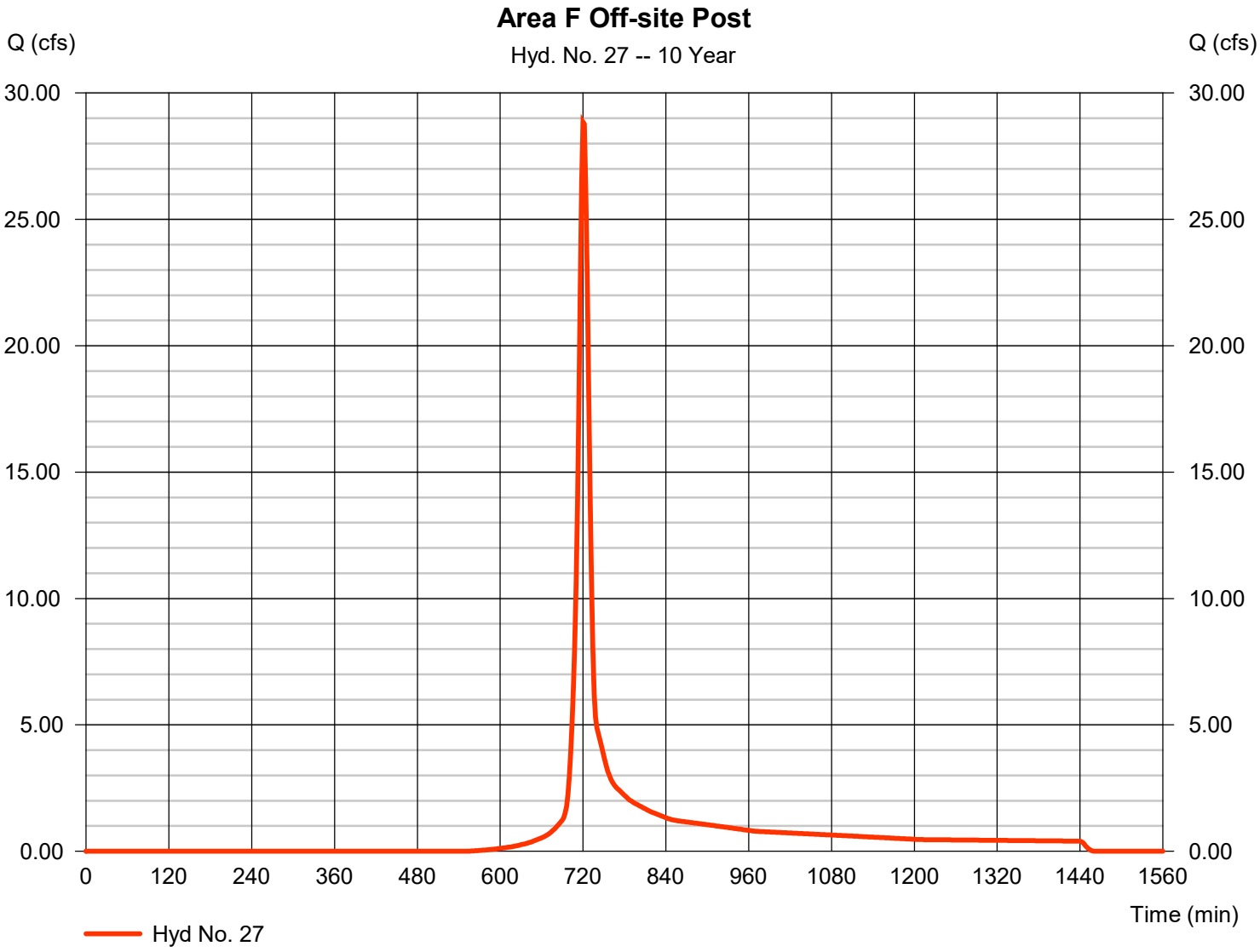


Hydrograph Report

Hyd. No. 27

Area F Off-site Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	28.85 cfs
Storm frequency	=	10 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	75,191 cuft
Drainage area	=	8.730 ac	Curve number	=	72.4
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.60 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

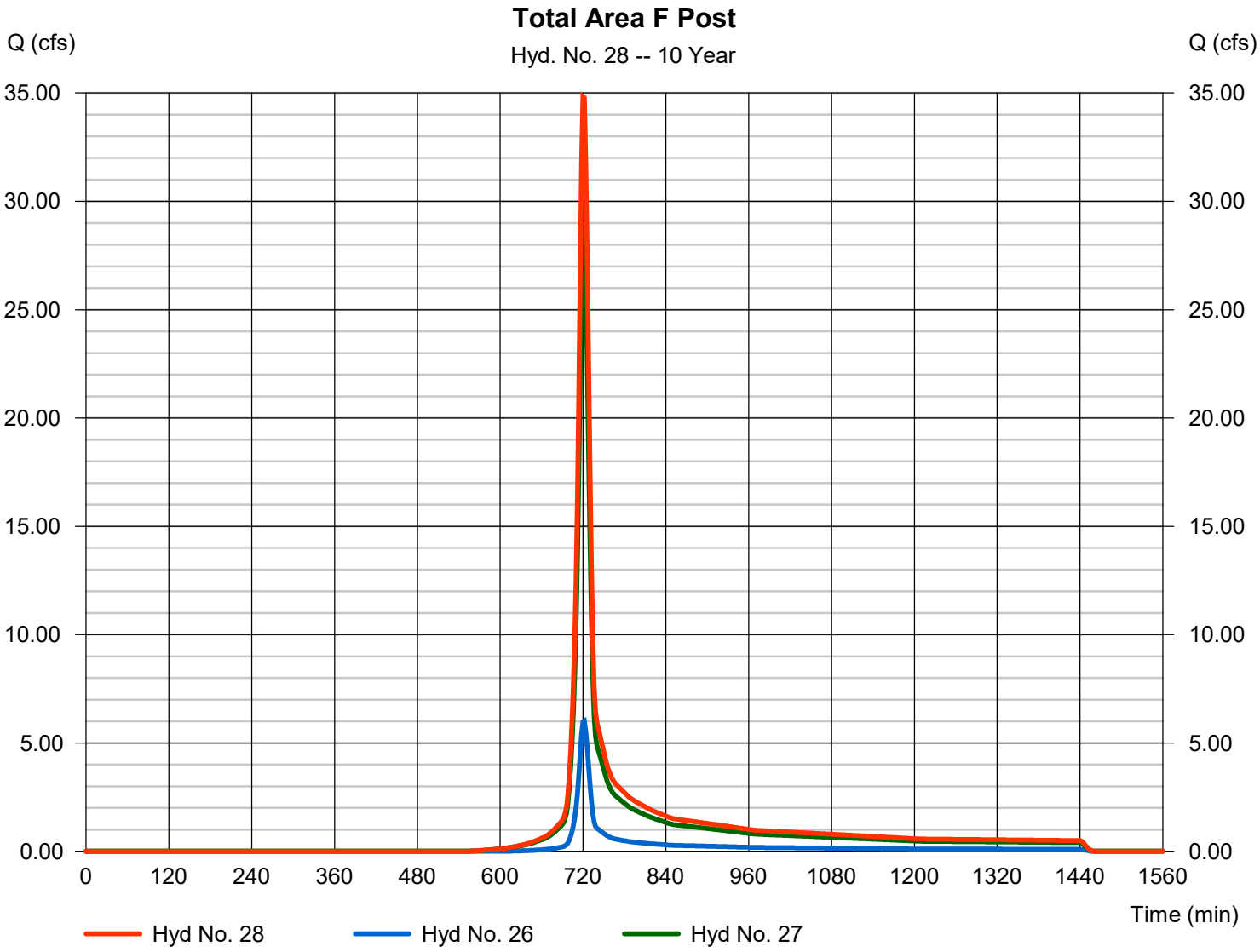


Hydrograph Report

Hyd. No. 28

Total Area F Post

Hydrograph type	= Combine	Peak discharge	= 34.83 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 90,981 cuft
Inflow hyds.	= 26, 27	Contrib. drain. area	= 10.840 ac

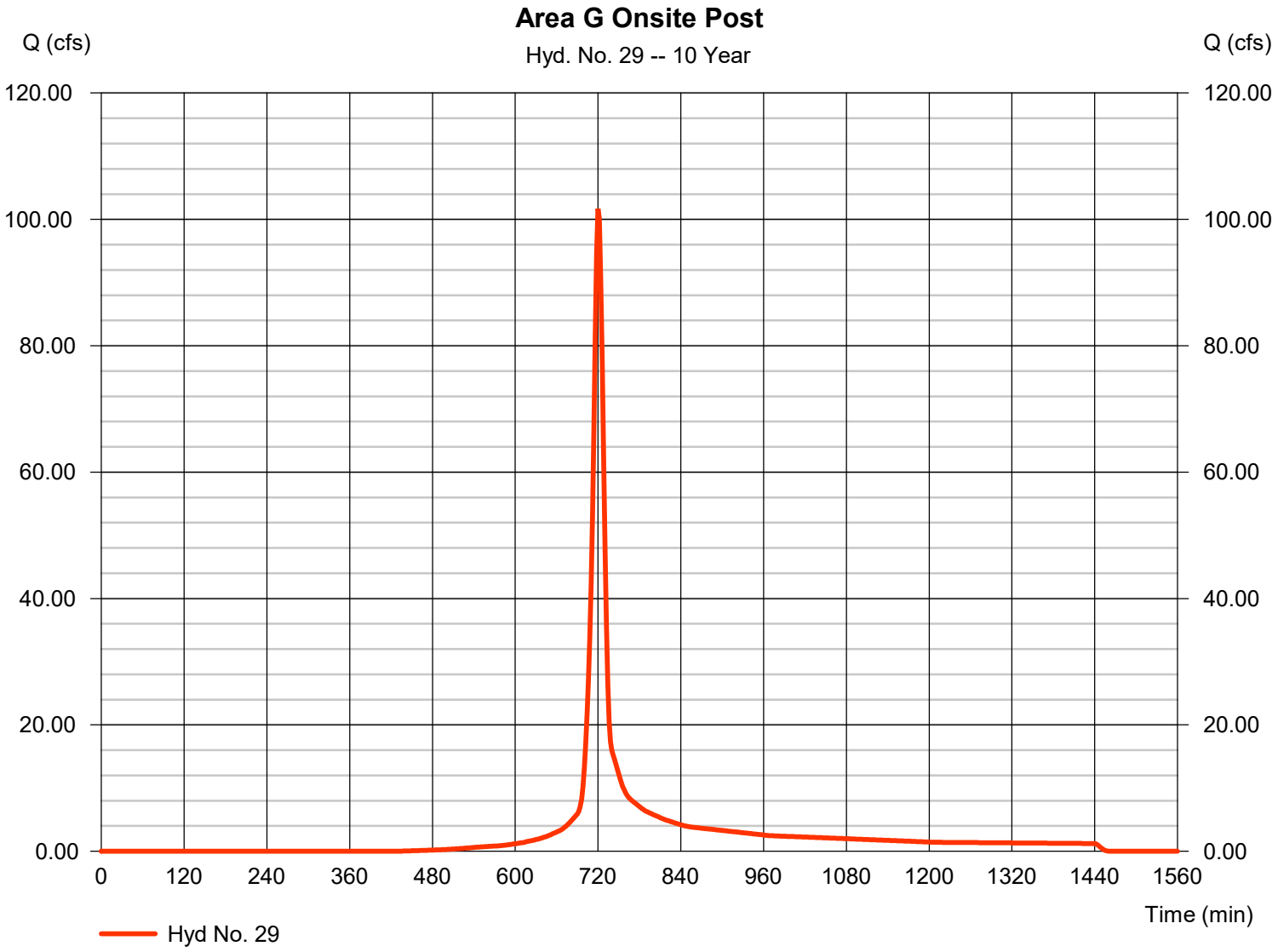


Hydrograph Report

Hyd. No. 29

Area G Onsite Post

Hydrograph type	= SCS Runoff	Peak discharge	= 101.68 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 264,029 cuft
Drainage area	= 23.810 ac	Curve number	= 79.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.40 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

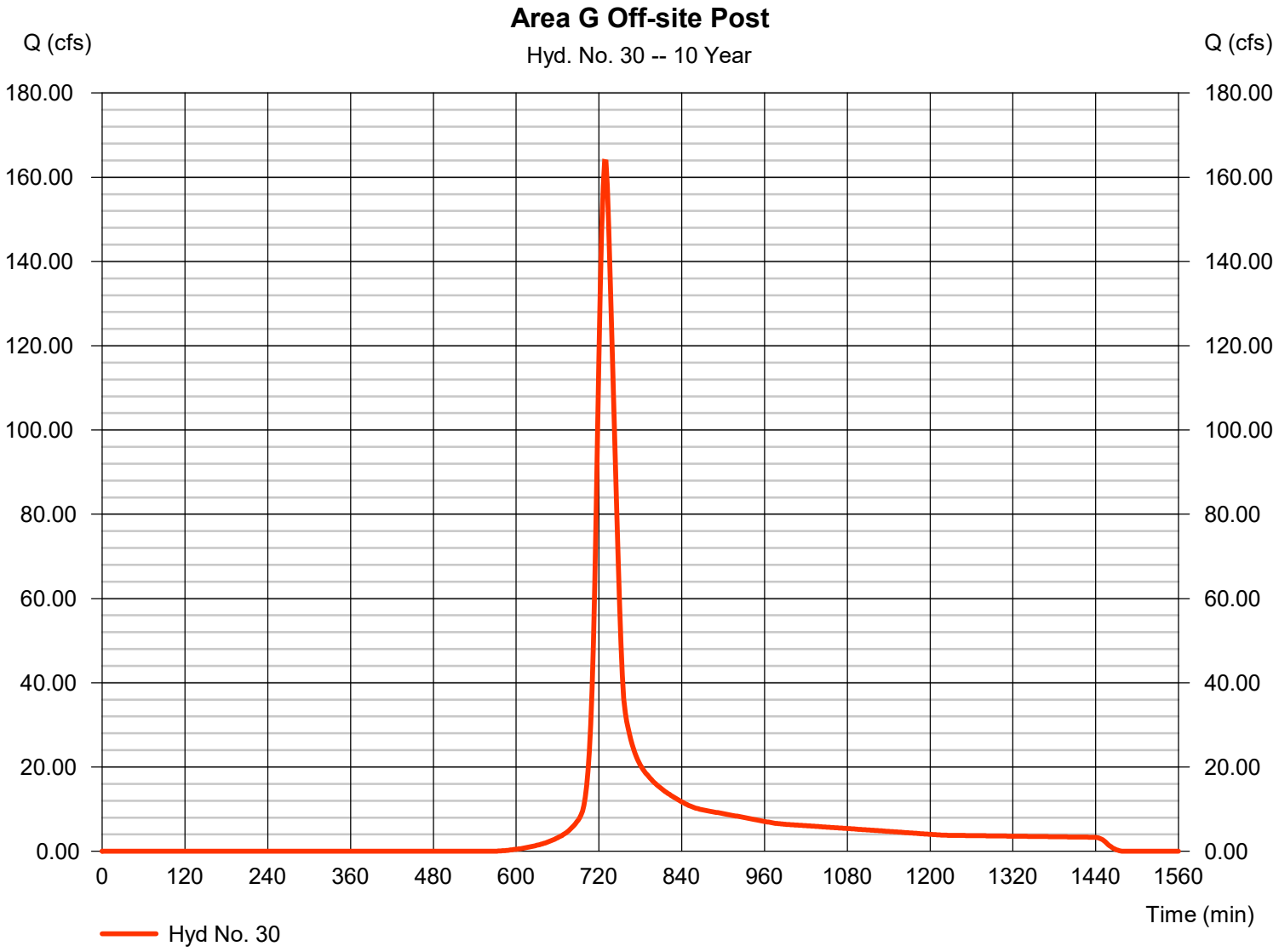


Hydrograph Report

Hyd. No. 30

Area G Off-site Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	163.74 cfs
Storm frequency	=	10 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	611,531 cuft
Drainage area	=	76.600 ac	Curve number	=	71.6
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	23.80 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

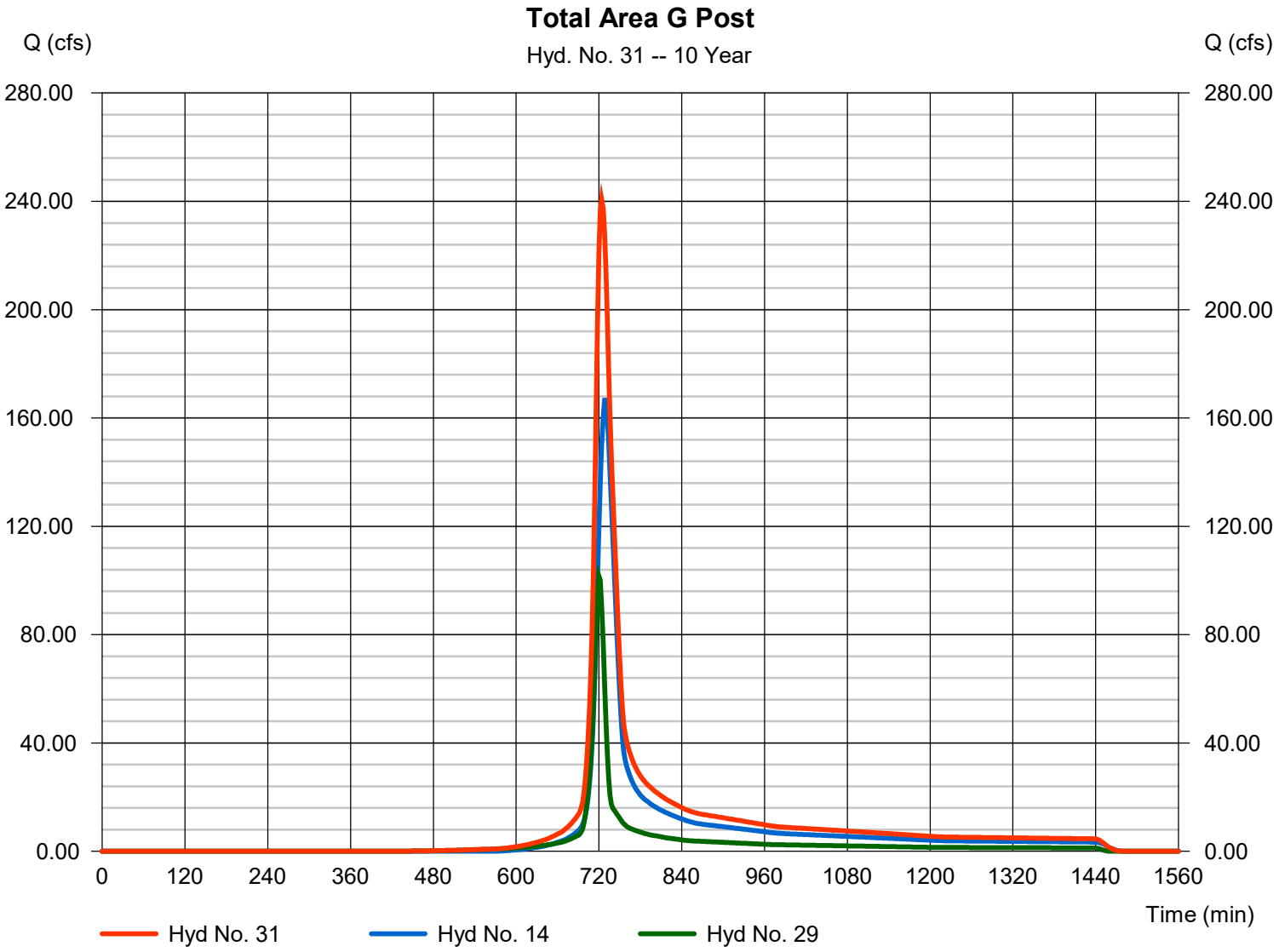


Hydrograph Report

Hyd. No. 31

Total Area G Post

Hydrograph type	= Combine	Peak discharge	= 240.56 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 885,921 cuft
Inflow hyds.	= 14, 29	Contrib. drain. area	= 101.420 ac

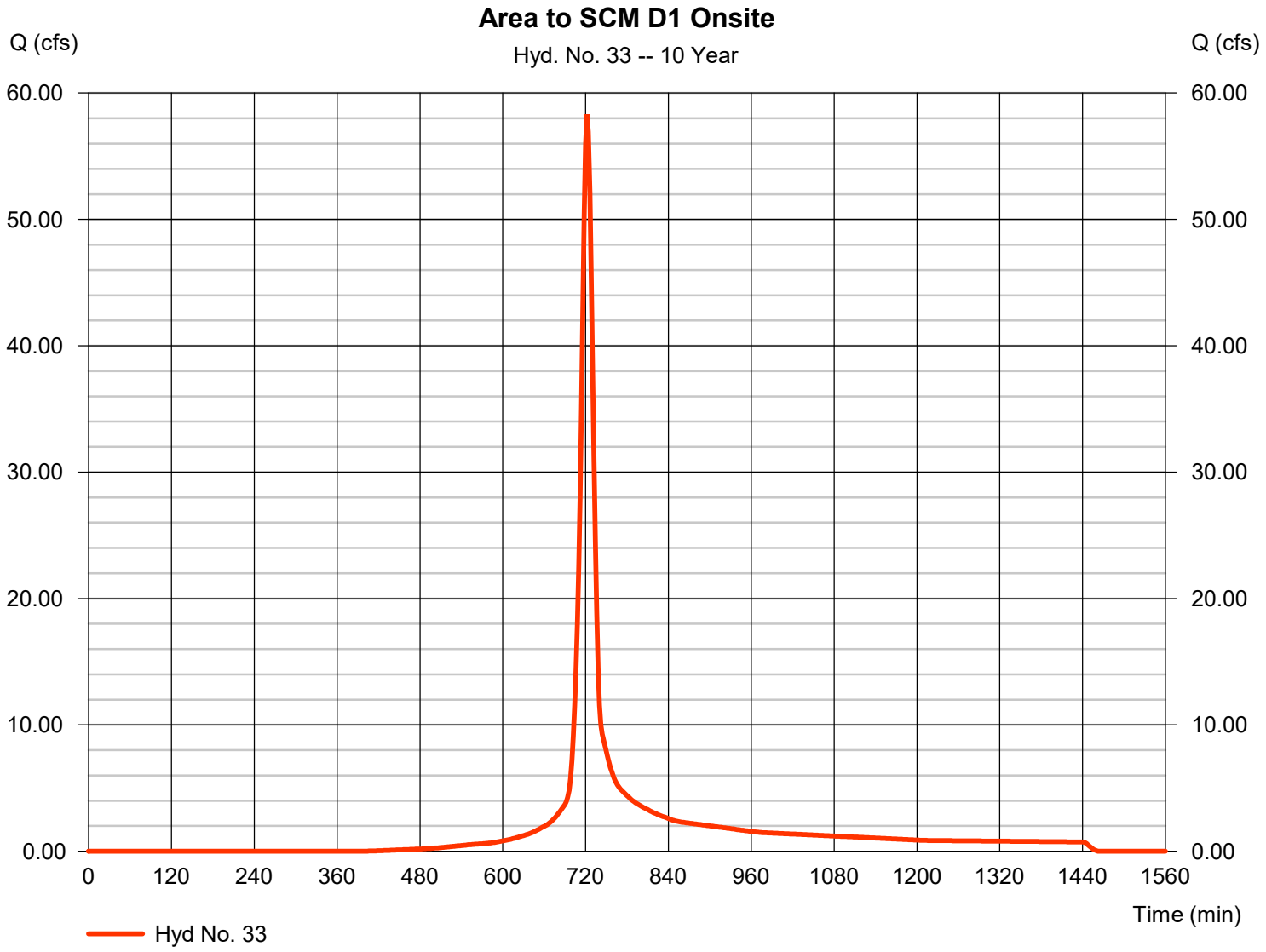


Hydrograph Report

Hyd. No. 33

Area to SCM D1 Onsite

Hydrograph type	= SCS Runoff	Peak discharge	= 58.31 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 164,068 cuft
Drainage area	= 14.850 ac	Curve number	= 81.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 16.30 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

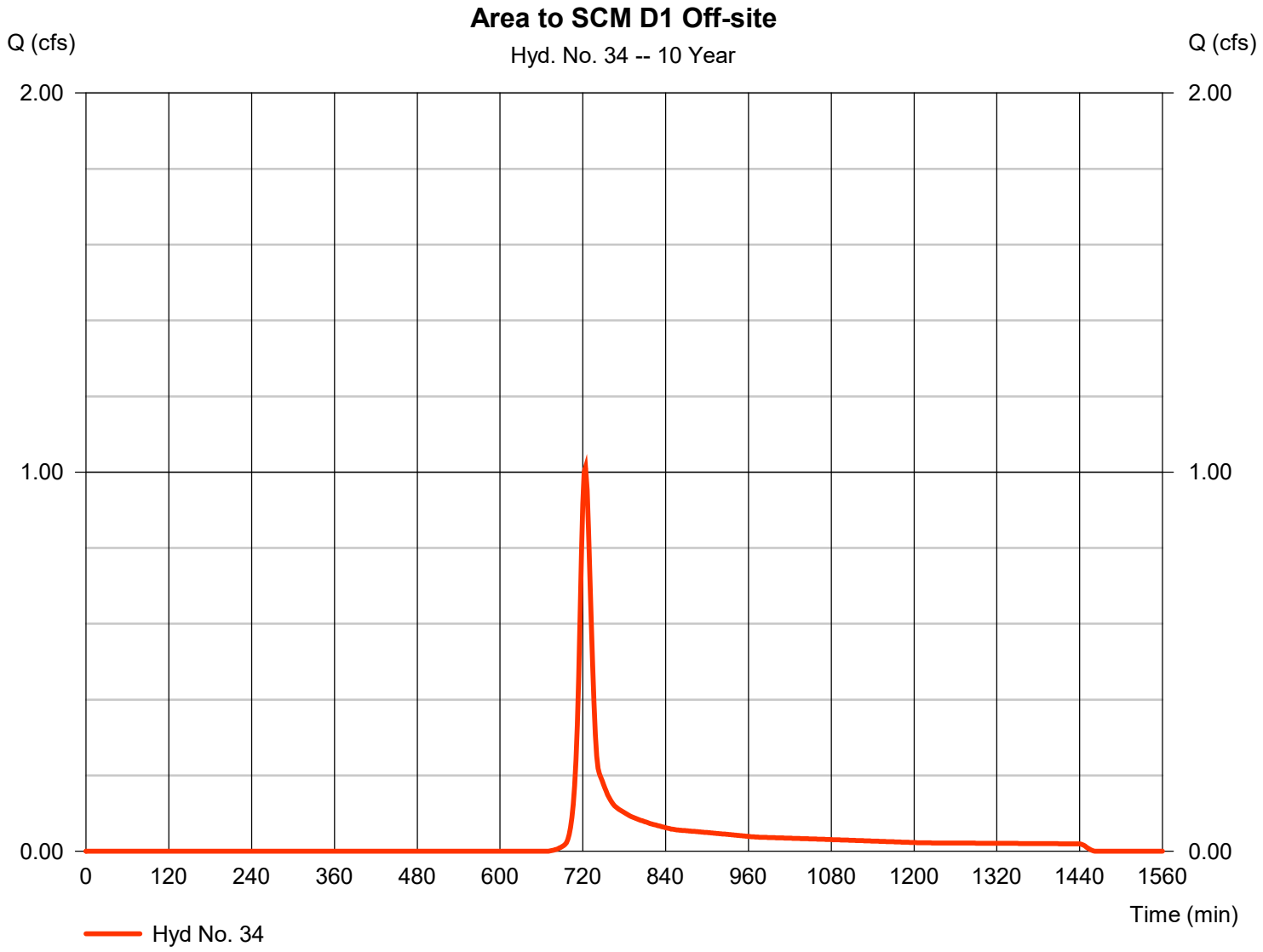


Hydrograph Report

Hyd. No. 34

Area to SCM D1 Off-site

Hydrograph type	= SCS Runoff	Peak discharge	= 1.012 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 3,004 cuft
Drainage area	= 0.560 ac	Curve number	= 62.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.30 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

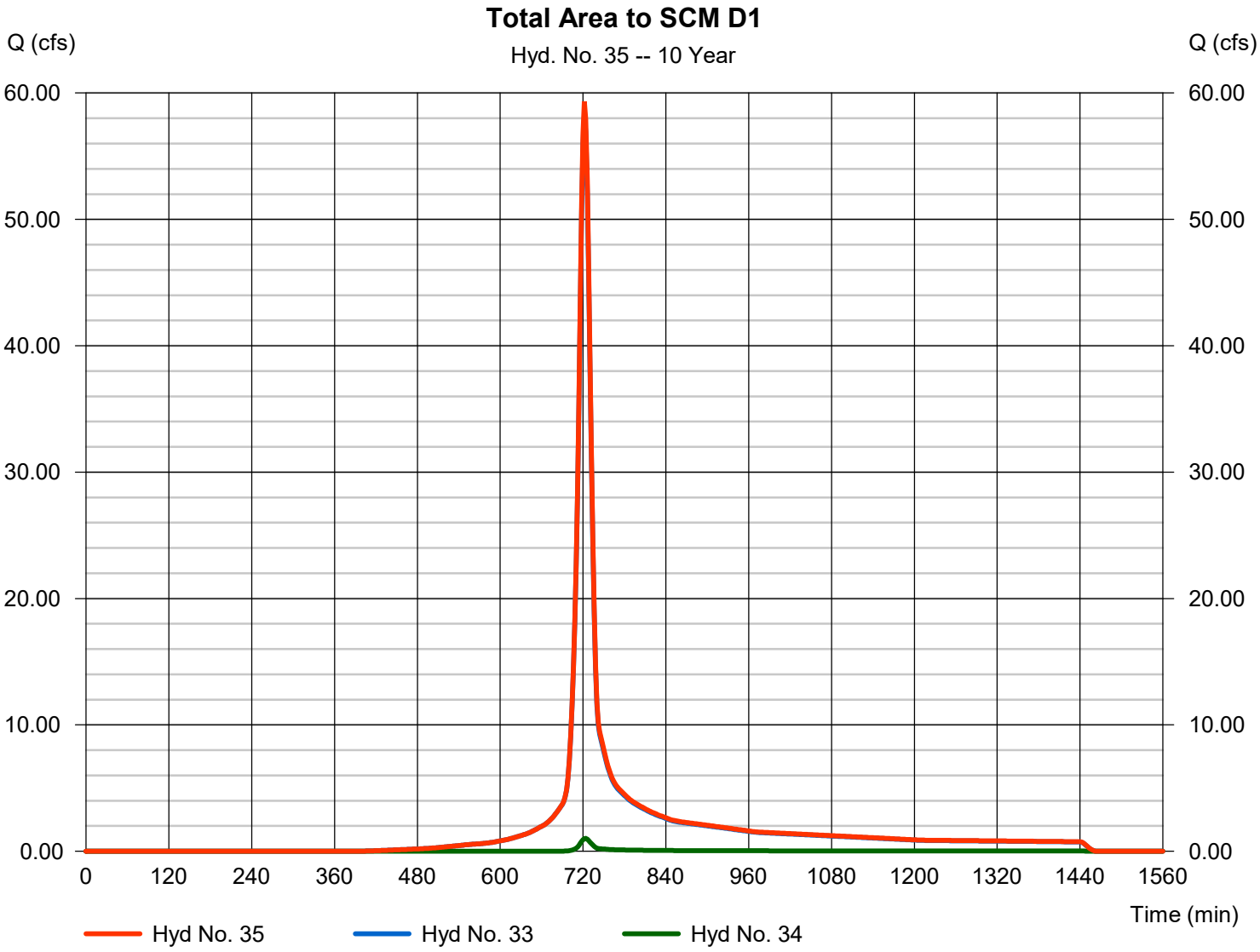


Hydrograph Report

Hyd. No. 35

Total Area to SCM D1

Hydrograph type	= Combine	Peak discharge	= 59.31 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 167,072 cuft
Inflow hyds.	= 33, 34	Contrib. drain. area	= 15.410 ac



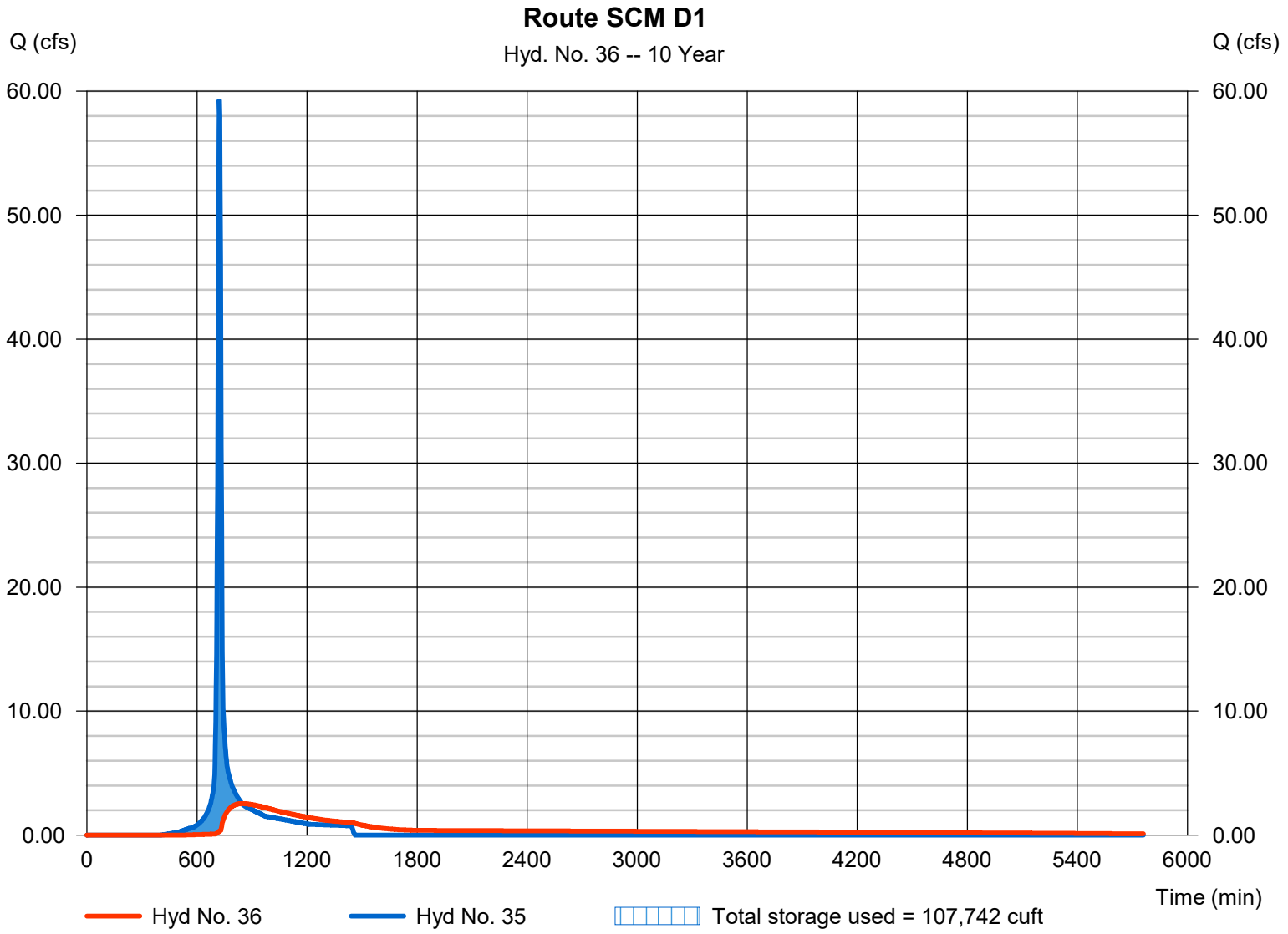
Hydrograph Report

Hyd. No. 36

Route SCM D1

Hydrograph type	=	Reservoir	Peak discharge	=	2.548 cfs
Storm frequency	=	10 yrs	Time to peak	=	844 min
Time interval	=	2 min	Hyd. volume	=	150,149 cuft
Inflow hyd. No.	=	35 - Total Area to SCM D1	Max. Elevation	=	386.17 ft
Reservoir name	=	SCM D1	Max. Storage	=	107,742 cuft

Storage Indication method used.

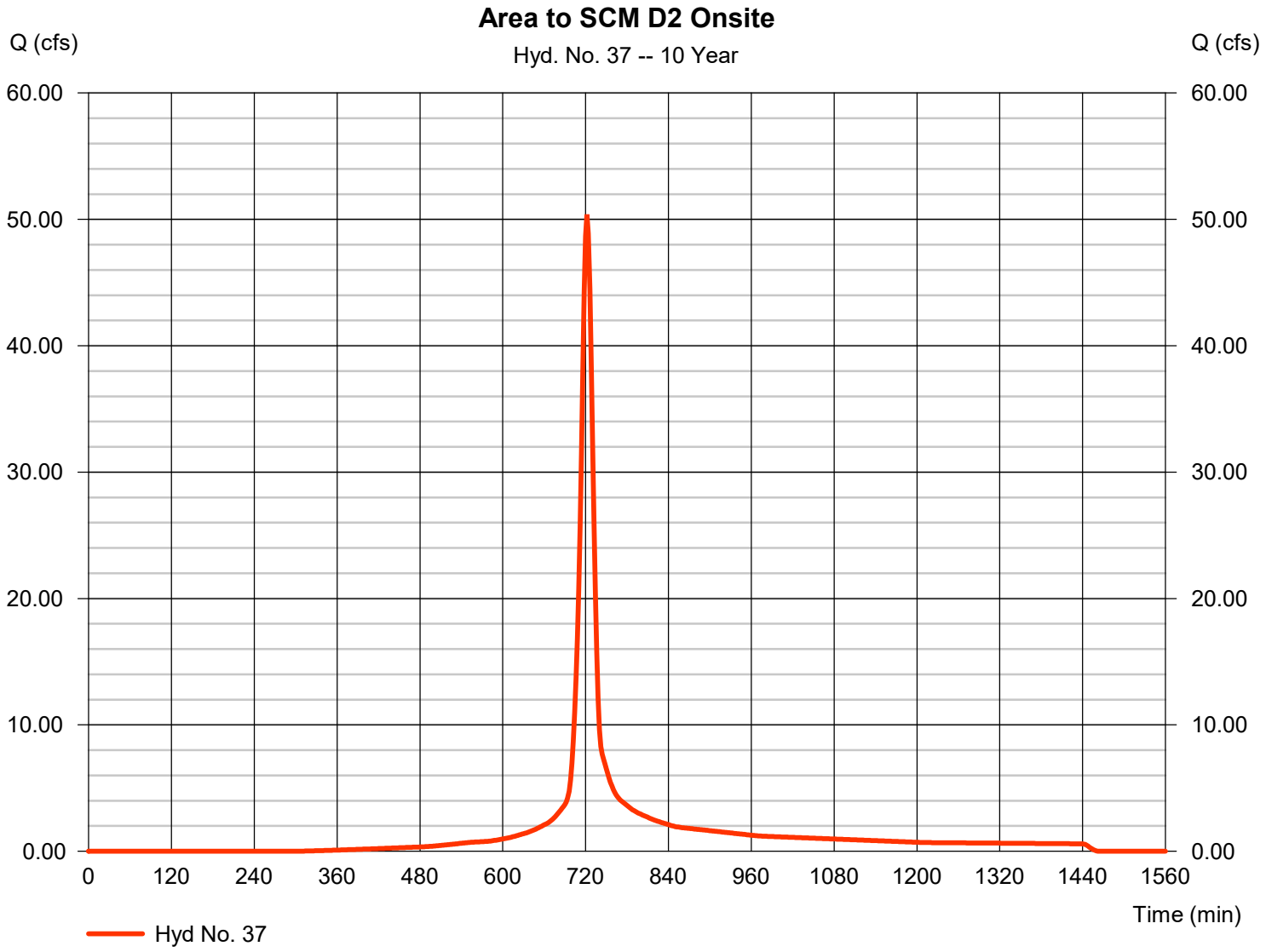


Hydrograph Report

Hyd. No. 37

Area to SCM D2 Onsite

Hydrograph type	= SCS Runoff	Peak discharge	= 50.39 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 144,035 cuft
Drainage area	= 11.300 ac	Curve number	= 86.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.80 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

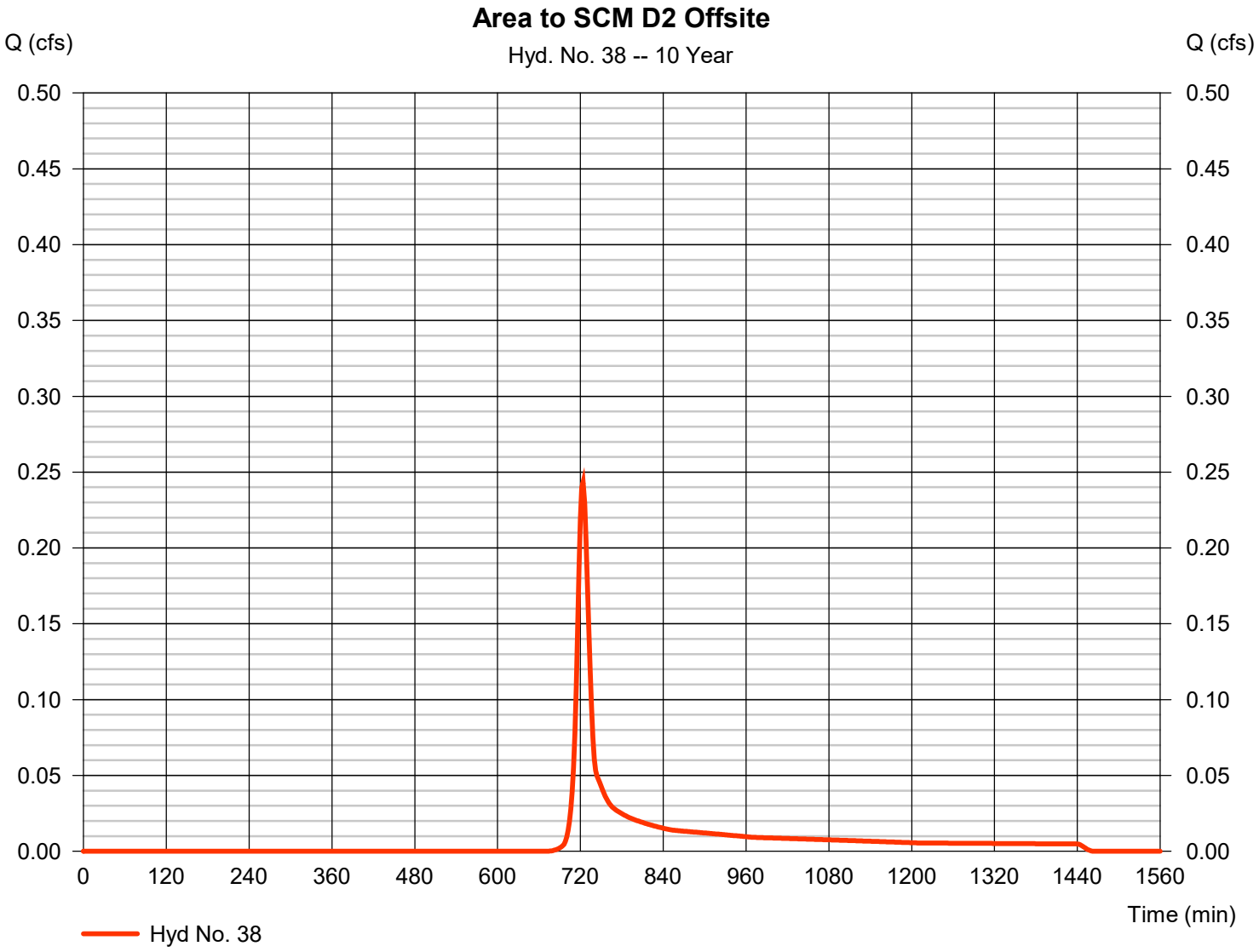


Hydrograph Report

Hyd. No. 38

Area to SCM D2 Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 0.243 cfs
Storm frequency	= 10 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 726 cuft
Drainage area	= 0.140 ac	Curve number	= 61.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 13.80 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

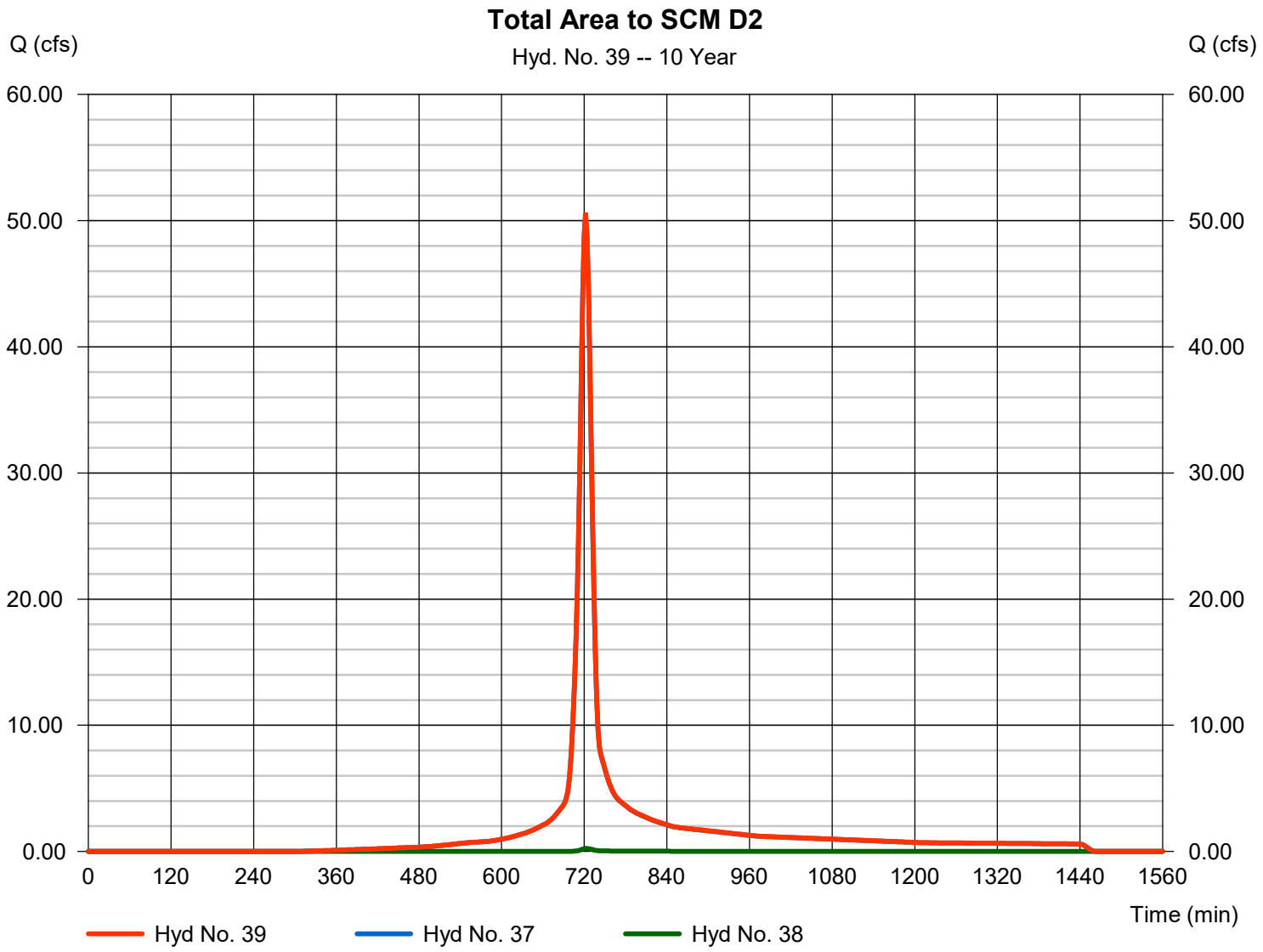


Hydrograph Report

Hyd. No. 39

Total Area to SCM D2

Hydrograph type	= Combine	Peak discharge	= 50.63 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 144,761 cuft
Inflow hyds.	= 37, 38	Contrib. drain. area	= 11.440 ac



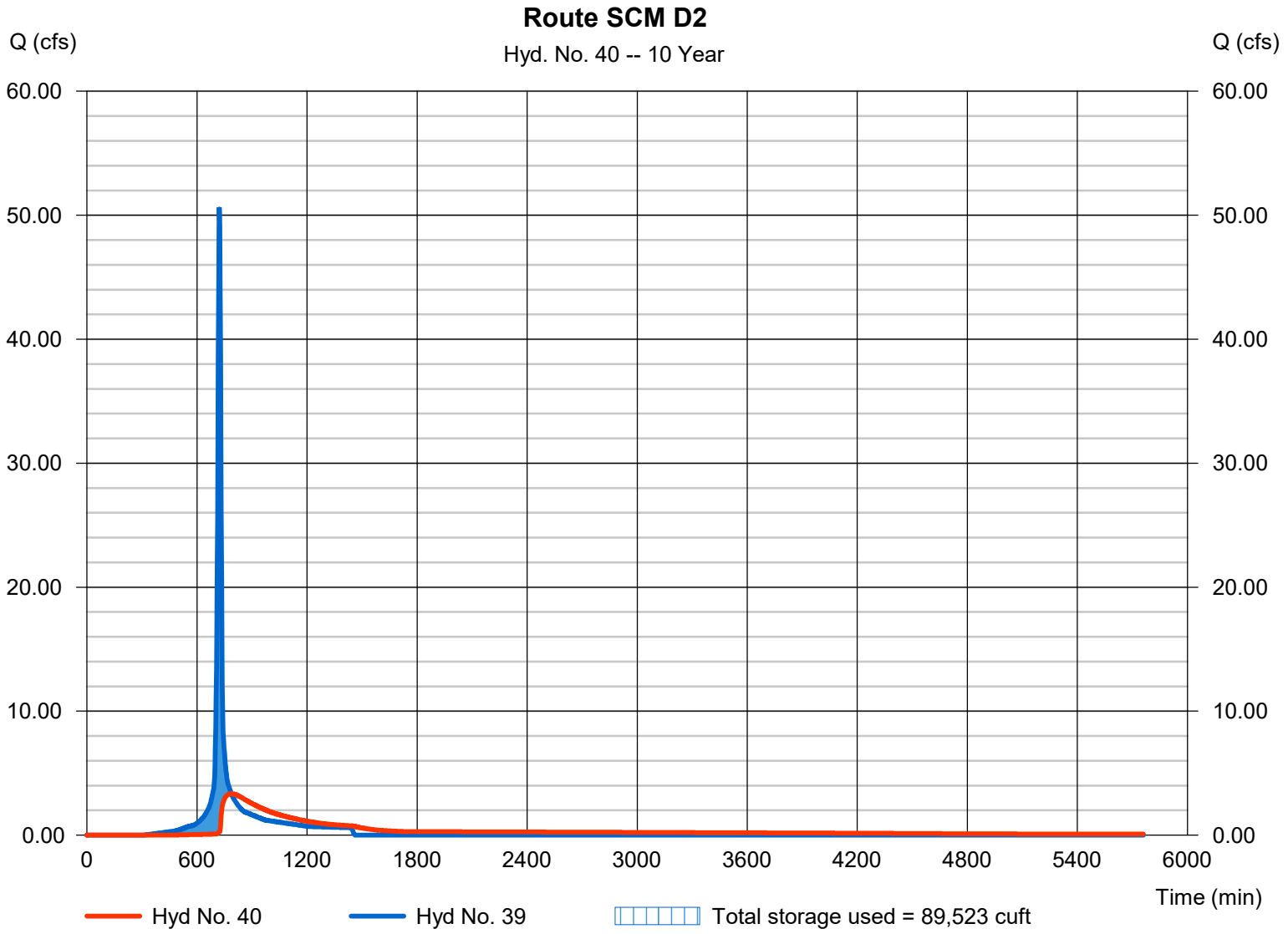
Hydrograph Report

Hyd. No. 40

Route SCM D2

Hydrograph type	=	Reservoir	Peak discharge	=	3.340 cfs
Storm frequency	=	10 yrs	Time to peak	=	788 min
Time interval	=	2 min	Hyd. volume	=	127,177 cuft
Inflow hyd. No.	=	39 - Total Area to SCM D2	Max. Elevation	=	393.43 ft
Reservoir name	=	SCM D2	Max. Storage	=	89,523 cuft

Storage Indication method used.

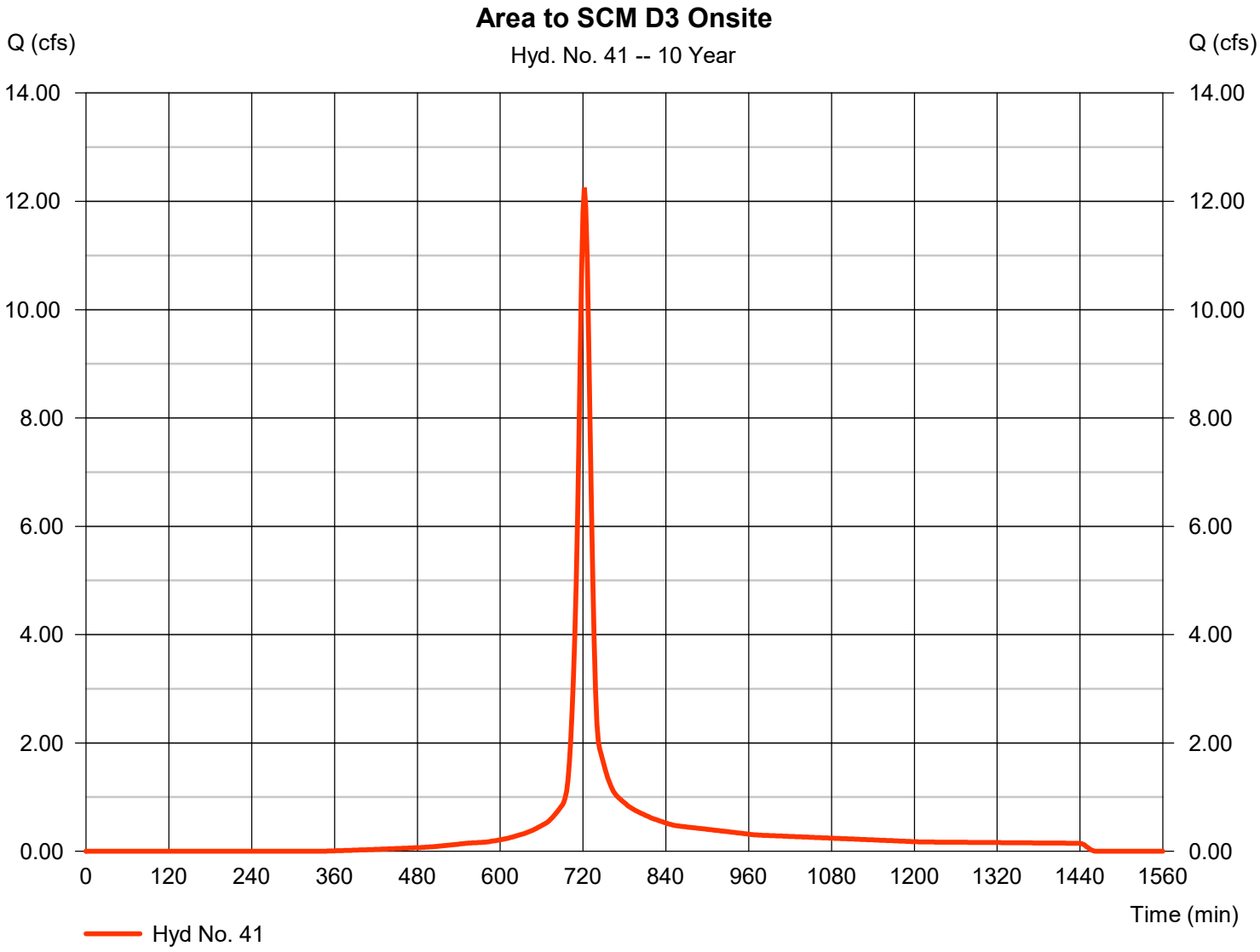


Hydrograph Report

Hyd. No. 41

Area to SCM D3 Onsite

Hydrograph type	= SCS Runoff	Peak discharge	= 12.25 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 34,756 cuft
Drainage area	= 2.870 ac	Curve number	= 84.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.20 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



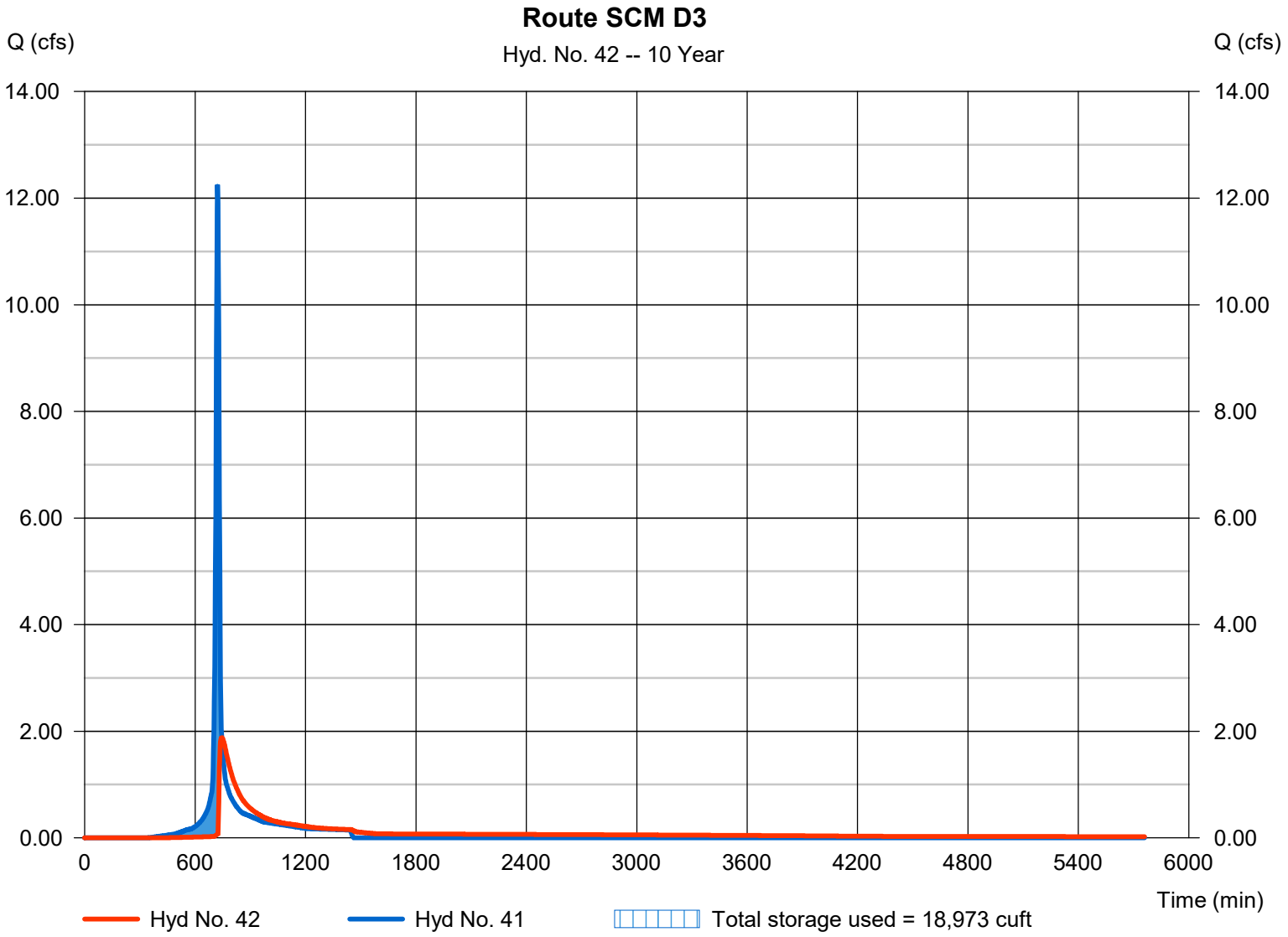
Hydrograph Report

Hyd. No. 42

Route SCM D3

Hydrograph type	=	Reservoir	Peak discharge	=	1.878 cfs
Storm frequency	=	10 yrs	Time to peak	=	744 min
Time interval	=	2 min	Hyd. volume	=	32,268 cuft
Inflow hyd. No.	=	41 - Area to SCM D3 Onsite	Max. Elevation	=	385.41 ft
Reservoir name	=	SCM D3	Max. Storage	=	18,973 cuft

Storage Indication method used.

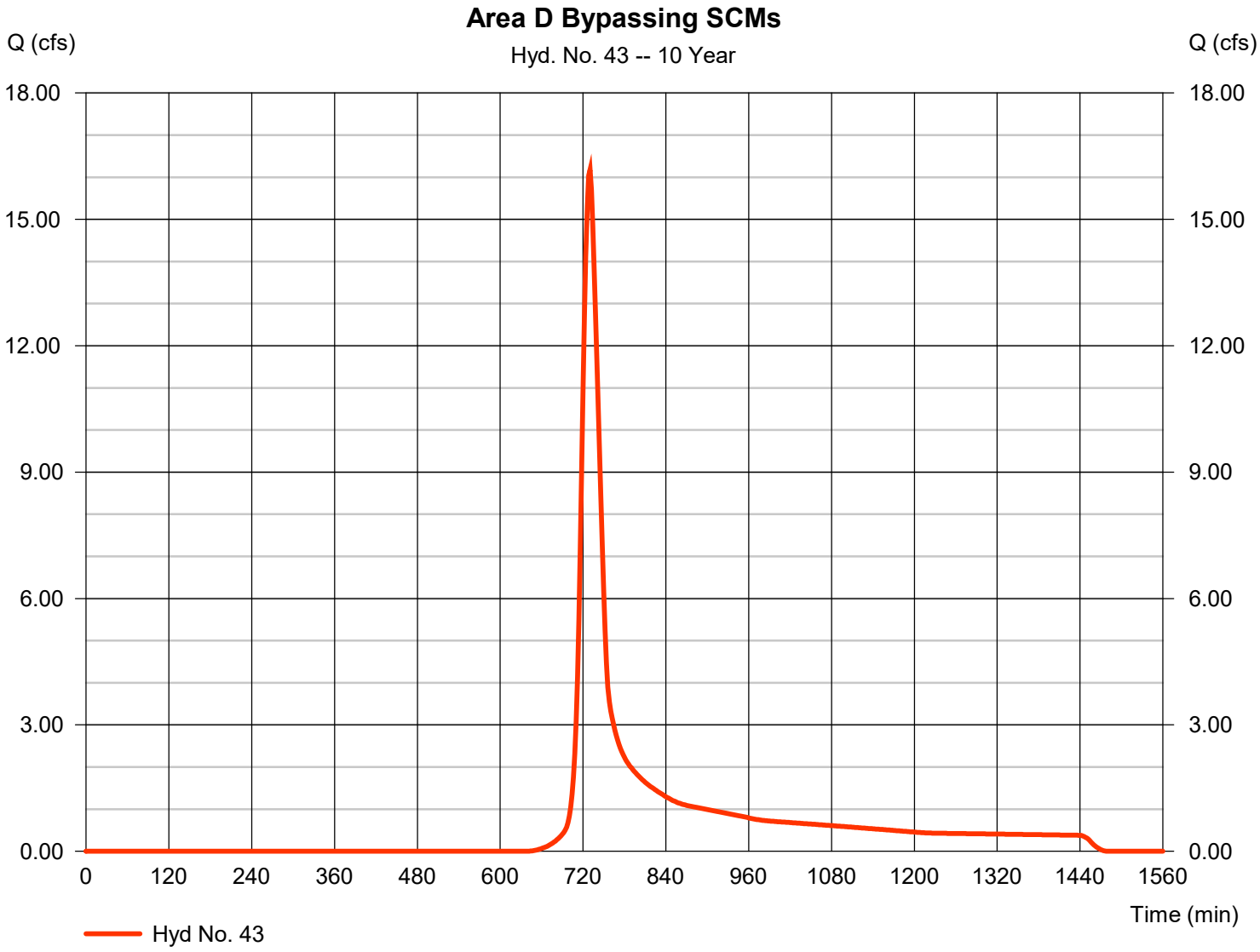


Hydrograph Report

Hyd. No. 43

Area D Bypassing SCMs

Hydrograph type	= SCS Runoff	Peak discharge	= 16.18 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 62,300 cuft
Drainage area	= 9.870 ac	Curve number	= 65.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 24.00 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

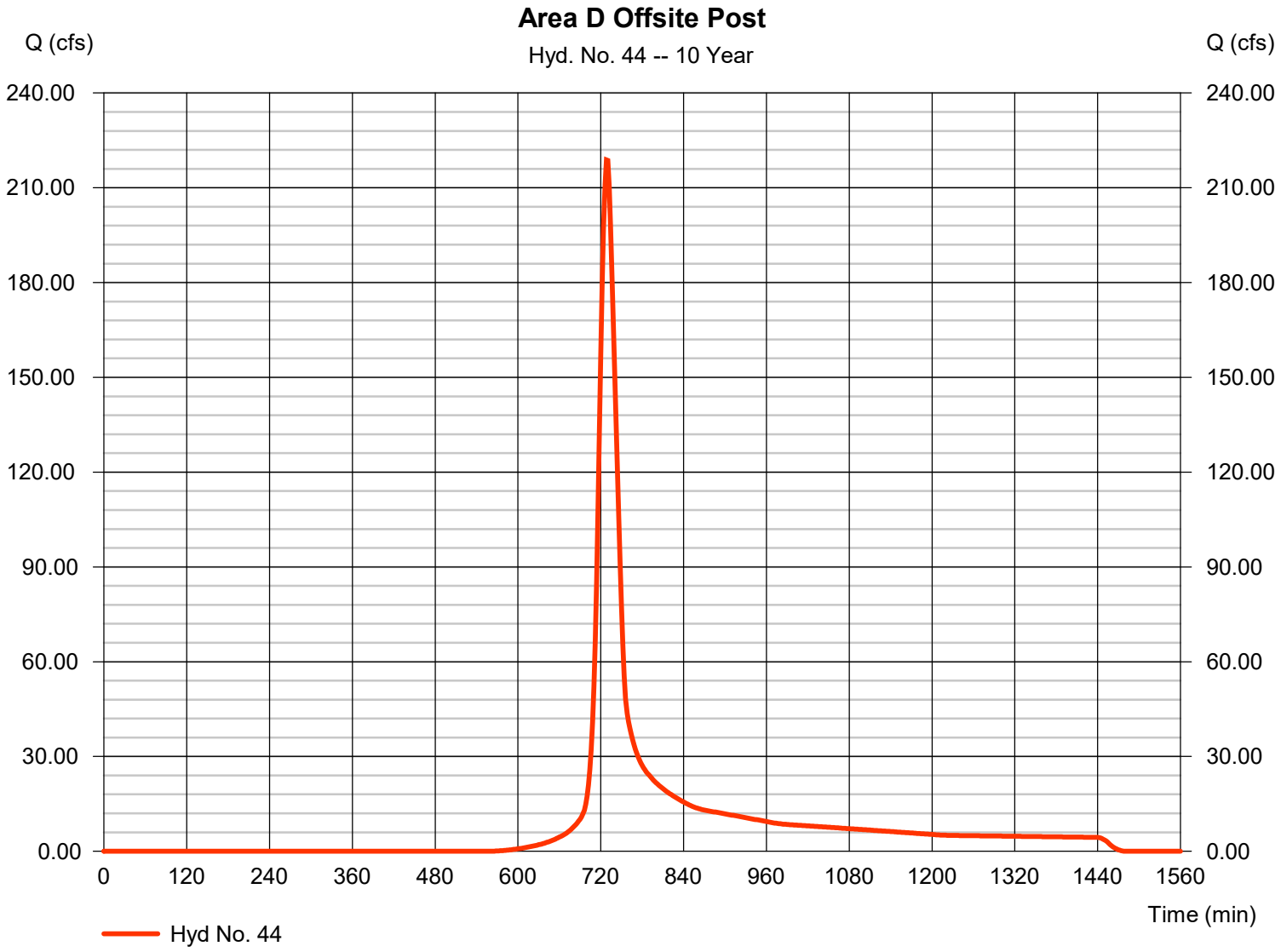


Hydrograph Report

Hyd. No. 44

Area D Offsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	218.81 cfs
Storm frequency	=	10 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	815,798 cuft
Drainage area	=	100.690 ac	Curve number	=	72
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

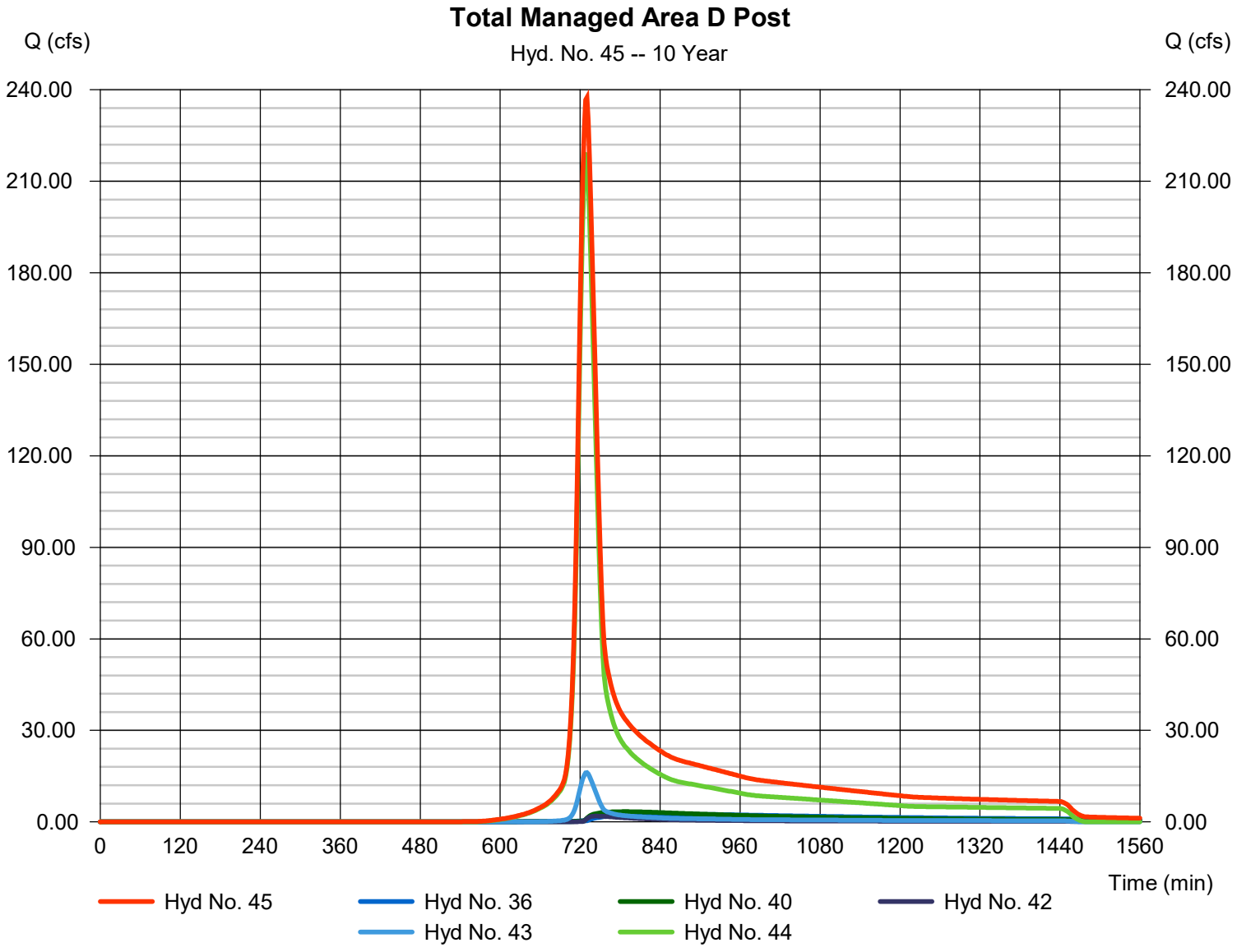


Hydrograph Report

Hyd. No. 45

Total Managed Area D Post

Hydrograph type	= Combine	Peak discharge	= 237.42 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 1,187,694 cuft
Inflow hyds.	= 36, 40, 42, 43, 44	Contrib. drain. area	= 110.560 ac

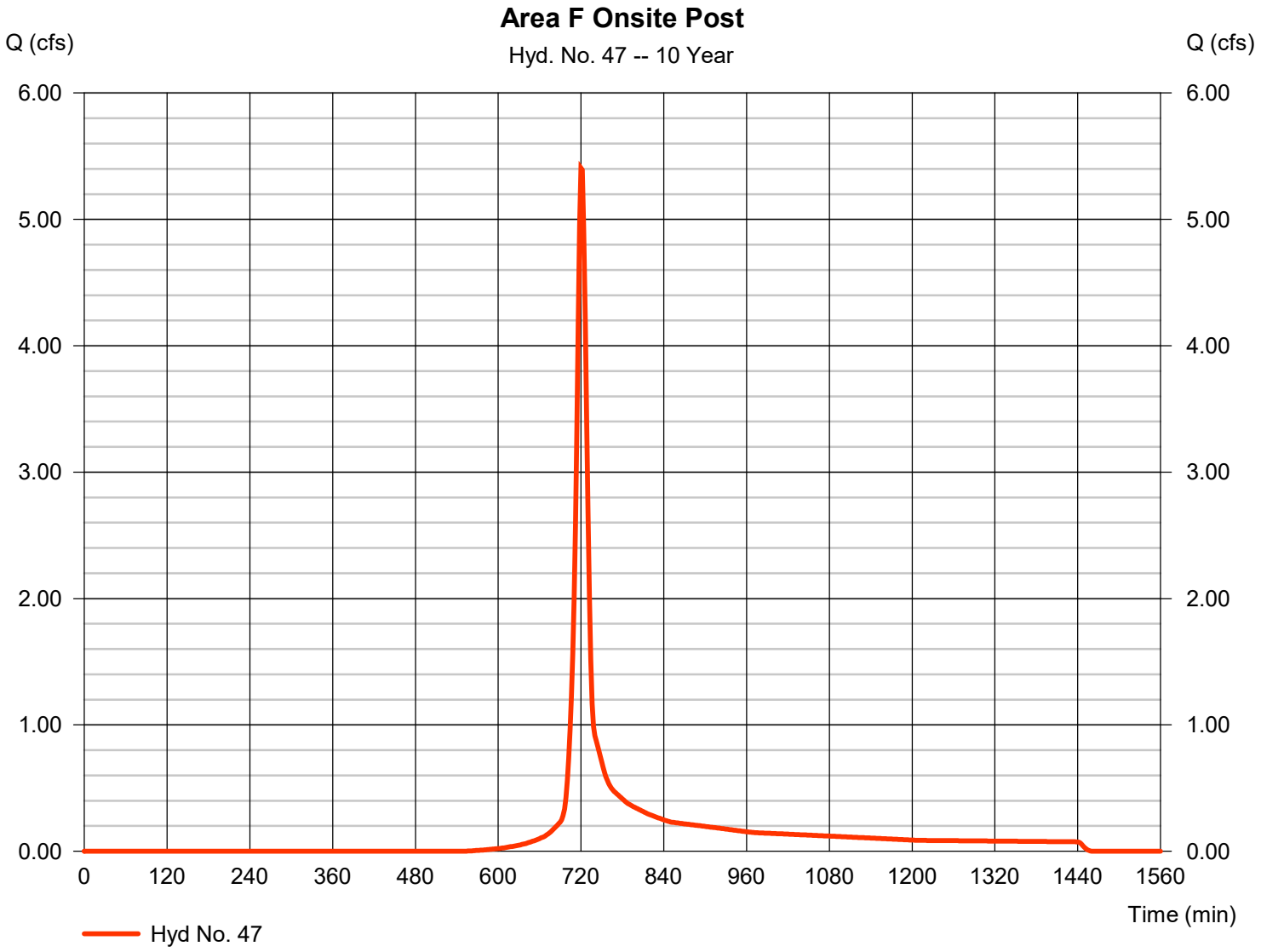


Hydrograph Report

Hyd. No. 47

Area F Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.407 cfs
Storm frequency	=	10 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	14,090 cuft
Drainage area	=	1.630 ac	Curve number	=	72.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.60 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

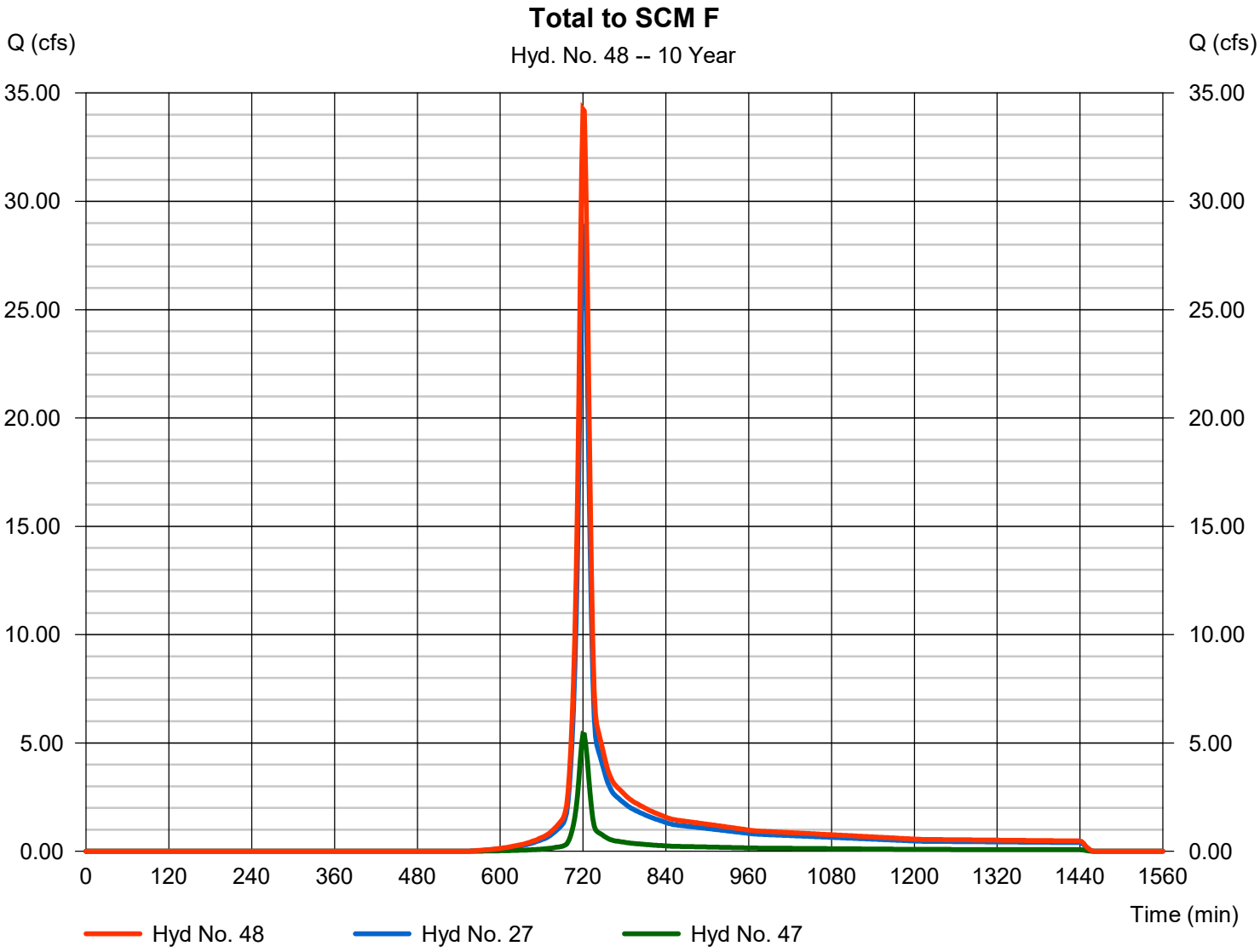


Hydrograph Report

Hyd. No. 48

Total to SCM F

Hydrograph type	= Combine	Peak discharge	= 34.25 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 89,281 cuft
Inflow hyds.	= 27, 47	Contrib. drain. area	= 10.360 ac



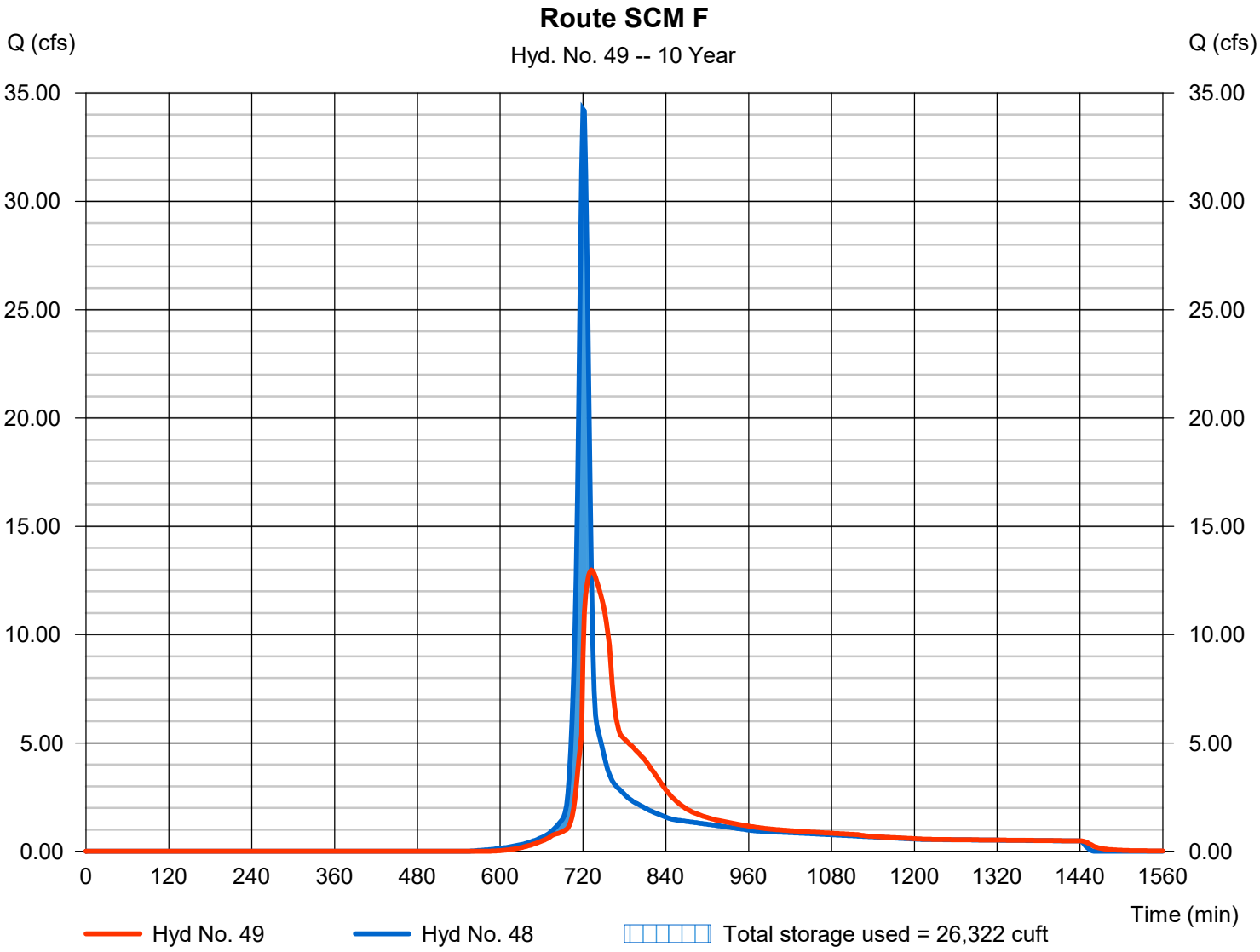
Hydrograph Report

Hyd. No. 49

Route SCM F

Hydrograph type	=	Reservoir	Peak discharge	=	12.97 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	89,271 cuft
Inflow hyd. No.	=	48 - Total to SCM F	Max. Elevation	=	390.61 ft
Reservoir name	=	SCM F	Max. Storage	=	26,322 cuft

Storage Indication method used.

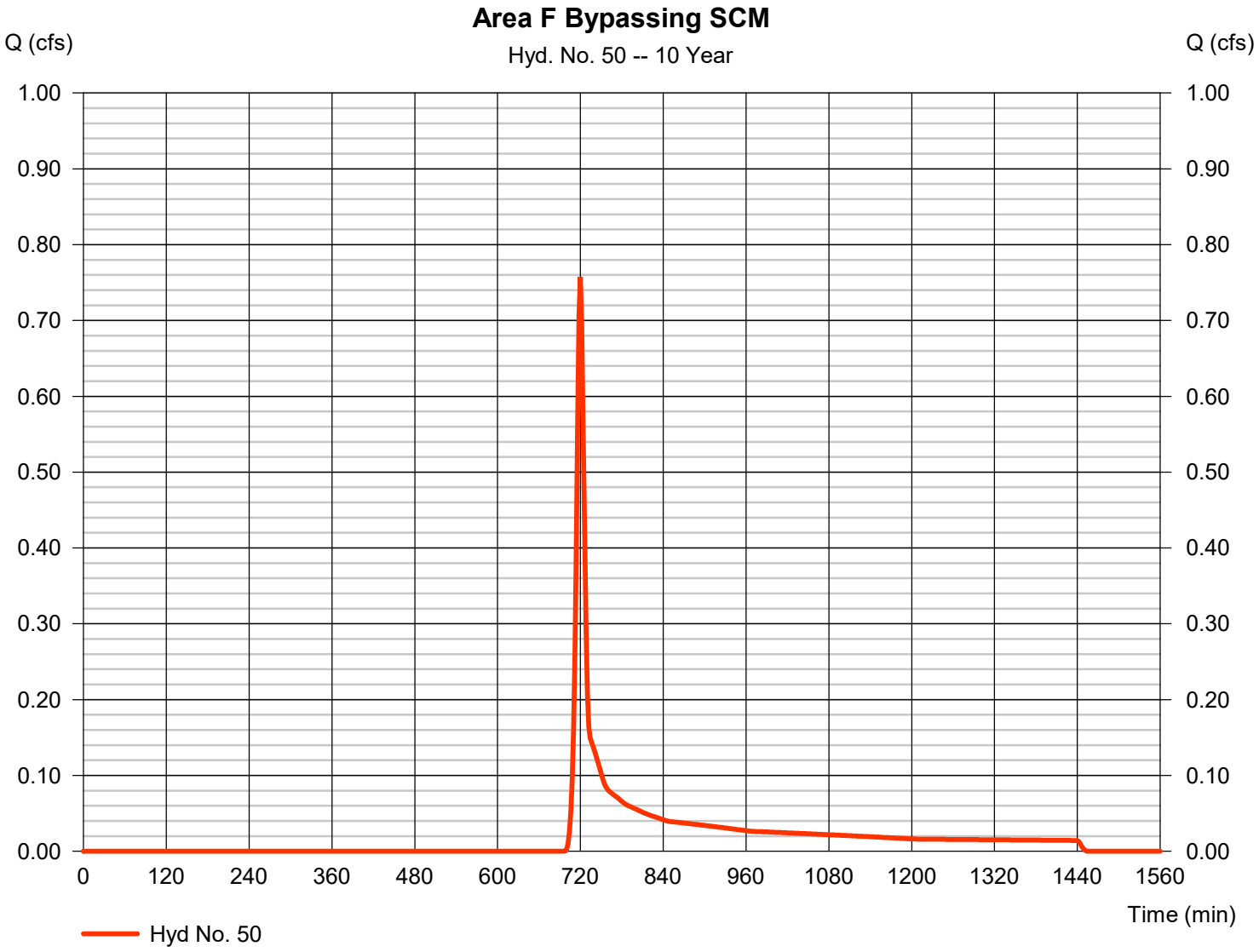


Hydrograph Report

Hyd. No. 50

Area F Bypassing SCM

Hydrograph type	= SCS Runoff	Peak discharge	= 0.757 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 1,885 cuft
Drainage area	= 0.480 ac	Curve number	= 55.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.60 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

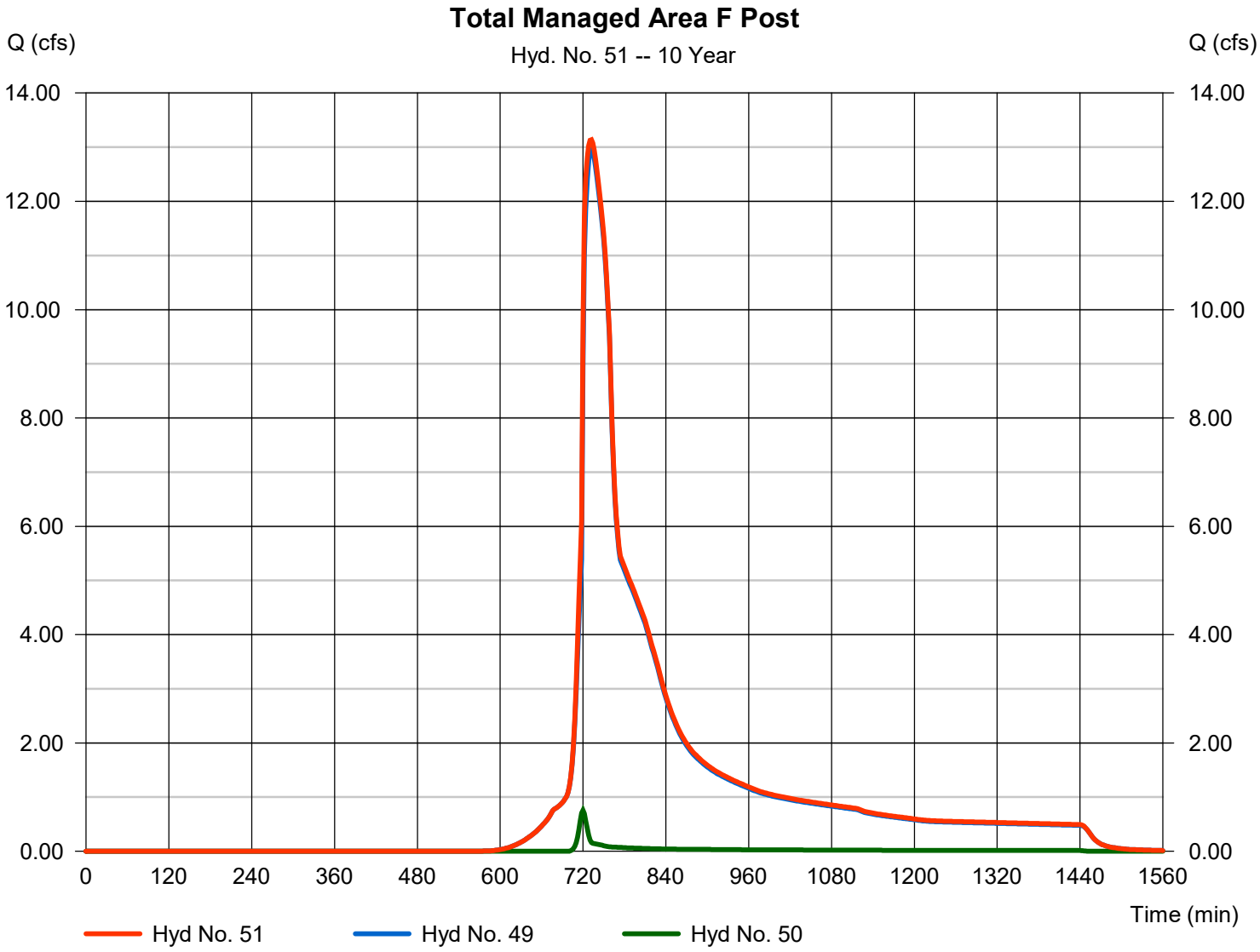


Hydrograph Report

Hyd. No. 51

Total Managed Area F Post

Hydrograph type	= Combine	Peak discharge	= 13.14 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 91,156 cuft
Inflow hyds.	= 49, 50	Contrib. drain. area	= 0.480 ac

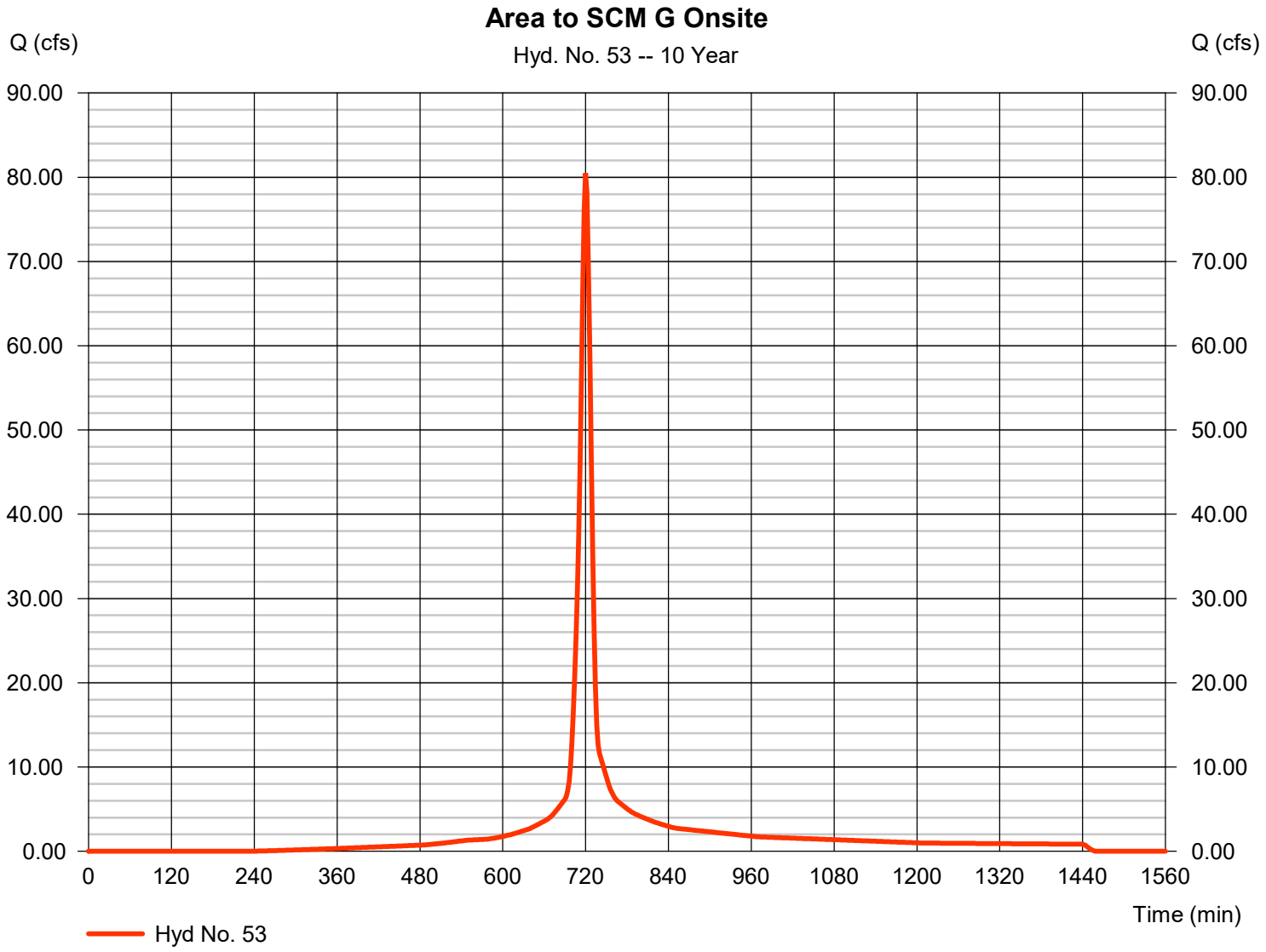


Hydrograph Report

Hyd. No. 53

Area to SCM G Onsite

Hydrograph type	= SCS Runoff	Peak discharge	= 80.47 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 217,368 cuft
Drainage area	= 14.730 ac	Curve number	= 89.8
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.40 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

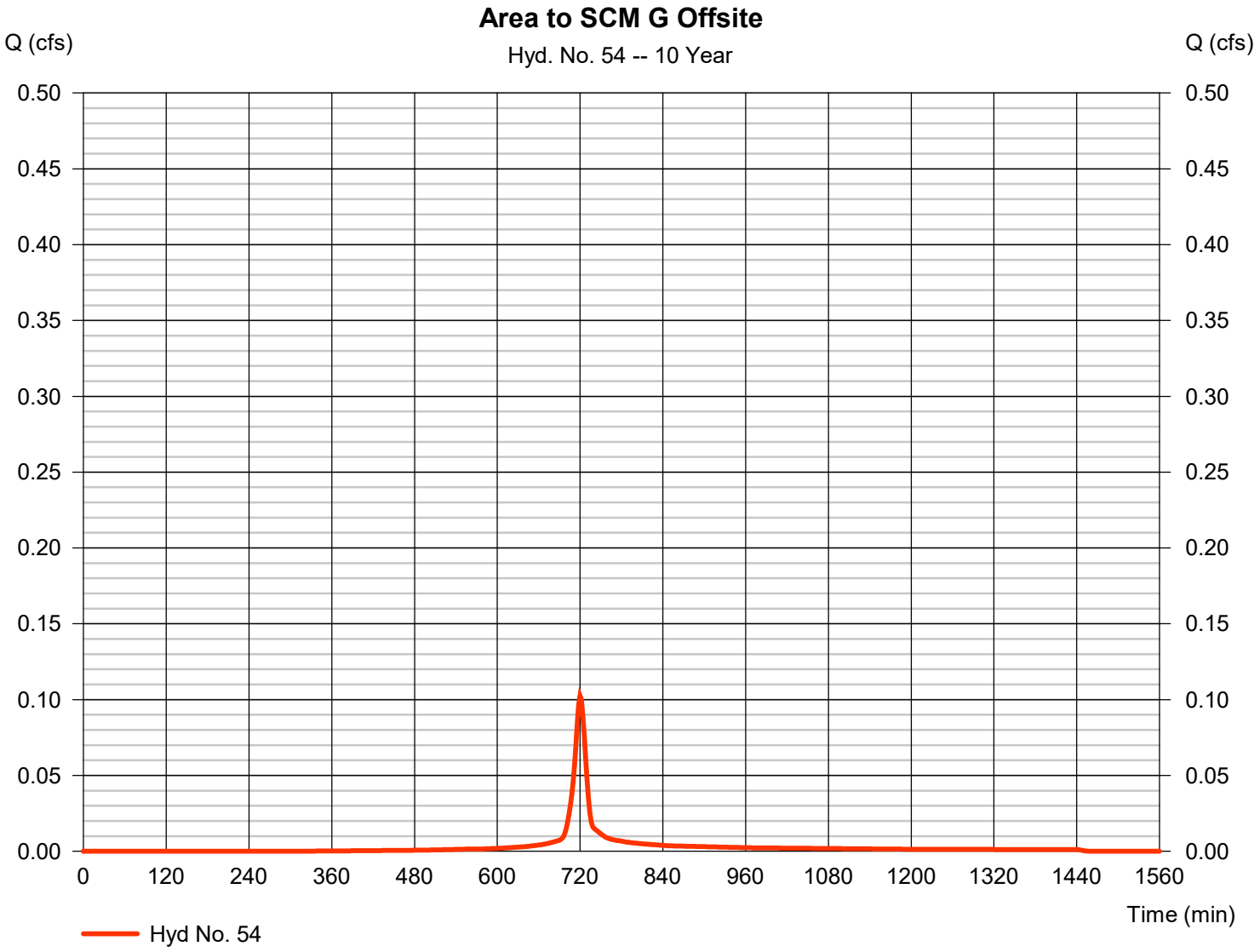


Hydrograph Report

Hyd. No. 54

Area to SCM G Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 0.103 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 272 cuft
Drainage area	= 0.020 ac	Curve number	= 86.8
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.40 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

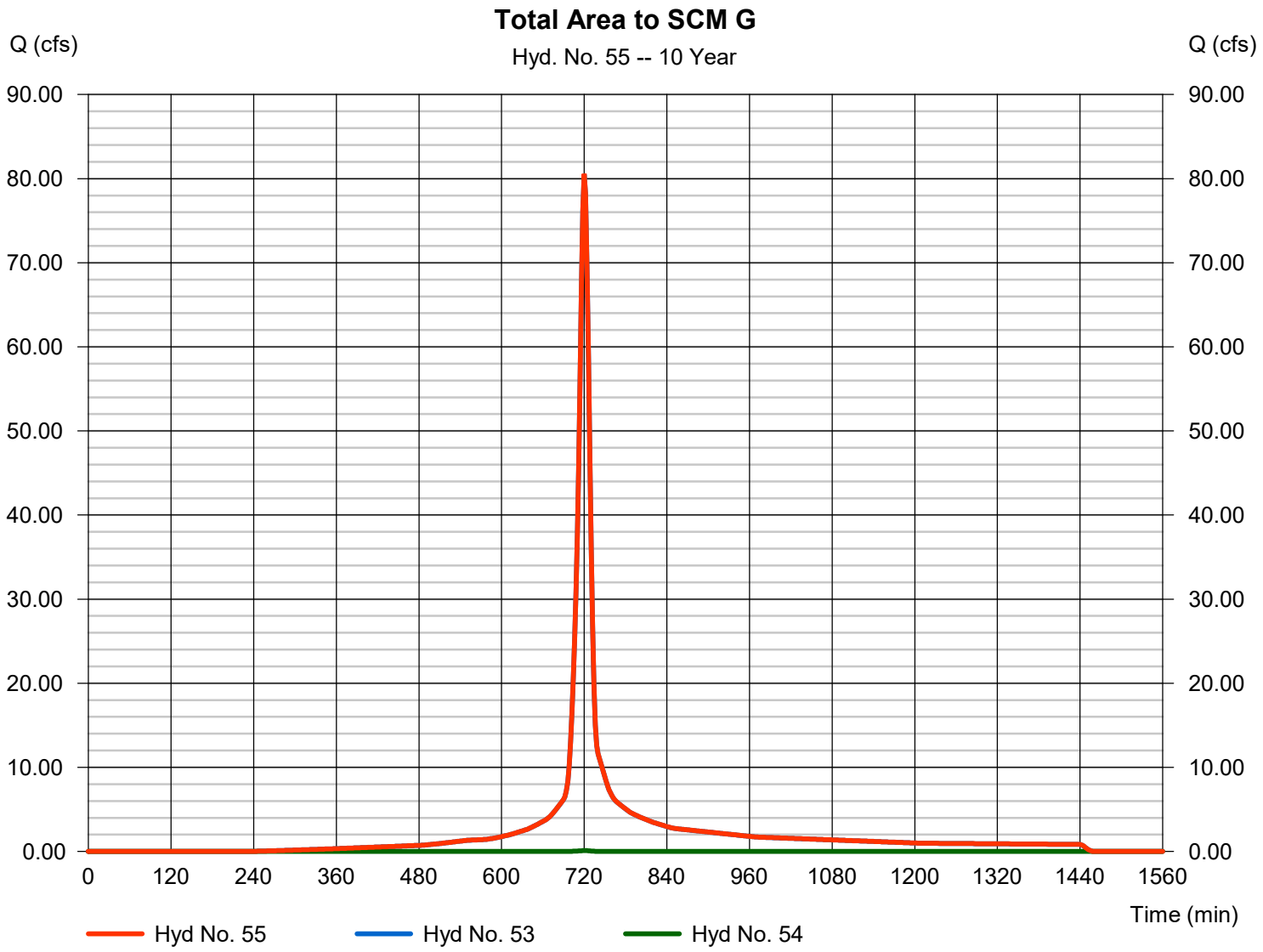


Hydrograph Report

Hyd. No. 55

Total Area to SCM G

Hydrograph type	= Combine	Peak discharge	= 80.58 cfs
Storm frequency	= 10 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 217,640 cuft
Inflow hyds.	= 53, 54	Contrib. drain. area	= 14.750 ac



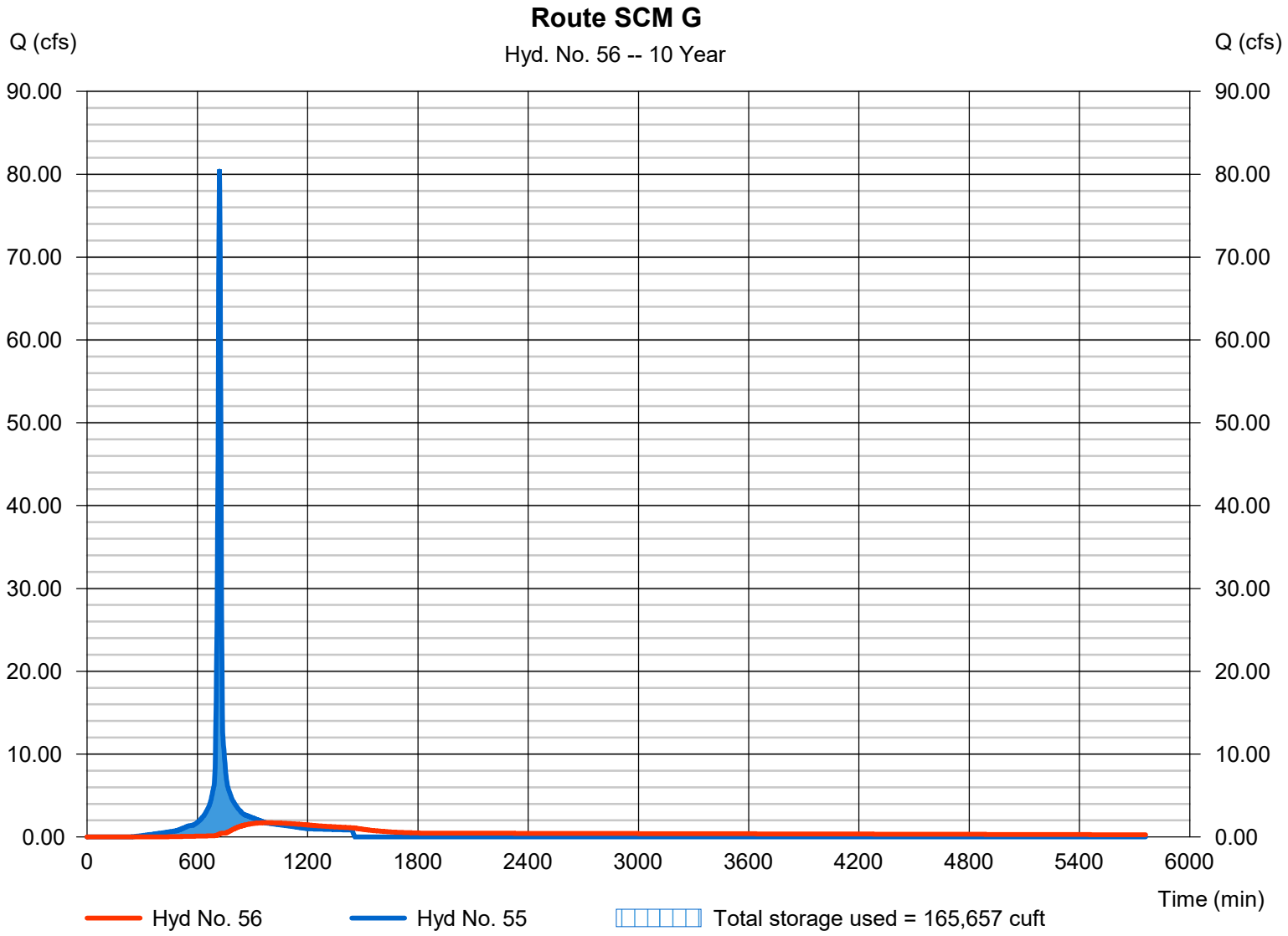
Hydrograph Report

Hyd. No. 56

Route SCM G

Hydrograph type	= Reservoir	Peak discharge	= 1.712 cfs
Storm frequency	= 10 yrs	Time to peak	= 972 min
Time interval	= 2 min	Hyd. volume	= 163,223 cuft
Inflow hyd. No.	= 55 - Total Area to SCM G	Max. Elevation	= 390.01 ft
Reservoir name	= SCM G	Max. Storage	= 165,657 cuft

Storage Indication method used.

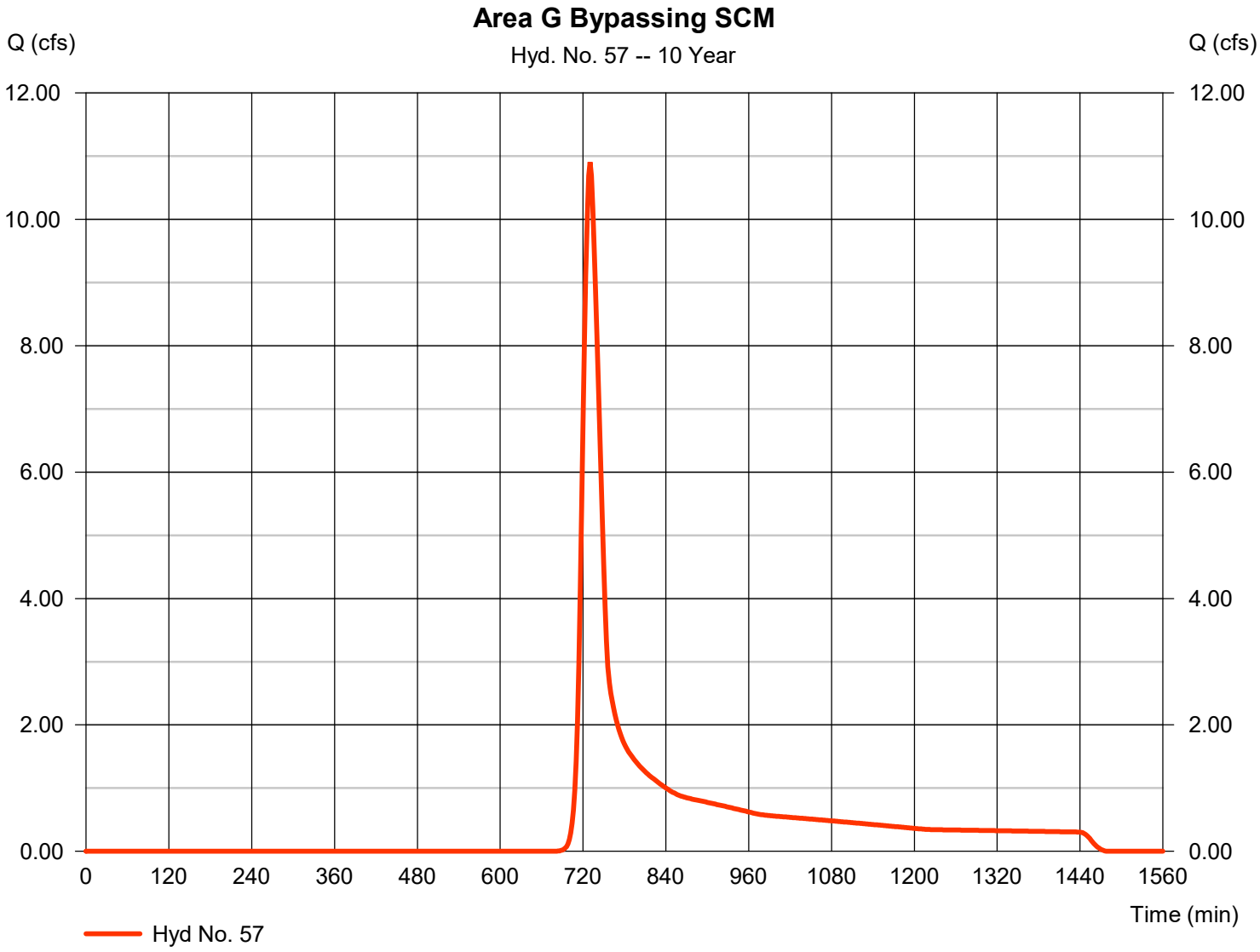


Hydrograph Report

Hyd. No. 57

Area G Bypassing SCM

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.91 cfs
Storm frequency	=	10 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	44,552 cuft
Drainage area	=	9.070 ac	Curve number	=	60.3
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	23.80 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

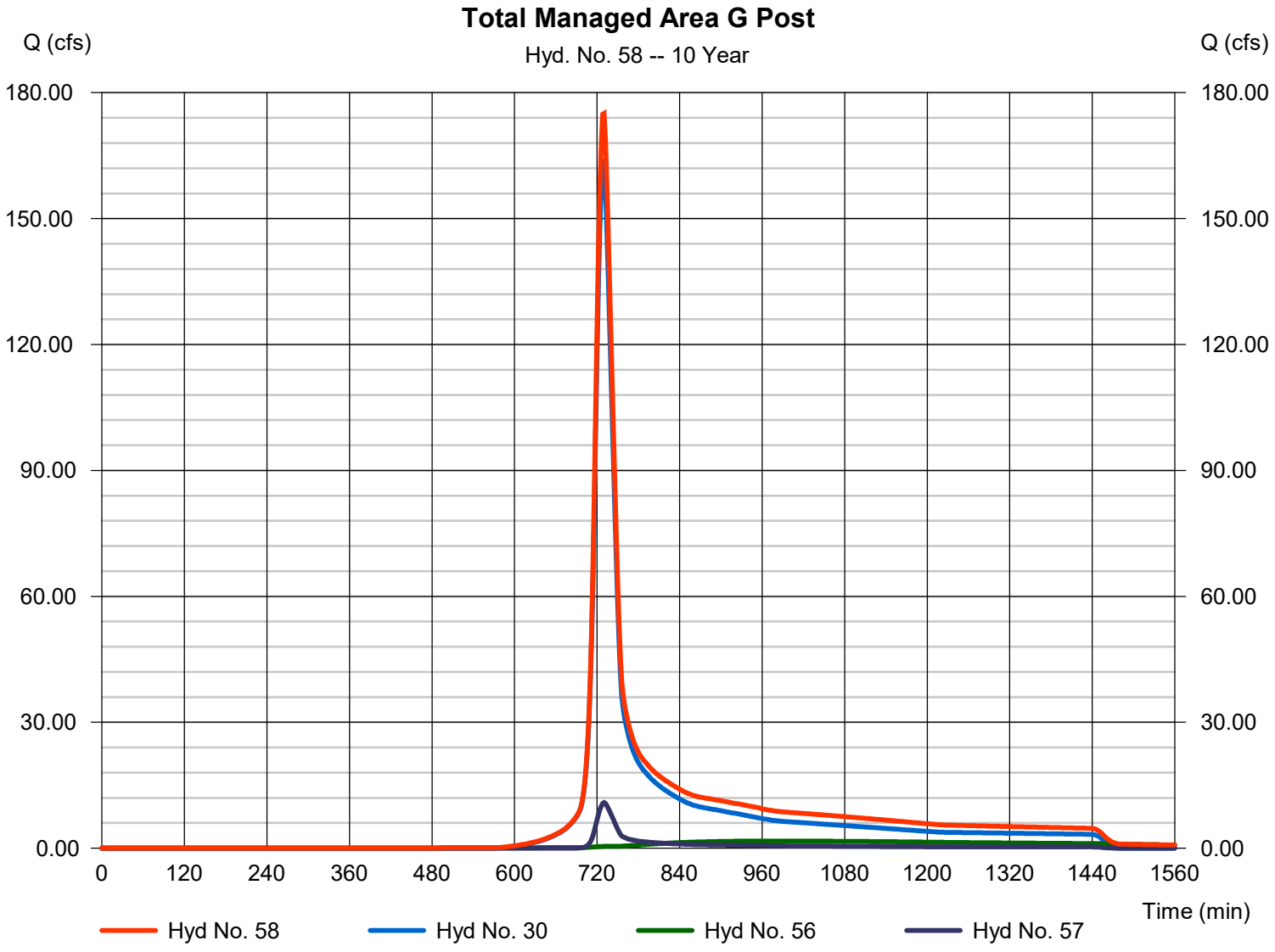


Hydrograph Report

Hyd. No. 58

Total Managed Area G Post

Hydrograph type	= Combine	Peak discharge	= 175.02 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 819,307 cuft
Inflow hyds.	= 30, 56, 57	Contrib. drain. area	= 85.670 ac

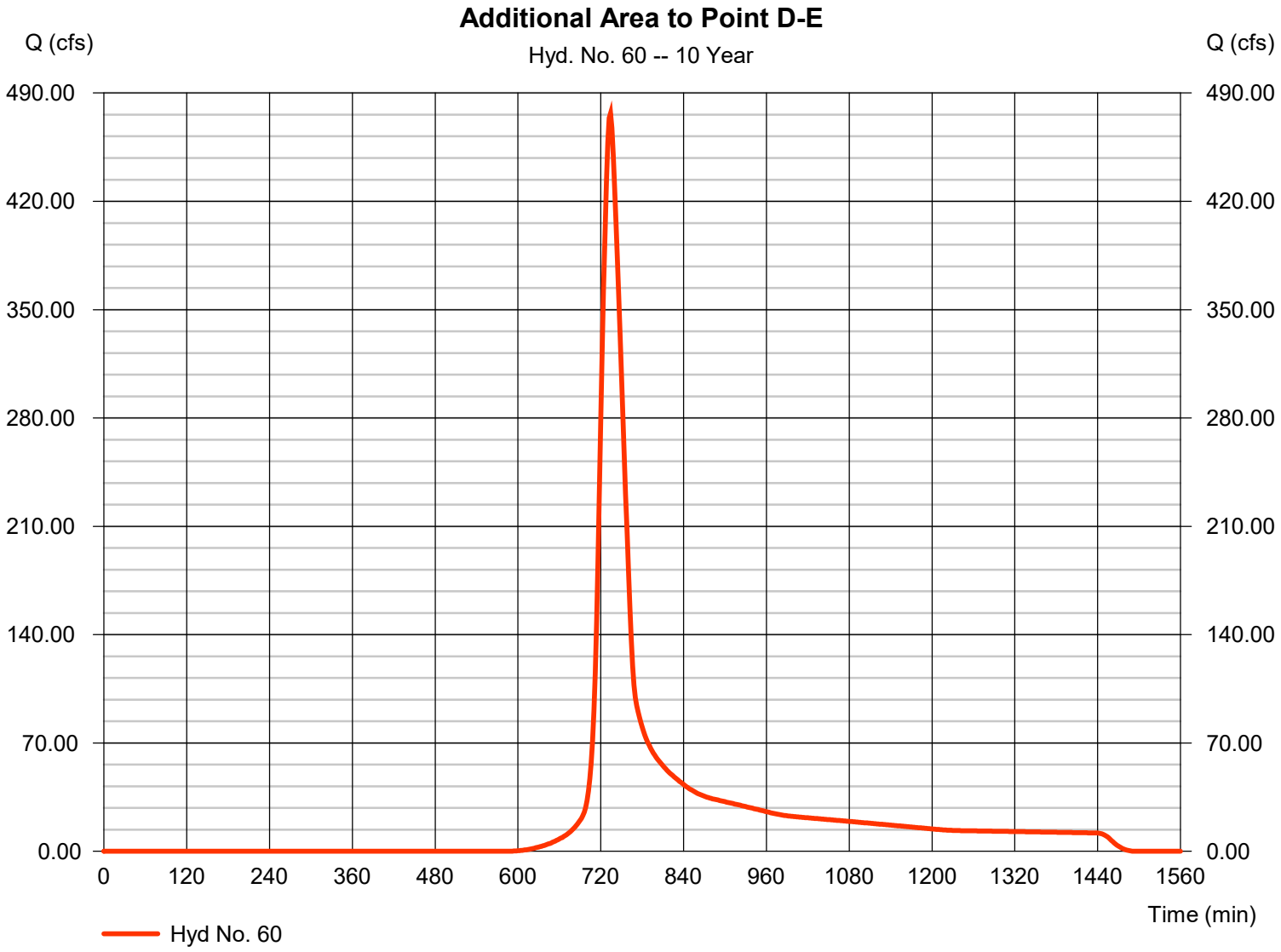


Hydrograph Report

Hyd. No. 60

Additional Area to Point D-E

Hydrograph type	= SCS Runoff	Peak discharge	= 476.83 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 2,111,072 cuft
Drainage area	= 271.000 ac	Curve number	= 70.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.50 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

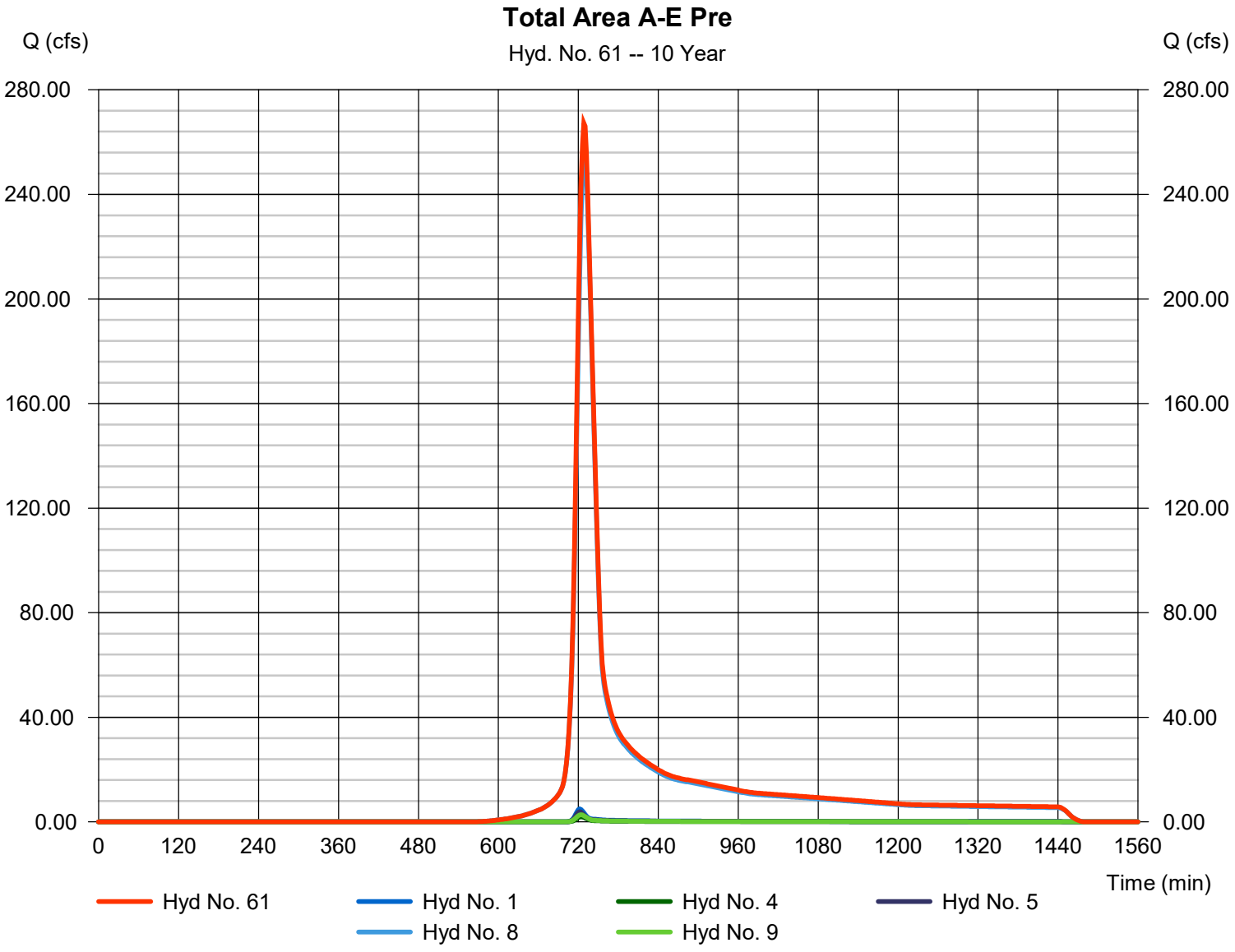


Hydrograph Report

Hyd. No. 61

Total Area A-E Pre

Hydrograph type	= Combine	Peak discharge	= 267.30 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 1,013,043 cuft
Inflow hyds.	= 1, 4, 5, 8, 9	Contrib. drain. area	= 10.720 ac

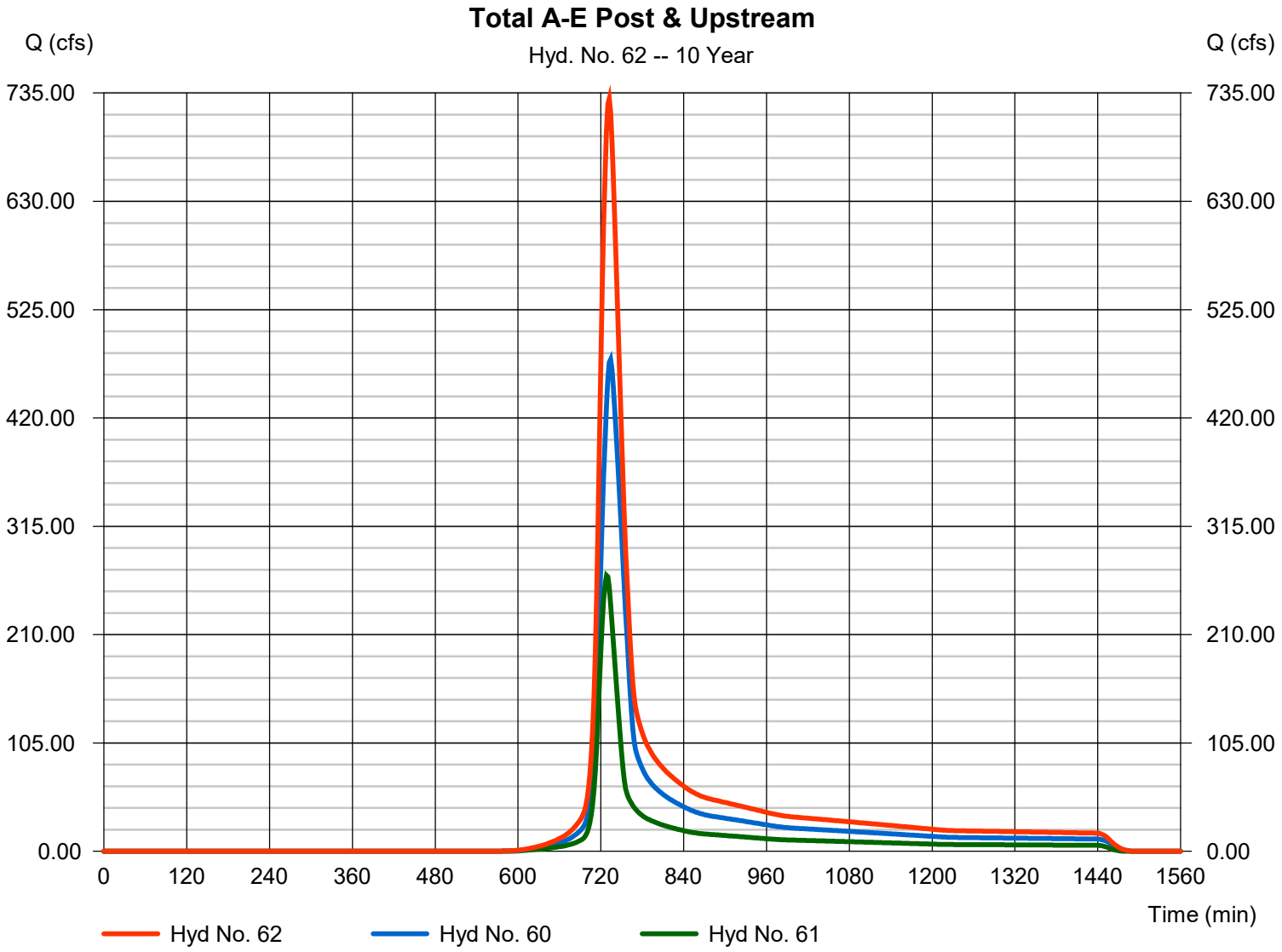


Hydrograph Report

Hyd. No. 62

Total A-E Post & Upstream

Hydrograph type	= Combine	Peak discharge	= 729.59 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 3,124,115 cuft
Inflow hyds.	= 60, 61	Contrib. drain. area	= 271.000 ac



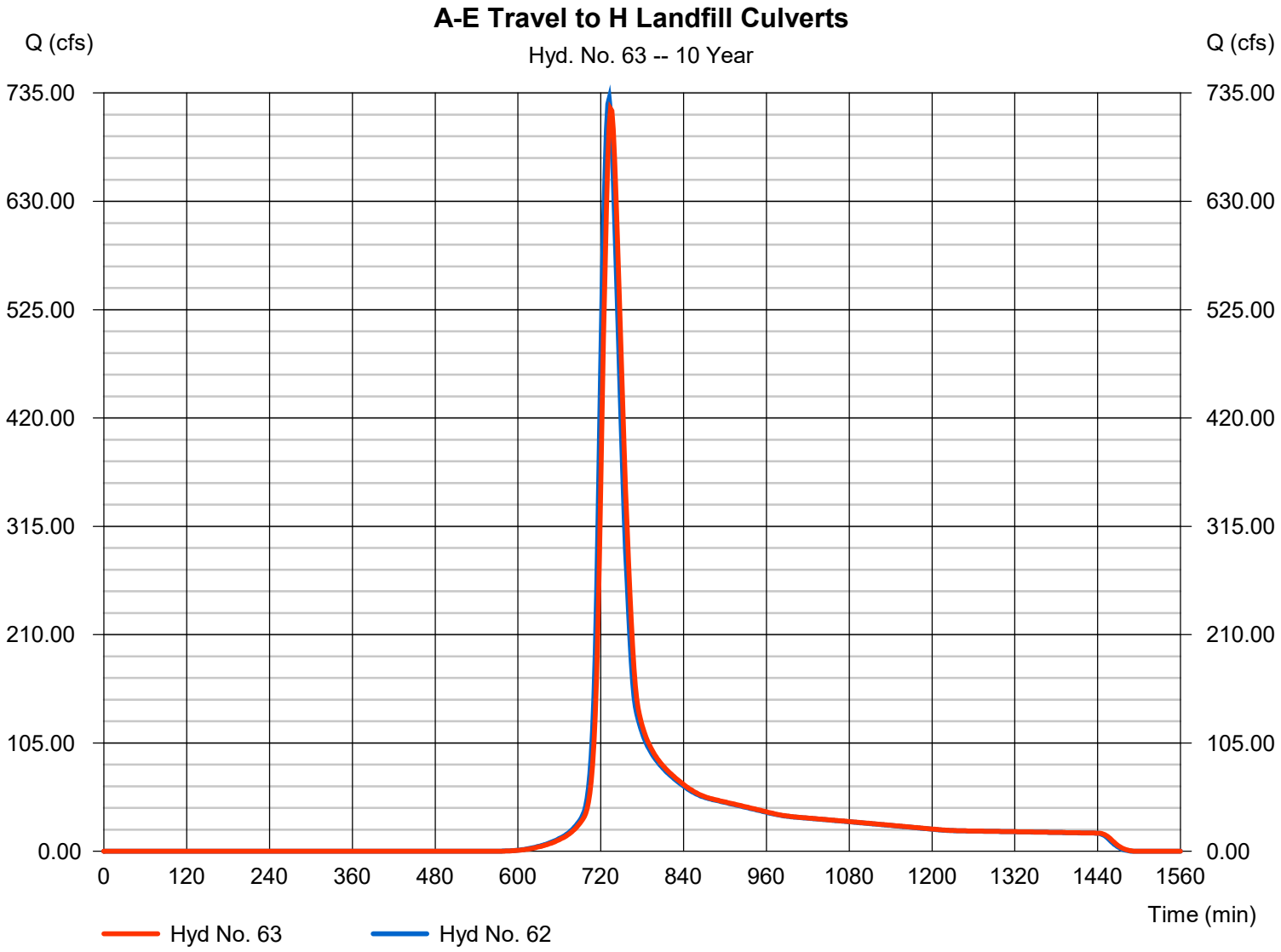
Hydrograph Report

Hyd. No. 63

A-E Travel to H Landfill Culverts

Hydrograph type	= Reach	Peak discharge	= 719.68 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 3,124,113 cuft
Inflow hyd. No.	= 62 - Total A-E Post & Upstream	Section type	= Trapezoidal
Reach length	= 1500.0 ft	Channel slope	= 0.7 %
Manning's n	= 0.025	Bottom width	= 6.0 ft
Side slope	= 2.0:1	Max. depth	= 2.0 ft
Rating curve x	= 1.509	Rating curve m	= 1.374
Ave. velocity	= 8.12 ft/s	Routing coeff.	= 0.6172

Modified Att-Kin routing method used.

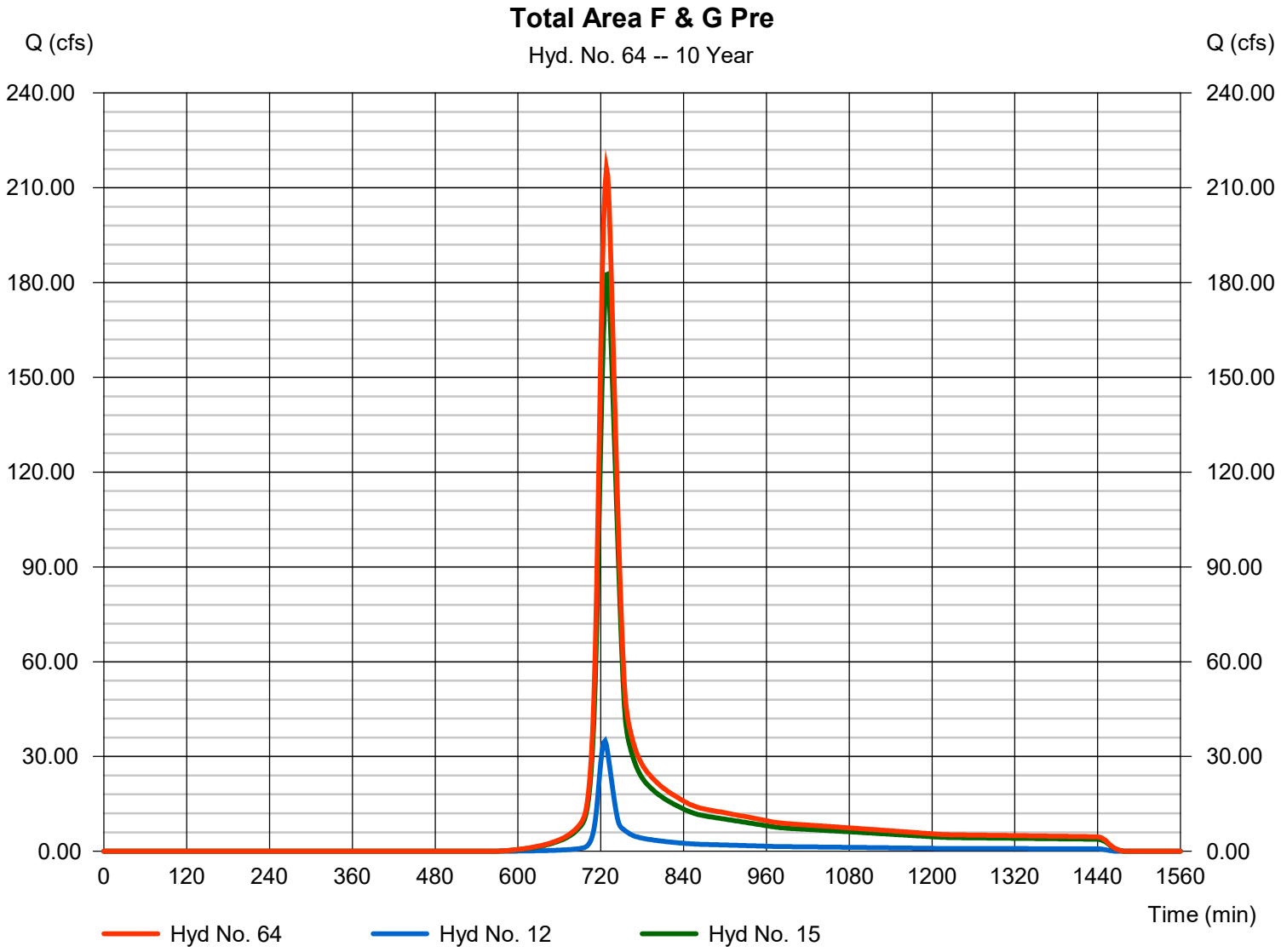


Hydrograph Report

Hyd. No. 64

Total Area F & G Pre

Hydrograph type	= Combine	Peak discharge	= 216.12 cfs
Storm frequency	= 10 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 807,398 cuft
Inflow hyds.	= 12, 15	Contrib. drain. area	= 0.000 ac



Hydrograph Report

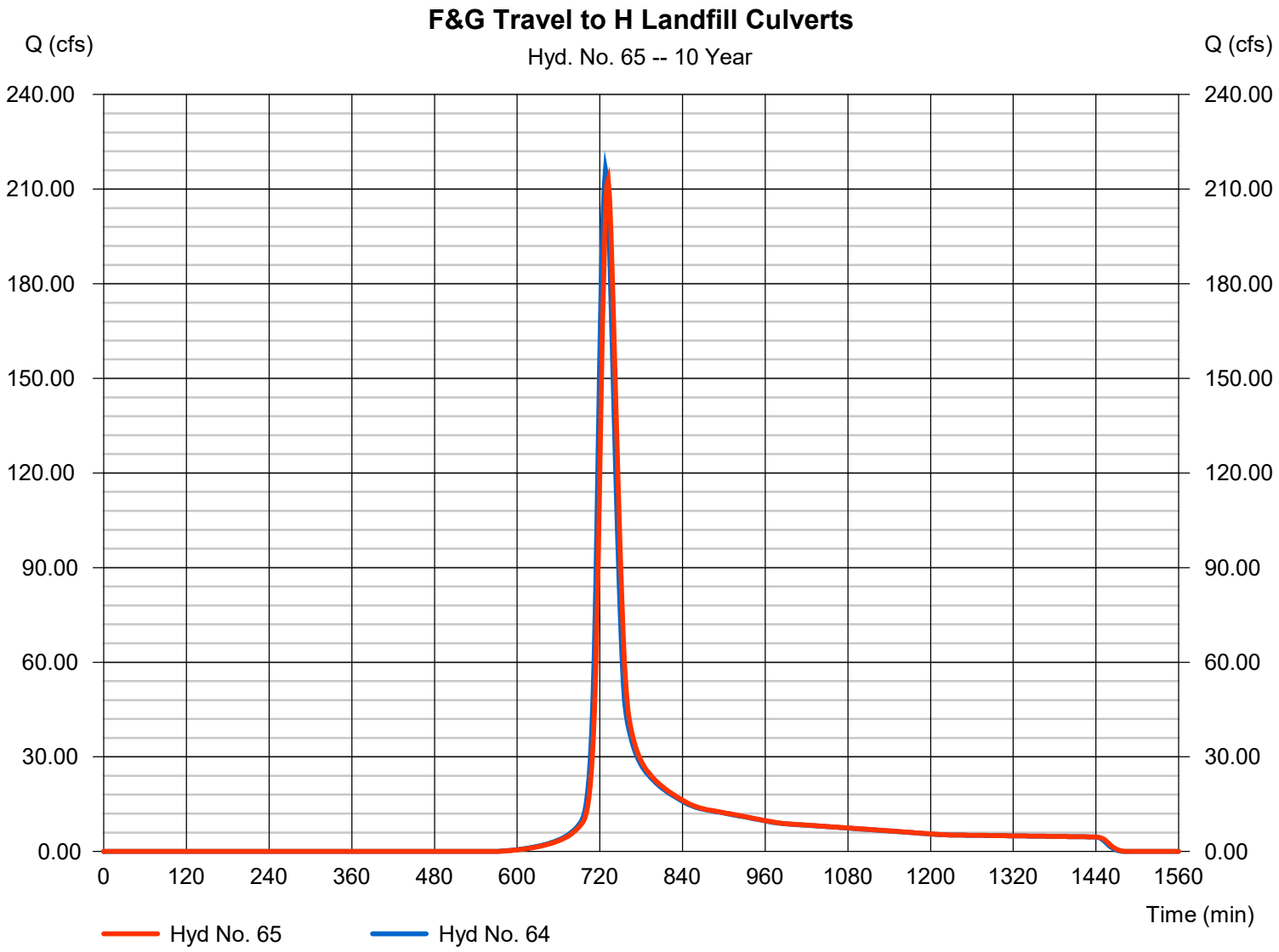
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Friday, 02 / 12 / 2021

Hyd. No. 65

F&G Travel to H Landfill Culverts

Hydrograph type	= Reach	Peak discharge	= 212.94 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 807,396 cuft
Inflow hyd. No.	= 64 - Total Area F & G Pre	Section type	= Trapezoidal
Reach length	= 1300.0 ft	Channel slope	= 1.5 %
Manning's n	= 0.025	Bottom width	= 6.0 ft
Side slope	= 2.0:1	Max. depth	= 2.0 ft
Rating curve x	= 2.209	Rating curve m	= 1.374
Ave. velocity	= 7.69 ft/s	Routing coeff.	= 0.6559

Modified Att-Kin routing method used.

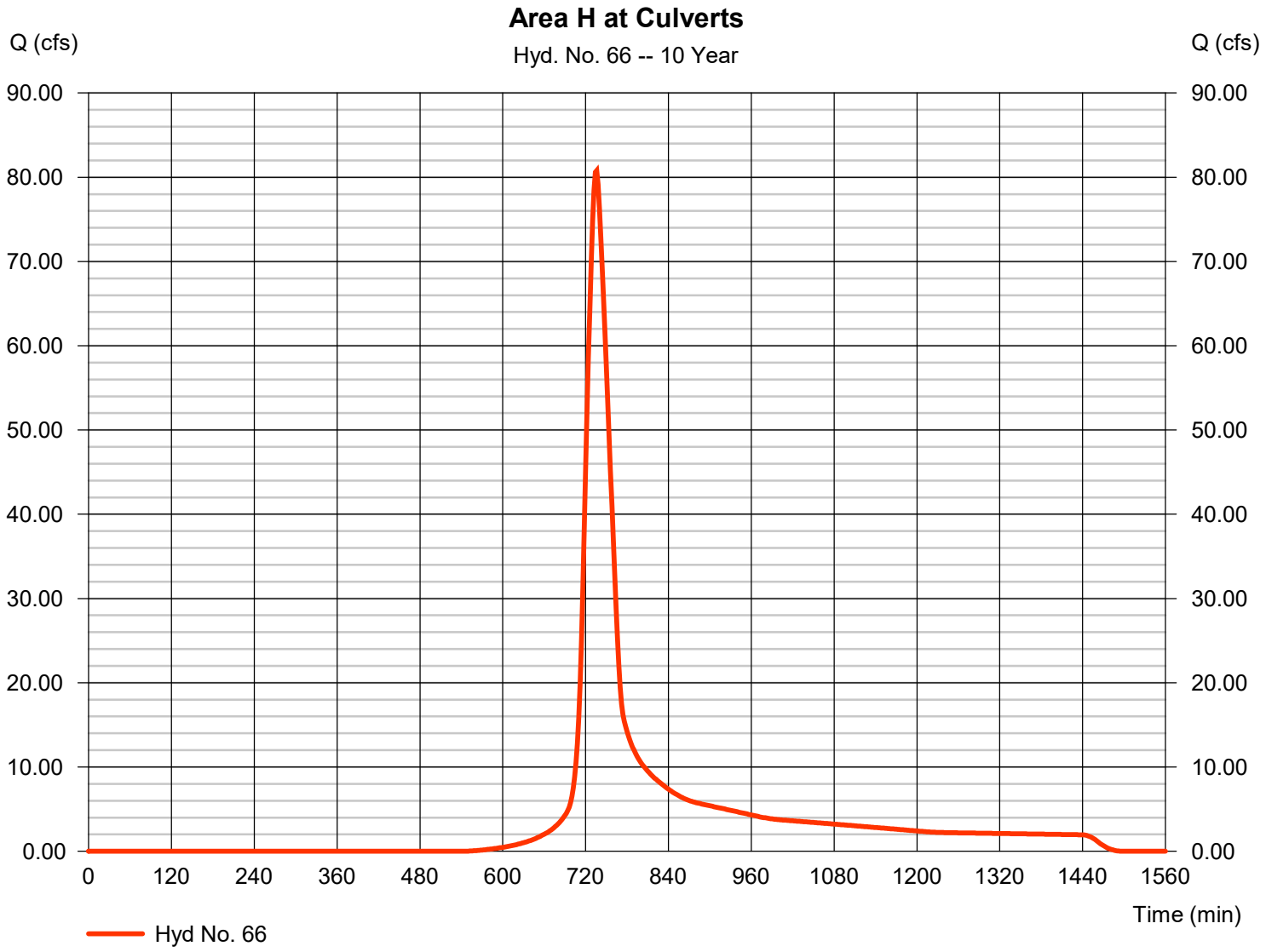


Hydrograph Report

Hyd. No. 66

Area H at Culverts

Hydrograph type	=	SCS Runoff	Peak discharge	=	80.80 cfs
Storm frequency	=	10 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	370,628 cuft
Drainage area	=	43.300 ac	Curve number	=	73.4
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	35.10 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

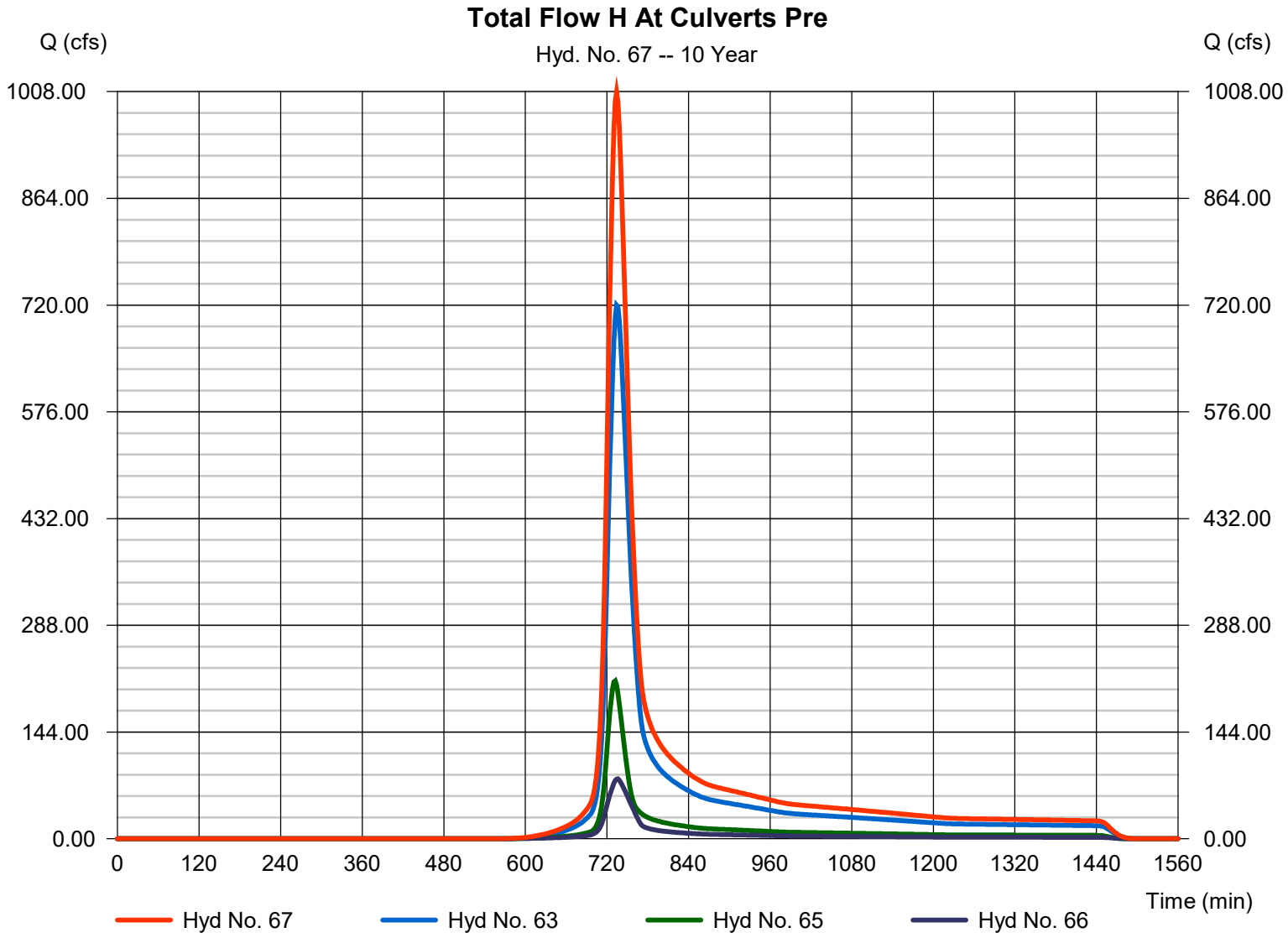


Hydrograph Report

Hyd. No. 67

Total Flow H At Culverts Pre

Hydrograph type	= Combine	Peak discharge	= 1007.55 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 4,302,135 cuft
Inflow hyds.	= 63, 65, 66	Contrib. drain. area	= 43.300 ac

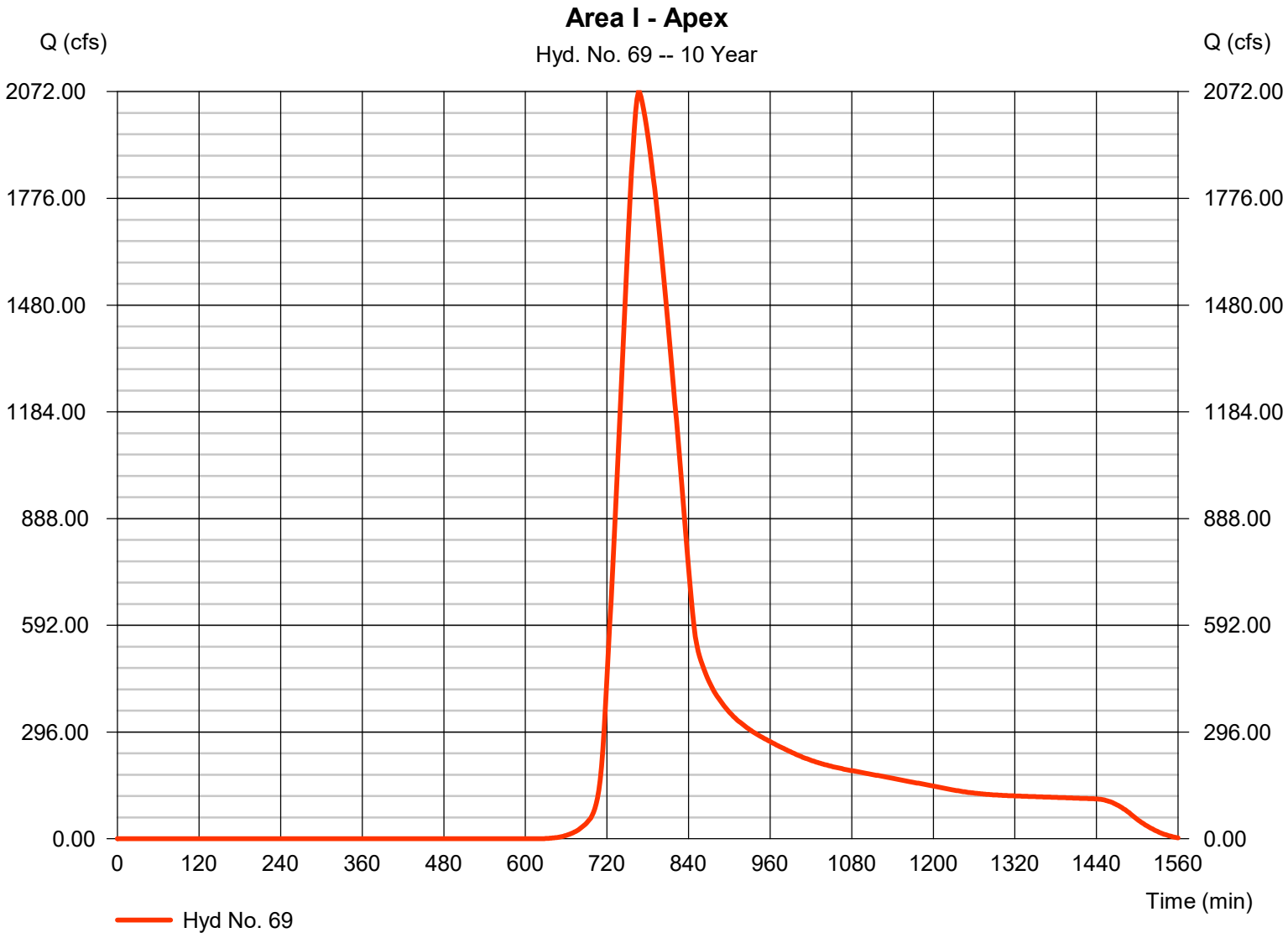


Hydrograph Report

Hyd. No. 69

Area I - Apex

Hydrograph type	= SCS Runoff	Peak discharge	= 2069.32 cfs
Storm frequency	= 10 yrs	Time to peak	= 768 min
Time interval	= 2 min	Hyd. volume	= 18,443,486 cuft
Drainage area	= 2637.000 ac	Curve number	= 67.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 87.40 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



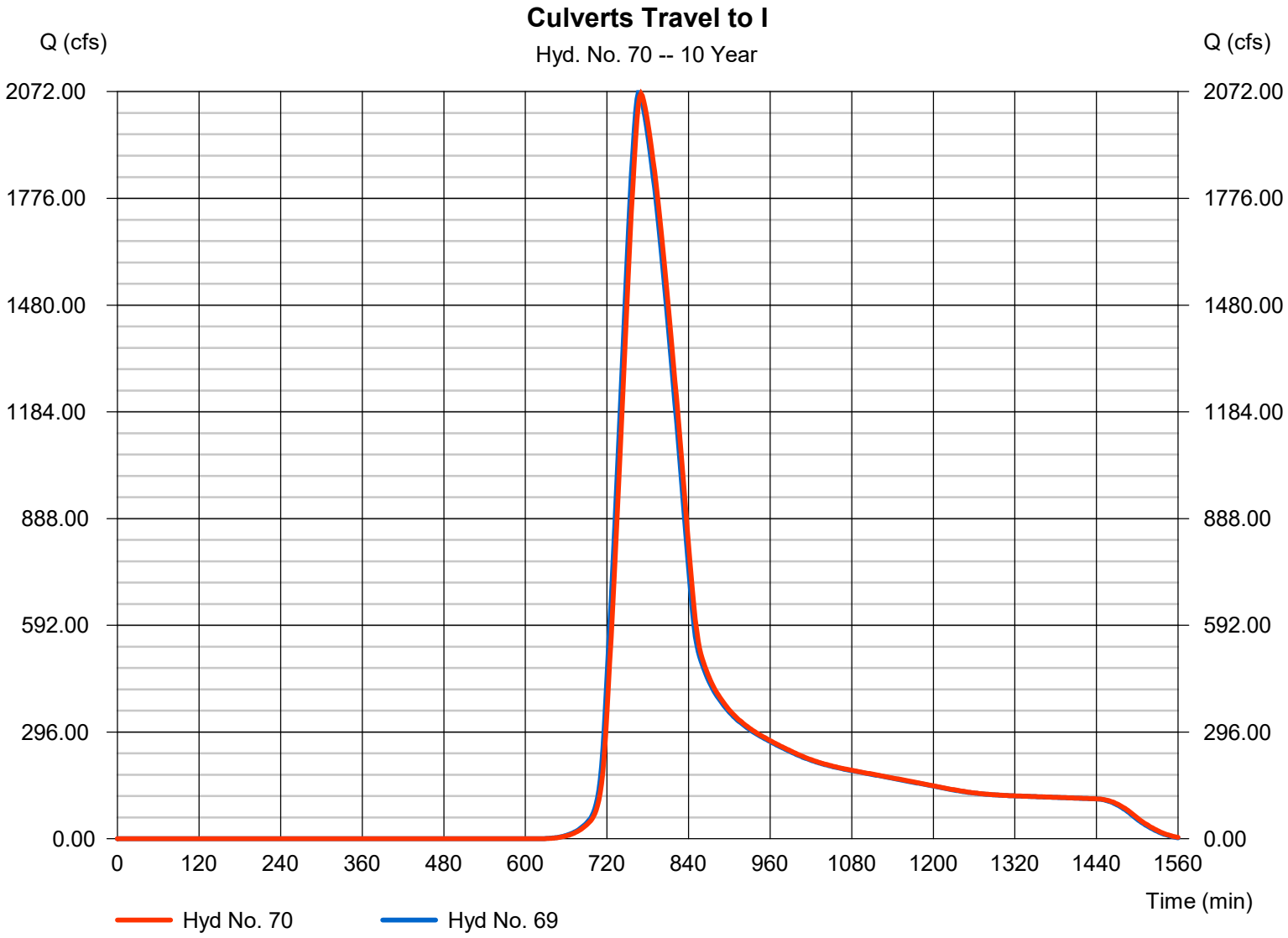
Hydrograph Report

Hyd. No. 70

Culverts Travel to I

Hydrograph type	=	Reach	Peak discharge	=	2066.04 cfs
Storm frequency	=	10 yrs	Time to peak	=	770 min
Time interval	=	2 min	Hyd. volume	=	18,443,470 cuft
Inflow hyd. No.	=	69 - Area I - Apex	Section type	=	Trapezoidal
Reach length	=	1670.0 ft	Channel slope	=	0.7 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	1.509	Rating curve m	=	1.374
Ave. velocity	=	10.79 ft/s	Routing coeff.	=	0.6949

Modified Att-Kin routing method used.

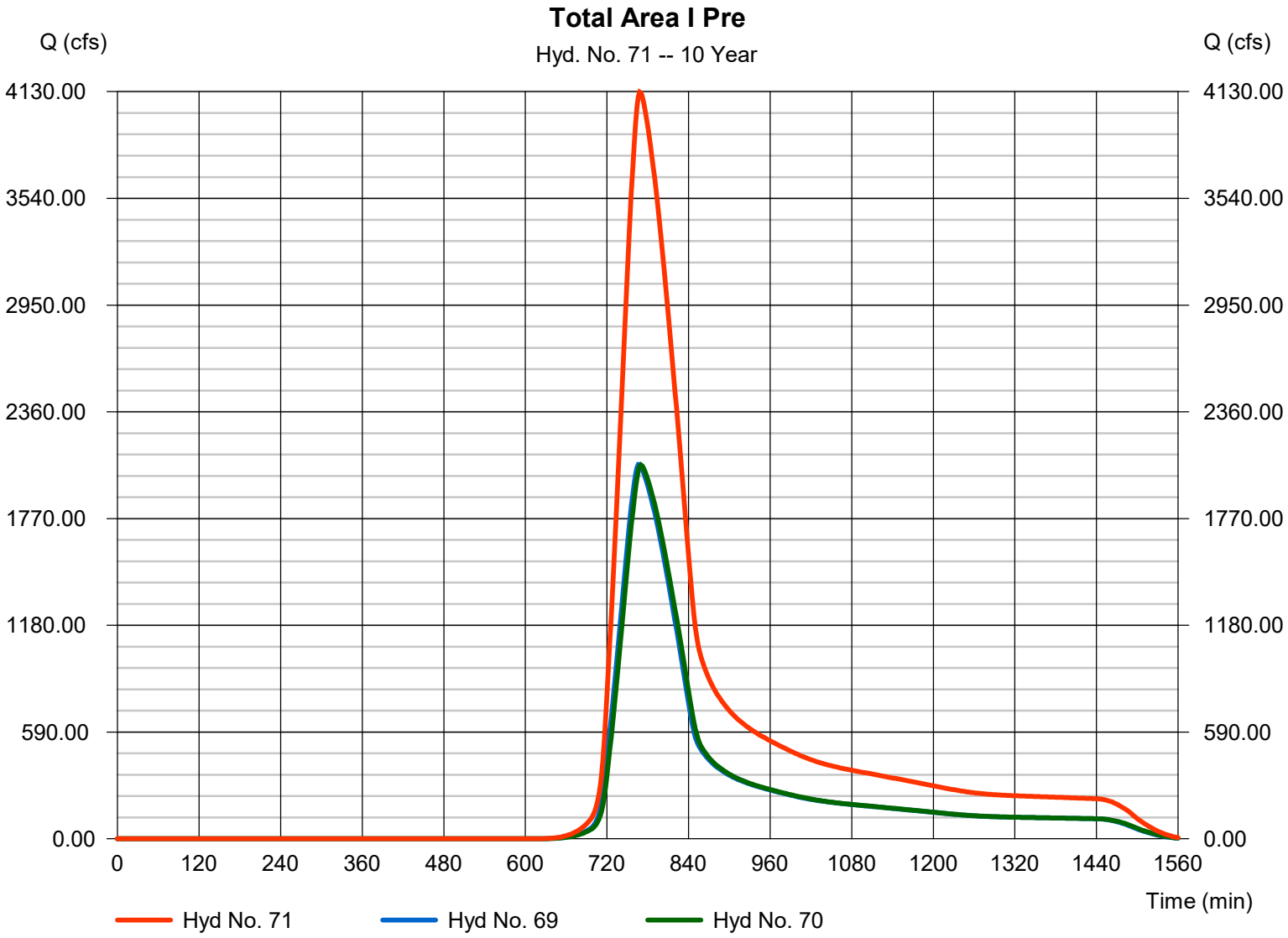


Hydrograph Report

Hyd. No. 71

Total Area I Pre

Hydrograph type	= Combine	Peak discharge	= 4127.88 cfs
Storm frequency	= 10 yrs	Time to peak	= 768 min
Time interval	= 2 min	Hyd. volume	= 36,886,940 cuft
Inflow hyds.	= 69, 70	Contrib. drain. area	= 2637.000 ac

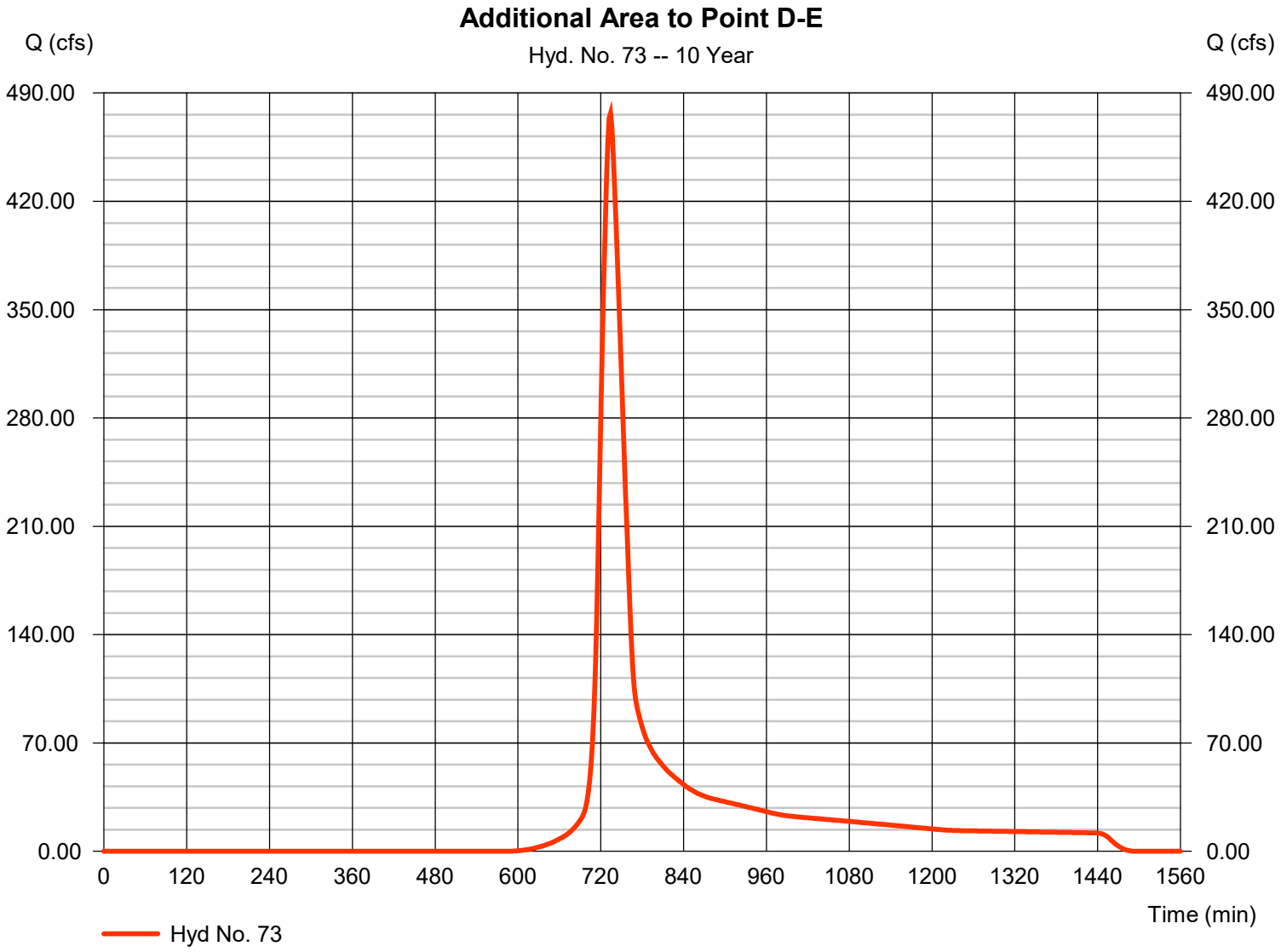


Hydrograph Report

Hyd. No. 73

Additional Area to Point D-E

Hydrograph type	=	SCS Runoff	Peak discharge	=	476.83 cfs
Storm frequency	=	10 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	2,111,072 cuft
Drainage area	=	271.000 ac	Curve number	=	70.2
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	32.50 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

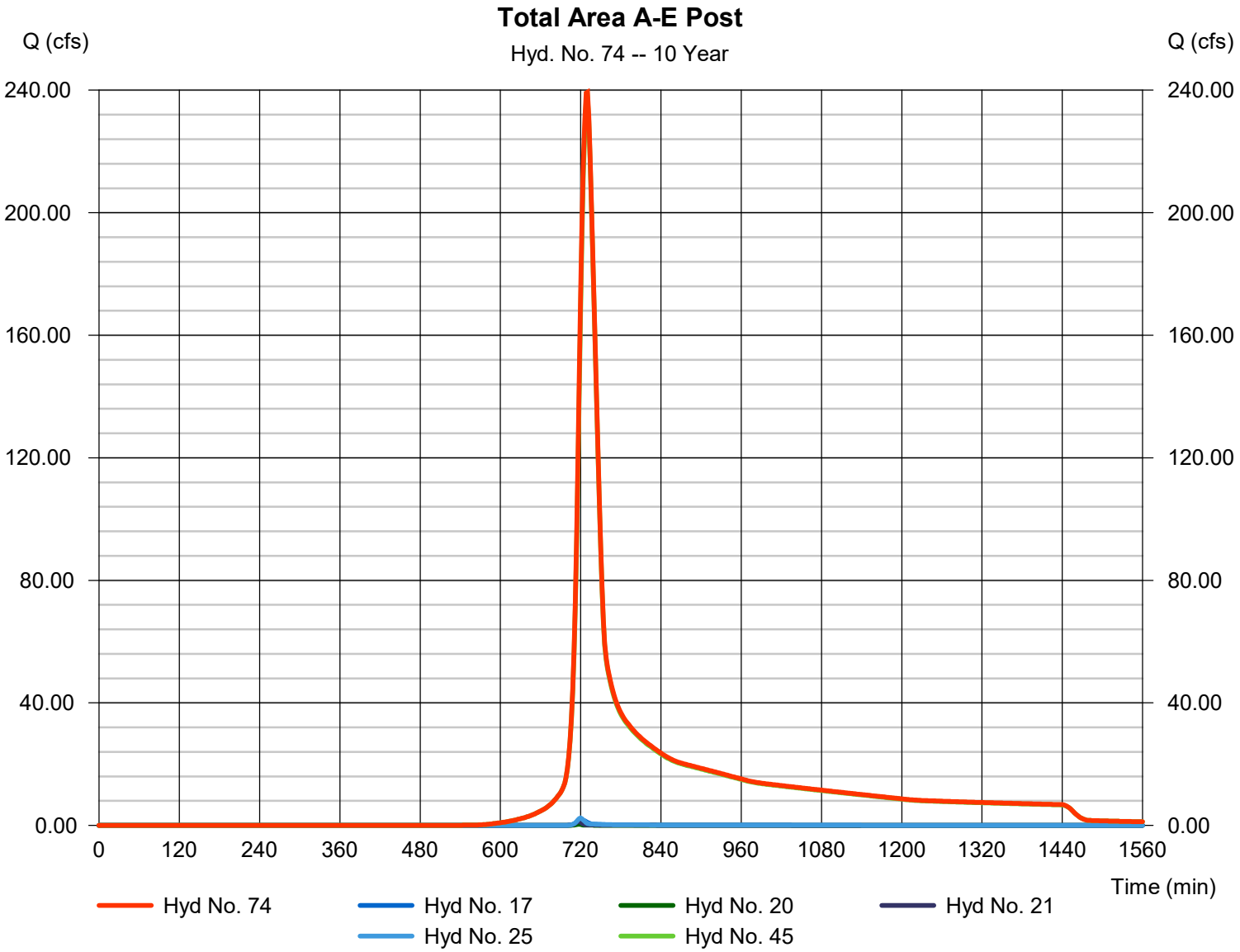


Hydrograph Report

Hyd. No. 74

Total Area A-E Post

Hydrograph type	= Combine	Peak discharge	= 239.32 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 1,202,116 cuft
Inflow hyds.	= 17, 20, 21, 25, 45	Contrib. drain. area	= 3.290 ac

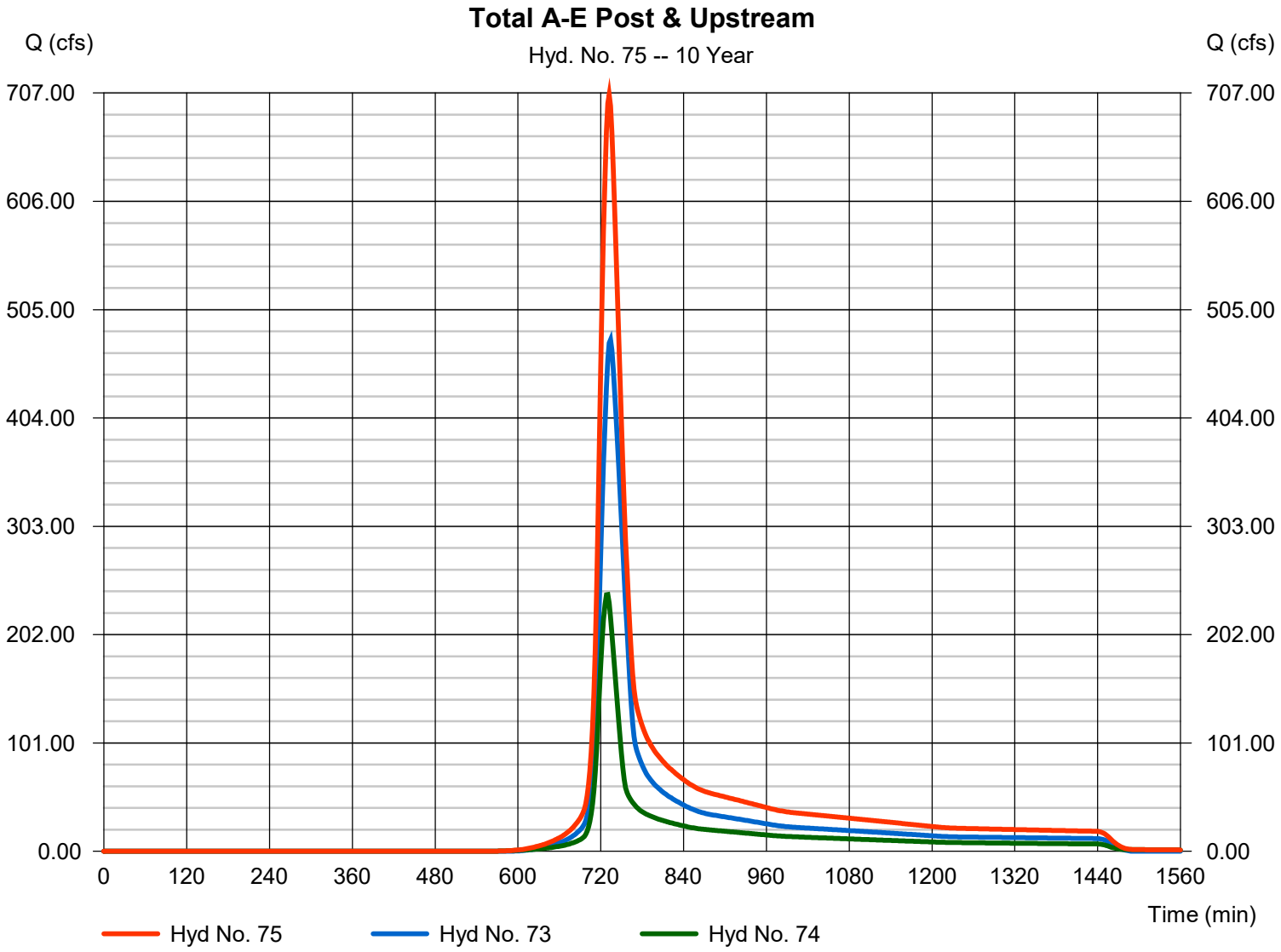


Hydrograph Report

Hyd. No. 75

Total A-E Post & Upstream

Hydrograph type	=	Combine	Peak discharge	=	705.29 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	3,313,189 cuft
Inflow hyds.	=	73, 74	Contrib. drain. area	=	271.000 ac



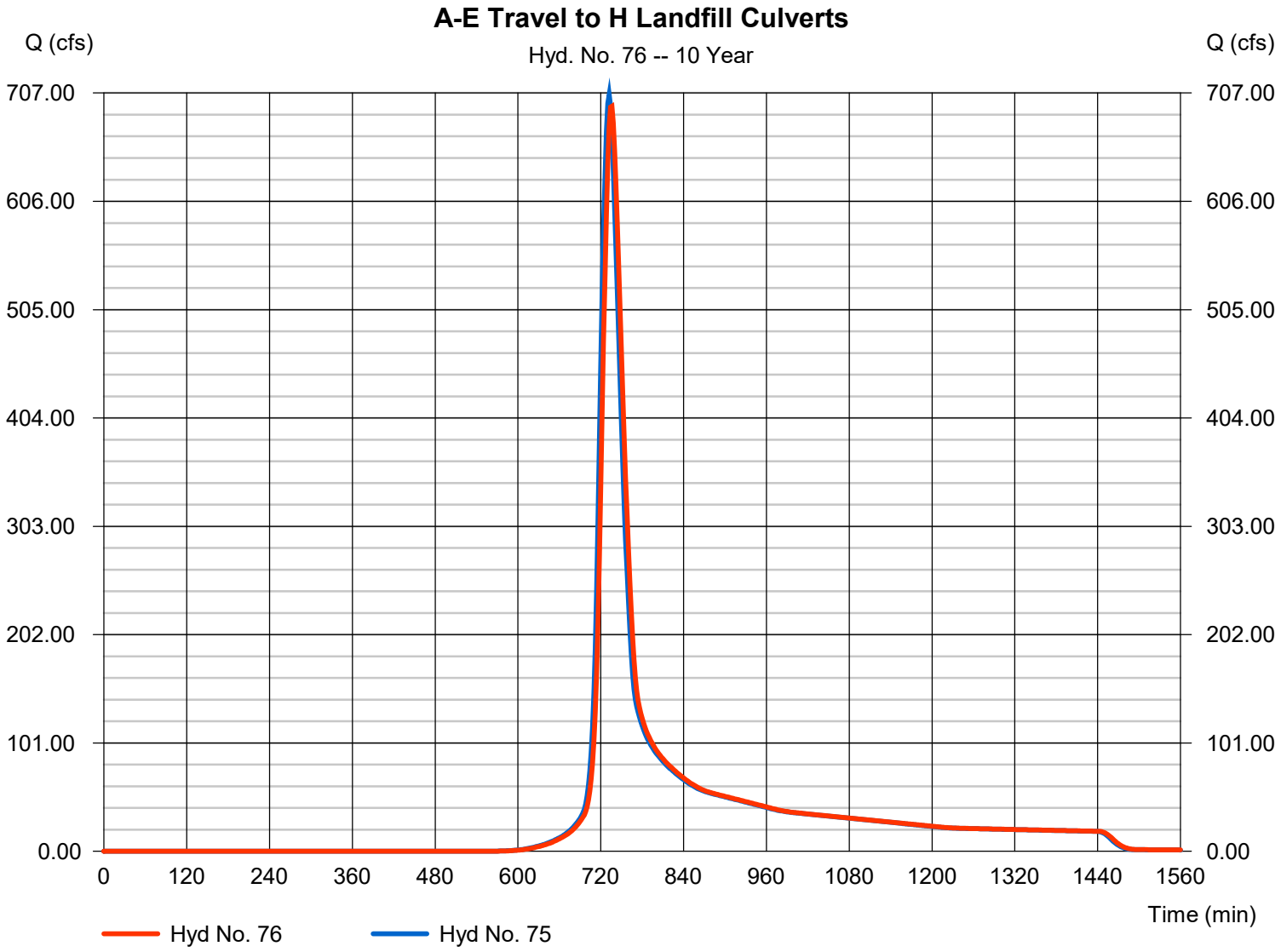
Hydrograph Report

Hyd. No. 76

A-E Travel to H Landfill Culverts

Hydrograph type	=	Reach	Peak discharge	=	694.57 cfs
Storm frequency	=	10 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	3,313,144 cuft
Inflow hyd. No.	=	75 - Total A-E Post & Upstream	Section type	=	Trapezoidal
Reach length	=	1500.0 ft	Channel slope	=	0.7 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	1.509	Rating curve m	=	1.374
Ave. velocity	=	8.05 ft/s	Routing coeff.	=	0.6132

Modified Att-Kin routing method used.

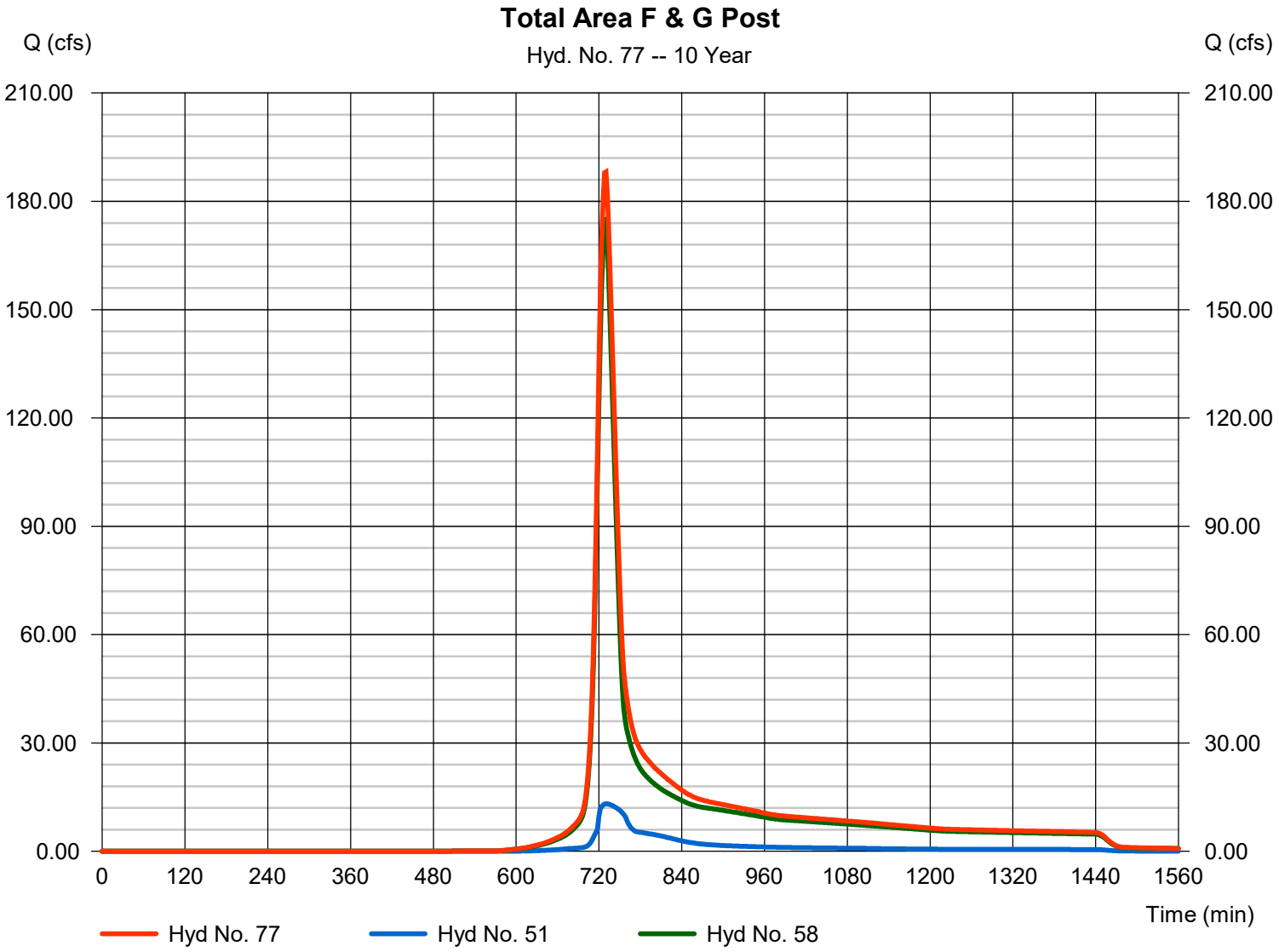


Hydrograph Report

Hyd. No. 77

Total Area F & G Post

Hydrograph type	= Combine	Peak discharge	= 188.15 cfs
Storm frequency	= 10 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 910,464 cuft
Inflow hyds.	= 51, 58	Contrib. drain. area	= 0.000 ac



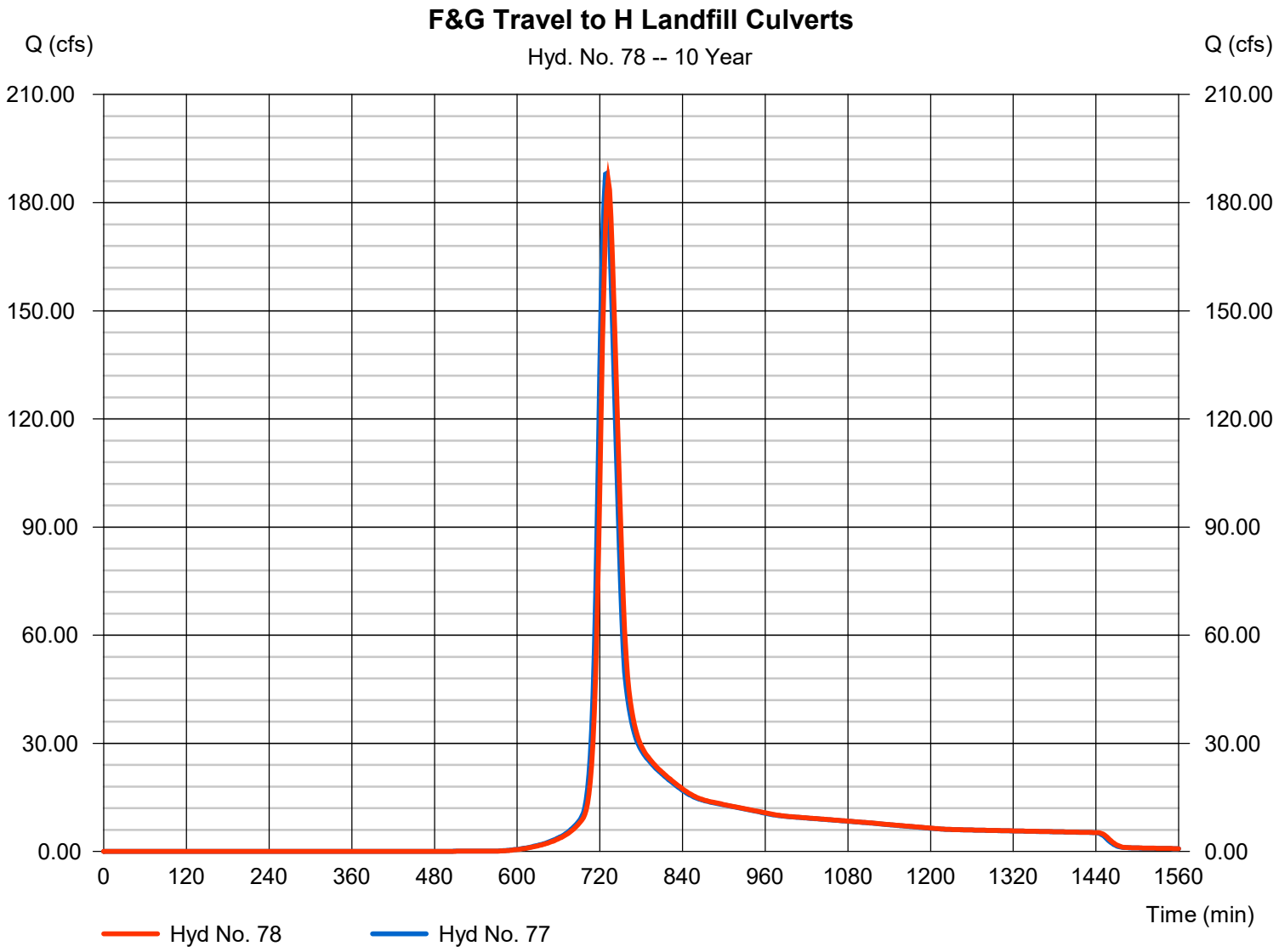
Hydrograph Report

Hyd. No. 78

F&G Travel to H Landfill Culverts

Hydrograph type	=	Reach	Peak discharge	=	186.16 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	910,414 cuft
Inflow hyd. No.	=	77 - Total Area F & G Post	Section type	=	Trapezoidal
Reach length	=	1300.0 ft	Channel slope	=	1.5 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	2.209	Rating curve m	=	1.374
Ave. velocity	=	7.41 ft/s	Routing coeff.	=	0.6394

Modified Att-Kin routing method used.

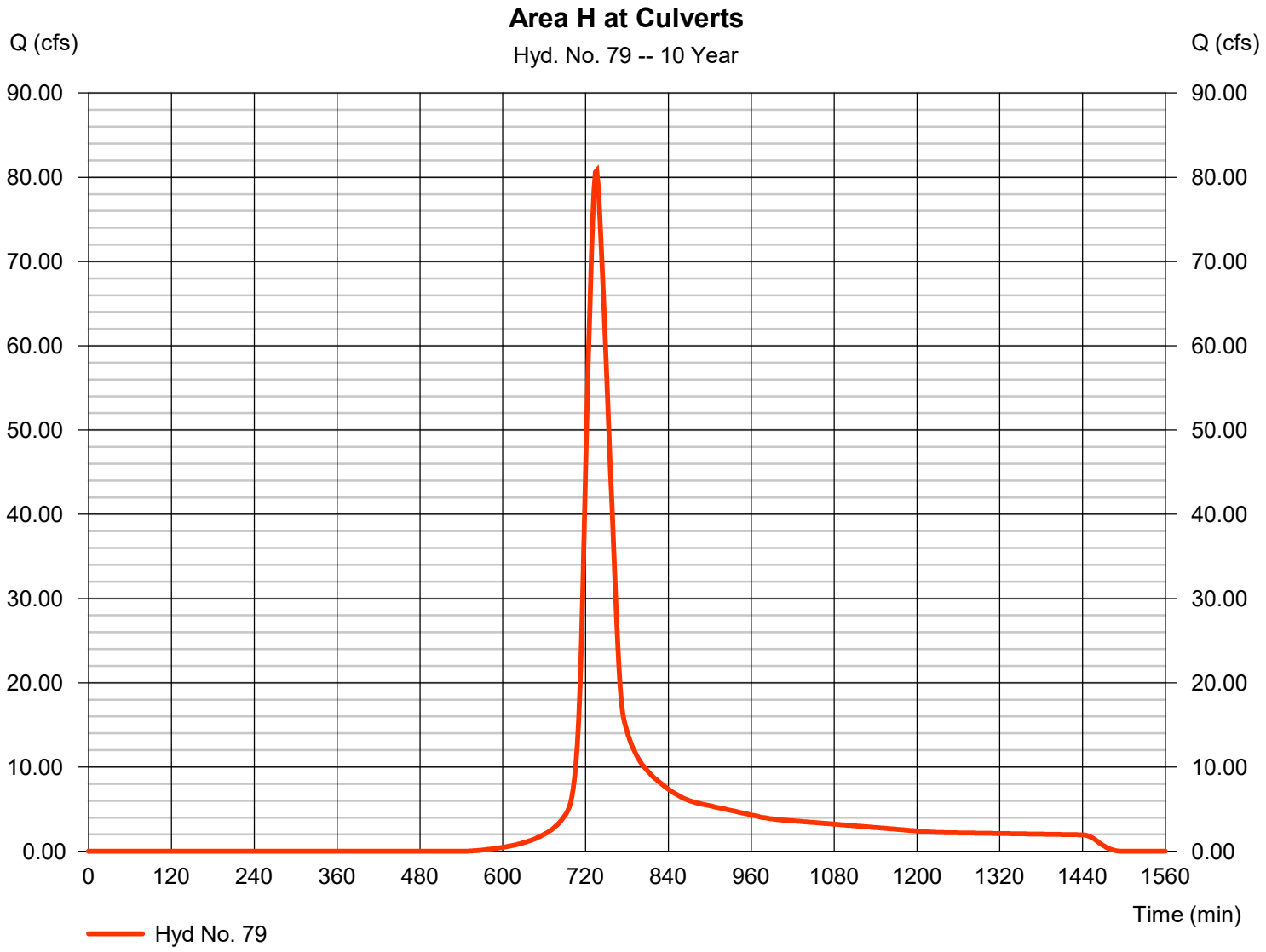


Hydrograph Report

Hyd. No. 79

Area H at Culverts

Hydrograph type	=	SCS Runoff	Peak discharge	=	80.80 cfs
Storm frequency	=	10 yrs	Time to peak	=	736 min
Time interval	=	2 min	Hyd. volume	=	370,628 cuft
Drainage area	=	43.300 ac	Curve number	=	73.4
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	35.10 min
Total precip.	=	5.09 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

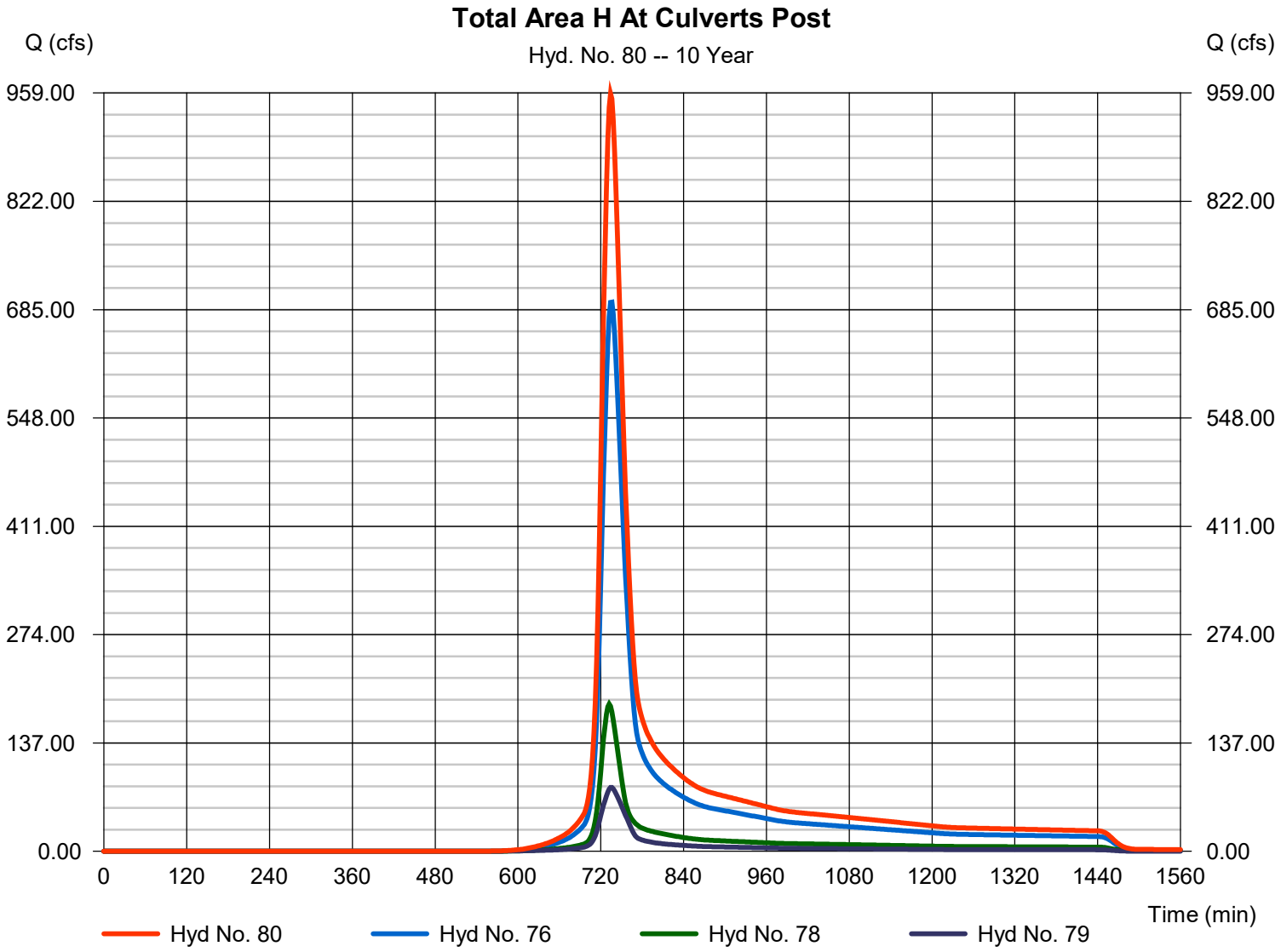


Hydrograph Report

Hyd. No. 80

Total Area H At Culverts Post

Hydrograph type	= Combine	Peak discharge	= 958.19 cfs
Storm frequency	= 10 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 4,594,181 cuft
Inflow hyds.	= 76, 78, 79	Contrib. drain. area	= 43.300 ac

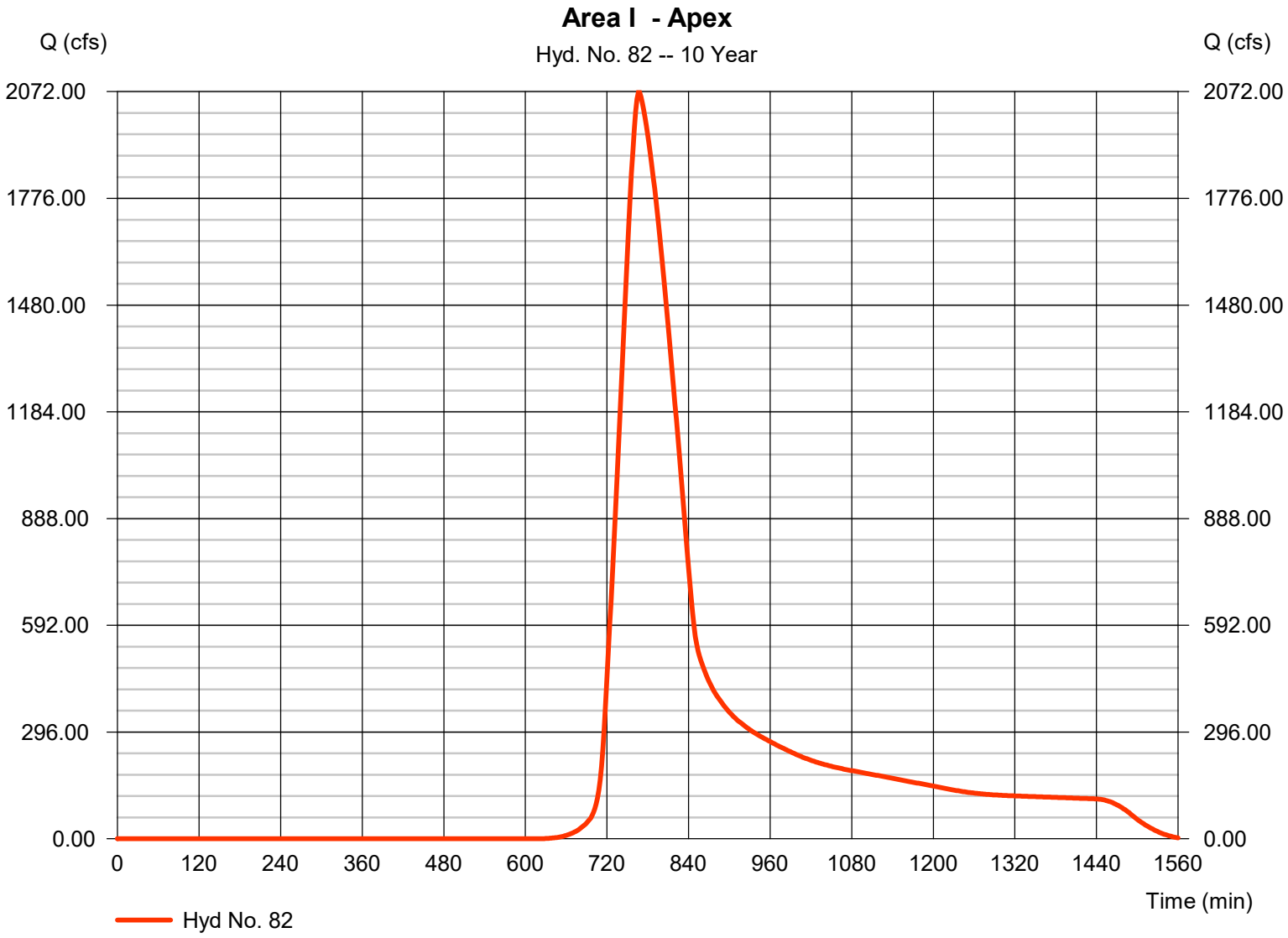


Hydrograph Report

Hyd. No. 82

Area I - Apex

Hydrograph type	= SCS Runoff	Peak discharge	= 2069.32 cfs
Storm frequency	= 10 yrs	Time to peak	= 768 min
Time interval	= 2 min	Hyd. volume	= 18,443,486 cuft
Drainage area	= 2637.000 ac	Curve number	= 67.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 87.40 min
Total precip.	= 5.09 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



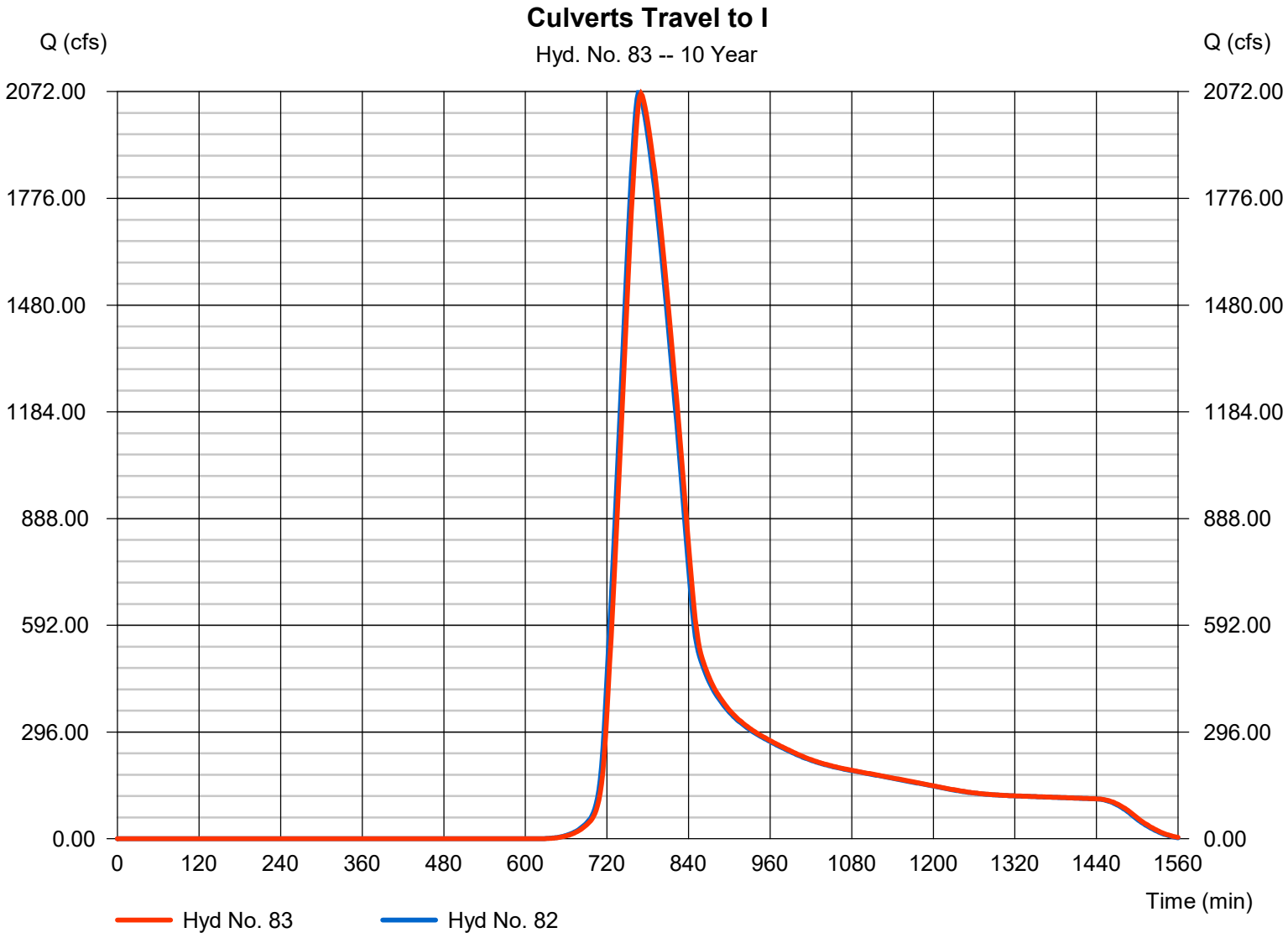
Hydrograph Report

Hyd. No. 83

Culverts Travel to I

Hydrograph type	=	Reach	Peak discharge	=	2066.04 cfs
Storm frequency	=	10 yrs	Time to peak	=	770 min
Time interval	=	2 min	Hyd. volume	=	18,443,470 cuft
Inflow hyd. No.	=	82 - Area I - Apex	Section type	=	Trapezoidal
Reach length	=	1670.0 ft	Channel slope	=	0.7 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	1.509	Rating curve m	=	1.374
Ave. velocity	=	10.79 ft/s	Routing coeff.	=	0.6949

Modified Att-Kin routing method used.

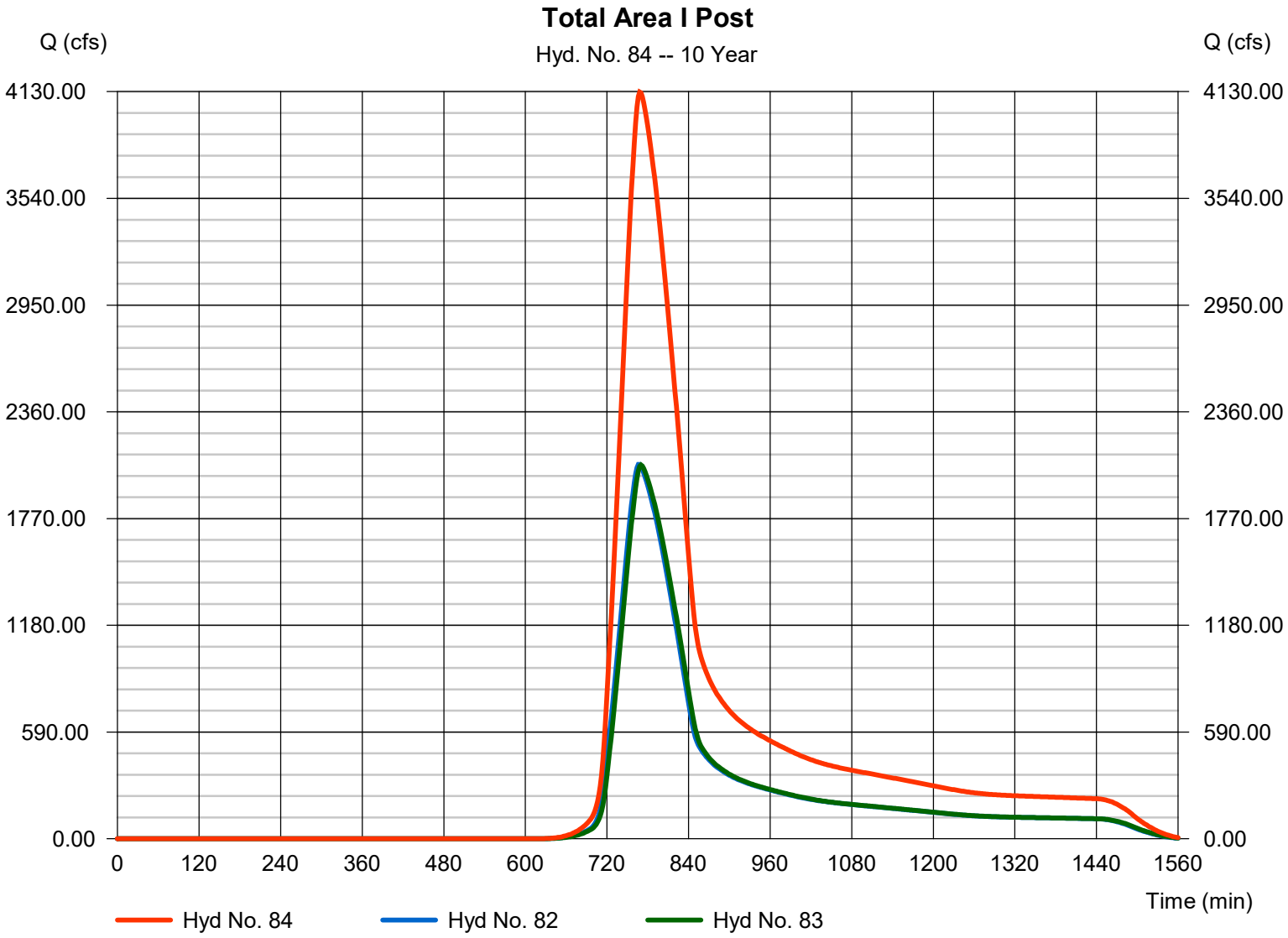


Hydrograph Report

Hyd. No. 84

Total Area I Post

Hydrograph type	= Combine	Peak discharge	= 4127.88 cfs
Storm frequency	= 10 yrs	Time to peak	= 768 min
Time interval	= 2 min	Hyd. volume	= 36,886,940 cuft
Inflow hyds.	= 82, 83	Contrib. drain. area	= 2637.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	13.63	2	722	36,332	------	------	------	Area A Onsite Pre
2	SCS Runoff	8.496	2	722	22,648	------	------	------	Area A Off-site Pre
3	Combine	22.12	2	722	58,980	1, 2	------	------	Total Area A Pre
4	SCS Runoff	5.349	2	724	15,614	------	------	------	Area B Onsite Pre
5	SCS Runoff	10.65	2	722	28,405	------	------	------	Area C Onsite Pre
6	SCS Runoff	90.03	2	730	337,564	------	------	------	Area D Onsite Pre
7	SCS Runoff	428.42	2	728	1,571,968	------	------	------	Area D Offsite Pre
8	Combine	518.37	2	728	1,909,532	6, 7	------	------	Total Area D Pre
9	SCS Runoff	7.103	2	724	20,529	------	------	------	Area E Onsite Pre
10	SCS Runoff	43.59	2	726	142,936	------	------	------	Area F Onsite Pre
11	SCS Runoff	38.48	2	724	120,290	------	------	------	Area F Off-site Pre
12	Combine	81.66	2	724	263,226	10, 11	------	------	Total Area F Pre
13	SCS Runoff	37.99	2	730	142,423	------	------	------	Area G Onsite Pre
14	SCS Runoff	326.52	2	728	1,198,150	------	------	------	Area G Off-site Pre
15	Combine	364.47	2	728	1,340,572	13, 14	------	------	Toital Area G Pre
17	SCS Runoff	4.316	2	722	11,339	------	------	------	Area A Onsite Post
18	SCS Runoff	8.496	2	722	22,648	------	------	------	Area A Off-site Post
19	Combine	12.81	2	722	33,987	17, 18	------	------	Total Area A Post
20	SCS Runoff	1.018	2	718	2,038	------	------	------	Area B Onsite Post
21	SCS Runoff	3.077	2	718	6,154	------	------	------	Area C Onsite Post
22	SCS Runoff	194.53	2	728	718,273	------	------	------	Area D Onsite Post
23	SCS Runoff	429.88	2	728	1,577,261	------	------	------	Area D Offsite Post
24	Combine	624.41	2	728	2,295,533	22, 23	------	------	Total Area D Post
25	SCS Runoff	6.093	2	720	14,008	------	------	------	Area E Onsite Post
26	SCS Runoff	12.15	2	720	31,492	------	------	------	Area F Onsite Post
27	SCS Runoff	55.37	2	720	143,751	------	------	------	Area F Off-site Post
28	Combine	67.52	2	720	175,244	26, 27	------	------	Total Area F Post
29	SCS Runoff	177.41	2	720	467,841	------	------	------	Area G Onsite Post
30	SCS Runoff	321.43	2	728	1,179,500	------	------	------	Area G Off-site Post
31	Combine	455.56	2	724	1,665,991	14, 29,	------	------	Total Area G Post
33	SCS Runoff	99.91	2	722	286,137	------	------	------	Area to SCM D1 Onsite
34	SCS Runoff	2.303	2	722	6,520	------	------	------	Area to SCM D1 Off-site
35	Combine	102.22	2	722	292,657	33, 34	------	------	Total Area to SCM D1

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
36	Reservoir	20.62	2	740	275,184	35	387.93	156,195	Route SCM D1
37	SCS Runoff	82.06	2	722	240,446	------	------	------	Area to SCM D2 Onsite
38	SCS Runoff	0.561	2	722	1,593	------	------	------	Area to SCM D2 Offsite
39	Combine	82.62	2	722	242,039	37, 38	------	------	Total Area to SCM D2
40	Reservoir	20.43	2	738	224,105	39	394.60	127,974	Route SCM D2
41	SCS Runoff	20.31	2	722	58,942	------	------	------	Area to SCM D3 Onsite
42	Reservoir	14.64	2	728	56,415	41	385.96	23,501	Route SCM D3
43	SCS Runoff	34.86	2	728	128,997	------	------	------	Area D Bypassing SCMs
44	SCS Runoff	426.95	2	728	1,566,526	------	------	------	Area D Offsite Post
45	Combine	509.98	2	728	2,251,225	36, 40, 42, 43, 44	------	------	Total Managed Area D Post
47	SCS Runoff	10.36	2	720	26,909	------	------	------	Area F Onsite Post
48	Combine	65.74	2	720	170,660	27, 47	------	------	Total to SCM F
49	Reservoir	44.66	2	728	170,650	48	391.94	44,097	Route SCM F
50	SCS Runoff	1.976	2	720	4,554	------	------	------	Area F Bypassing SCM
51	Combine	45.62	2	726	175,205	49, 50	------	------	Total Managed Area F Post
53	SCS Runoff	127.06	2	720	352,814	------	------	------	Area to SCM G Onsite
54	SCS Runoff	0.166	2	720	453	------	------	------	Area to SCM G Offsite
55	Combine	127.23	2	720	353,267	53, 54	------	------	Total Area to SCM G
56	Reservoir	17.97	2	740	297,140	55	390.93	212,594	Route SCM G
57	SCS Runoff	26.46	2	730	99,680	------	------	------	Area G Bypassing SCM
58	Combine	357.45	2	730	1,576,320	30, 56, 57	------	------	Total Managed Area G Post
60	SCS Runoff	955.12	2	732	4,136,777	------	------	------	Additional Area to Point D-E
61	Combine	544.57	2	728	2,010,413	1, 4, 5, 8, 9,	------	------	Total Area A-E Pre
62	Combine	1467.49	2	730	6,147,193	60, 61	------	------	Total A-E Post & Upstream
63	Reach	1460.15	2	734	6,147,189	62	------	------	A-E Travel to H Landfill Culverts
64	Combine	441.72	2	728	1,603,798	12, 15,	------	------	Total Area F & G Pre
65	Reach	438.08	2	730	1,603,796	64	------	------	F&G Travel to H Landfill Culverts
66	SCS Runoff	154.76	2	734	700,964	------	------	------	Area H at Culverts
67	Combine	2032.24	2	732	8,451,954	63, 65, 66	------	------	Total Flow H At Culverts Pre
69	SCS Runoff	4368.08	2	766	37,141,272	------	------	------	Area I - Apex
70	Reach	4360.76	2	768	37,141,256	69	------	------	Culverts Travel to I
71	Combine	8713.51	2	768	74,282,512	69, 70	------	------	Total Area I Pre

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
73	SCS Runoff	955.12	2	732	4,136,777	------	------	------	Additional Area to Point D-E
74	Combine	515.48	2	728	2,284,765	17, 20, 21,	------	------	Total Area A-E Post
75	Combine	1447.73	2	732	6,421,542	25, 45, 73, 74	------	------	Total A-E Post & Upstream
76	Reach	1439.33	2	734	6,421,509	75	------	------	A-E Travel to H Landfill Culverts
77	Combine	400.44	2	728	1,751,525	51, 58,	------	------	Total Area F & G Post
78	Reach	398.03	2	732	1,751,480	77	------	------	F&G Travel to H Landfill Culverts
79	SCS Runoff	154.76	2	734	700,964	------	------	------	Area H at Culverts
80	Combine	1981.70	2	734	8,873,954	76, 78, 79	------	------	Total Area H At Culverts Post
82	SCS Runoff	4368.08	2	766	37,141,272	------	------	------	Area I - Apex
83	Reach	4360.76	2	768	37,141,256	82	------	------	Culverts Travel to I
84	Combine	8713.51	2	768	74,282,512	82, 83	------	------	Total Area I Post

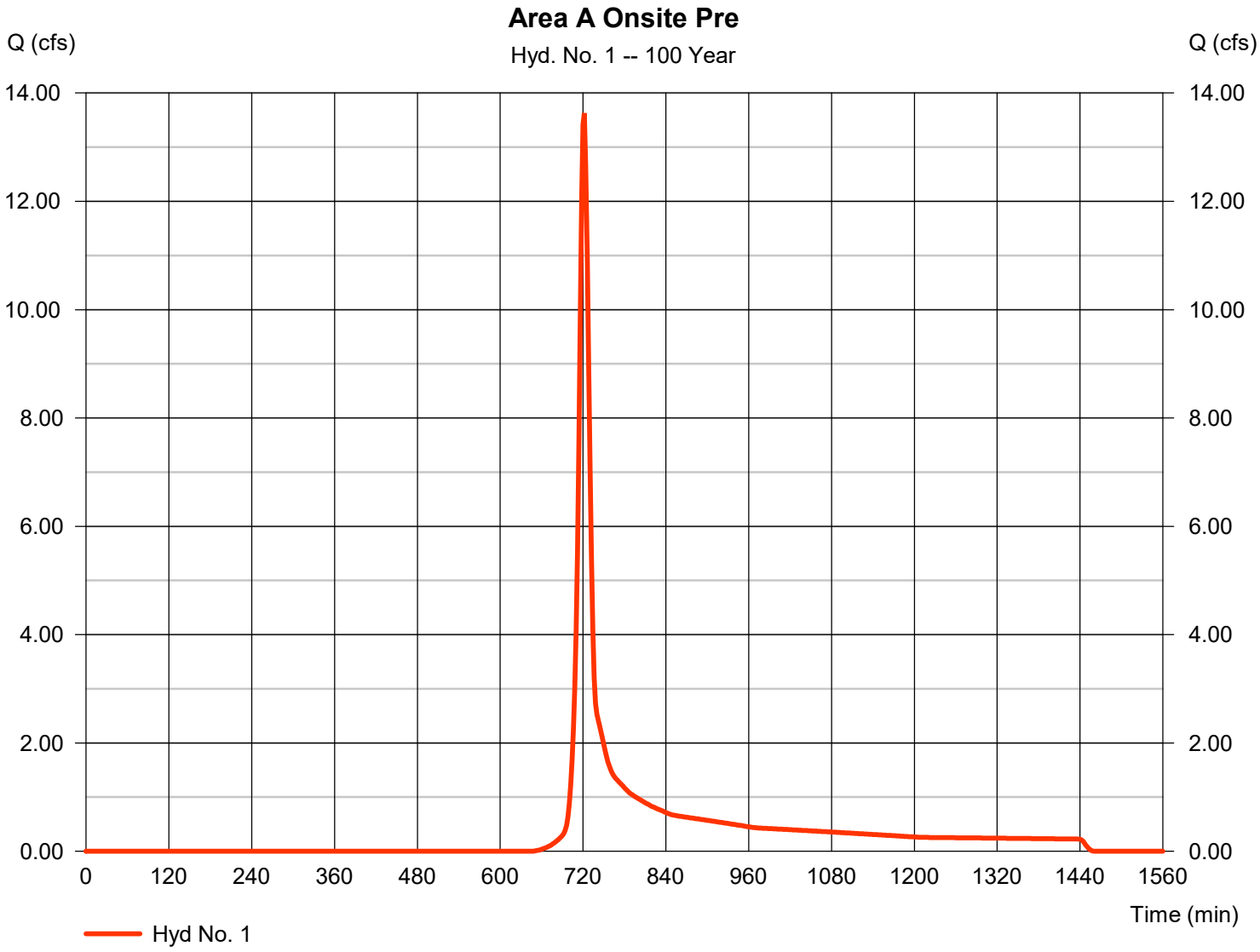
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Friday, 02 / 12 / 2021

Hyd. No. 1

Area A Onsite Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 13.63 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 36,332 cuft
Drainage area	= 3.850 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.10 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



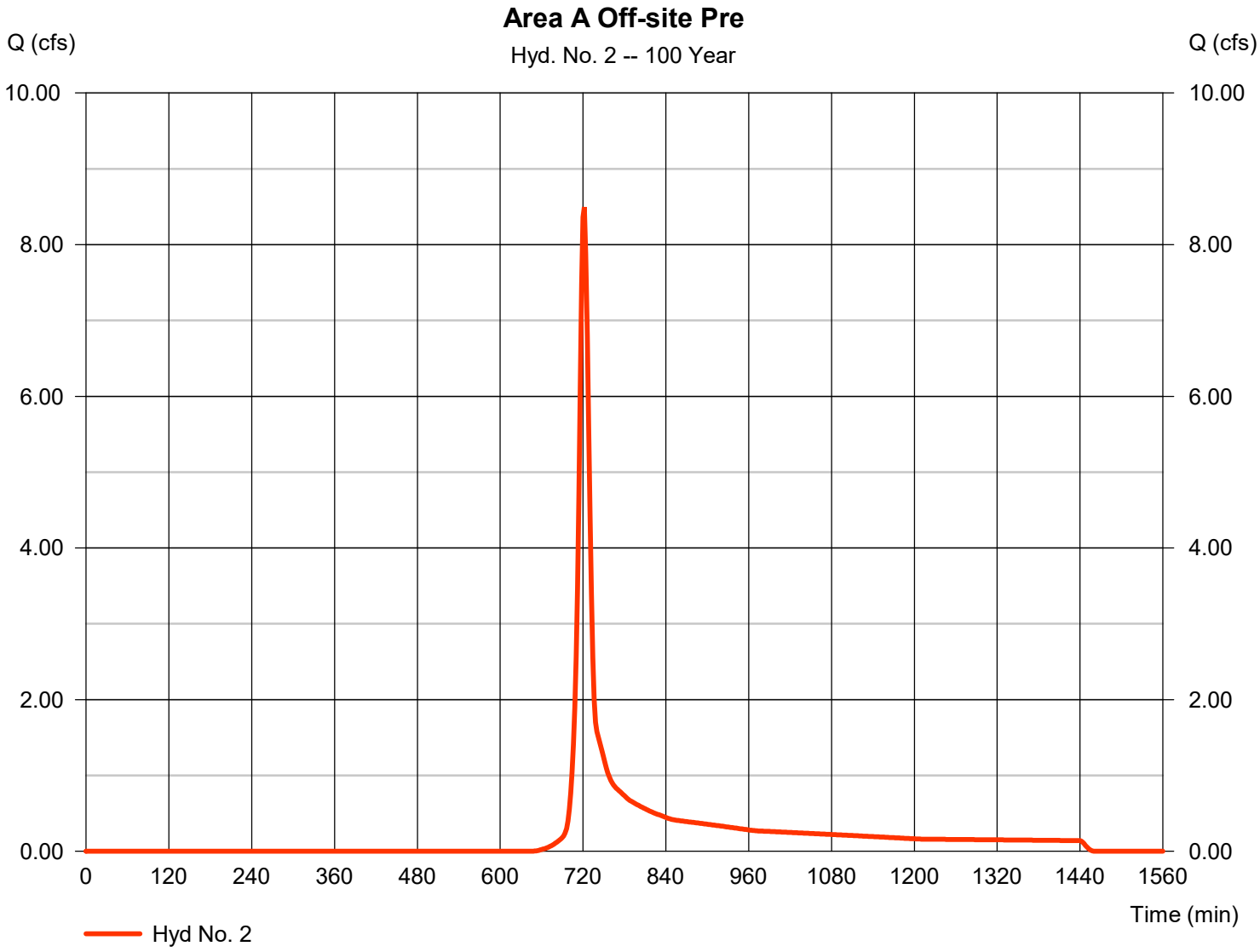
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Friday, 02 / 12 / 2021

Hyd. No. 2

Area A Off-site Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.496 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	22,648 cuft
Drainage area	=	2.400 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.10 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

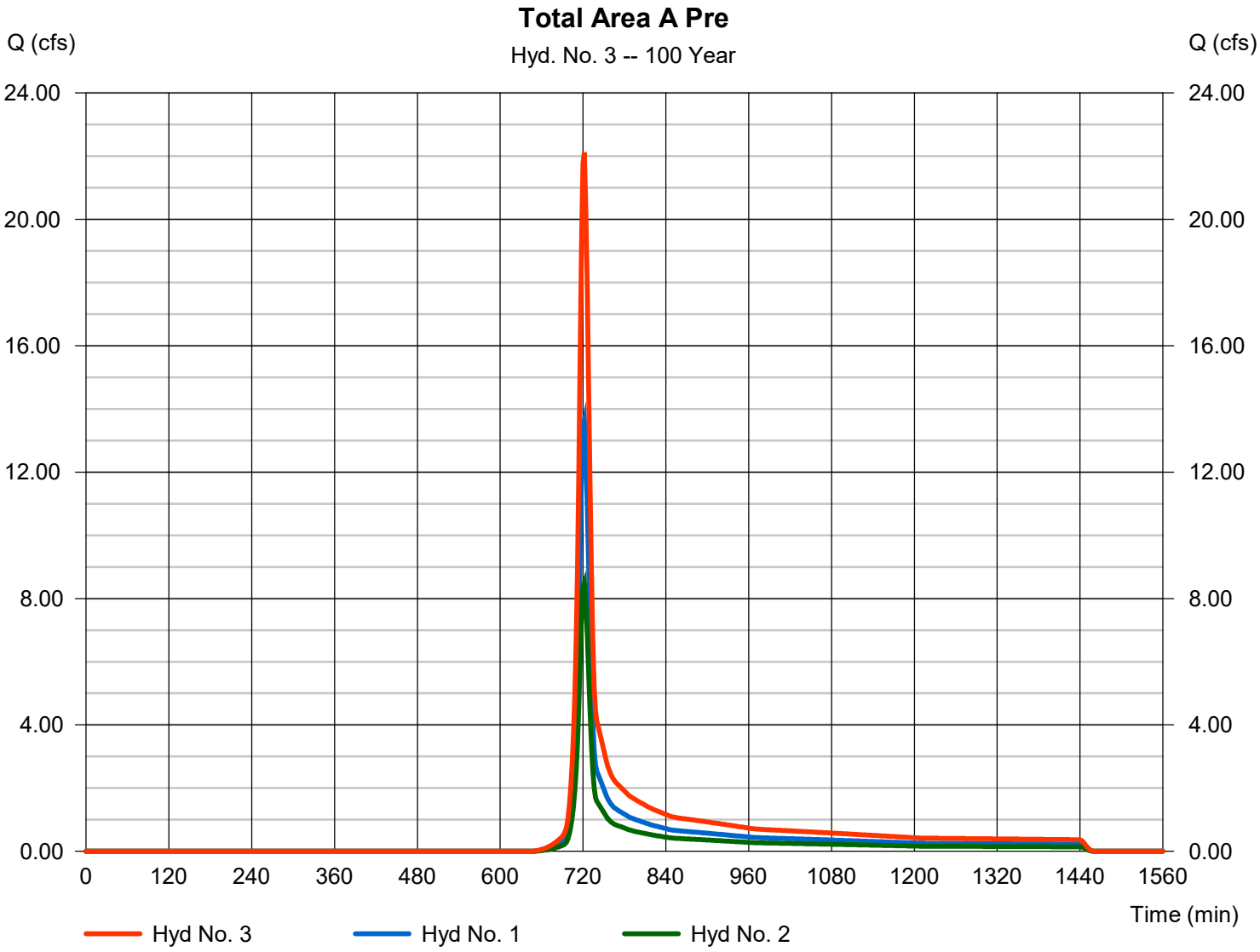


Hydrograph Report

Hyd. No. 3

Total Area A Pre

Hydrograph type	= Combine	Peak discharge	= 22.12 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 58,980 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 6.250 ac

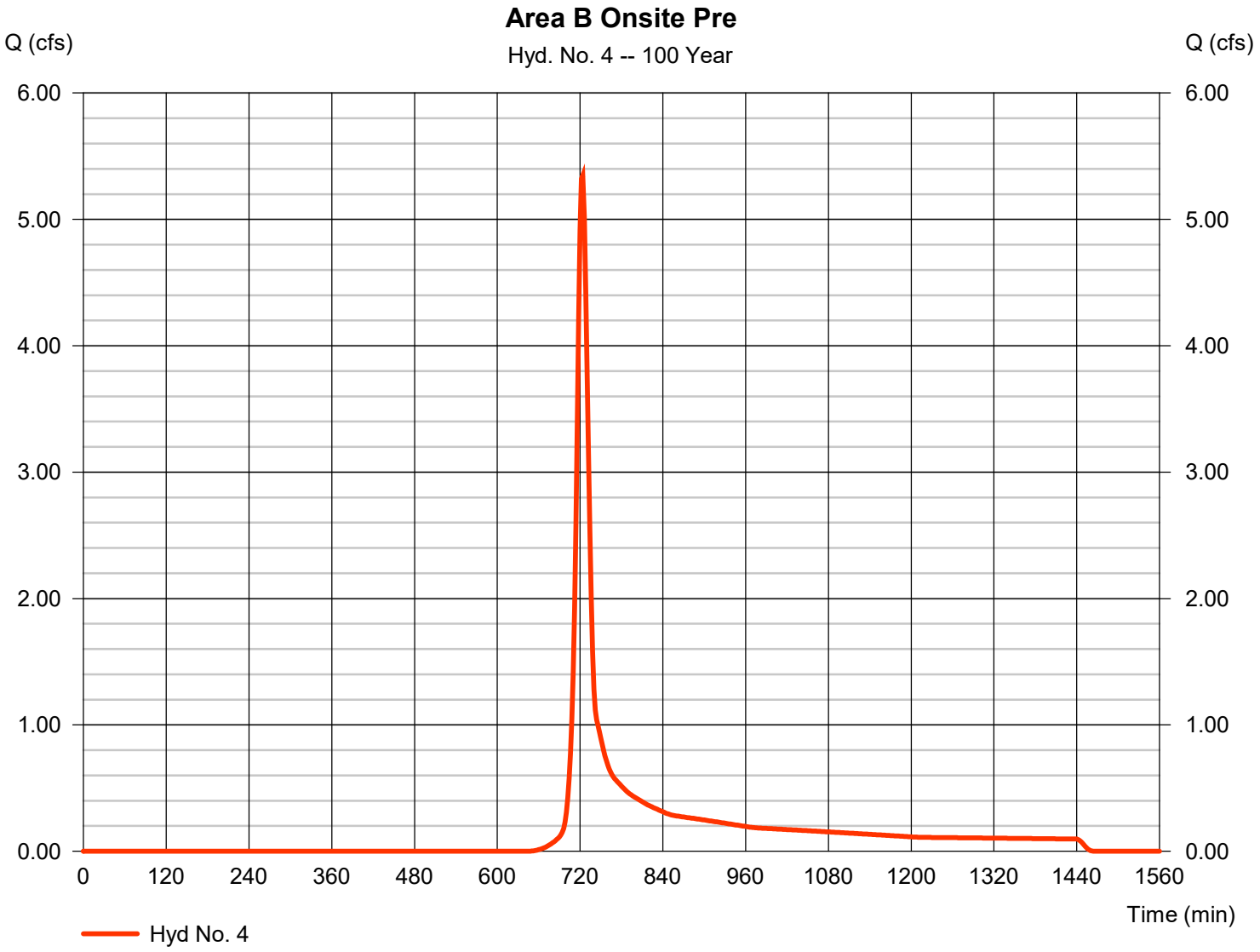


Hydrograph Report

Hyd. No. 4

Area B Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.349 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	15,614 cuft
Drainage area	=	1.750 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.20 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

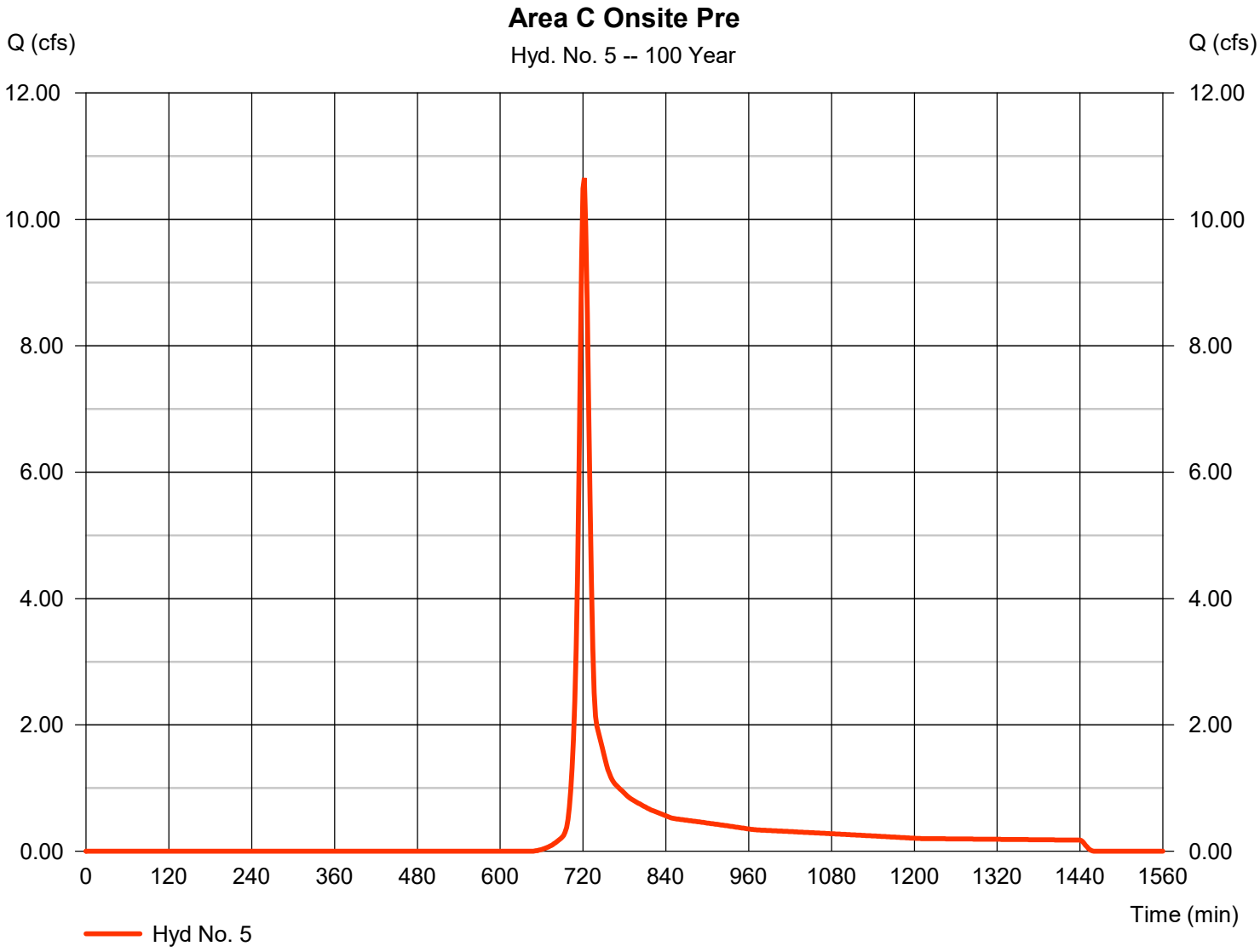


Hydrograph Report

Hyd. No. 5

Area C Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.65 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	28,405 cuft
Drainage area	=	3.010 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	10.80 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

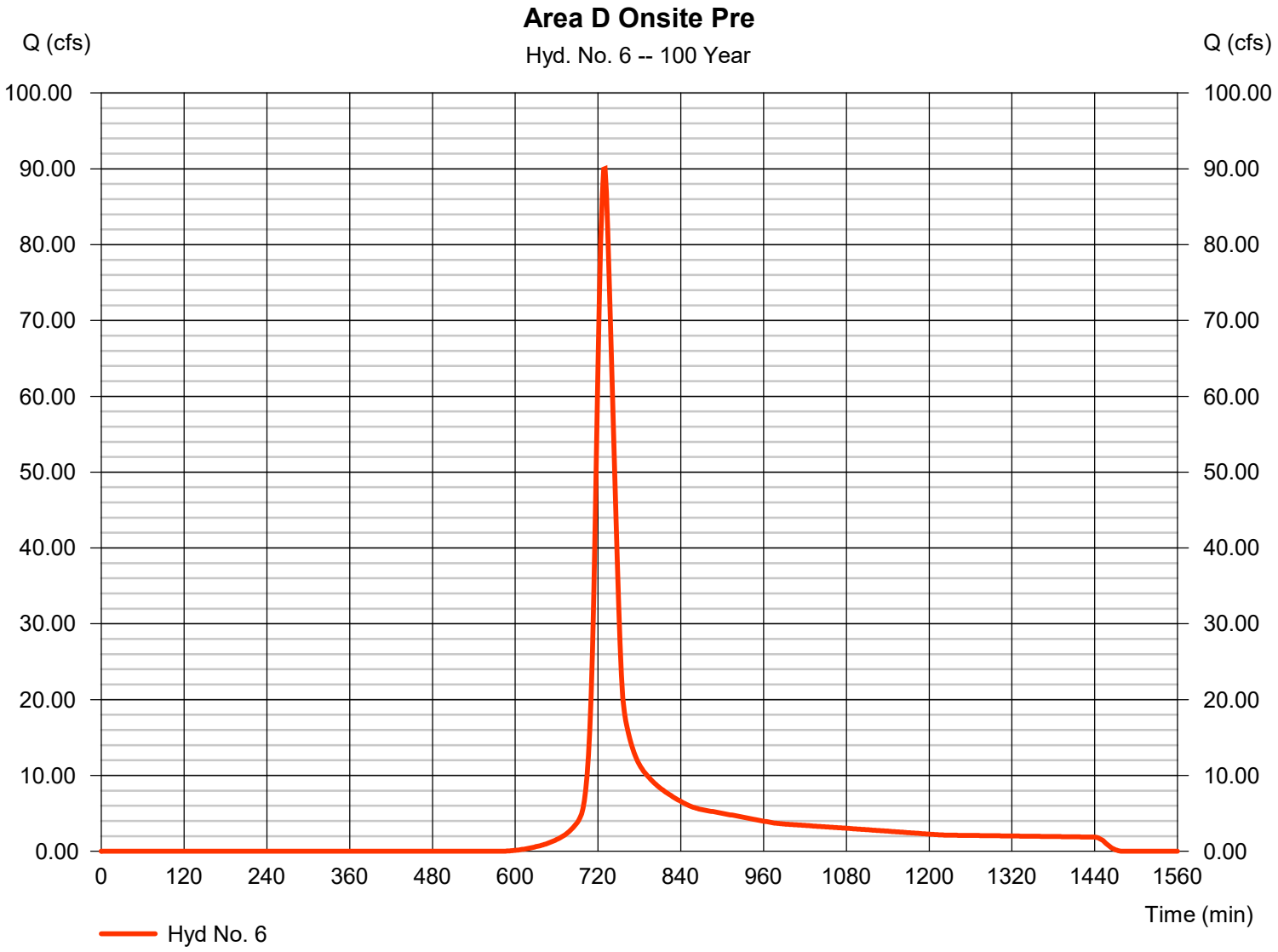


Hydrograph Report

Hyd. No. 6

Area D Onsite Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 90.03 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 337,564 cuft
Drainage area	= 29.390 ac	Curve number	= 61.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 24.00 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

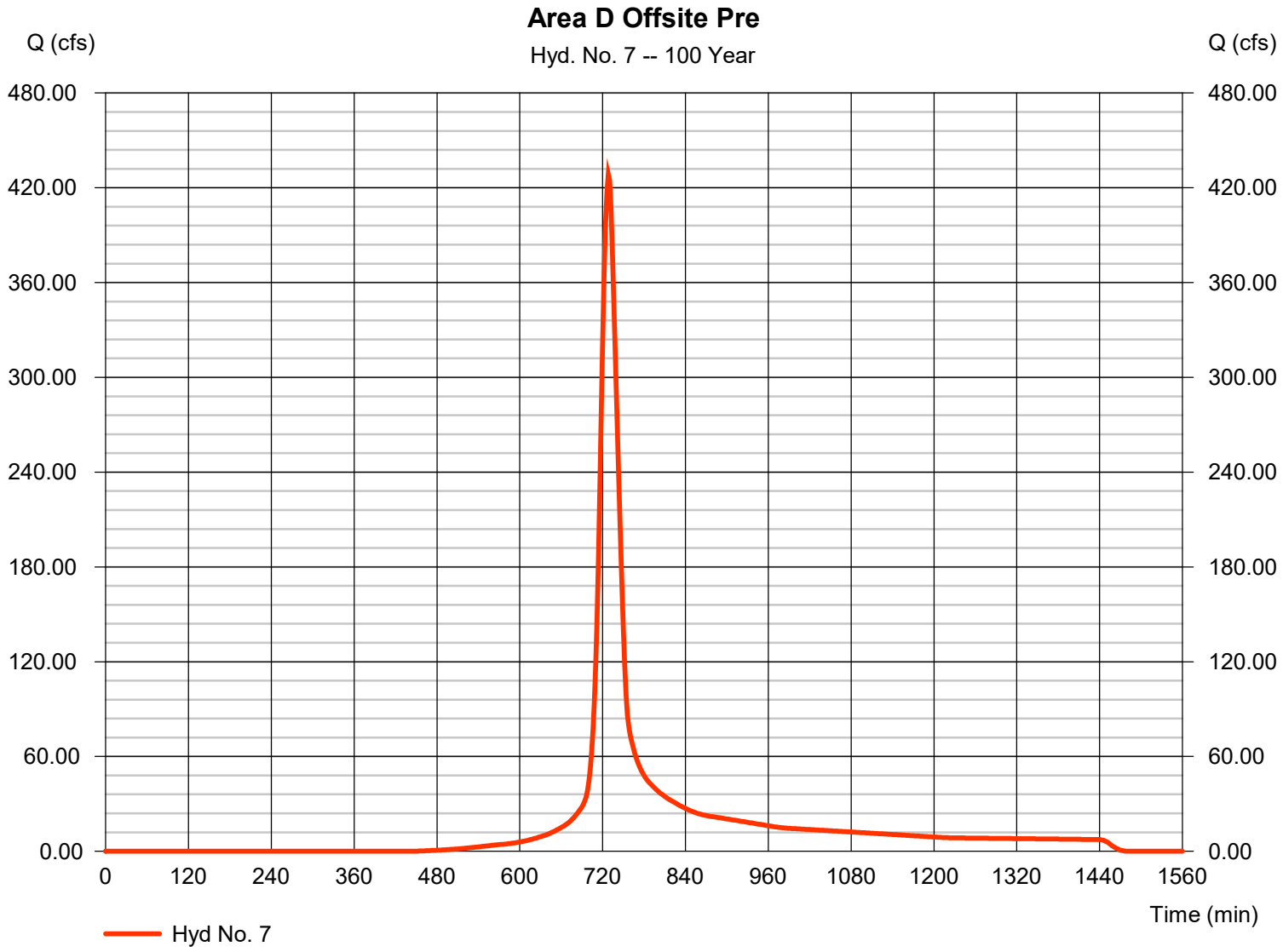


Hydrograph Report

Hyd. No. 7

Area D Offsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	428.42 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	1,571,968 cuft
Drainage area	=	101.300 ac	Curve number	=	71.9
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

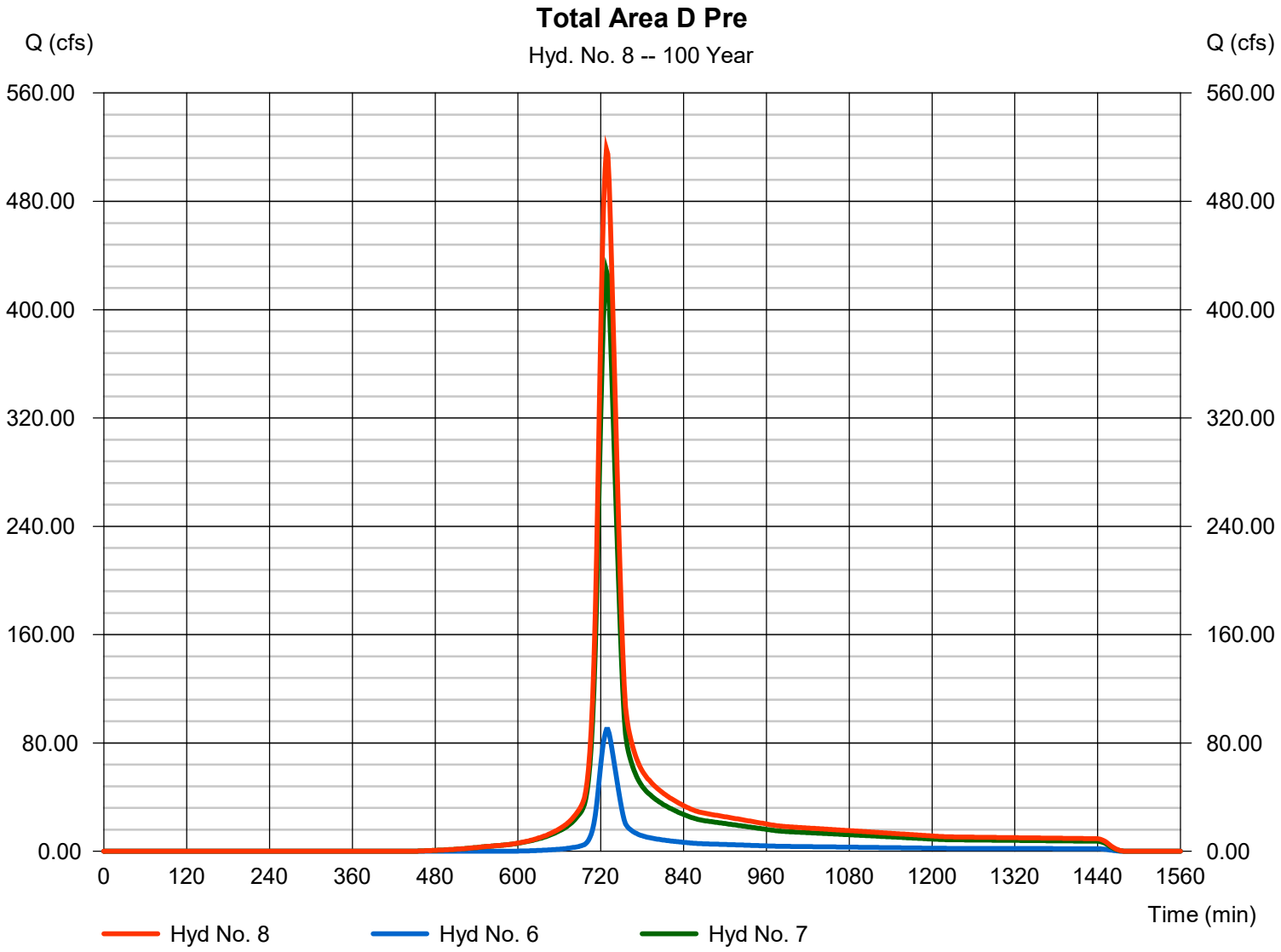


Hydrograph Report

Hyd. No. 8

Total Area D Pre

Hydrograph type	= Combine	Peak discharge	= 518.37 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 1,909,532 cuft
Inflow hyds.	= 6, 7	Contrib. drain. area	= 130.690 ac

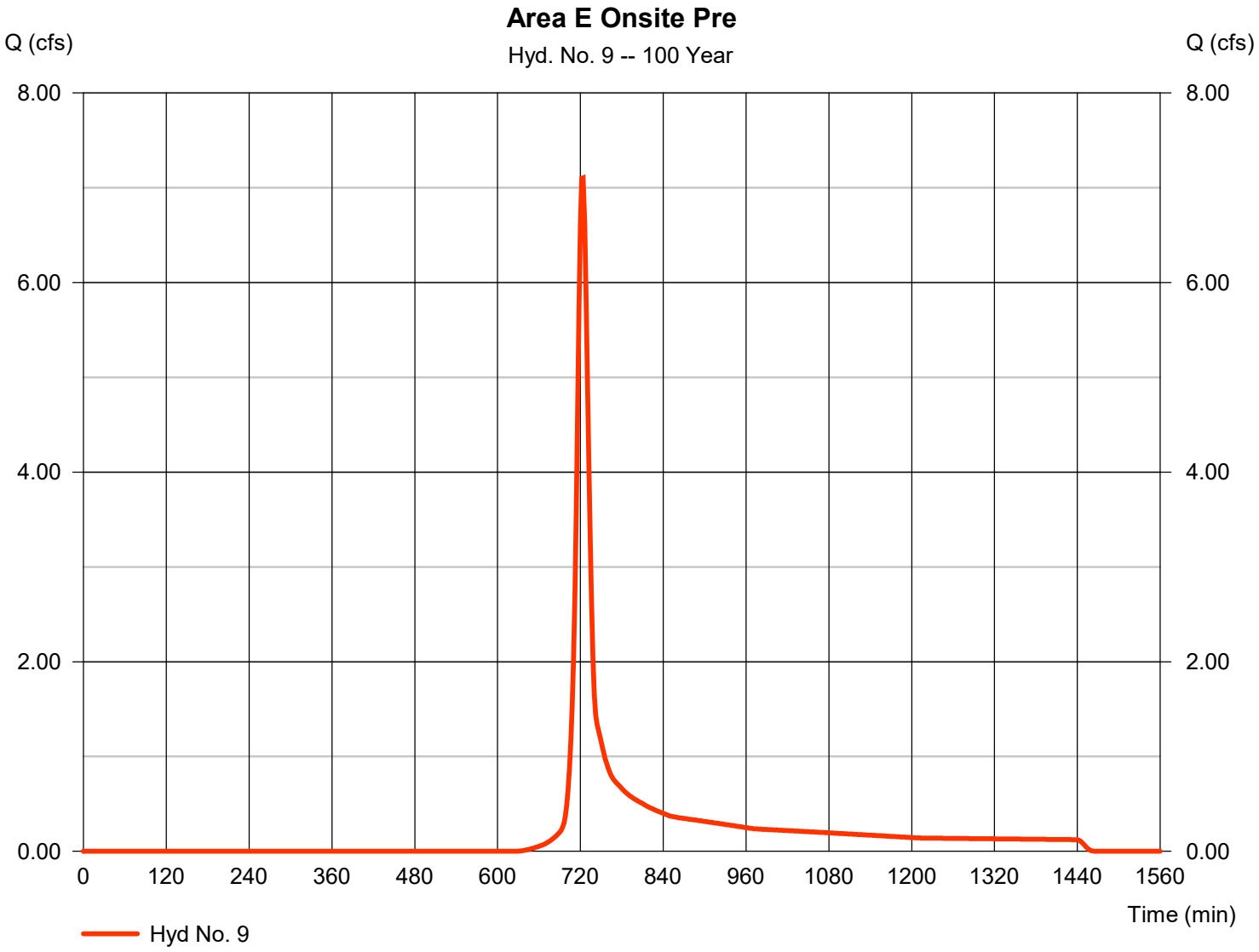


Hydrograph Report

Hyd. No. 9

Area E Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.103 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	20,529 cuft
Drainage area	=	2.110 ac	Curve number	=	57.2
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.30 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

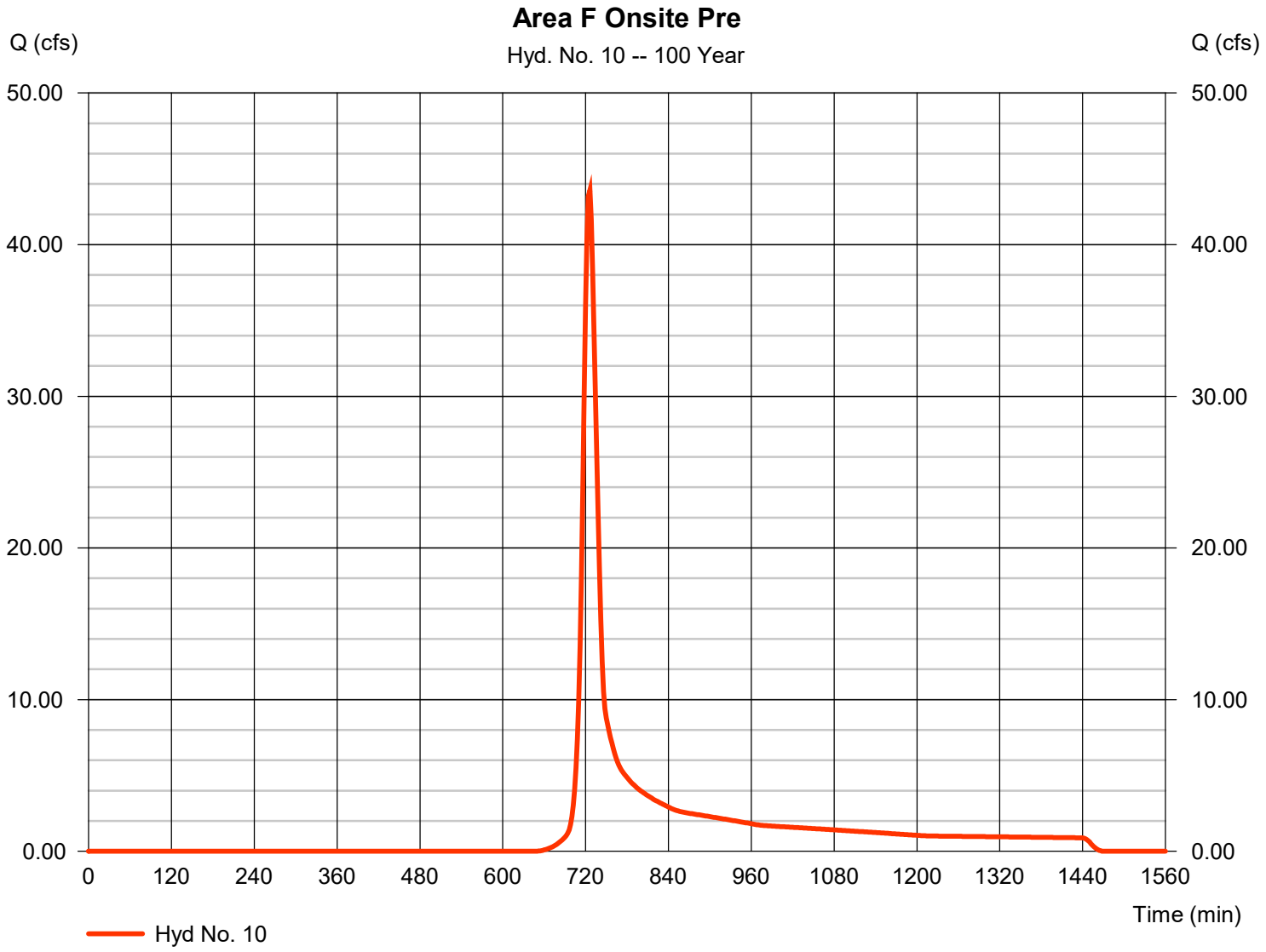


Hydrograph Report

Hyd. No. 10

Area F Onsite Pre

Hydrograph type	= SCS Runoff	Peak discharge	= 43.59 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 142,936 cuft
Drainage area	= 15.620 ac	Curve number	= 55
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 17.60 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

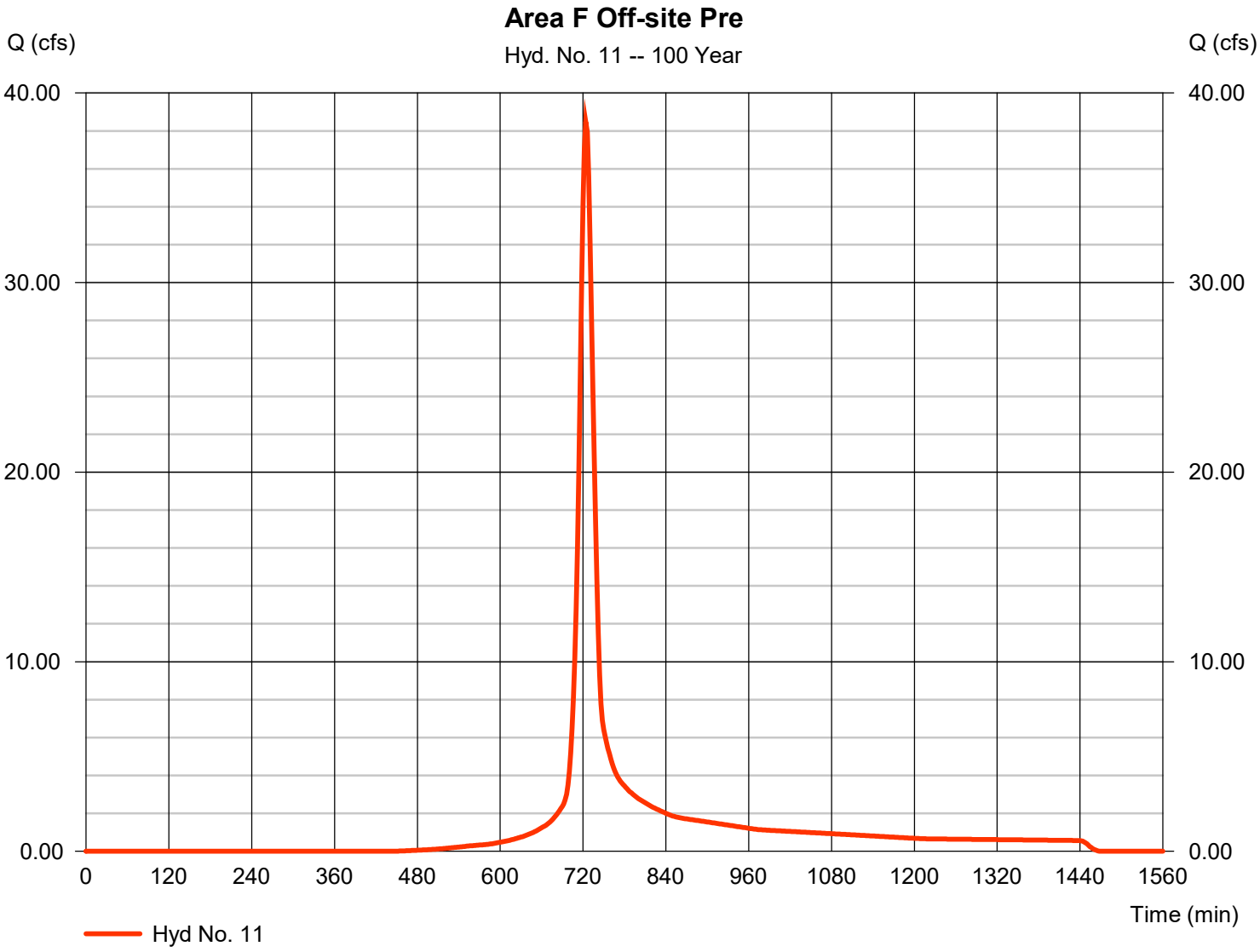


Hydrograph Report

Hyd. No. 11

Area F Off-site Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	38.48 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	120,290 cuft
Drainage area	=	7.670 ac	Curve number	=	71.7
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	17.60 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

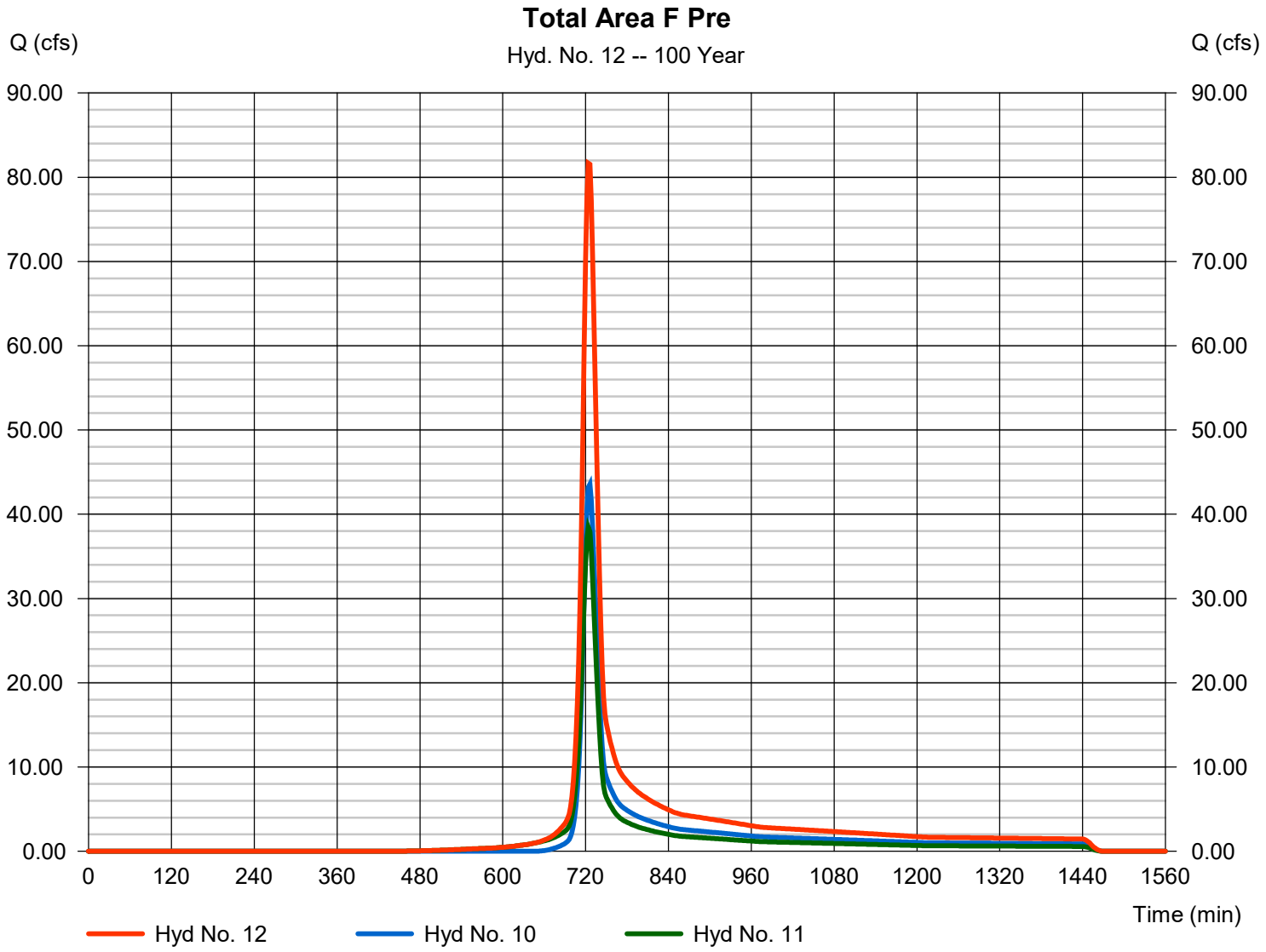


Hydrograph Report

Hyd. No. 12

Total Area F Pre

Hydrograph type	= Combine	Peak discharge	= 81.66 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 263,226 cuft
Inflow hyds.	= 10, 11	Contrib. drain. area	= 23.290 ac

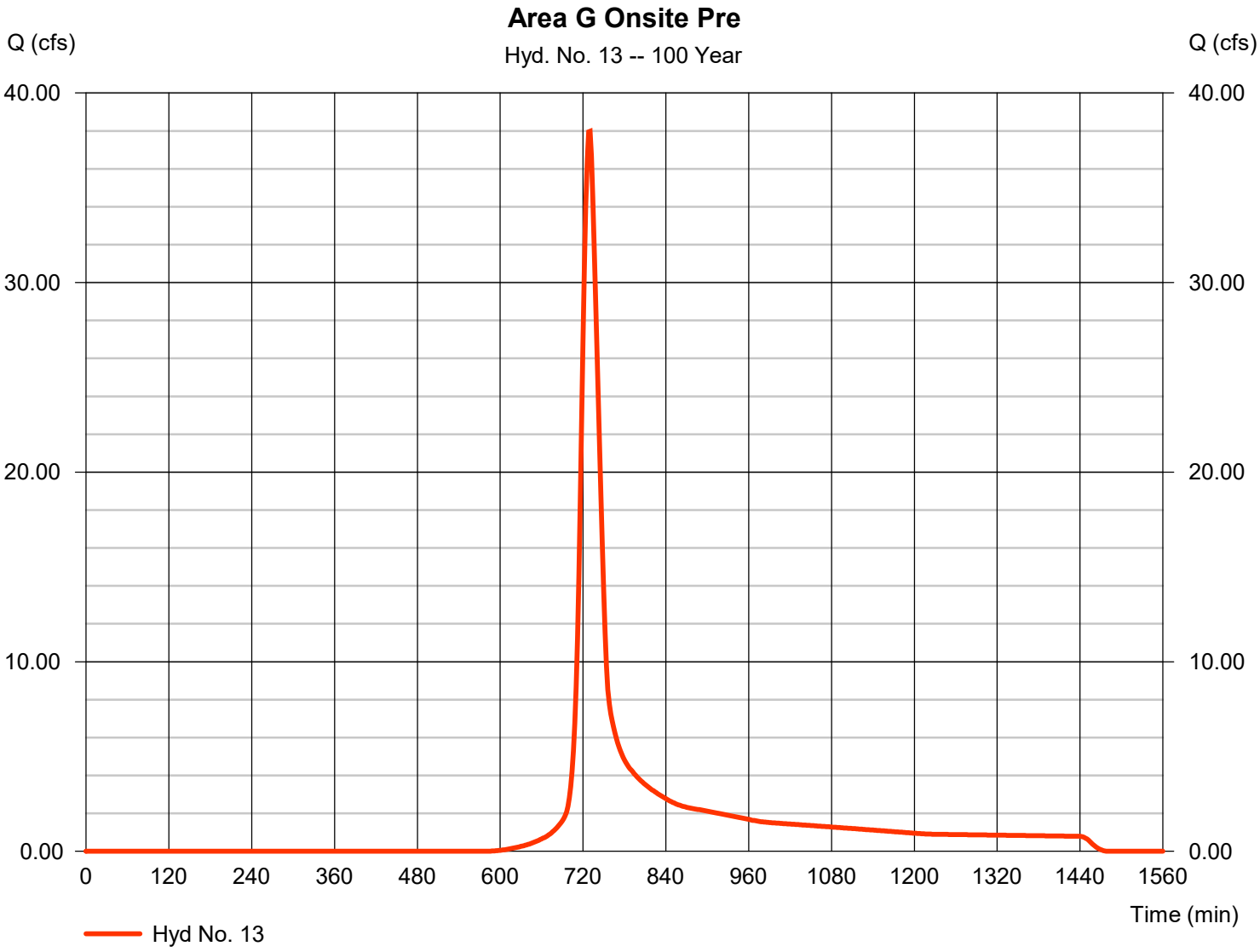


Hydrograph Report

Hyd. No. 13

Area G Onsite Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	37.99 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	142,423 cuft
Drainage area	=	12.400 ac	Curve number	=	61.6
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	23.80 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

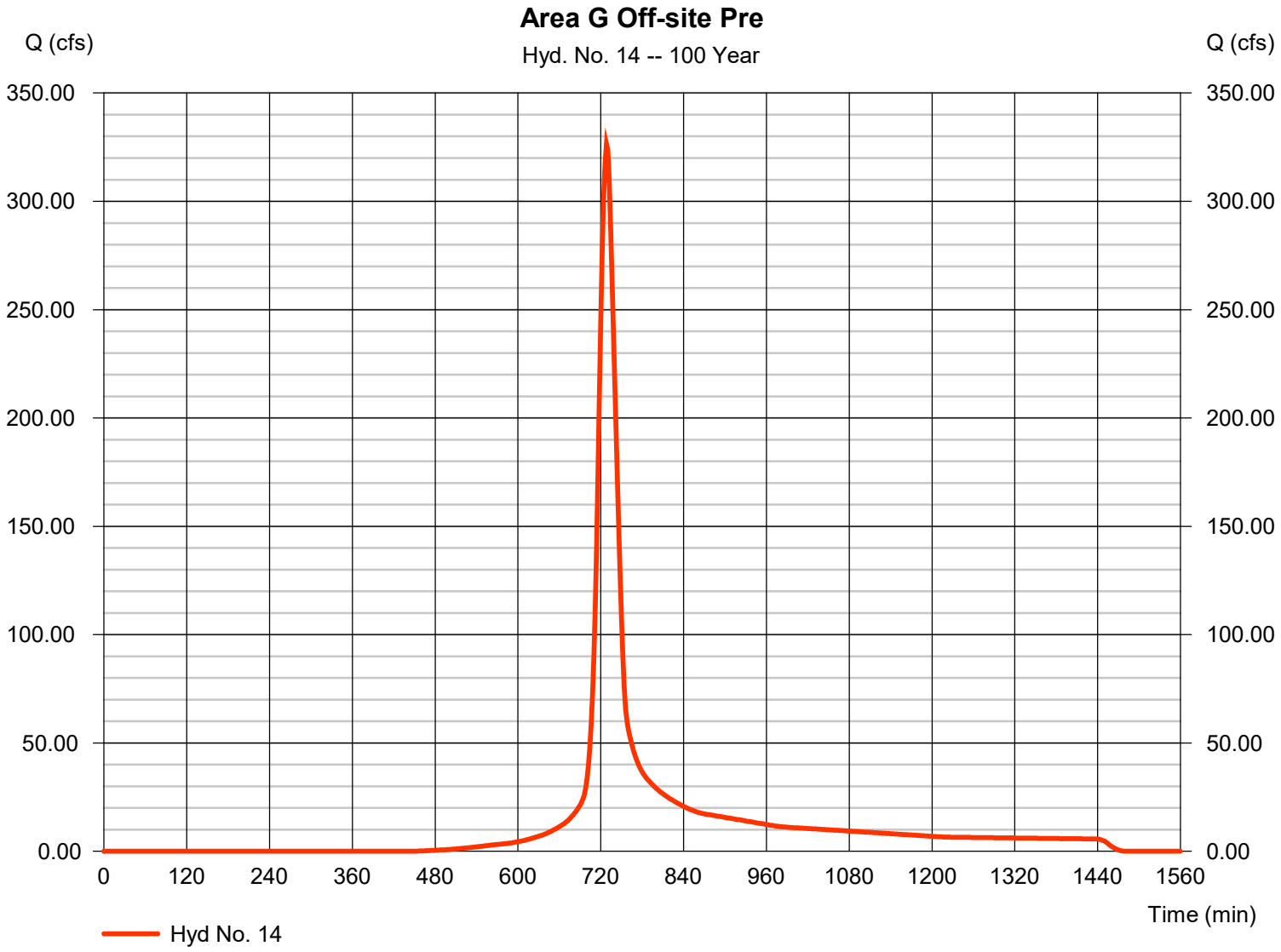


Hydrograph Report

Hyd. No. 14

Area G Off-site Pre

Hydrograph type	=	SCS Runoff	Peak discharge	=	326.52 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	1,198,150 cuft
Drainage area	=	77.610 ac	Curve number	=	71.7
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	23.80 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

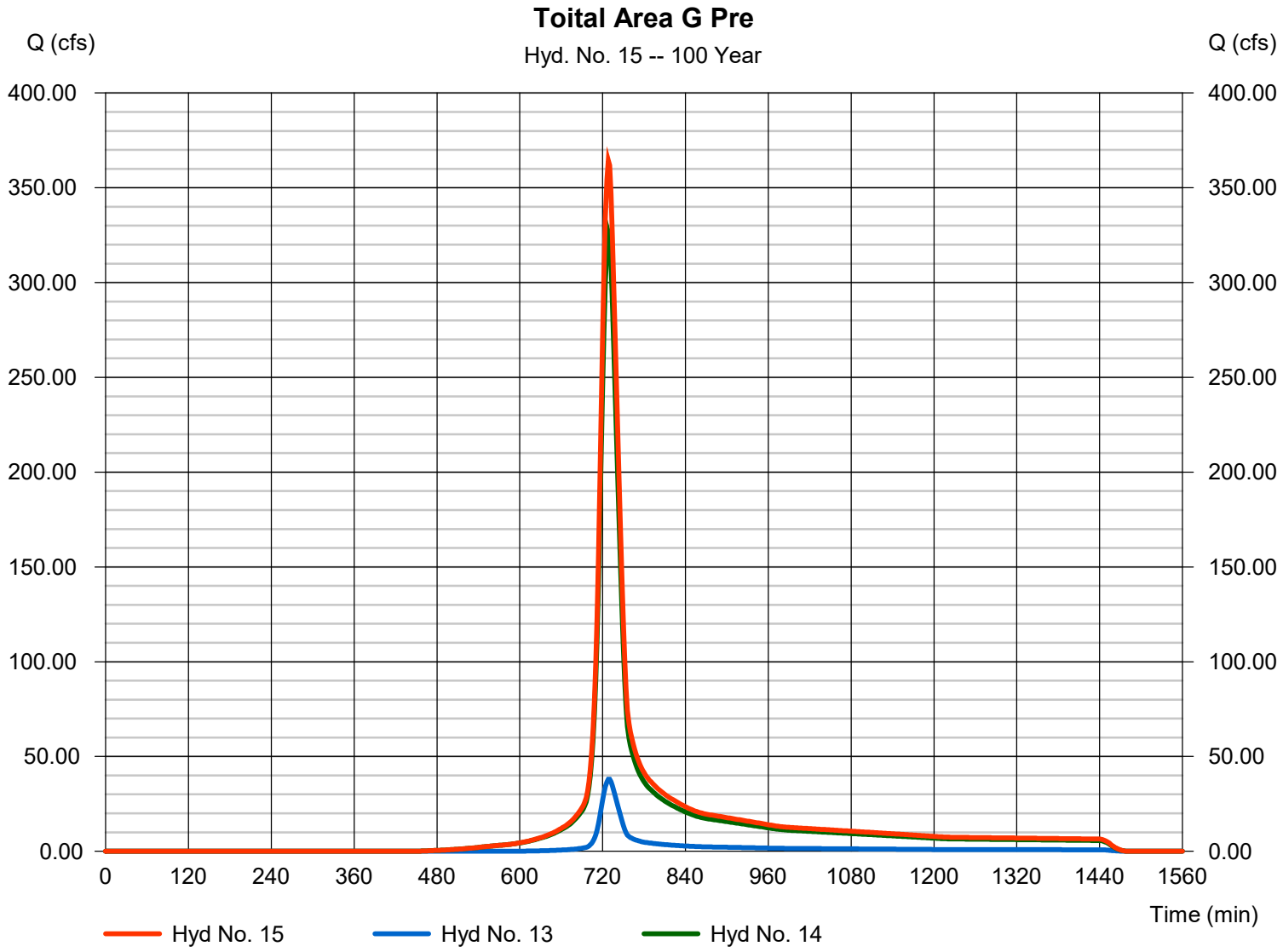


Hydrograph Report

Hyd. No. 15

Toital Area G Pre

Hydrograph type	=	Combine	Peak discharge	=	364.47 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	1,340,572 cuft
Inflow hyds.	=	13, 14	Contrib. drain. area	=	90.010 ac

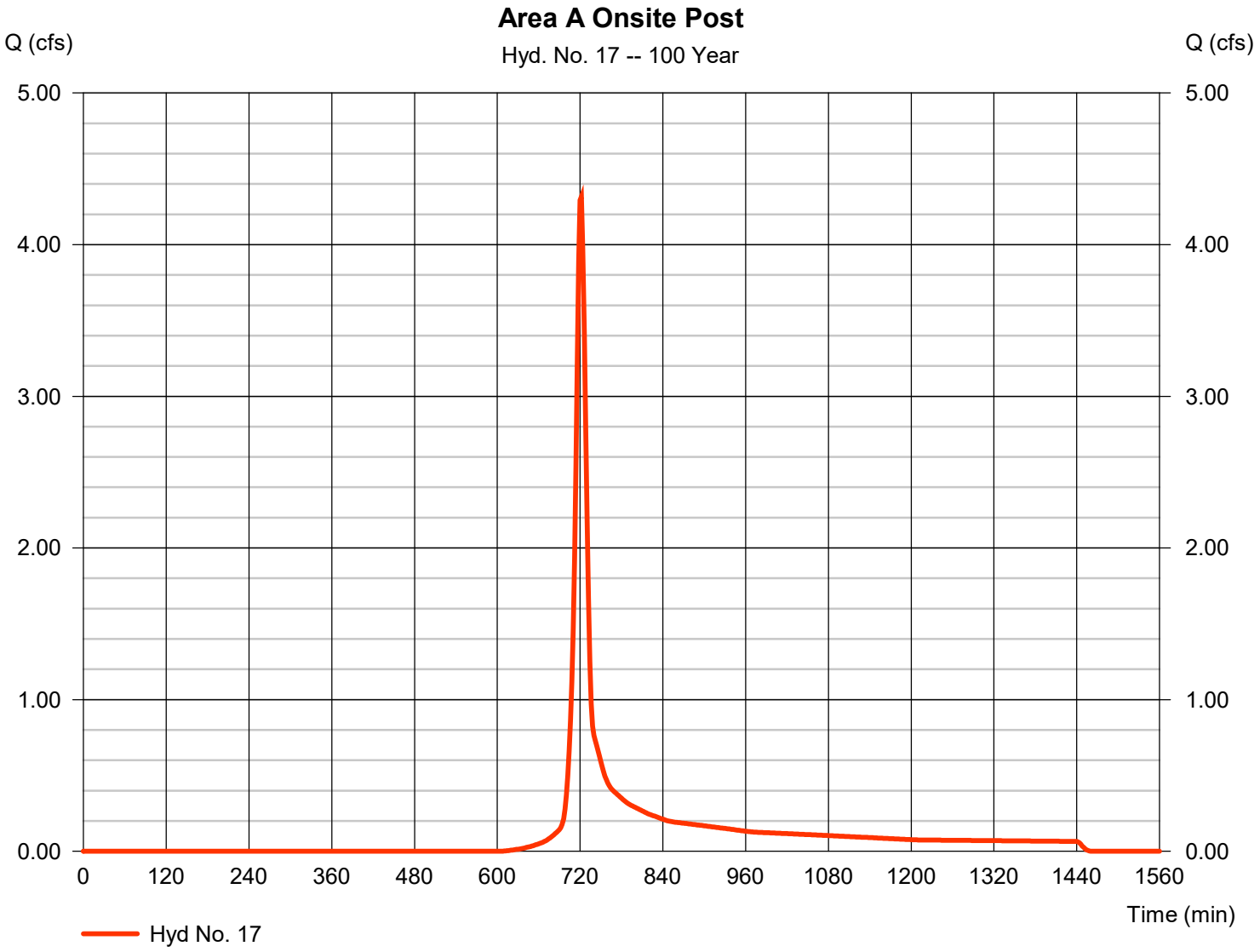


Hydrograph Report

Hyd. No. 17

Area A Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.316 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	11,339 cuft
Drainage area	=	1.020 ac	Curve number	=	59.3
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.10 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

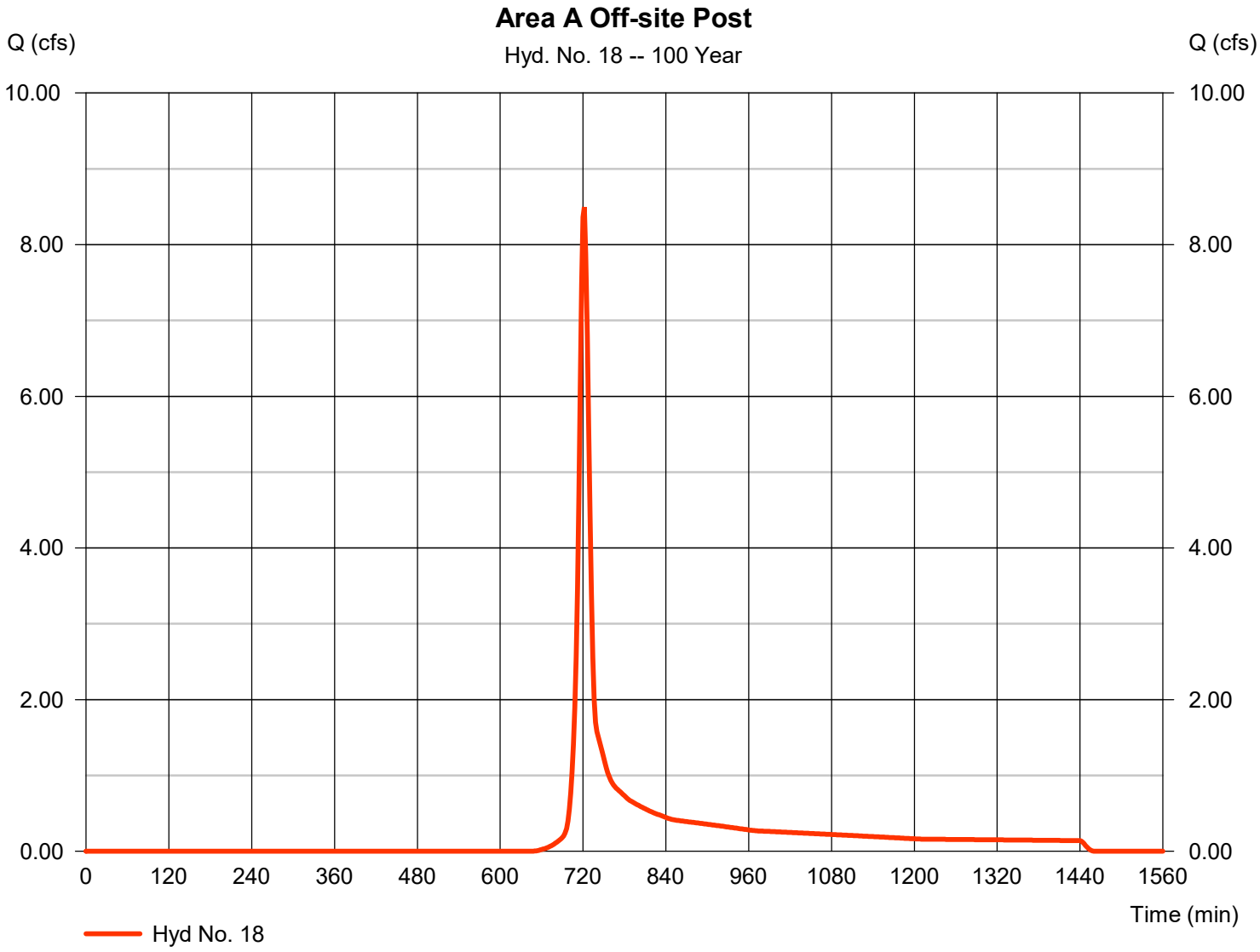


Hydrograph Report

Hyd. No. 18

Area A Off-site Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.496 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	22,648 cuft
Drainage area	=	2.400 ac	Curve number	=	55
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	12.10 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

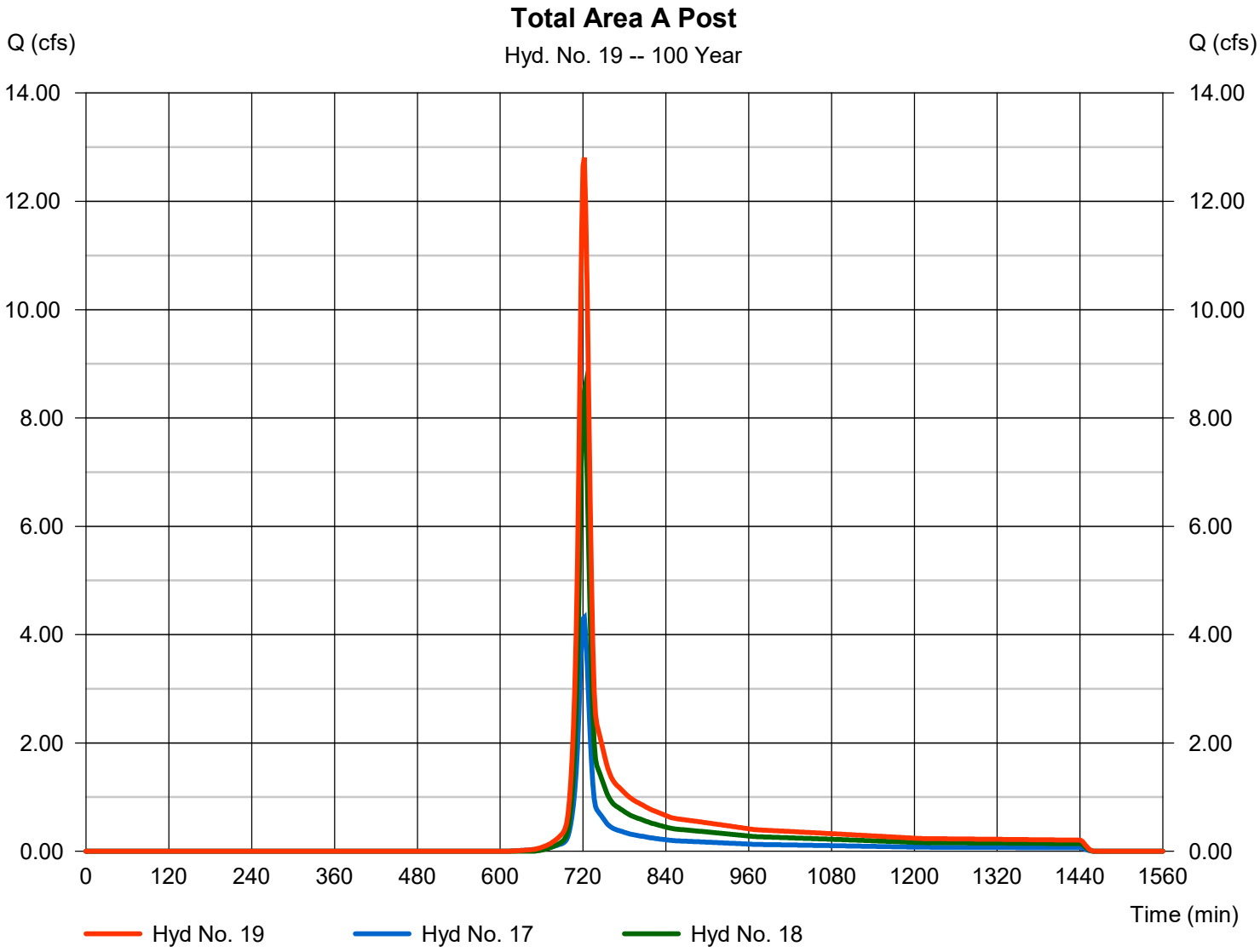


Hydrograph Report

Hyd. No. 19

Total Area A Post

Hydrograph type	= Combine	Peak discharge	= 12.81 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 33,987 cuft
Inflow hyds.	= 17, 18	Contrib. drain. area	= 3.420 ac

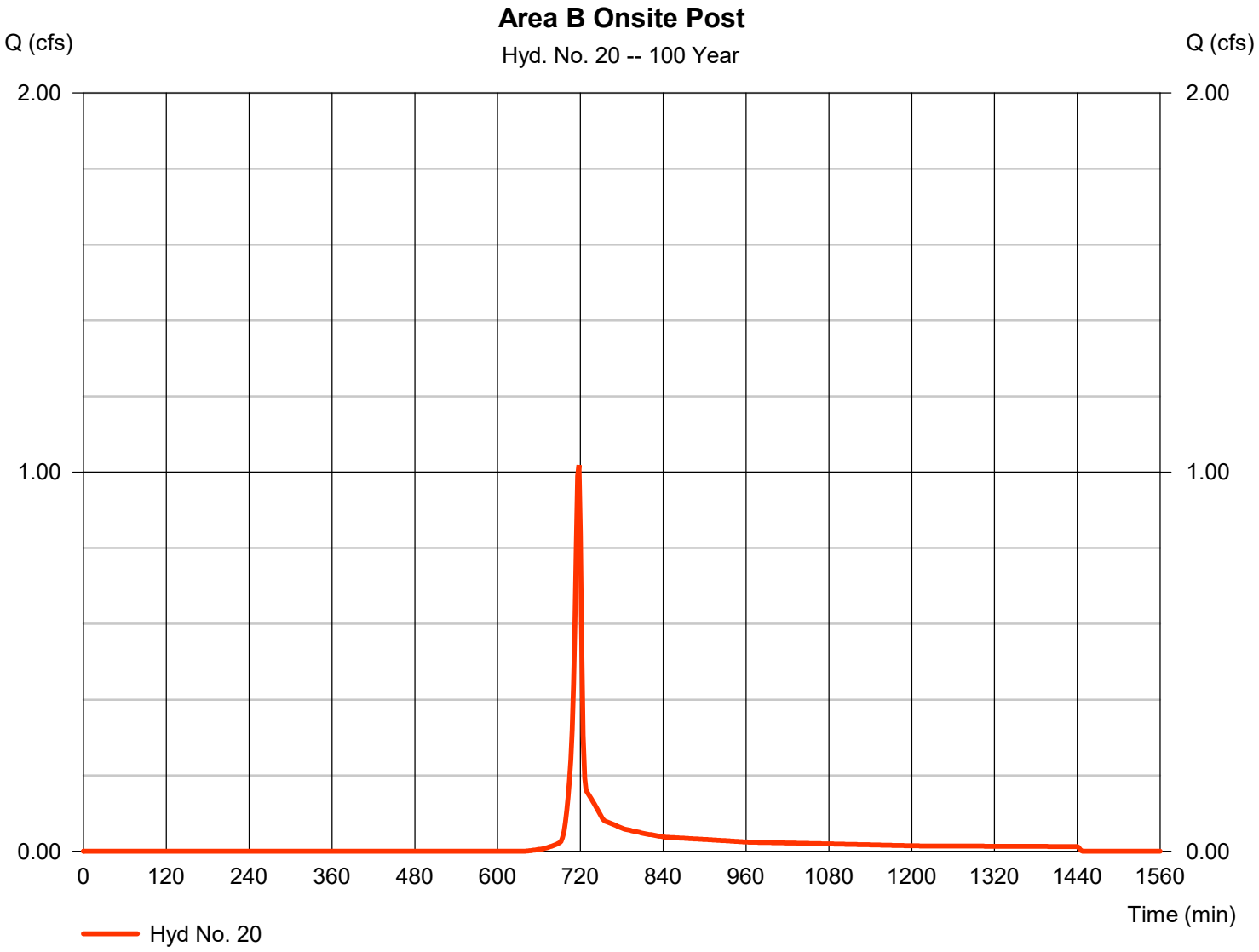


Hydrograph Report

Hyd. No. 20

Area B Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.018 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	2,038 cuft
Drainage area	=	0.230 ac	Curve number	=	55.8
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

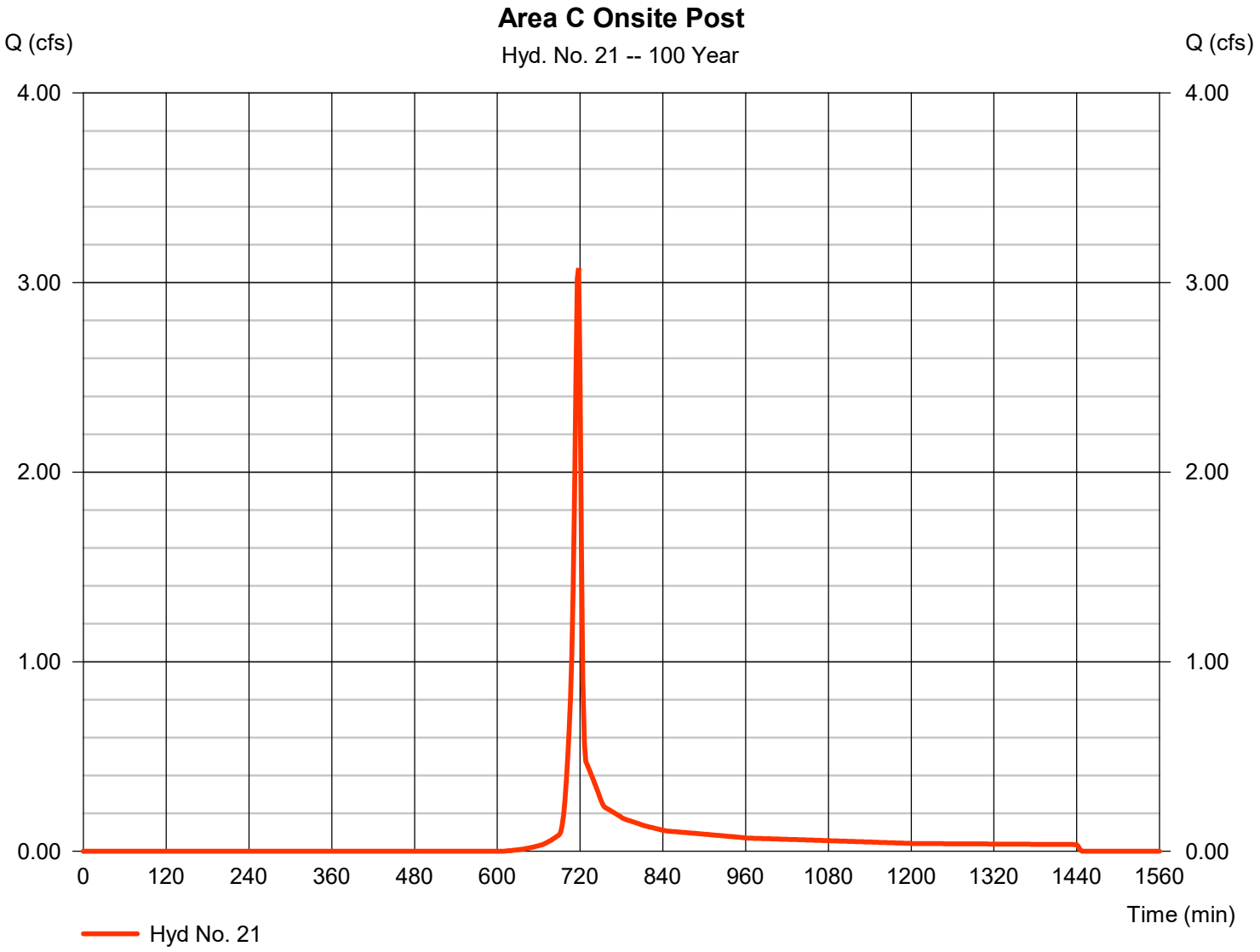


Hydrograph Report

Hyd. No. 21

Area C Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.077 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	6,154 cuft
Drainage area	=	0.620 ac	Curve number	=	58.8
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

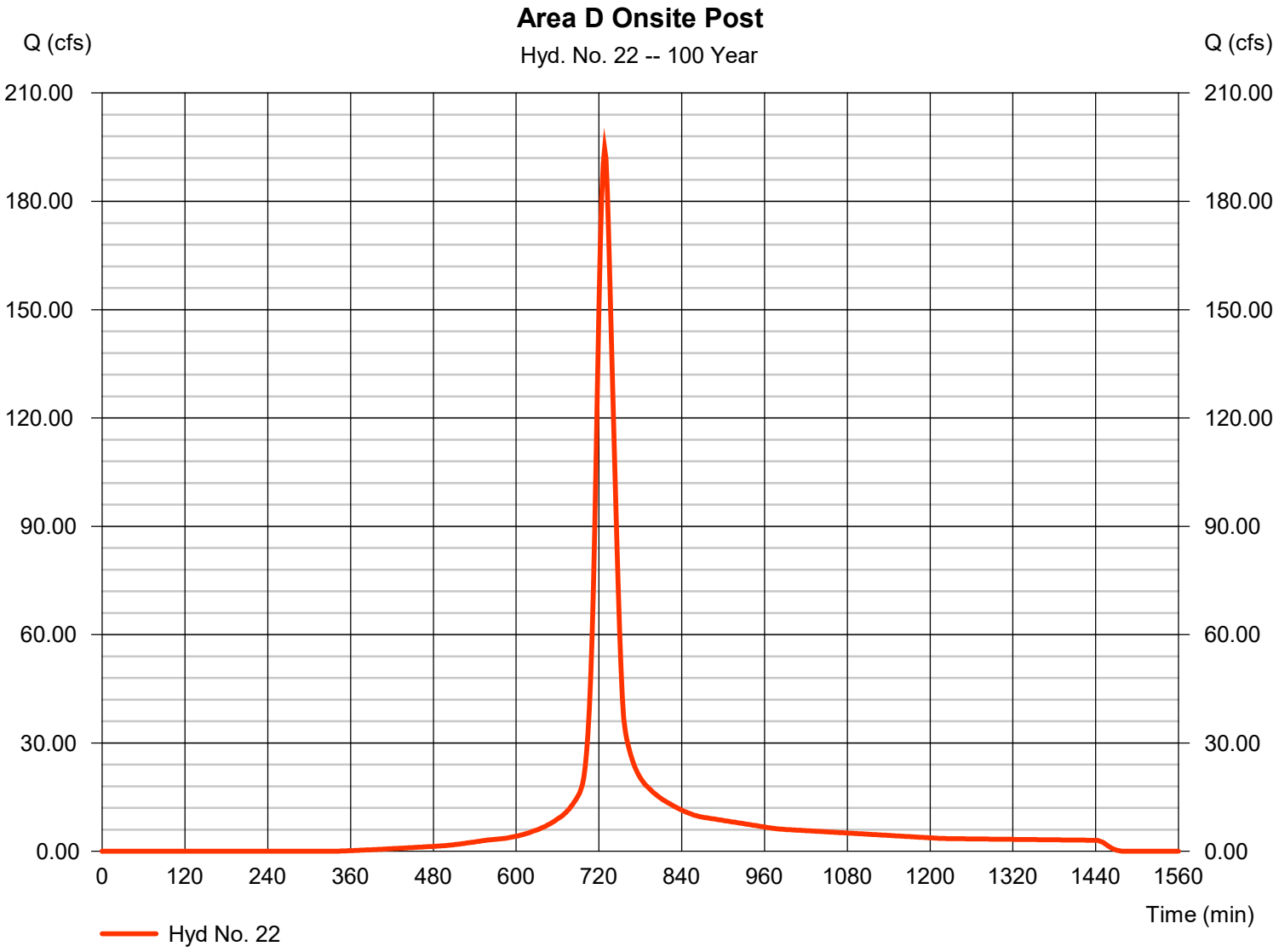


Hydrograph Report

Hyd. No. 22

Area D Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	194.53 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	718,273 cuft
Drainage area	=	38.890 ac	Curve number	=	79.2
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

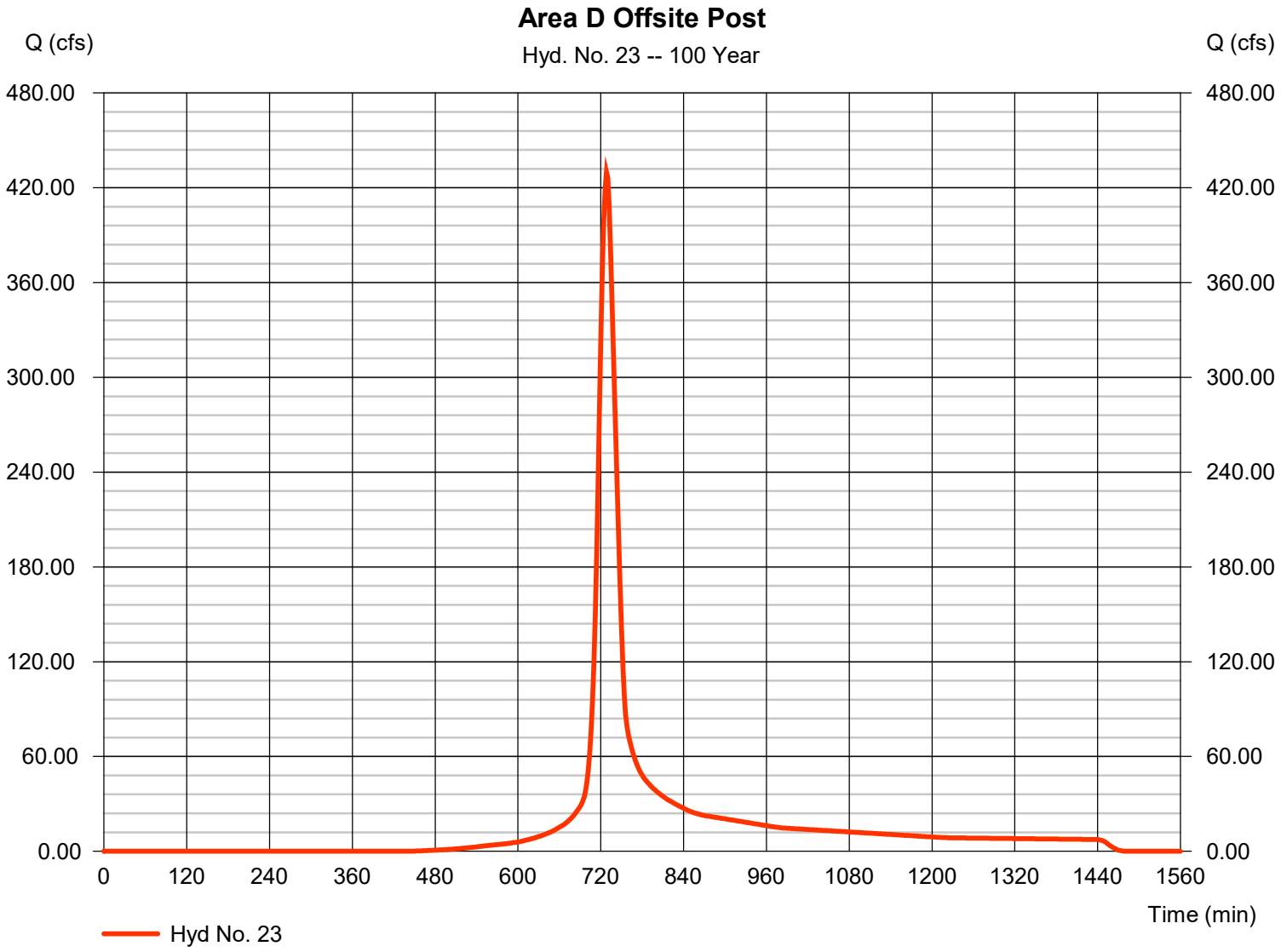


Hydrograph Report

Hyd. No. 23

Area D Offsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	429.88 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	1,577,261 cuft
Drainage area	=	101.380 ac	Curve number	=	72
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

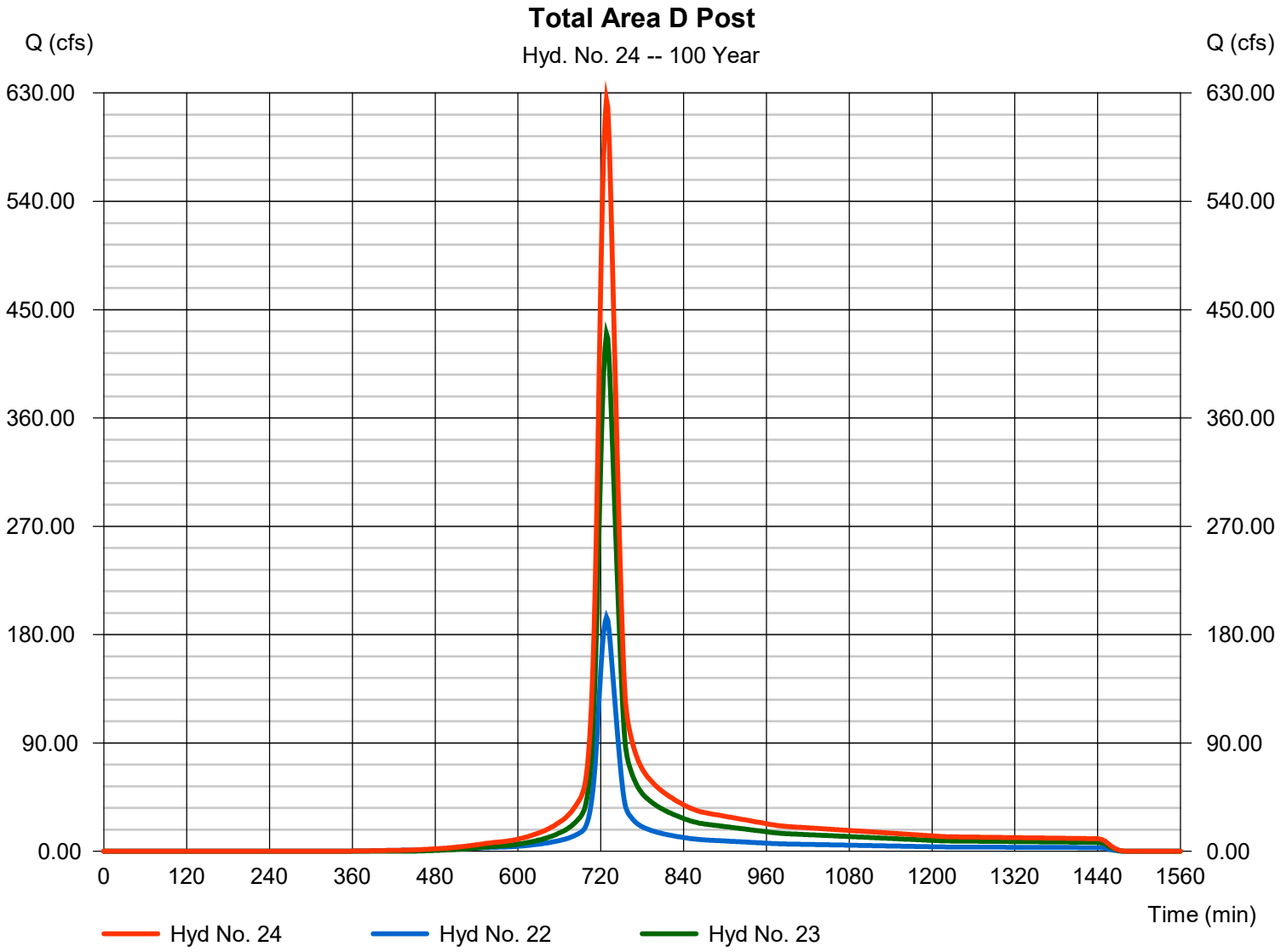


Hydrograph Report

Hyd. No. 24

Total Area D Post

Hydrograph type	= Combine	Peak discharge	= 624.41 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 2,295,533 cuft
Inflow hyds.	= 22, 23	Contrib. drain. area	= 140.270 ac

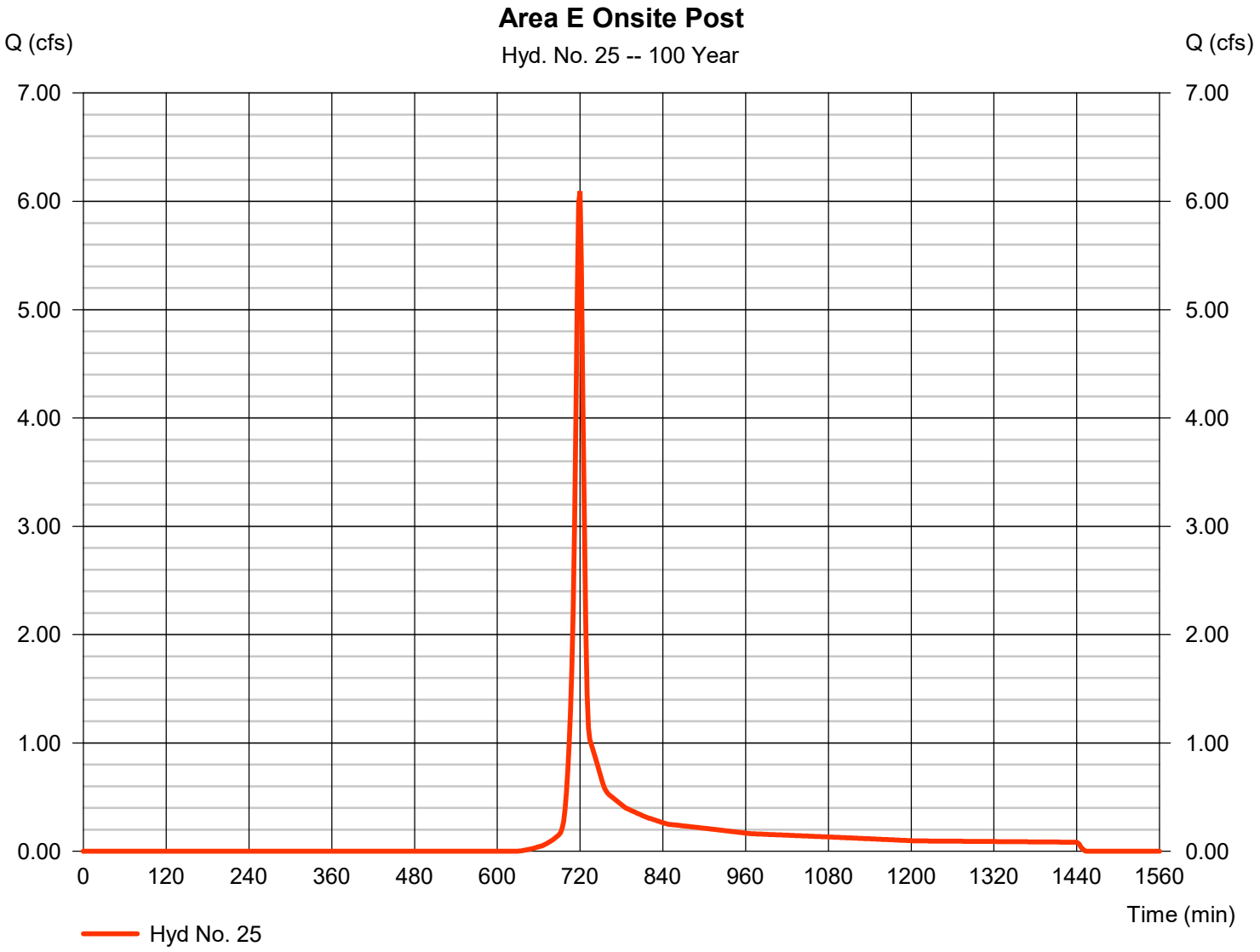


Hydrograph Report

Hyd. No. 25

Area E Onsite Post

Hydrograph type	= SCS Runoff	Peak discharge	= 6.093 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 14,008 cuft
Drainage area	= 1.420 ac	Curve number	= 56.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.20 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

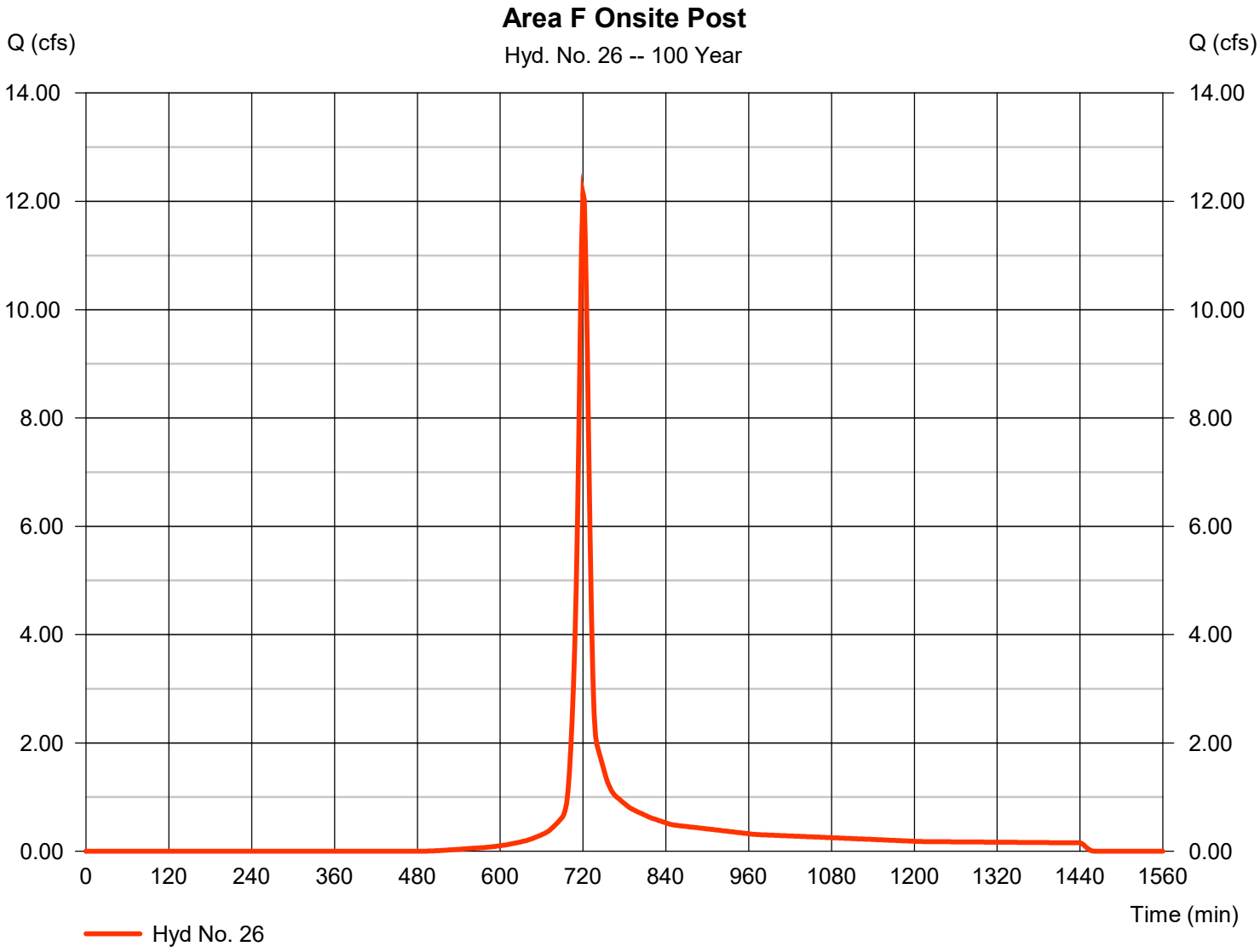


Hydrograph Report

Hyd. No. 26

Area F Onsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.15 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	31,492 cuft
Drainage area	=	2.110 ac	Curve number	=	68.7
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.60 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

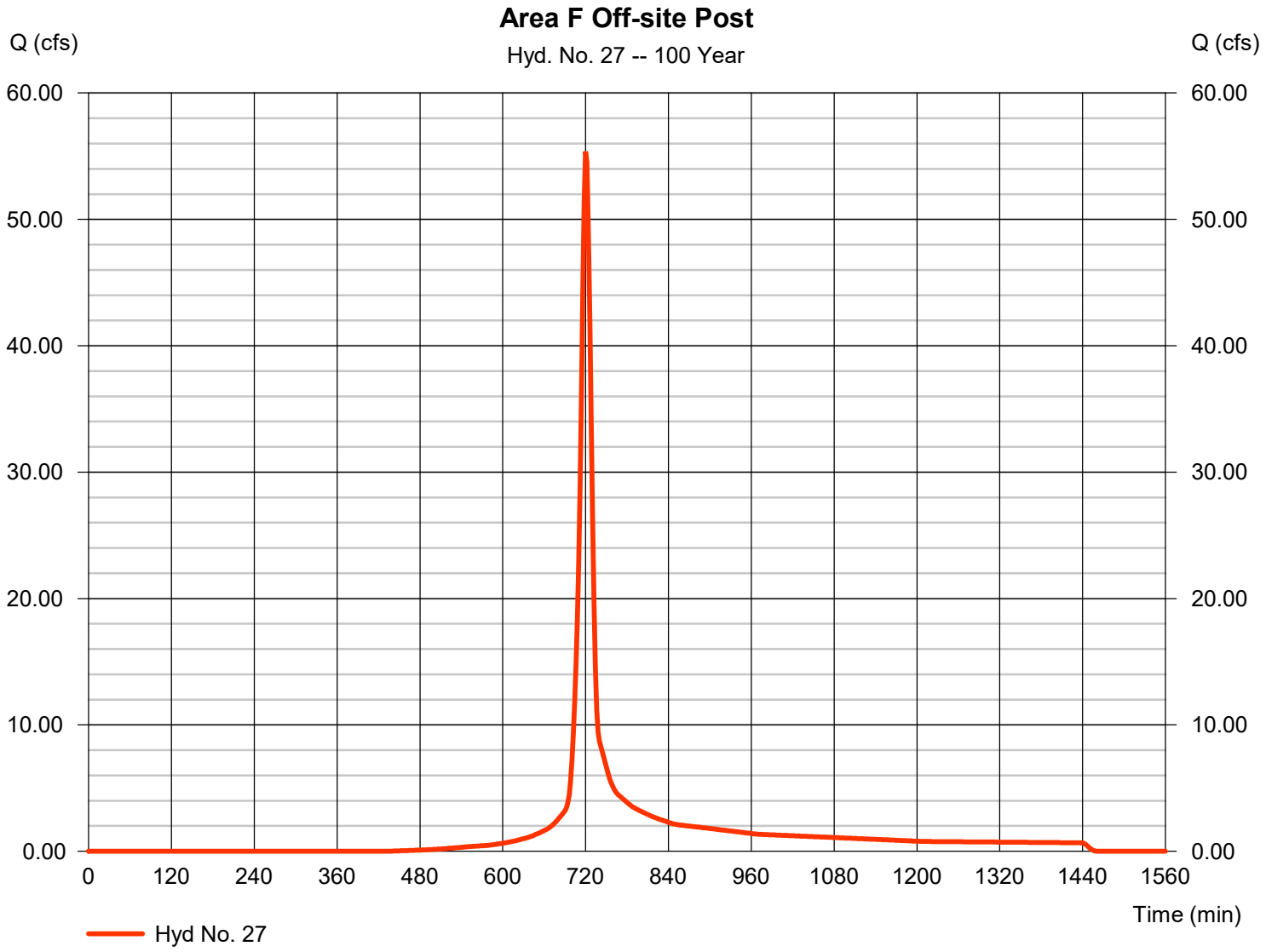


Hydrograph Report

Hyd. No. 27

Area F Off-site Post

Hydrograph type	= SCS Runoff	Peak discharge	= 55.37 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 143,751 cuft
Drainage area	= 8.730 ac	Curve number	= 72.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 12.60 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

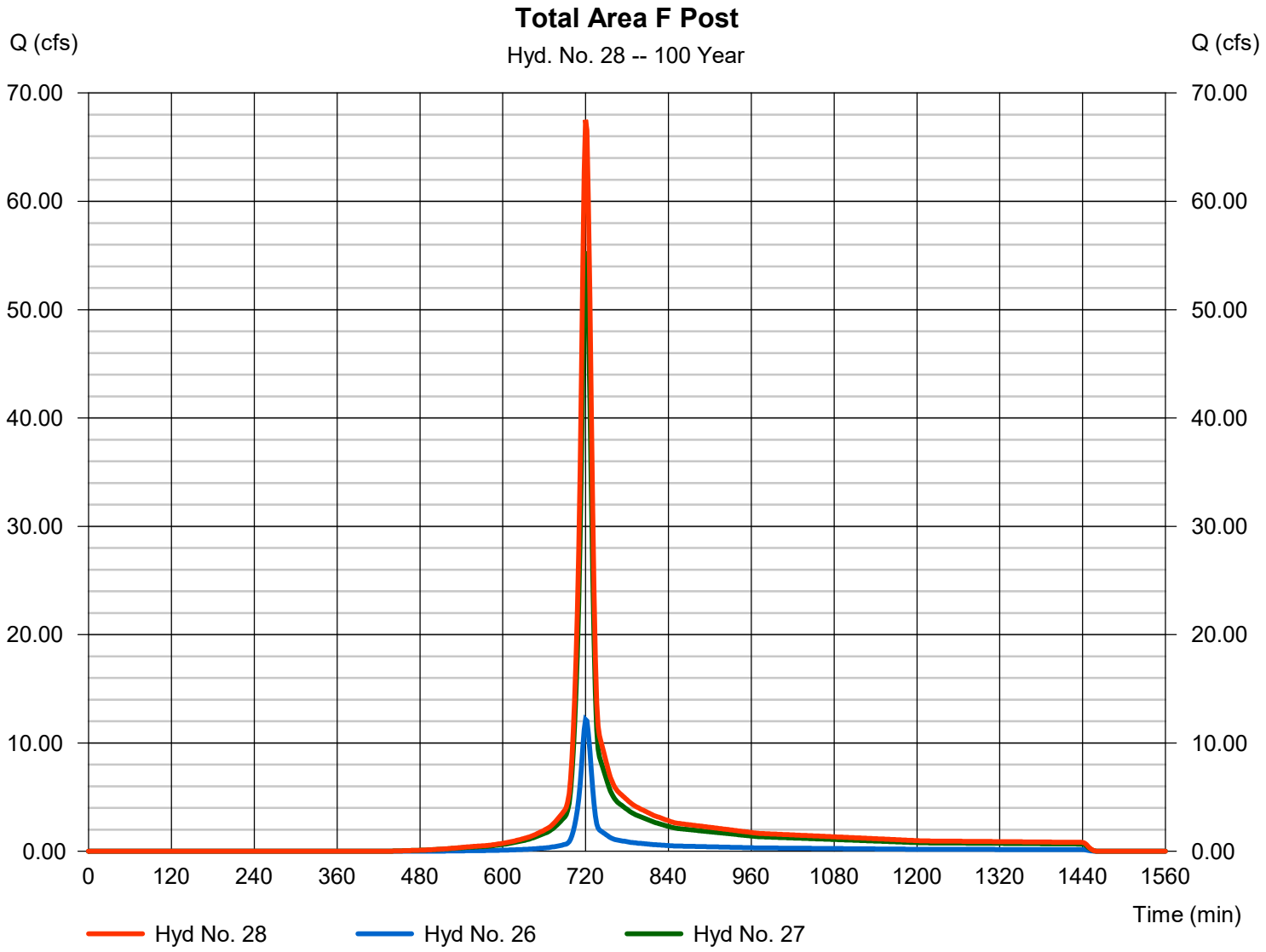


Hydrograph Report

Hyd. No. 28

Total Area F Post

Hydrograph type	= Combine	Peak discharge	= 67.52 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 175,244 cuft
Inflow hyds.	= 26, 27	Contrib. drain. area	= 10.840 ac

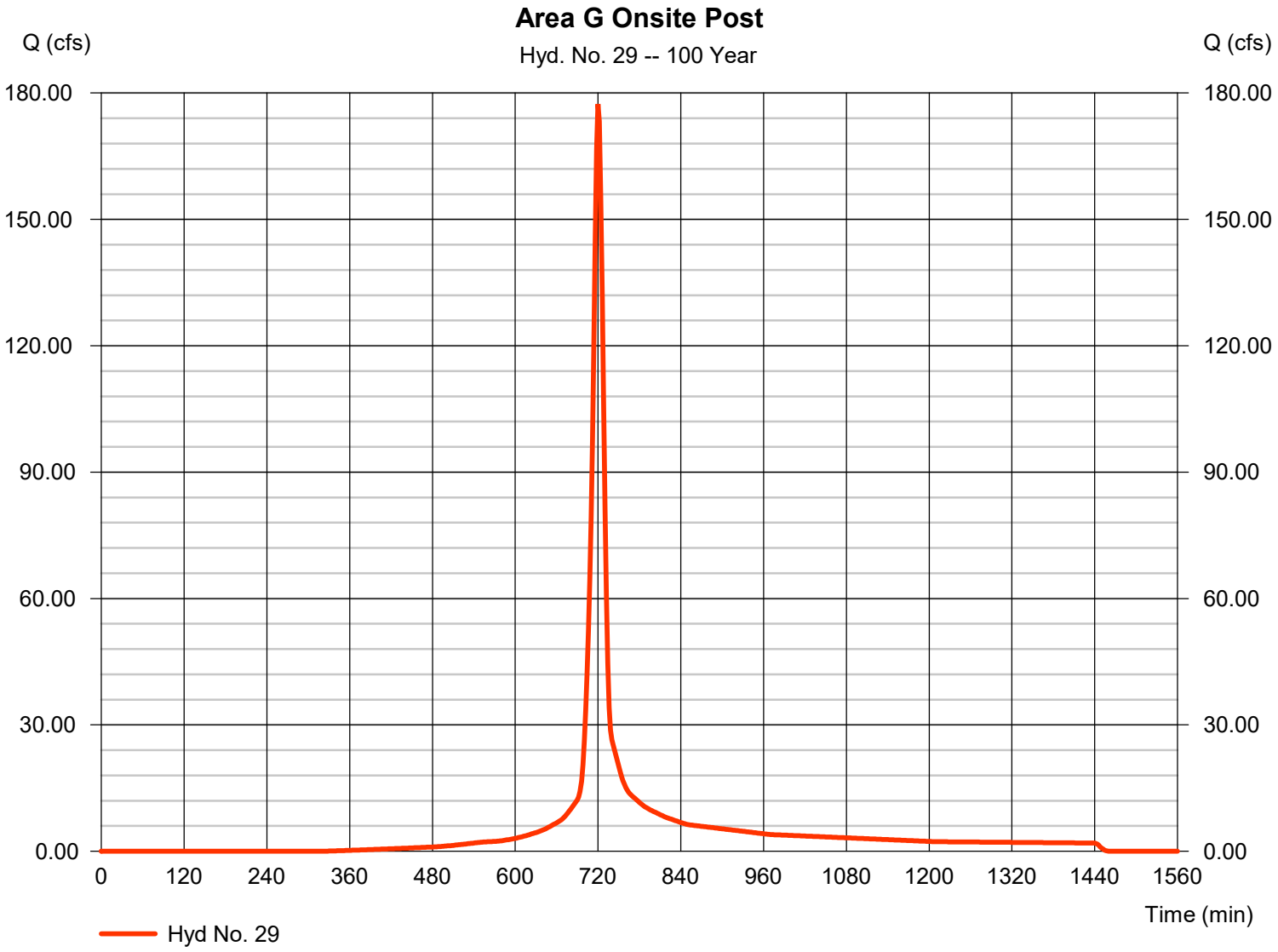


Hydrograph Report

Hyd. No. 29

Area G Onsite Post

Hydrograph type	= SCS Runoff	Peak discharge	= 177.41 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 467,841 cuft
Drainage area	= 23.810 ac	Curve number	= 79.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.40 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

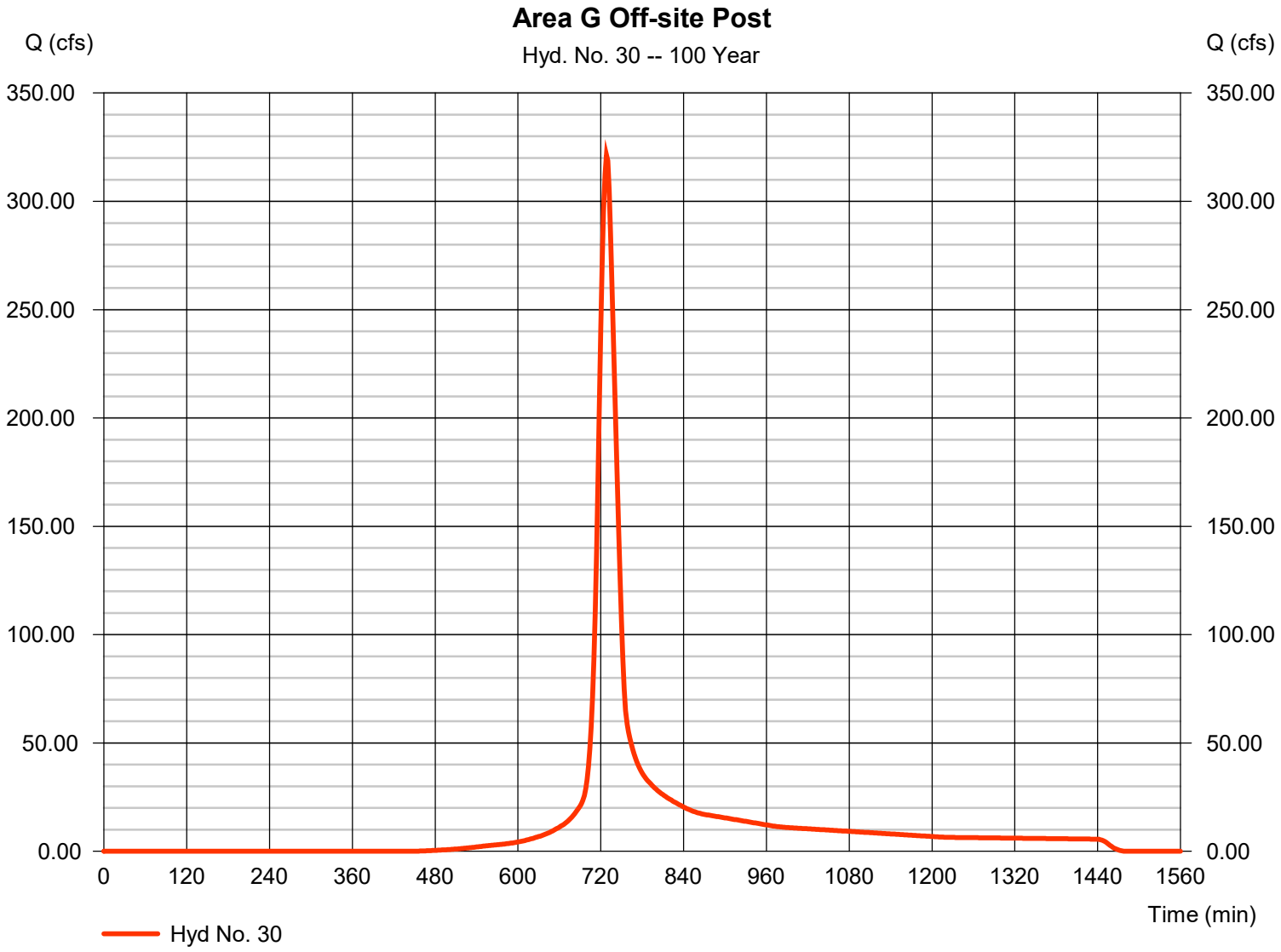


Hydrograph Report

Hyd. No. 30

Area G Off-site Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	321.43 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	1,179,500 cuft
Drainage area	=	76.600 ac	Curve number	=	71.6
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	23.80 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

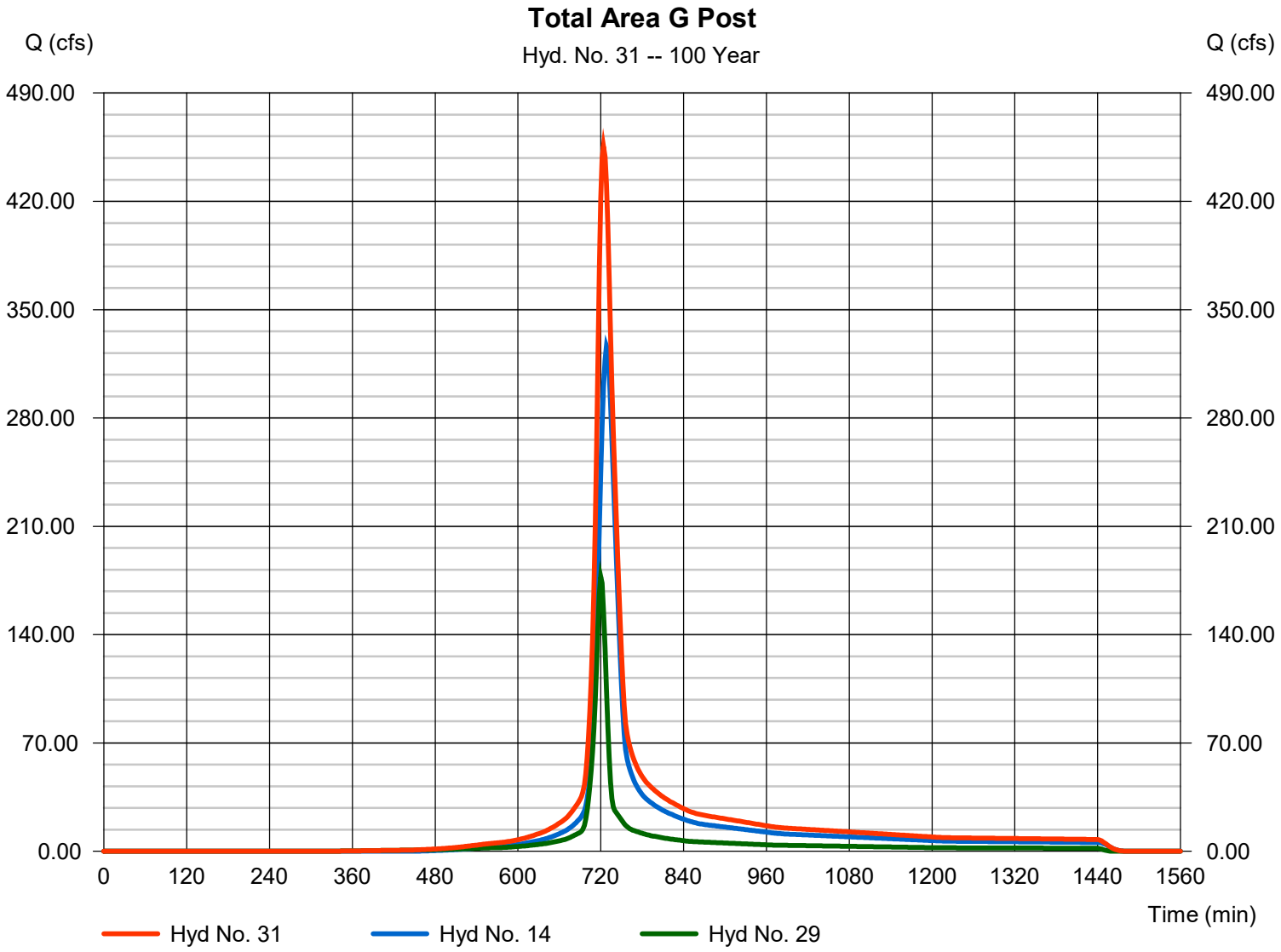


Hydrograph Report

Hyd. No. 31

Total Area G Post

Hydrograph type	= Combine	Peak discharge	= 455.56 cfs
Storm frequency	= 100 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,665,991 cuft
Inflow hyds.	= 14, 29	Contrib. drain. area	= 101.420 ac

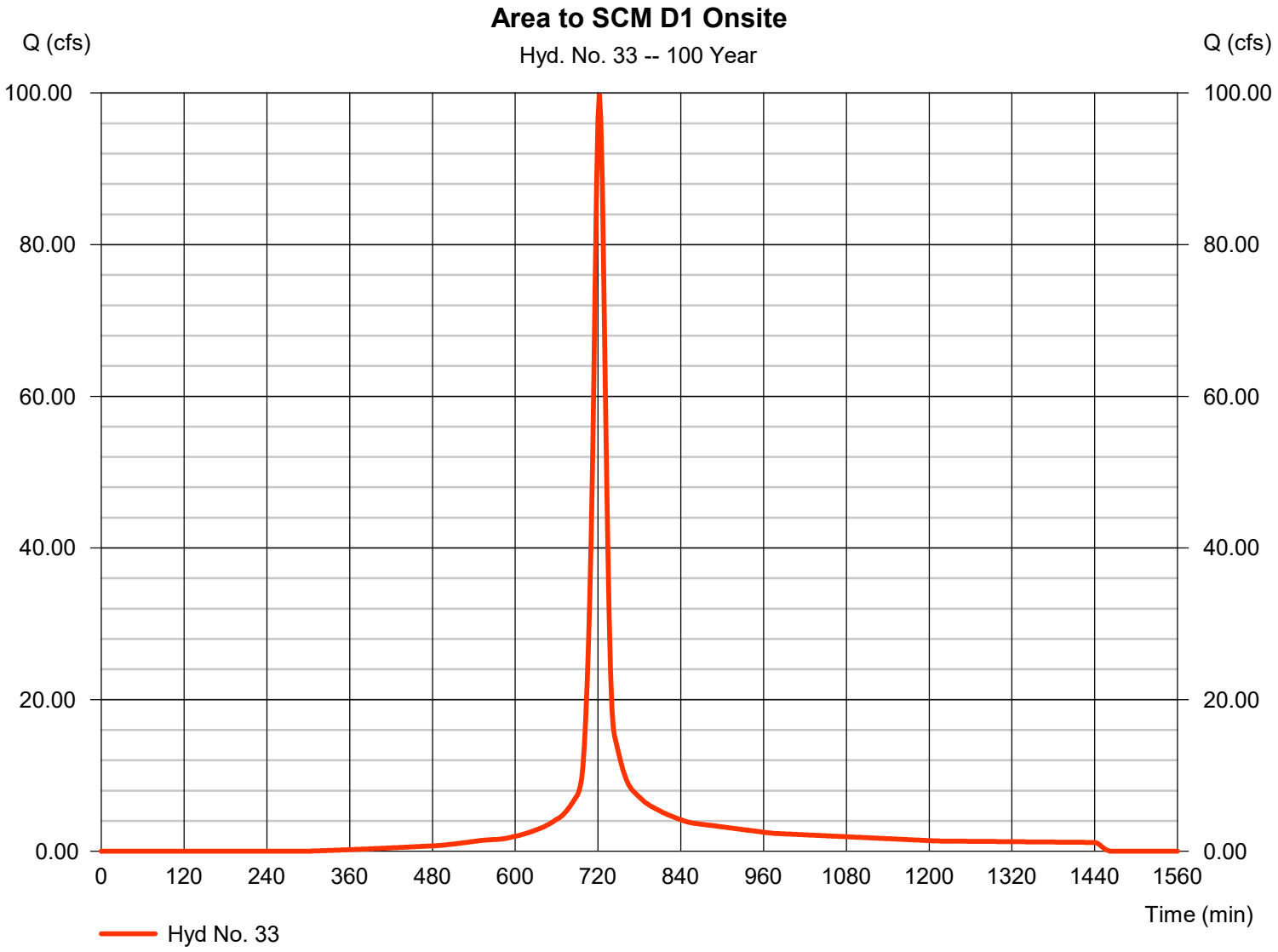


Hydrograph Report

Hyd. No. 33

Area to SCM D1 Onsite

Hydrograph type	= SCS Runoff	Peak discharge	= 99.91 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 286,137 cuft
Drainage area	= 14.850 ac	Curve number	= 81.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 16.30 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

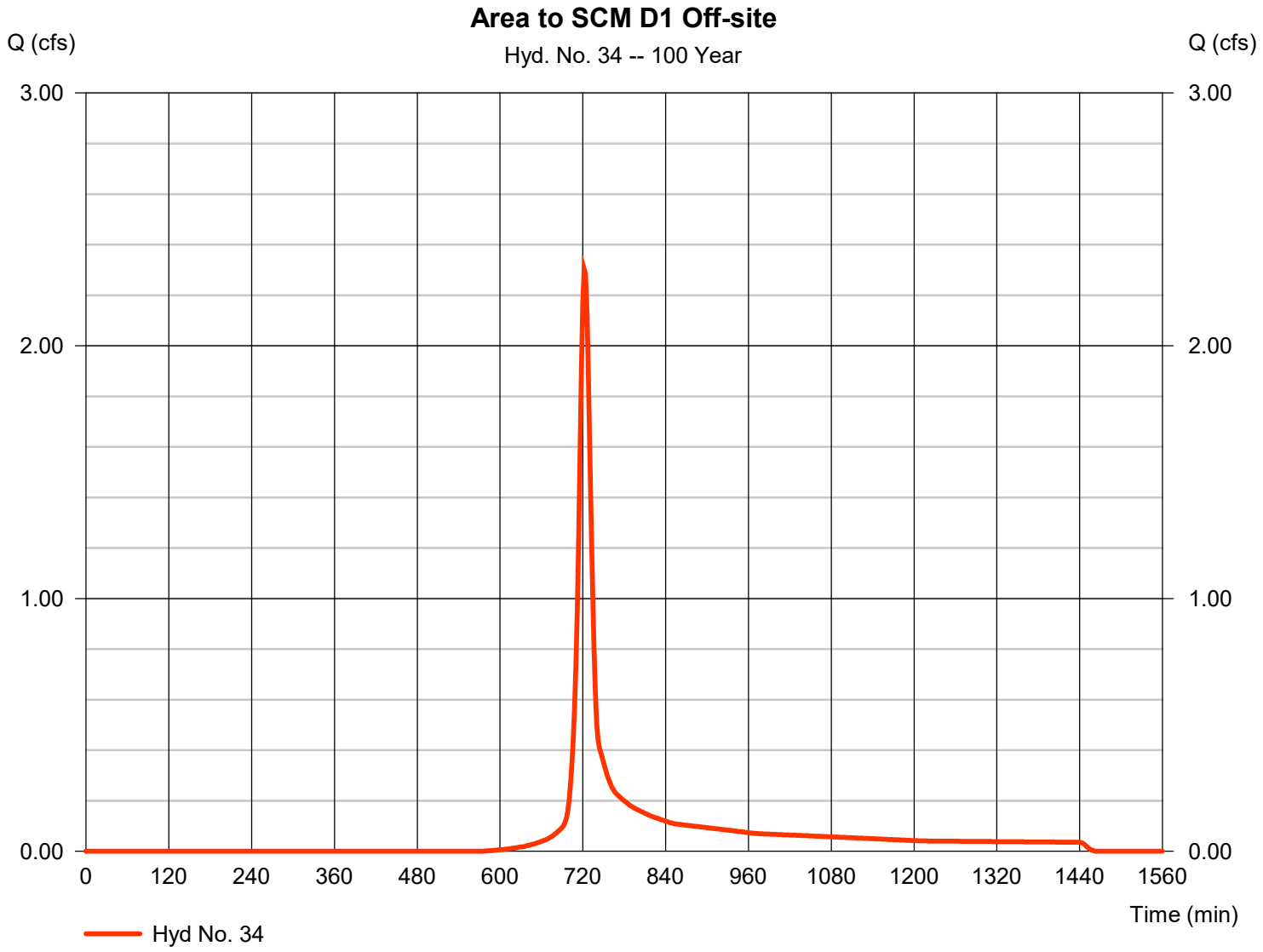


Hydrograph Report

Hyd. No. 34

Area to SCM D1 Off-site

Hydrograph type	= SCS Runoff	Peak discharge	= 2.303 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 6,520 cuft
Drainage area	= 0.560 ac	Curve number	= 62.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.30 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

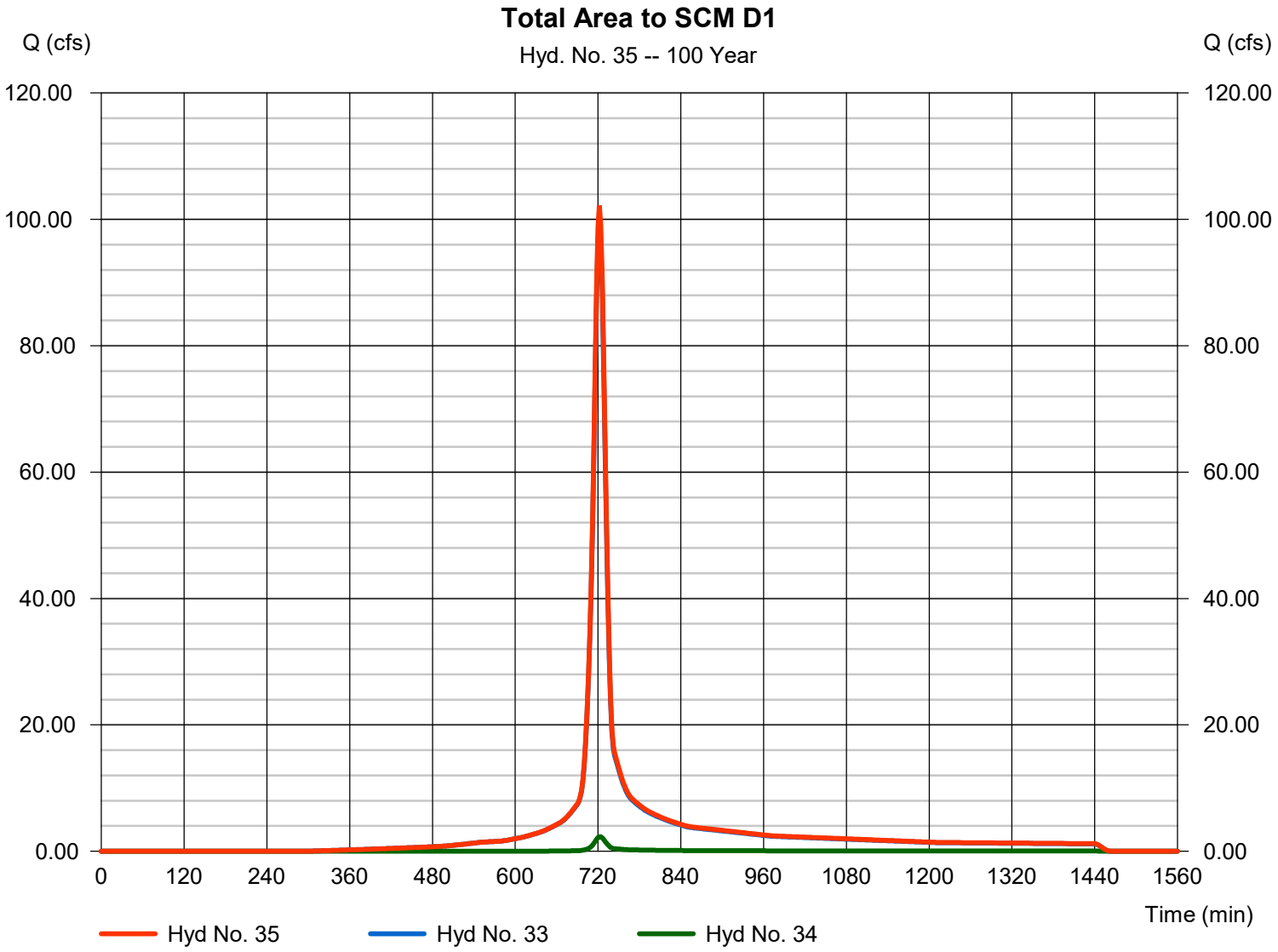


Hydrograph Report

Hyd. No. 35

Total Area to SCM D1

Hydrograph type	= Combine	Peak discharge	= 102.22 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 292,657 cuft
Inflow hyds.	= 33, 34	Contrib. drain. area	= 15.410 ac



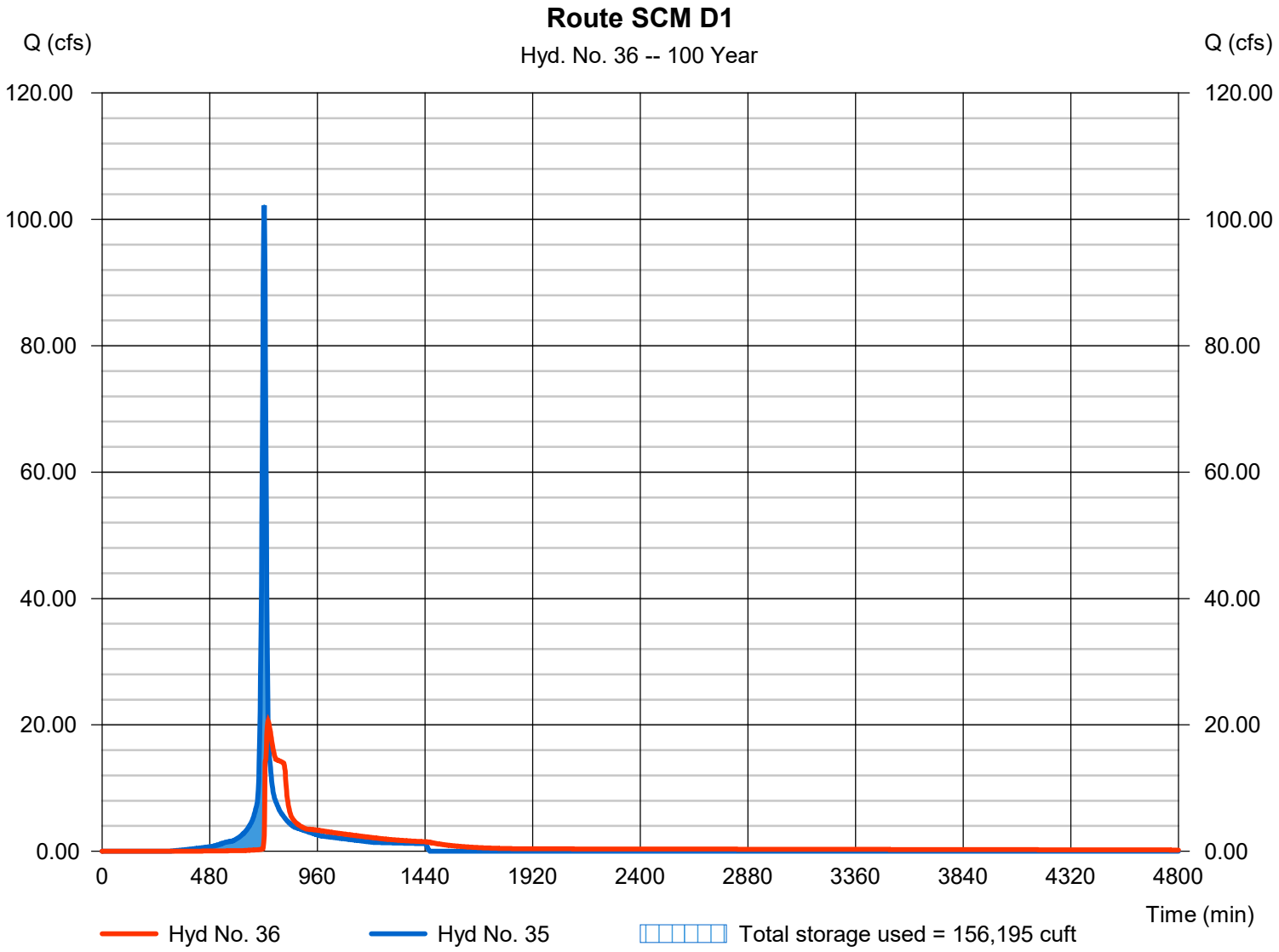
Hydrograph Report

Hyd. No. 36

Route SCM D1

Hydrograph type	=	Reservoir	Peak discharge	=	20.62 cfs
Storm frequency	=	100 yrs	Time to peak	=	740 min
Time interval	=	2 min	Hyd. volume	=	275,184 cuft
Inflow hyd. No.	=	35 - Total Area to SCM D1	Max. Elevation	=	387.93 ft
Reservoir name	=	SCM D1	Max. Storage	=	156,195 cuft

Storage Indication method used.

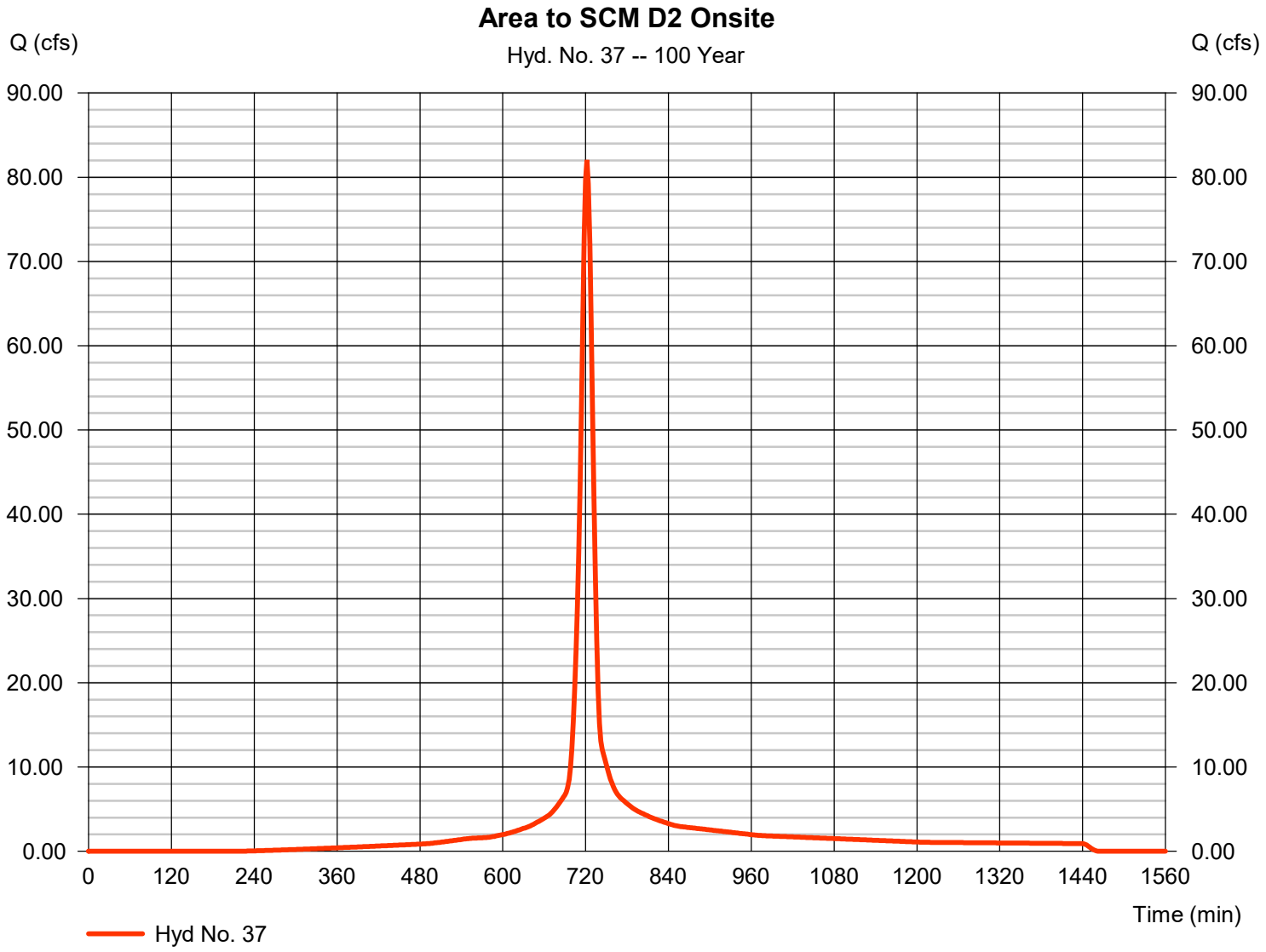


Hydrograph Report

Hyd. No. 37

Area to SCM D2 Onsite

Hydrograph type	= SCS Runoff	Peak discharge	= 82.06 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 240,446 cuft
Drainage area	= 11.300 ac	Curve number	= 86.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.80 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

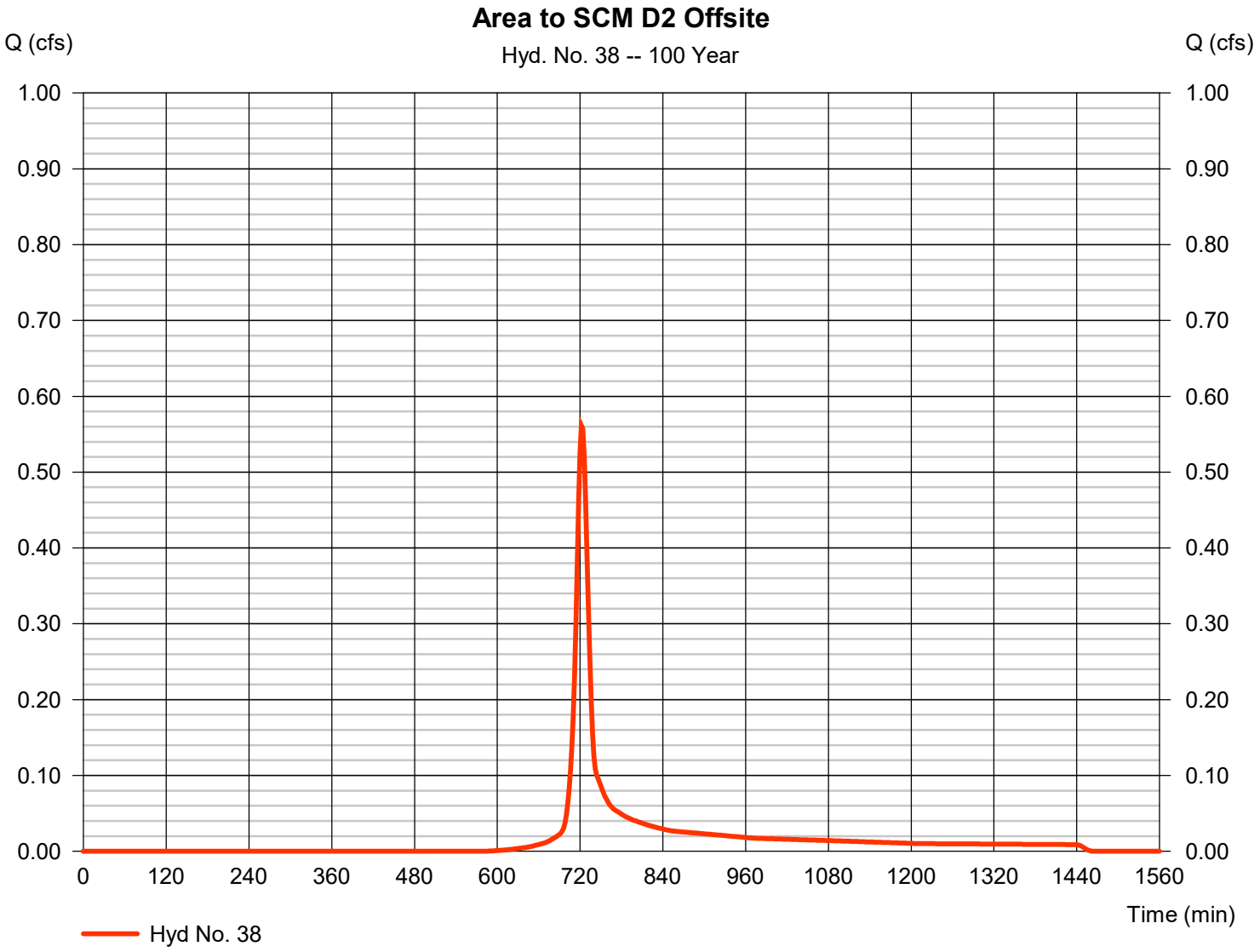


Hydrograph Report

Hyd. No. 38

Area to SCM D2 Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 0.561 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 1,593 cuft
Drainage area	= 0.140 ac	Curve number	= 61.6
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 13.80 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

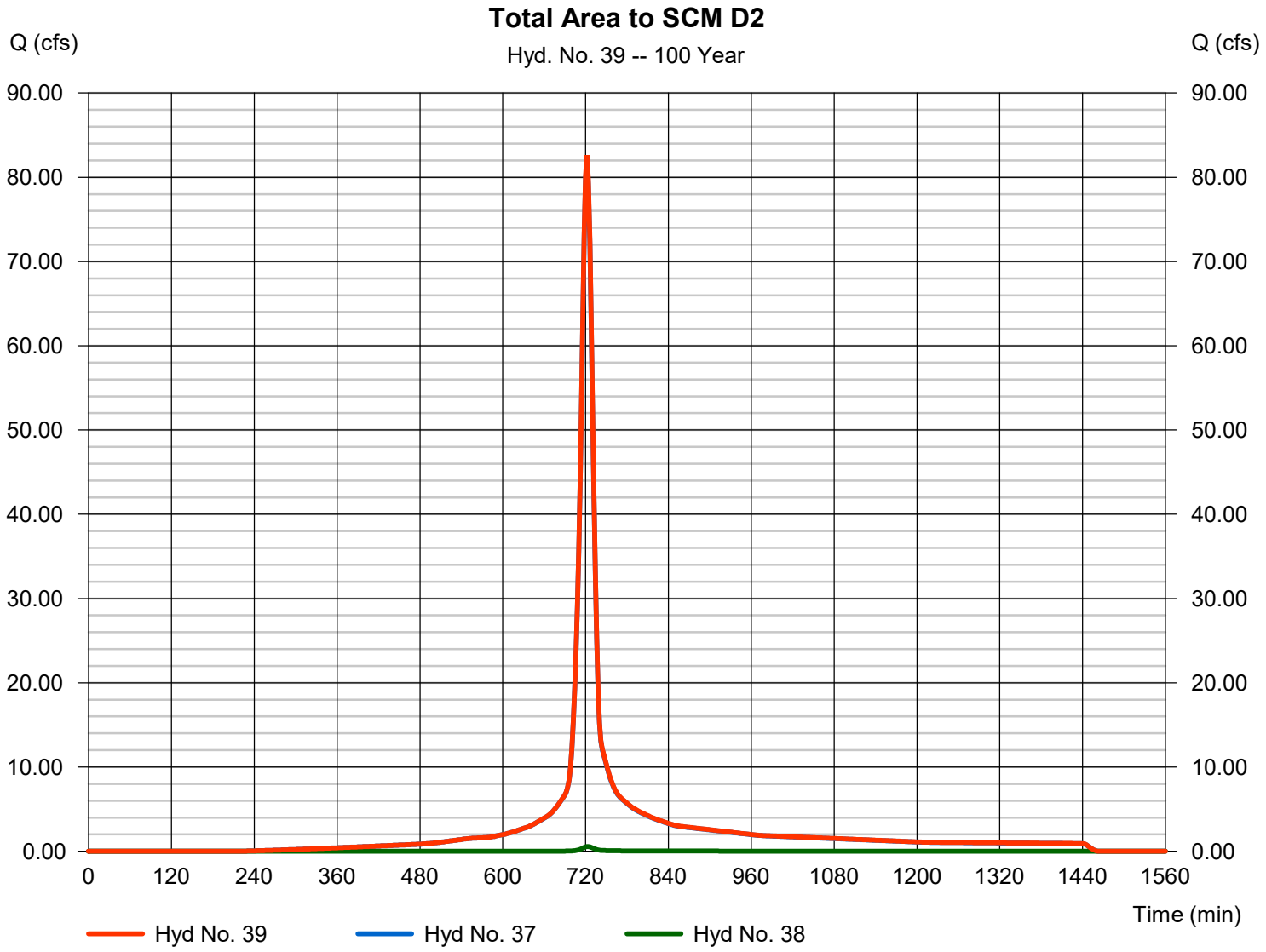


Hydrograph Report

Hyd. No. 39

Total Area to SCM D2

Hydrograph type	= Combine	Peak discharge	= 82.62 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 242,039 cuft
Inflow hyds.	= 37, 38	Contrib. drain. area	= 11.440 ac



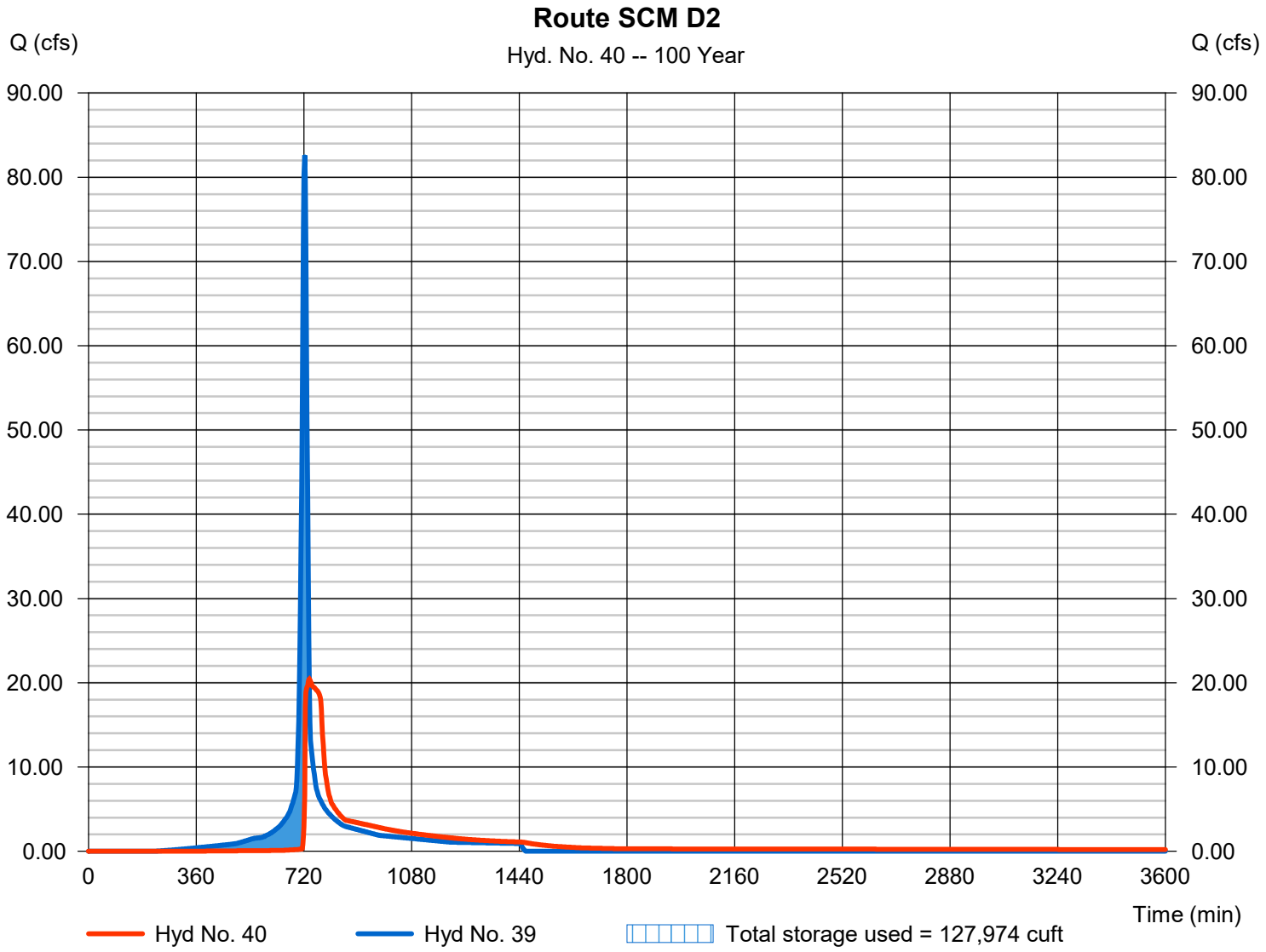
Hydrograph Report

Hyd. No. 40

Route SCM D2

Hydrograph type	=	Reservoir	Peak discharge	=	20.43 cfs
Storm frequency	=	100 yrs	Time to peak	=	738 min
Time interval	=	2 min	Hyd. volume	=	224,105 cuft
Inflow hyd. No.	=	39 - Total Area to SCM D2	Max. Elevation	=	394.60 ft
Reservoir name	=	SCM D2	Max. Storage	=	127,974 cuft

Storage Indication method used.

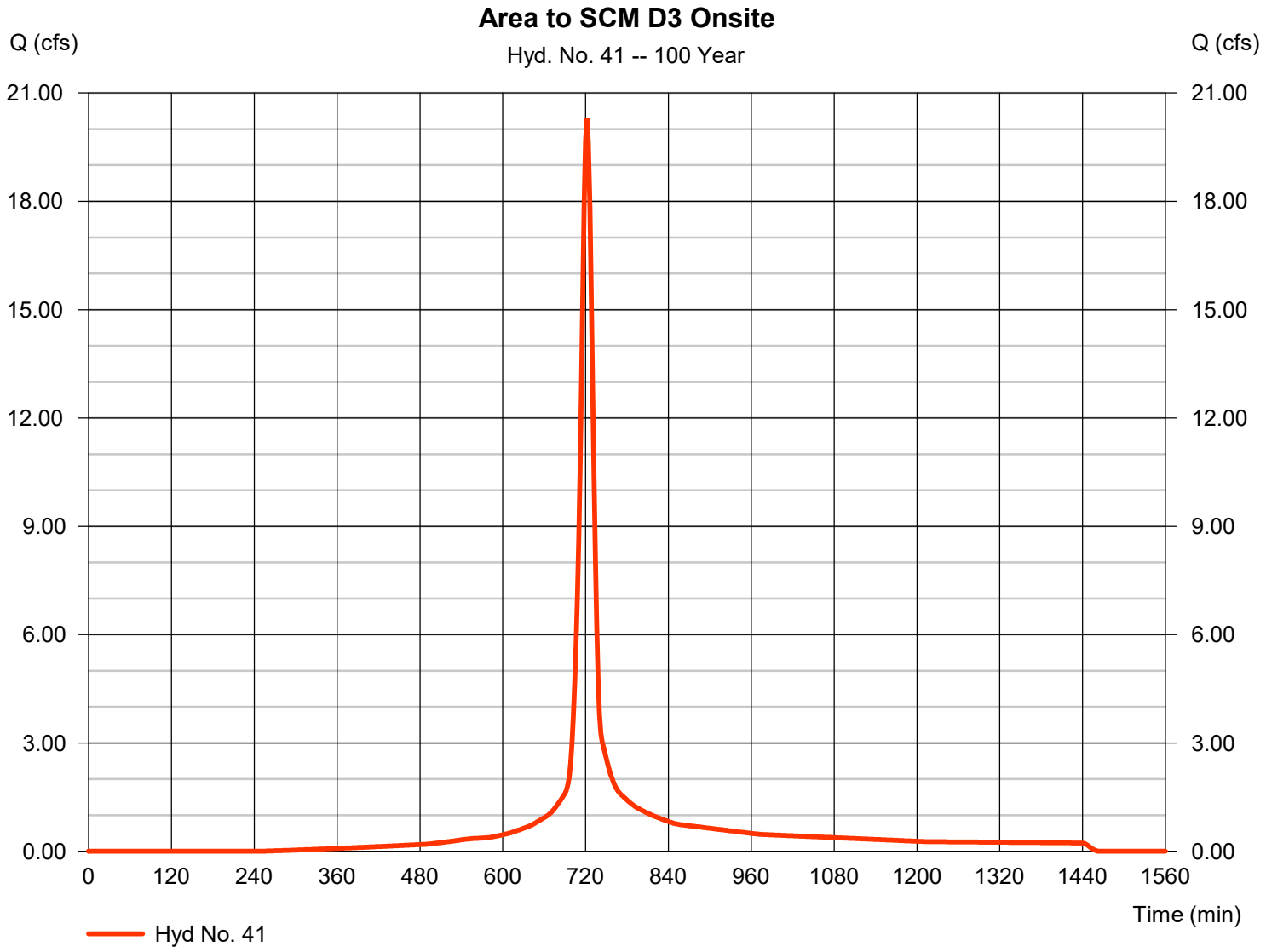


Hydrograph Report

Hyd. No. 41

Area to SCM D3 Onsite

Hydrograph type	= SCS Runoff	Peak discharge	= 20.31 cfs
Storm frequency	= 100 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 58,942 cuft
Drainage area	= 2.870 ac	Curve number	= 84.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.20 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



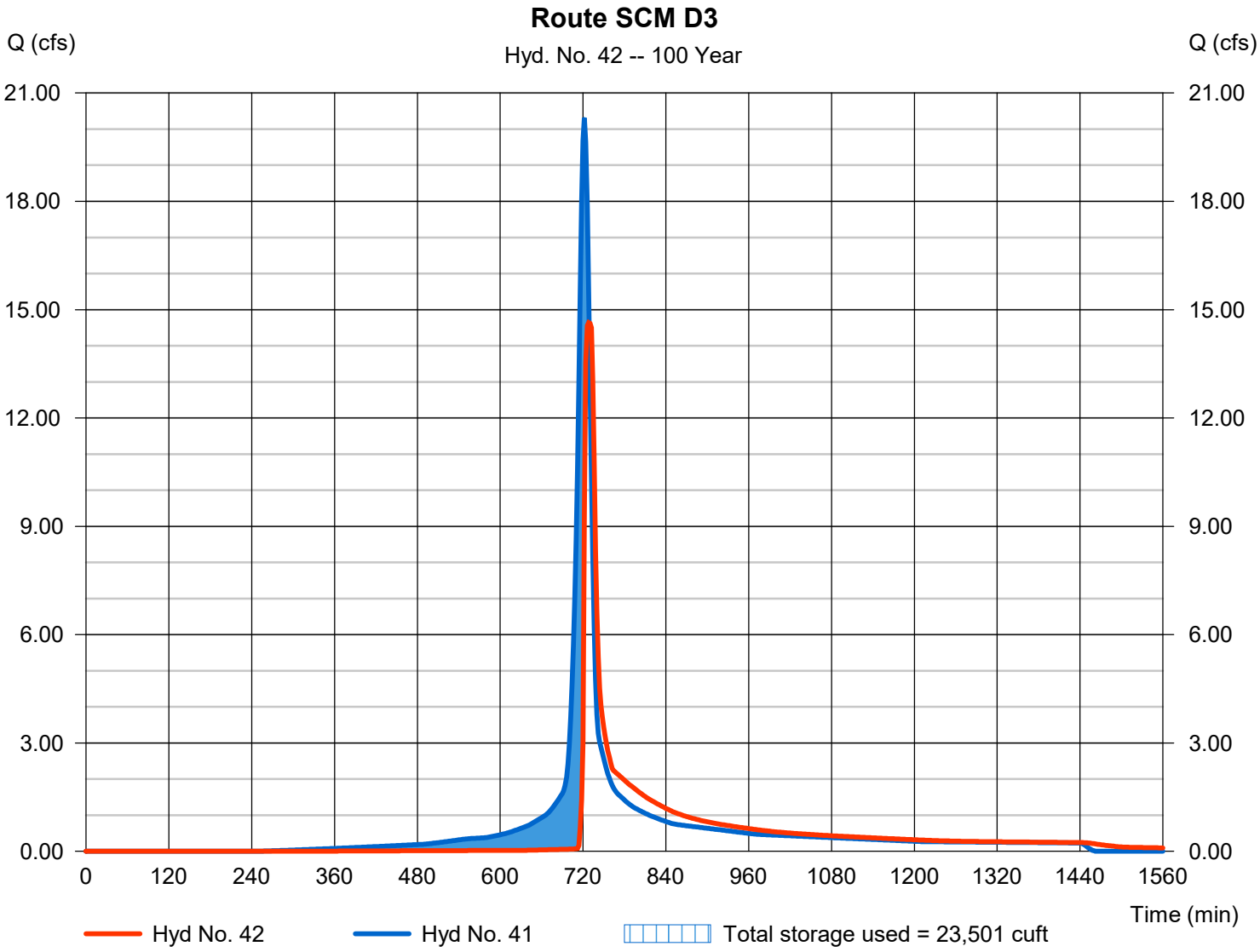
Hydrograph Report

Hyd. No. 42

Route SCM D3

Hydrograph type	=	Reservoir	Peak discharge	=	14.64 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	56,415 cuft
Inflow hyd. No.	=	41 - Area to SCM D3 Onsite	Max. Elevation	=	385.96 ft
Reservoir name	=	SCM D3	Max. Storage	=	23,501 cuft

Storage Indication method used.

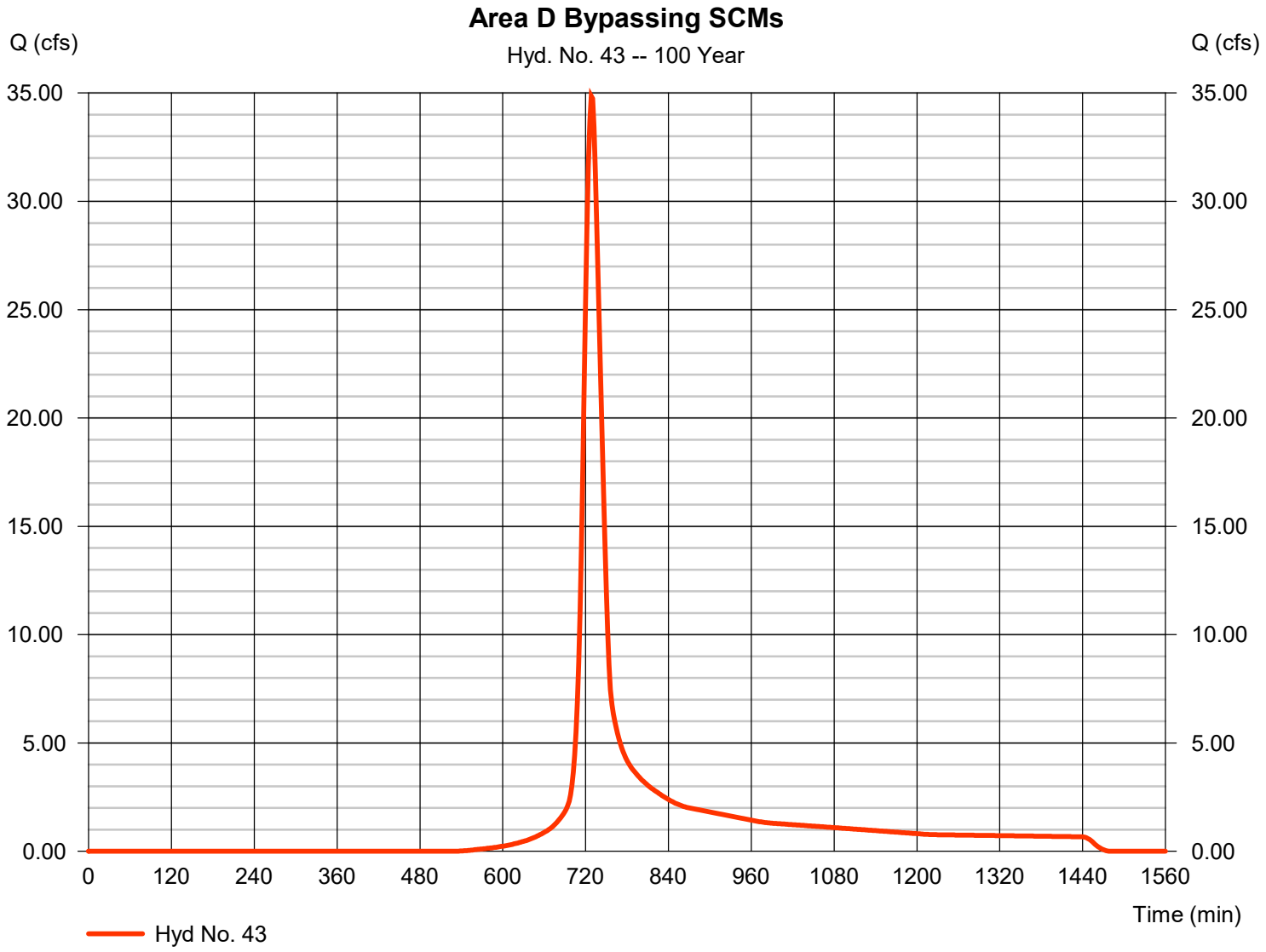


Hydrograph Report

Hyd. No. 43

Area D Bypassing SCMs

Hydrograph type	= SCS Runoff	Peak discharge	= 34.86 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 128,997 cuft
Drainage area	= 9.870 ac	Curve number	= 65.7
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 24.00 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

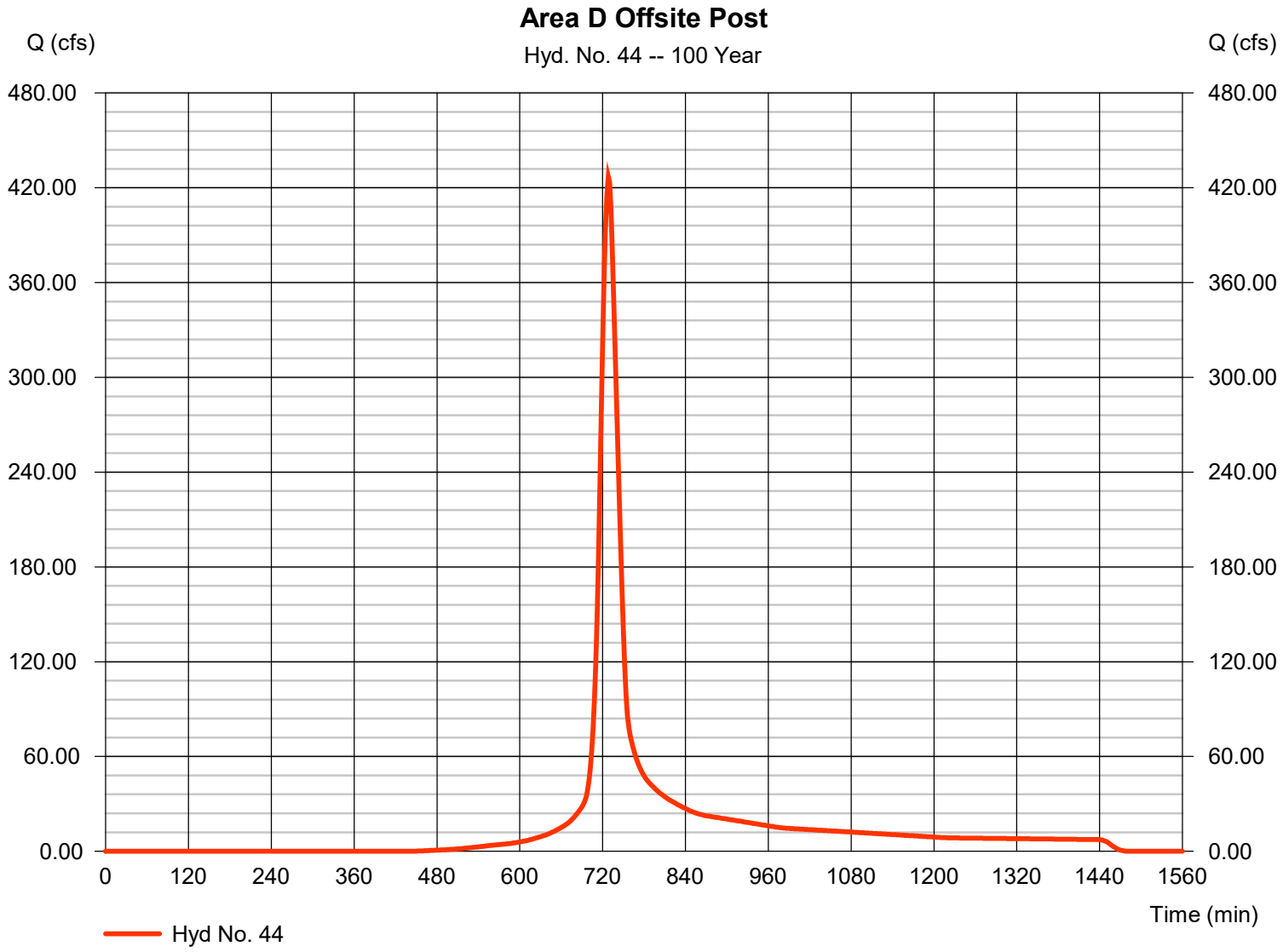


Hydrograph Report

Hyd. No. 44

Area D Offsite Post

Hydrograph type	=	SCS Runoff	Peak discharge	=	426.95 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	2 min	Hyd. volume	=	1,566,526 cuft
Drainage area	=	100.690 ac	Curve number	=	72
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.00 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

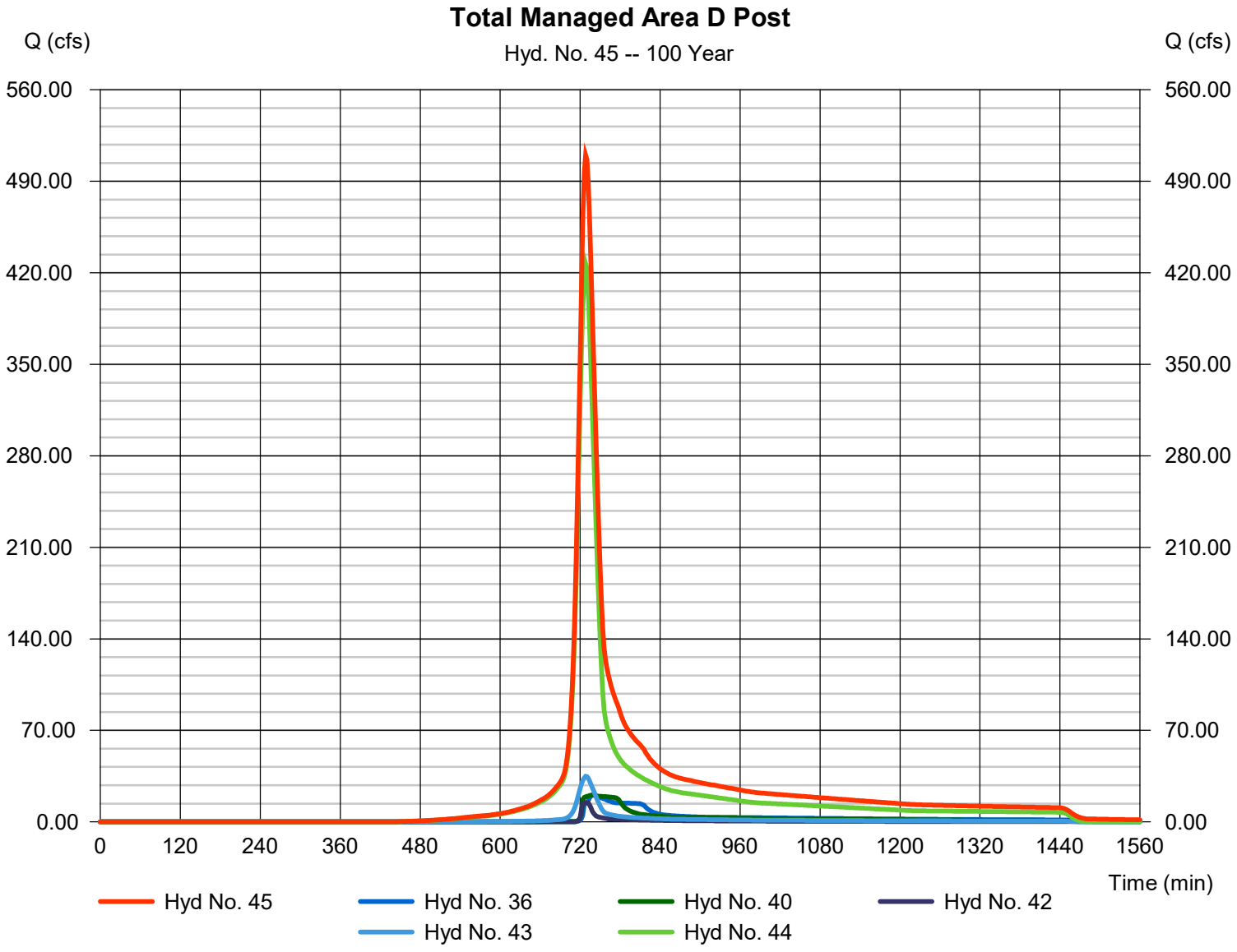


Hydrograph Report

Hyd. No. 45

Total Managed Area D Post

Hydrograph type	= Combine	Peak discharge	= 509.98 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 2,251,225 cuft
Inflow hyds.	= 36, 40, 42, 43, 44	Contrib. drain. area	= 110.560 ac

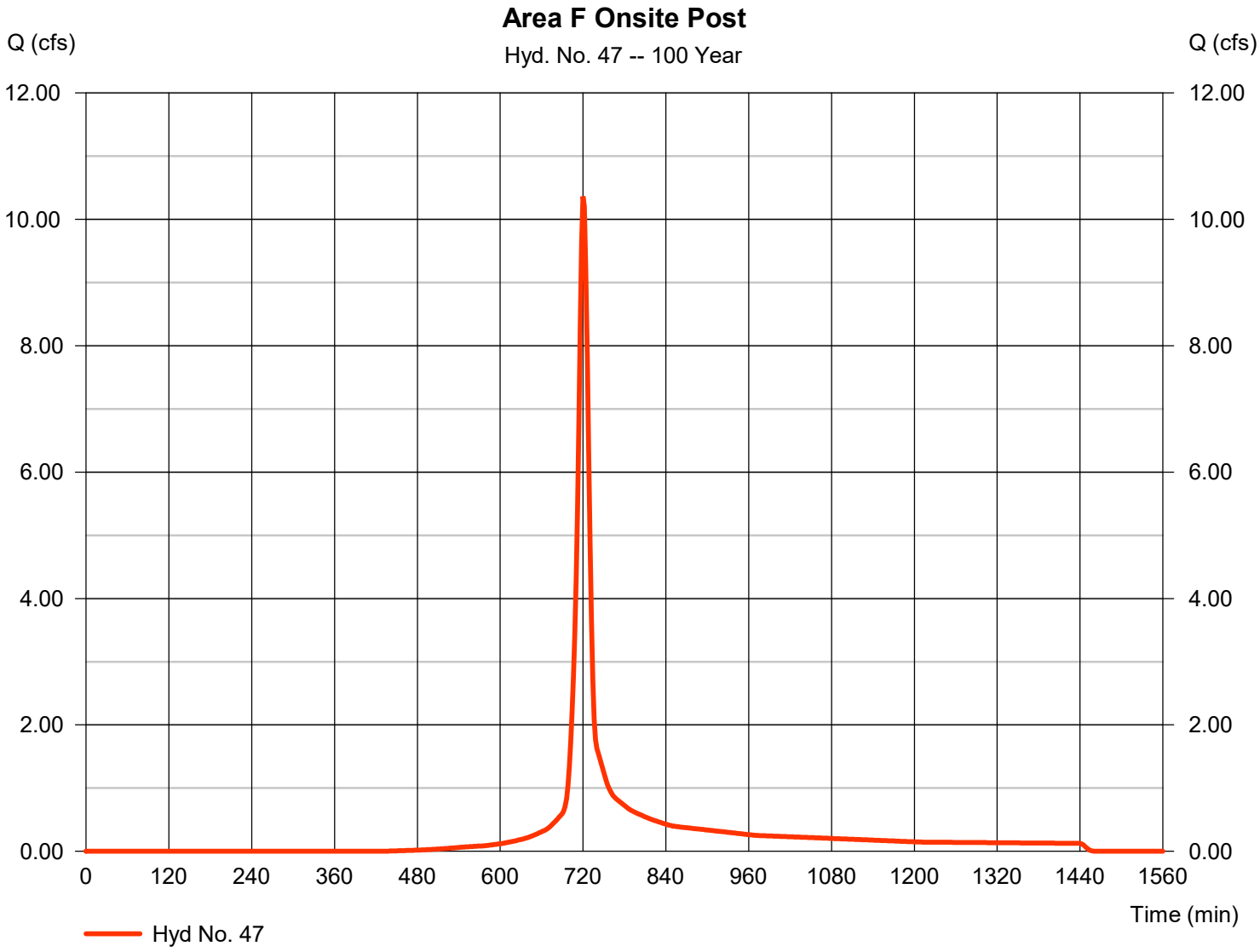


Hydrograph Report

Hyd. No. 47

Area F Onsite Post

Hydrograph type	= SCS Runoff	Peak discharge	= 10.36 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 26,909 cuft
Drainage area	= 1.630 ac	Curve number	= 72.5
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 12.60 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

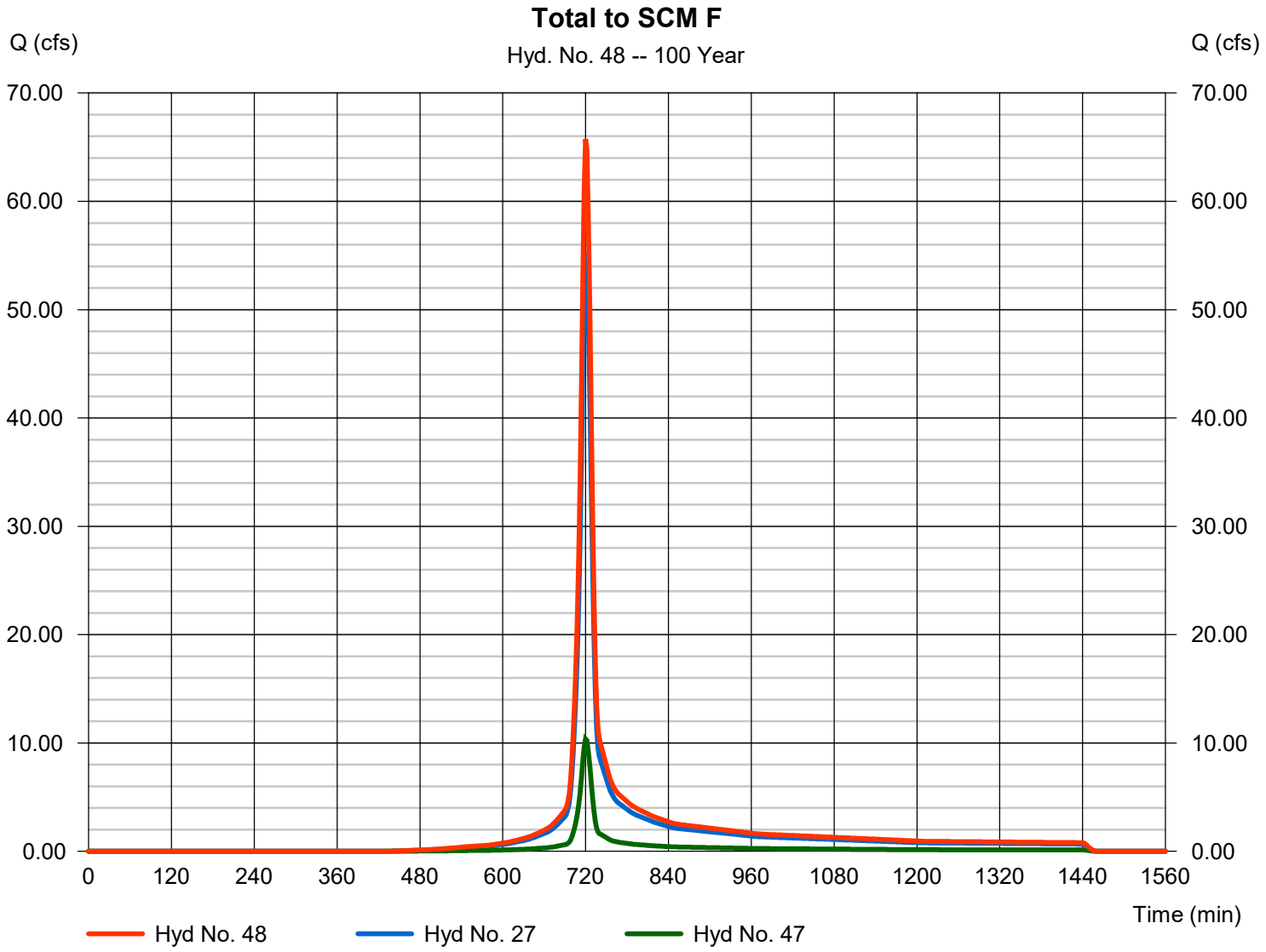


Hydrograph Report

Hyd. No. 48

Total to SCM F

Hydrograph type	= Combine	Peak discharge	= 65.74 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 170,660 cuft
Inflow hyds.	= 27, 47	Contrib. drain. area	= 10.360 ac



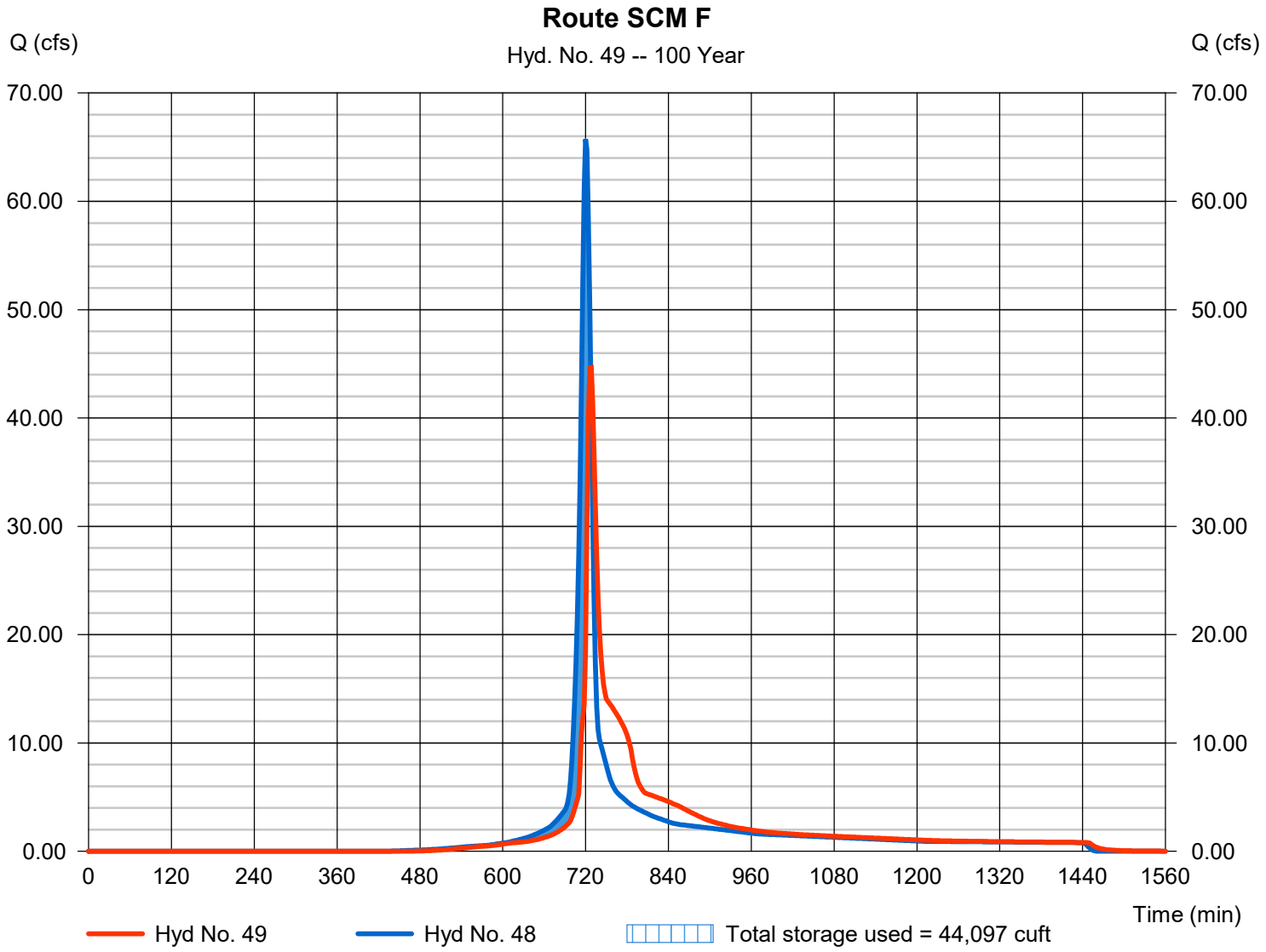
Hydrograph Report

Hyd. No. 49

Route SCM F

Hydrograph type	= Reservoir	Peak discharge	= 44.66 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 170,650 cuft
Inflow hyd. No.	= 48 - Total to SCM F	Max. Elevation	= 391.94 ft
Reservoir name	= SCM F	Max. Storage	= 44,097 cuft

Storage Indication method used.

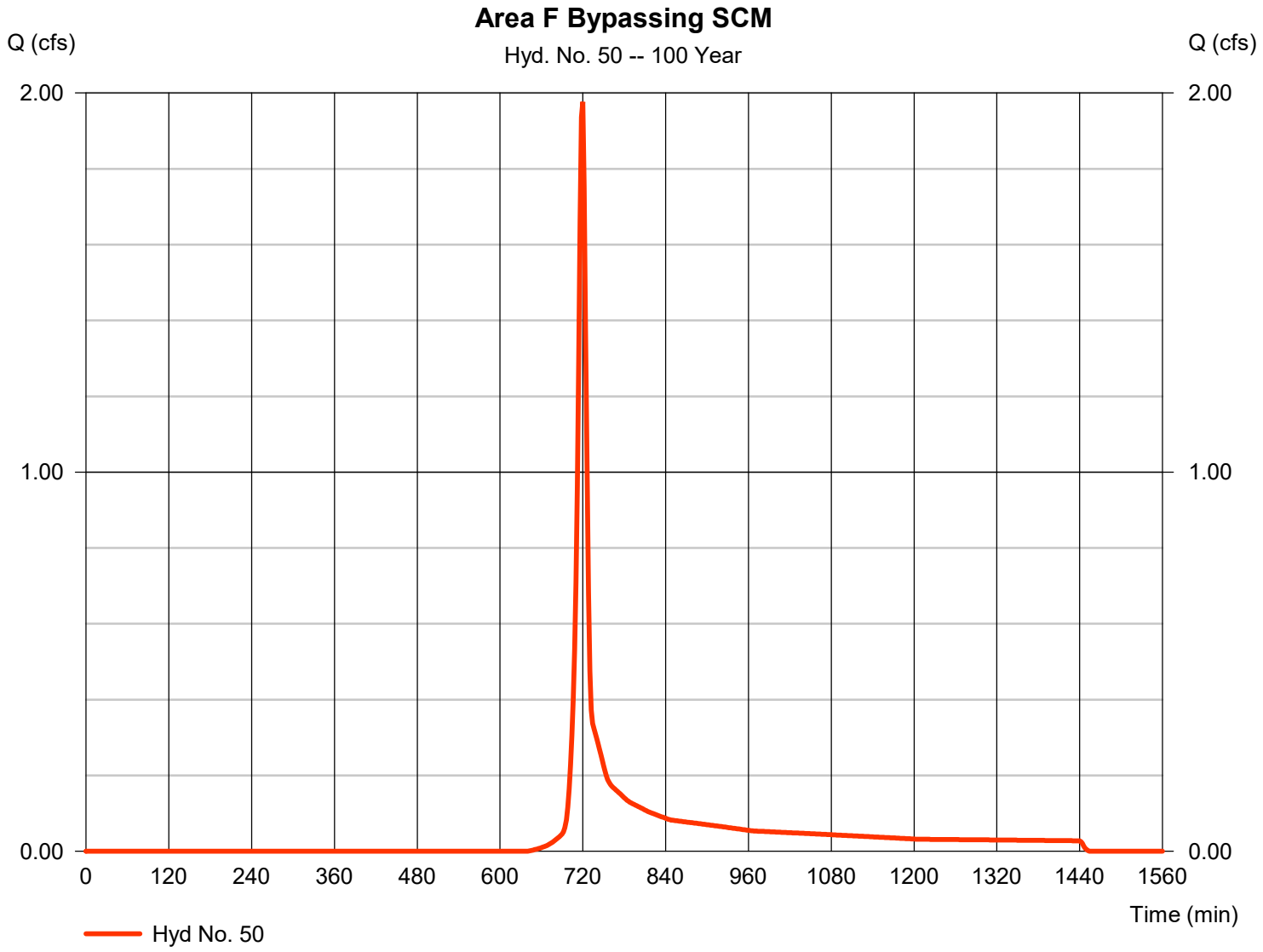


Hydrograph Report

Hyd. No. 50

Area F Bypassing SCM

Hydrograph type	= SCS Runoff	Peak discharge	= 1.976 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 4,554 cuft
Drainage area	= 0.480 ac	Curve number	= 55.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.60 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

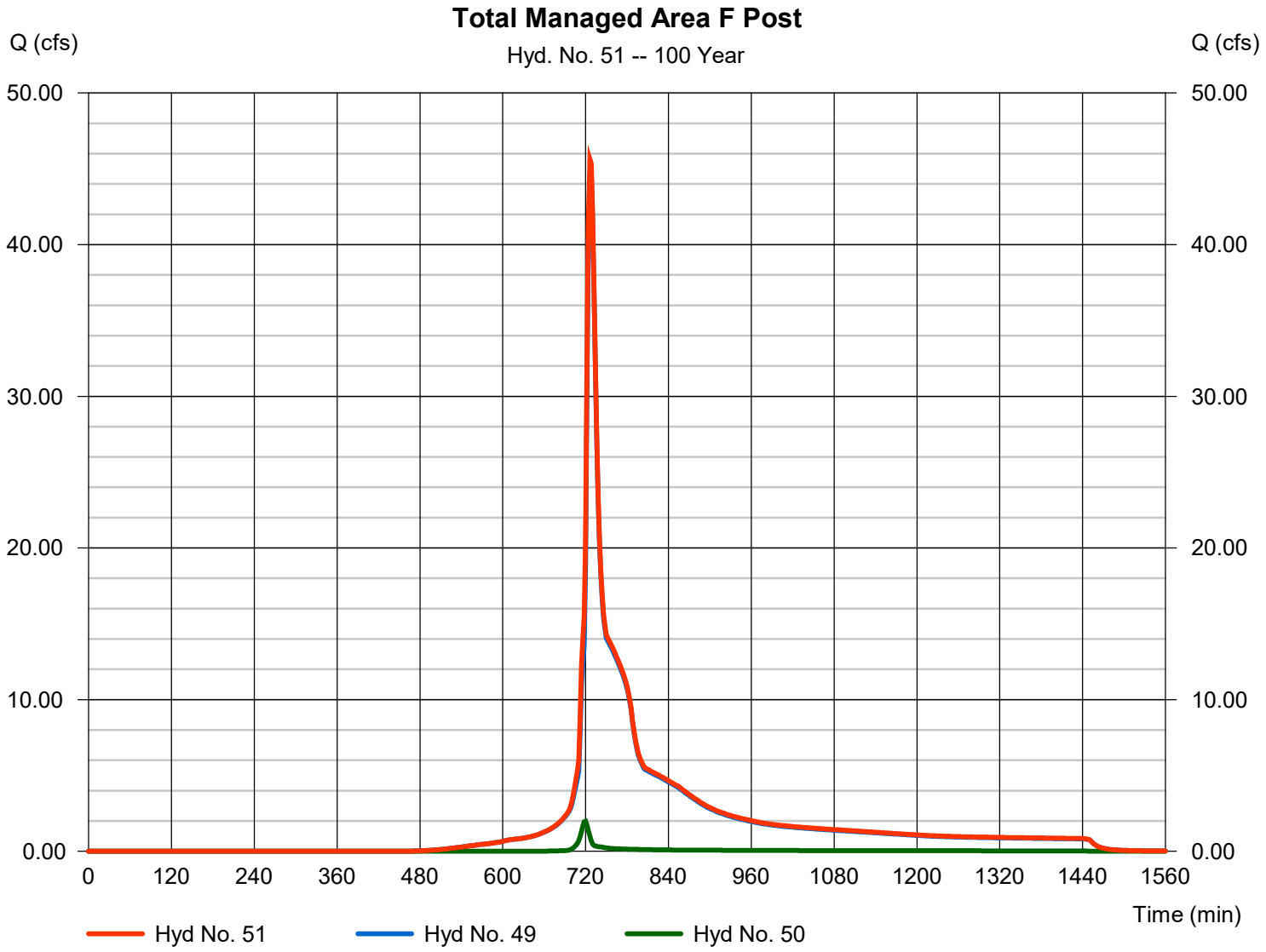


Hydrograph Report

Hyd. No. 51

Total Managed Area F Post

Hydrograph type	= Combine	Peak discharge	= 45.62 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 175,205 cuft
Inflow hyds.	= 49, 50	Contrib. drain. area	= 0.480 ac

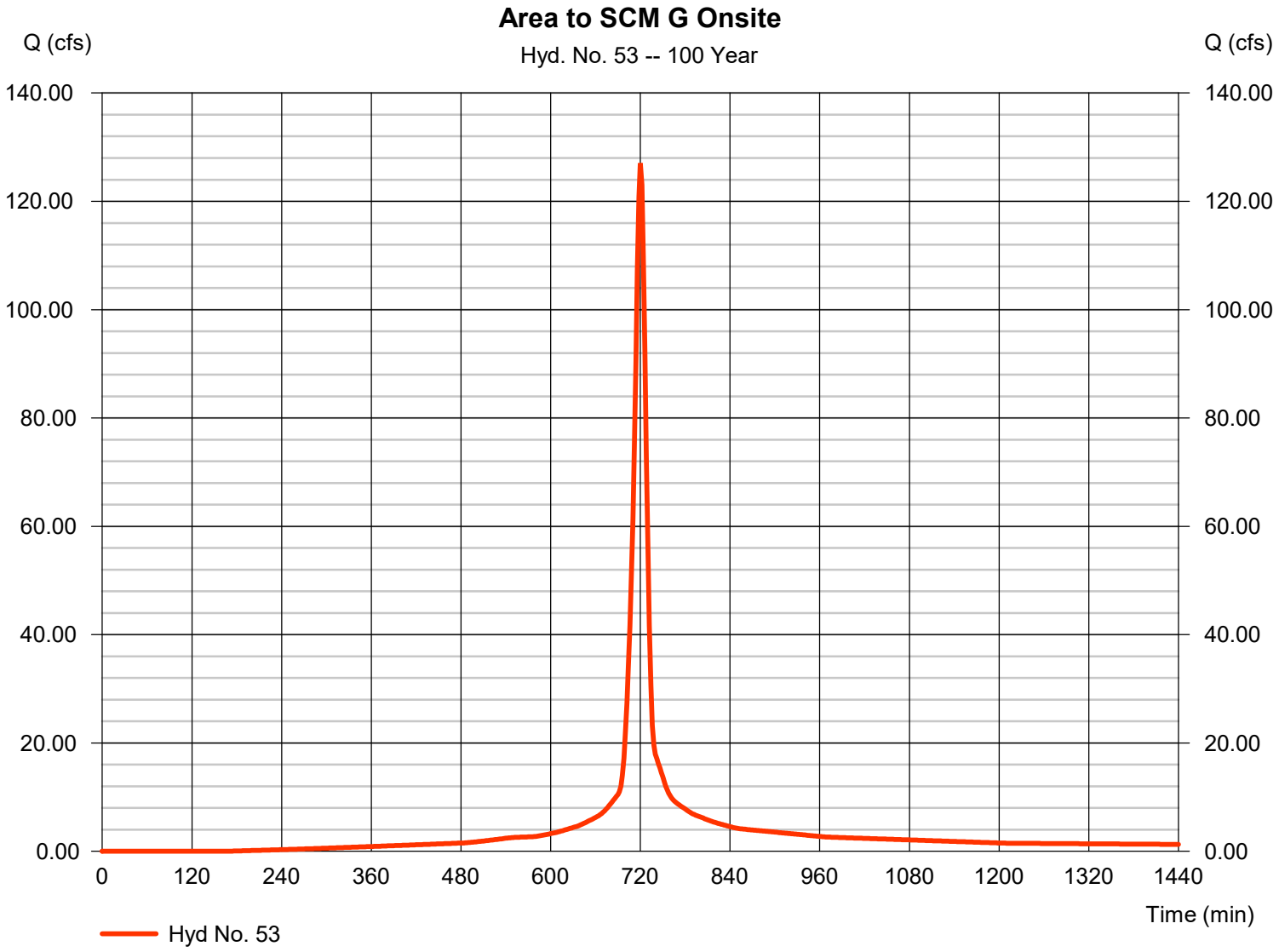


Hydrograph Report

Hyd. No. 53

Area to SCM G Onsite

Hydrograph type	= SCS Runoff	Peak discharge	= 127.06 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 352,814 cuft
Drainage area	= 14.730 ac	Curve number	= 89.8
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.40 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

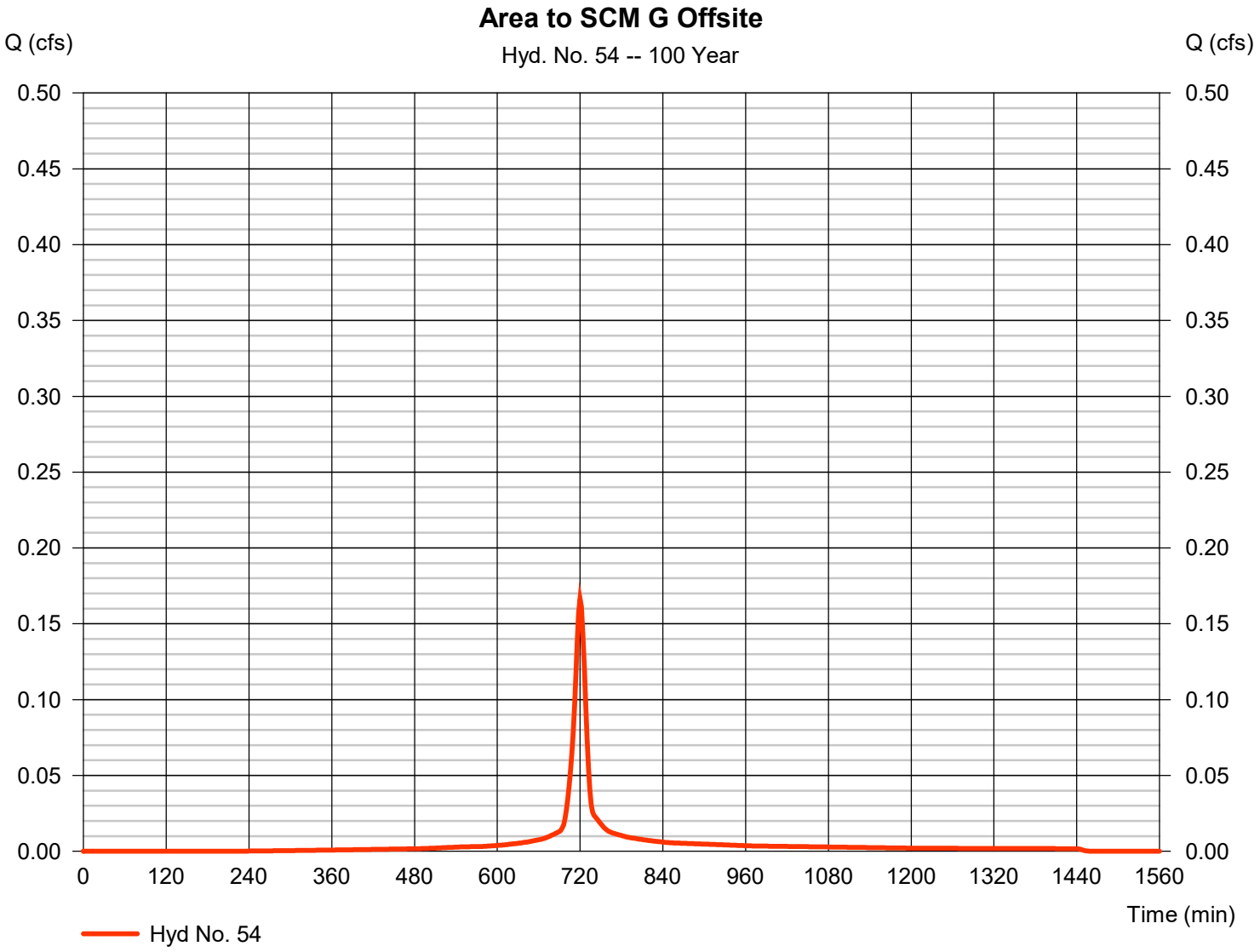


Hydrograph Report

Hyd. No. 54

Area to SCM G Offsite

Hydrograph type	= SCS Runoff	Peak discharge	= 0.166 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 453 cuft
Drainage area	= 0.020 ac	Curve number	= 86.8
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.40 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

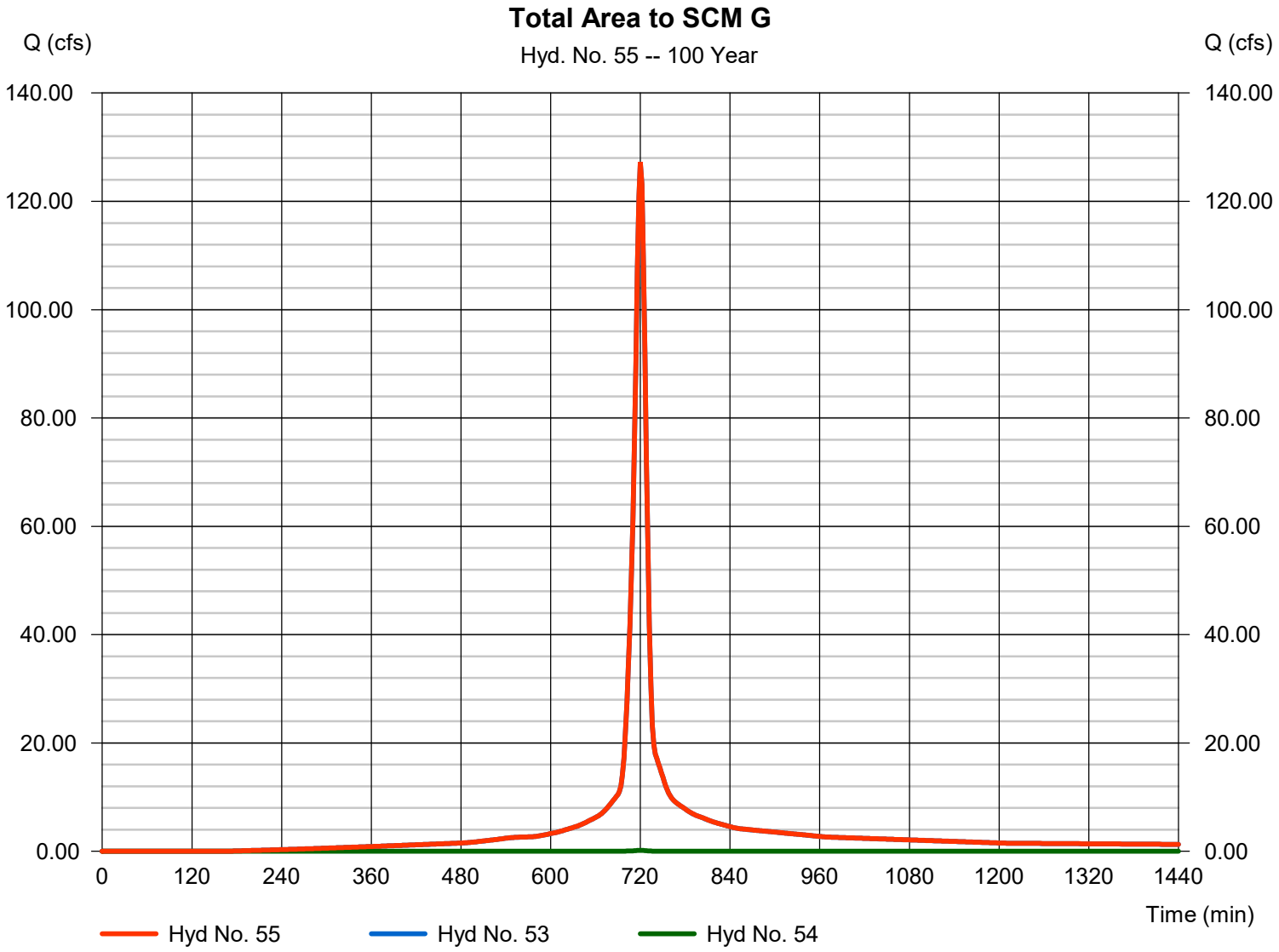


Hydrograph Report

Hyd. No. 55

Total Area to SCM G

Hydrograph type	= Combine	Peak discharge	= 127.23 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 353,267 cuft
Inflow hyds.	= 53, 54	Contrib. drain. area	= 14.750 ac



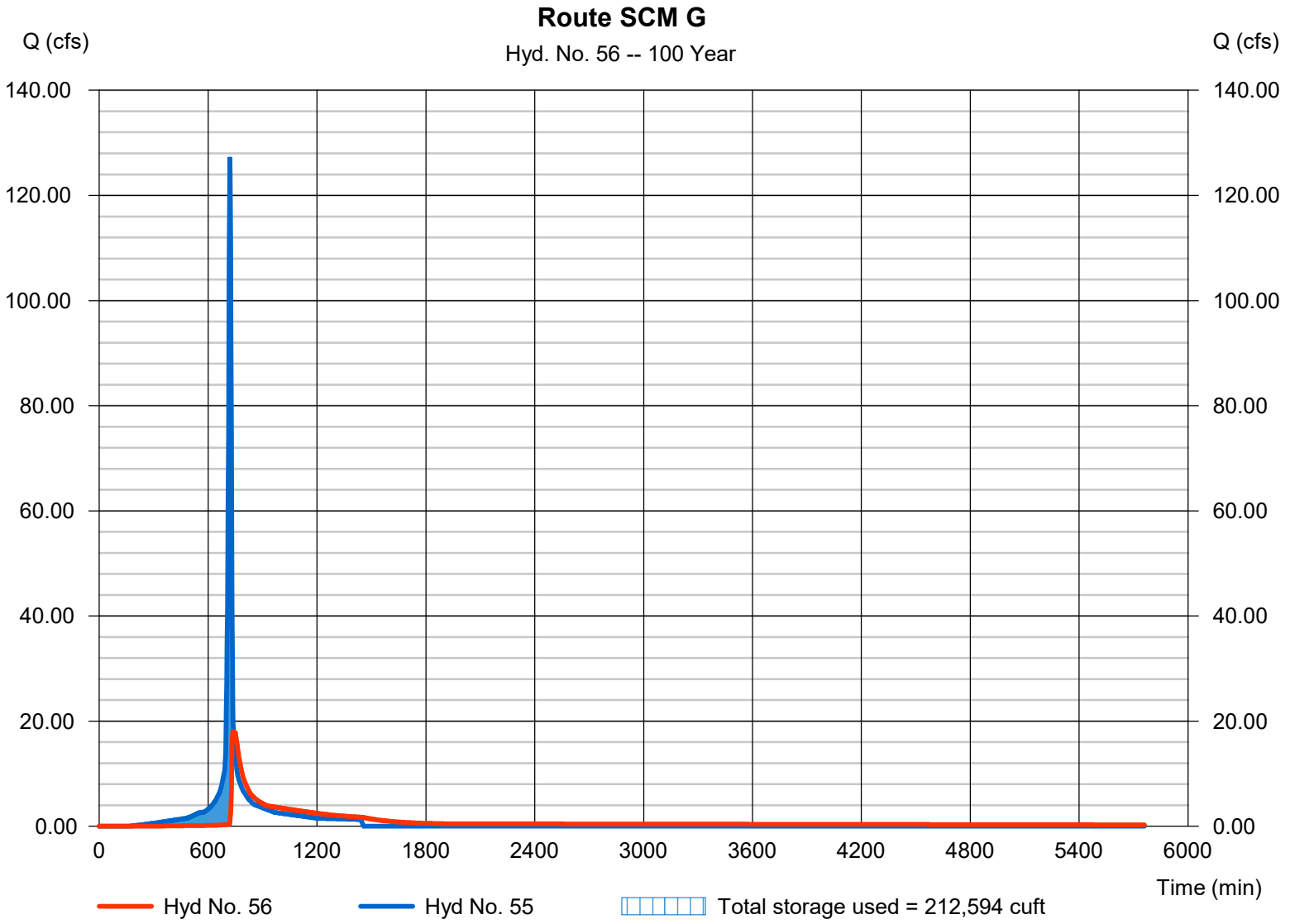
Hydrograph Report

Hyd. No. 56

Route SCM G

Hydrograph type	=	Reservoir	Peak discharge	=	17.97 cfs
Storm frequency	=	100 yrs	Time to peak	=	740 min
Time interval	=	2 min	Hyd. volume	=	297,140 cuft
Inflow hyd. No.	=	55 - Total Area to SCM G	Max. Elevation	=	390.93 ft
Reservoir name	=	SCM G	Max. Storage	=	212,594 cuft

Storage Indication method used.

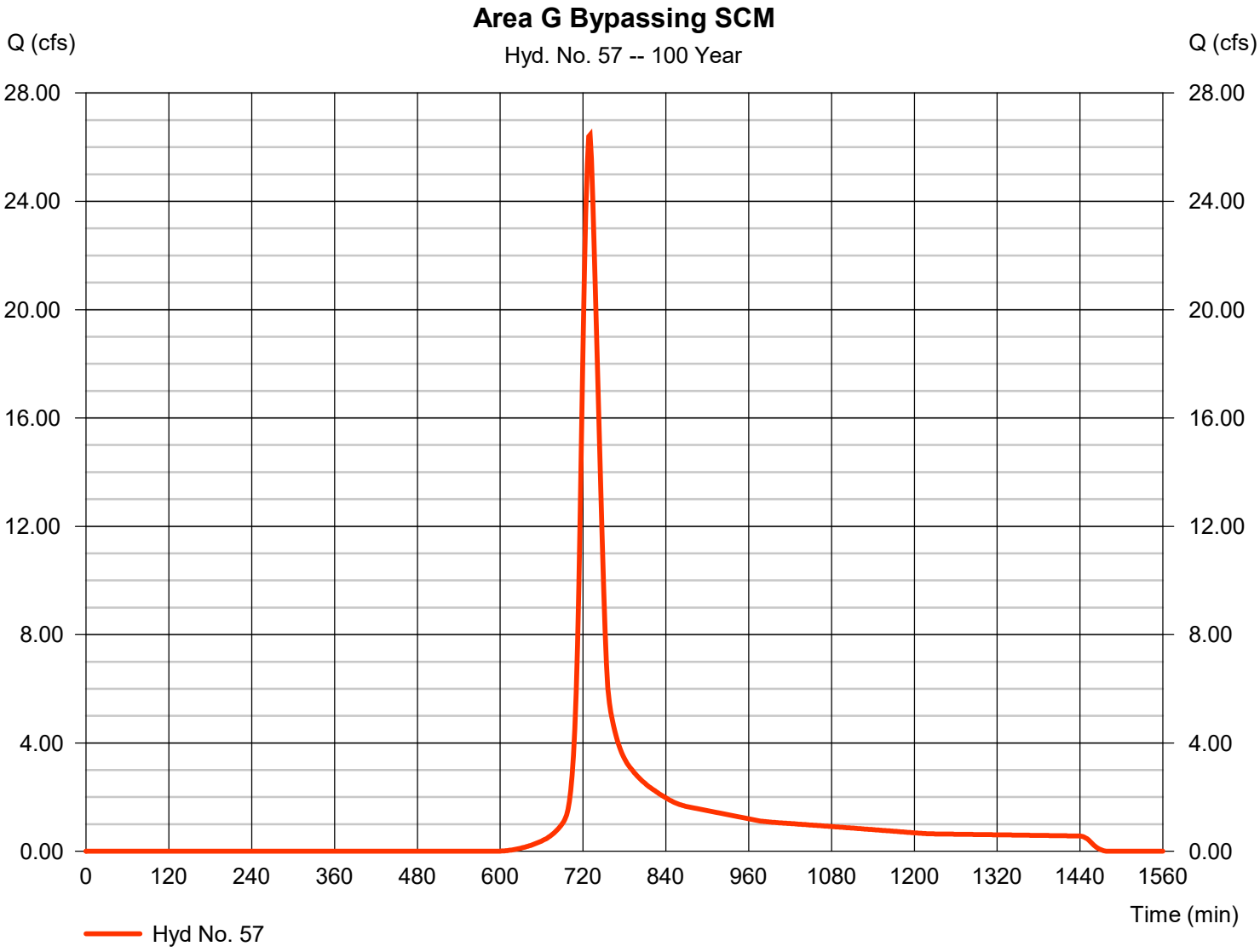


Hydrograph Report

Hyd. No. 57

Area G Bypassing SCM

Hydrograph type	= SCS Runoff	Peak discharge	= 26.46 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 99,680 cuft
Drainage area	= 9.070 ac	Curve number	= 60.3
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 23.80 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

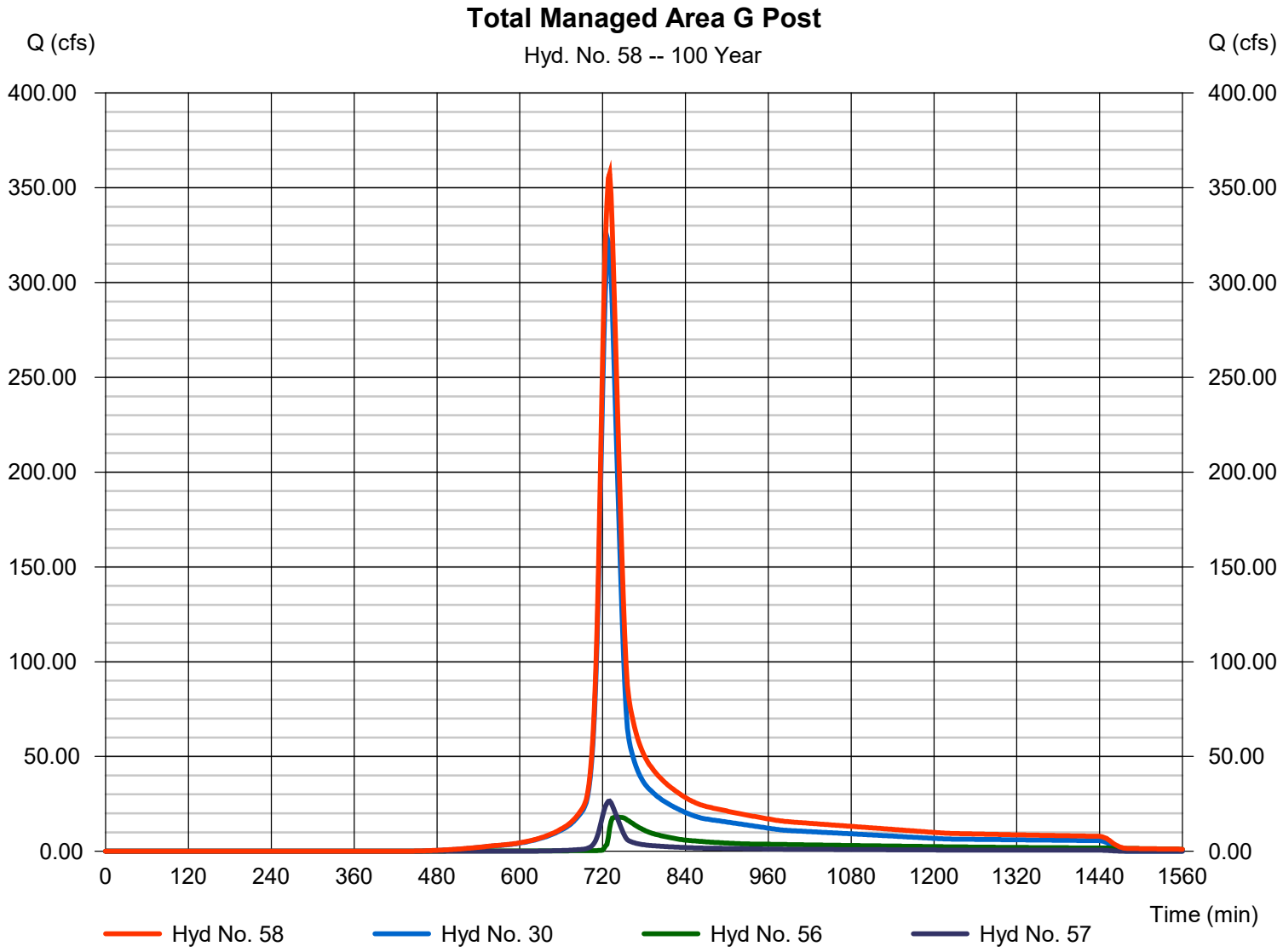


Hydrograph Report

Hyd. No. 58

Total Managed Area G Post

Hydrograph type	= Combine	Peak discharge	= 357.45 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 1,576,320 cuft
Inflow hyds.	= 30, 56, 57	Contrib. drain. area	= 85.670 ac

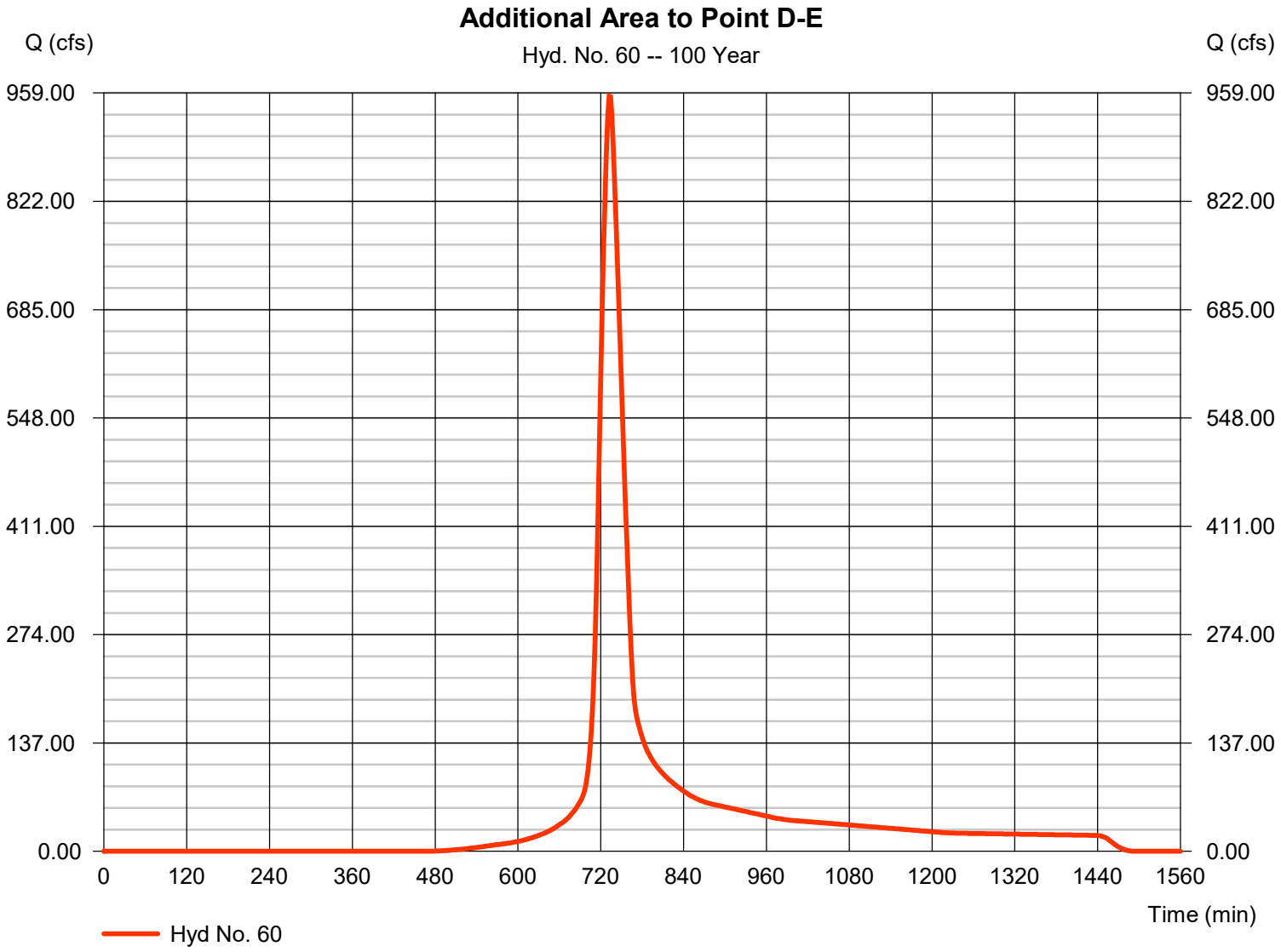


Hydrograph Report

Hyd. No. 60

Additional Area to Point D-E

Hydrograph type	= SCS Runoff	Peak discharge	= 955.12 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 4,136,777 cuft
Drainage area	= 271.000 ac	Curve number	= 70.2
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 32.50 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

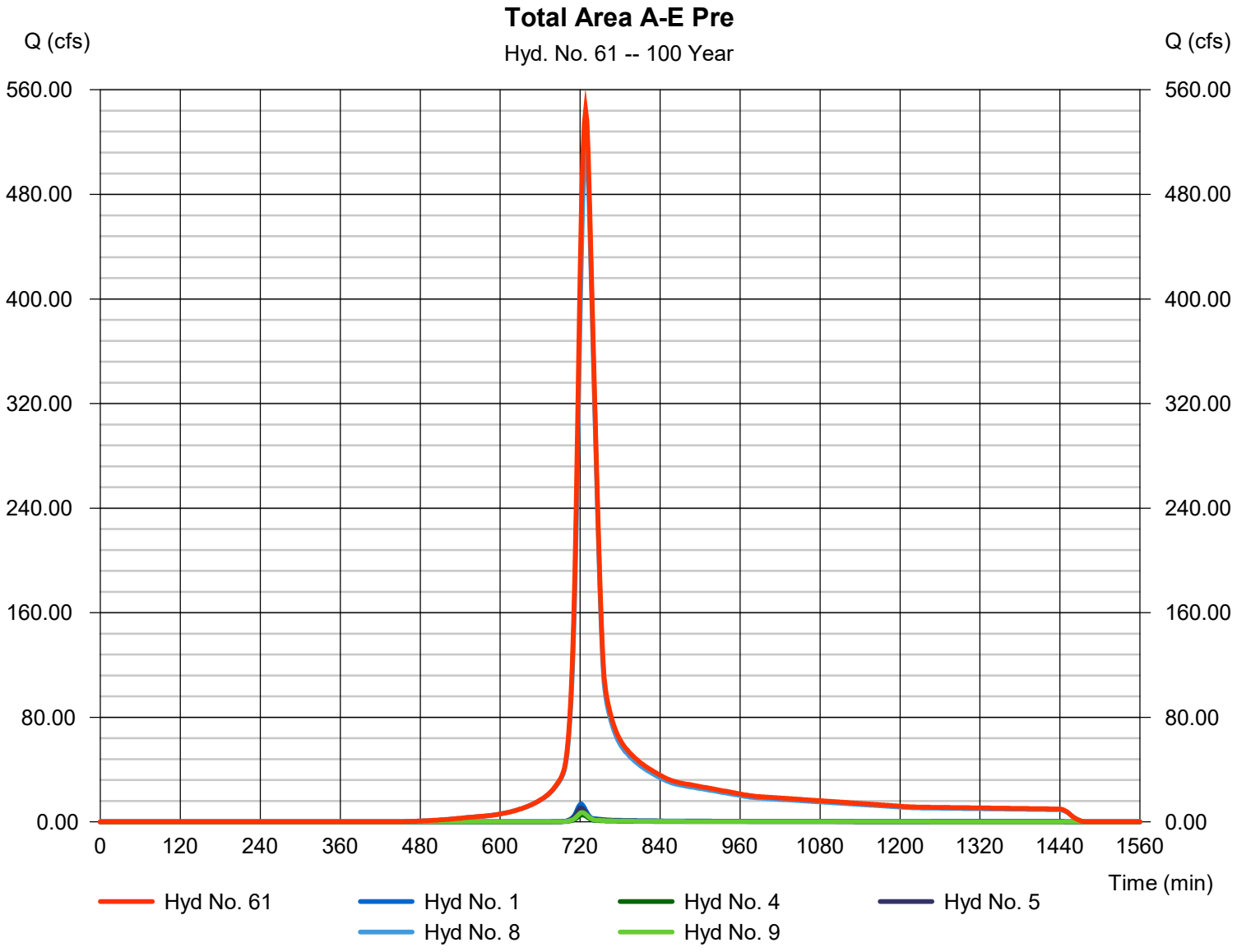


Hydrograph Report

Hyd. No. 61

Total Area A-E Pre

Hydrograph type	= Combine	Peak discharge	= 544.57 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 2,010,413 cuft
Inflow hyds.	= 1, 4, 5, 8, 9	Contrib. drain. area	= 10.720 ac

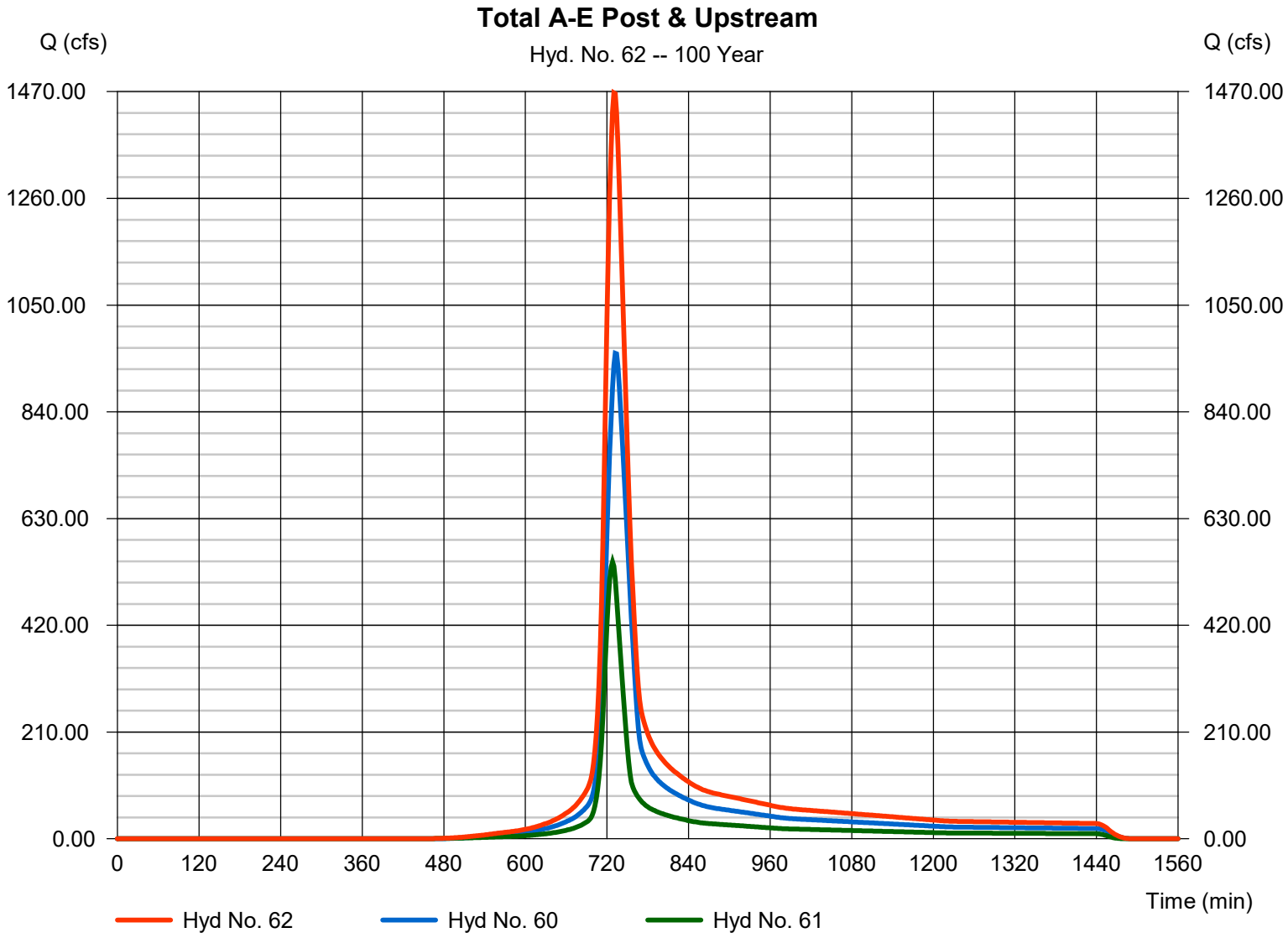


Hydrograph Report

Hyd. No. 62

Total A-E Post & Upstream

Hydrograph type	= Combine	Peak discharge	= 1467.49 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 2 min	Hyd. volume	= 6,147,193 cuft
Inflow hyds.	= 60, 61	Contrib. drain. area	= 271.000 ac



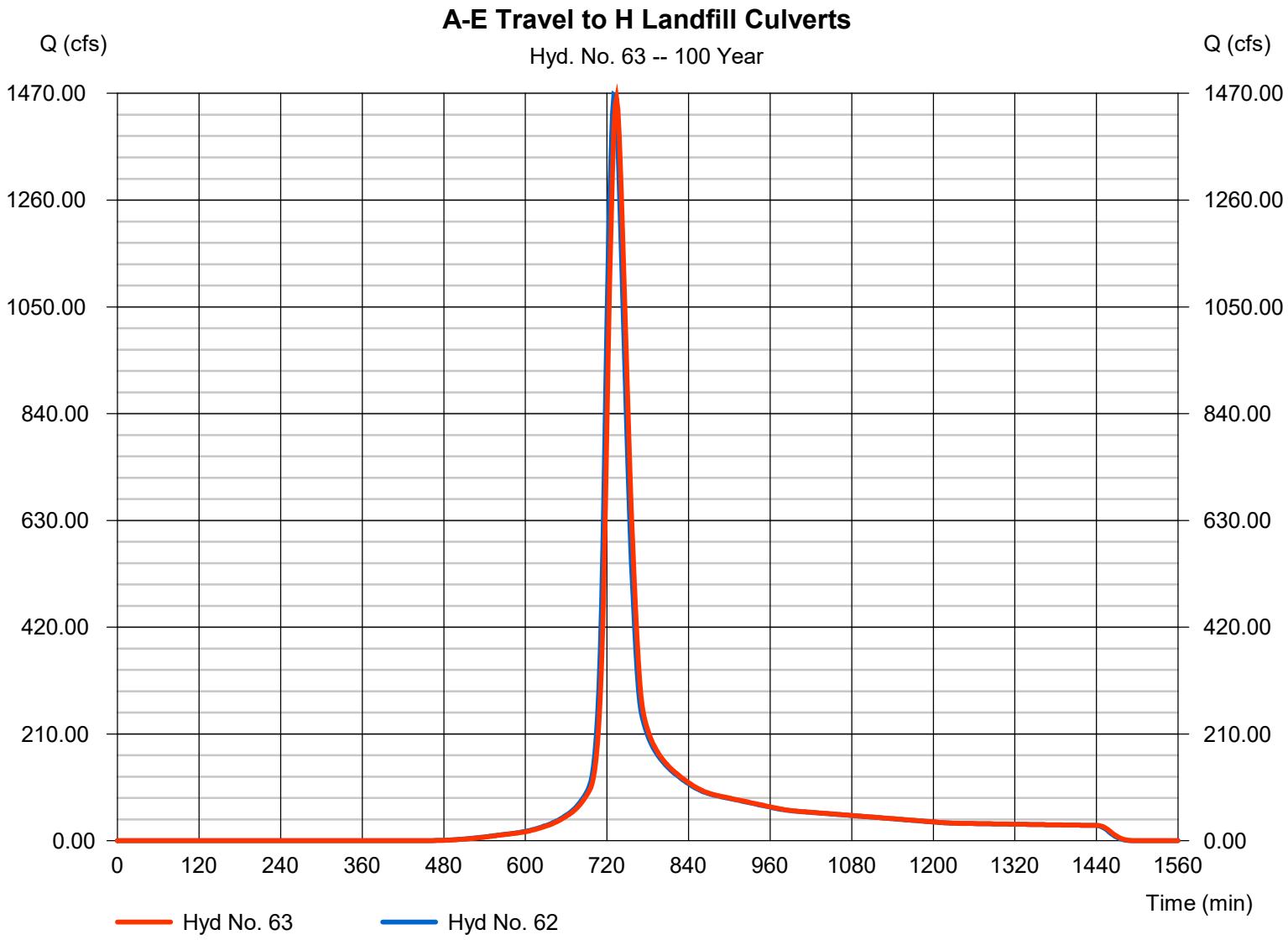
Hydrograph Report

Hyd. No. 63

A-E Travel to H Landfill Culverts

Hydrograph type	=	Reach	Peak discharge	=	1460.15 cfs
Storm frequency	=	100 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	6,147,189 cuft
Inflow hyd. No.	=	62 - Total A-E Post & Upstream	Section type	=	Trapezoidal
Reach length	=	1500.0 ft	Channel slope	=	0.7 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	1.509	Rating curve m	=	1.374
Ave. velocity	=	9.82 ft/s	Routing coeff.	=	0.7012

Modified Att-Kin routing method used.

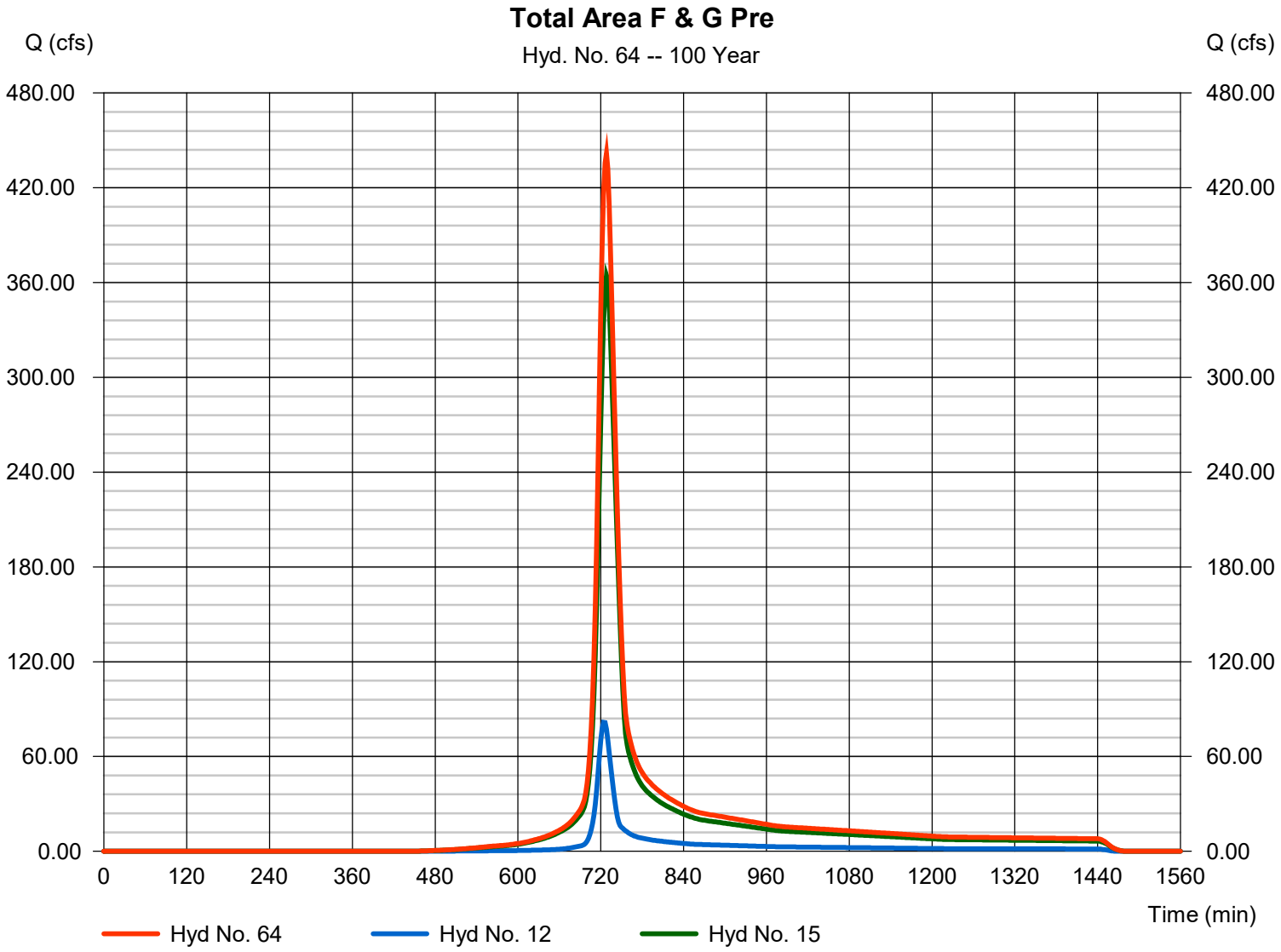


Hydrograph Report

Hyd. No. 64

Total Area F & G Pre

Hydrograph type	= Combine	Peak discharge	= 441.72 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 1,603,798 cuft
Inflow hyds.	= 12, 15	Contrib. drain. area	= 0.000 ac



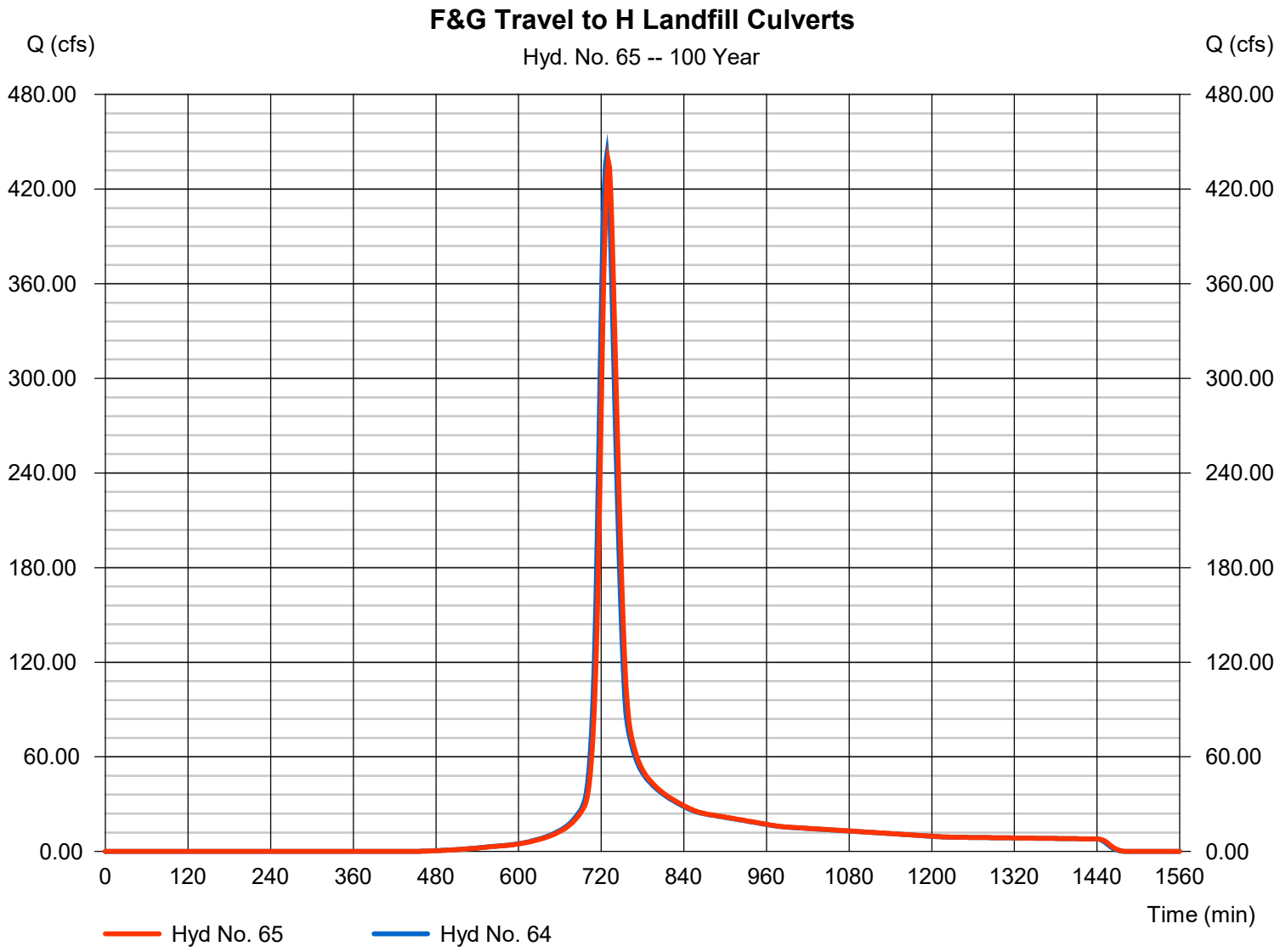
Hydrograph Report

Hyd. No. 65

F&G Travel to H Landfill Culverts

Hydrograph type	=	Reach	Peak discharge	=	438.08 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	2 min	Hyd. volume	=	1,603,796 cuft
Inflow hyd. No.	=	64 - Total Area F & G Pre	Section type	=	Trapezoidal
Reach length	=	1300.0 ft	Channel slope	=	1.5 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	2.209	Rating curve m	=	1.374
Ave. velocity	=	9.35 ft/s	Routing coeff.	=	0.7443

Modified Att-Kin routing method used.

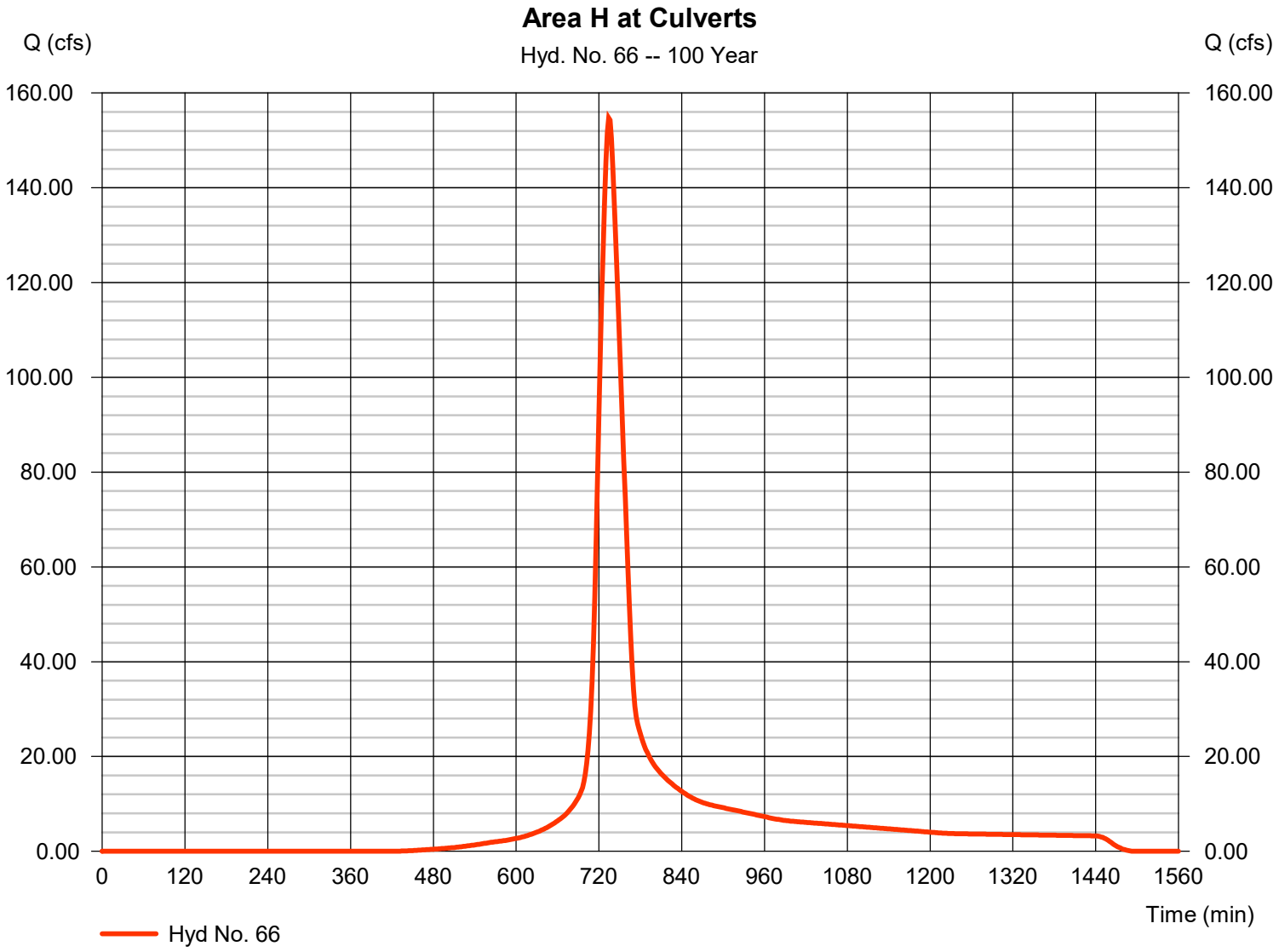


Hydrograph Report

Hyd. No. 66

Area H at Culverts

Hydrograph type	=	SCS Runoff	Peak discharge	=	154.76 cfs
Storm frequency	=	100 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	700,964 cuft
Drainage area	=	43.300 ac	Curve number	=	73.4
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	35.10 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

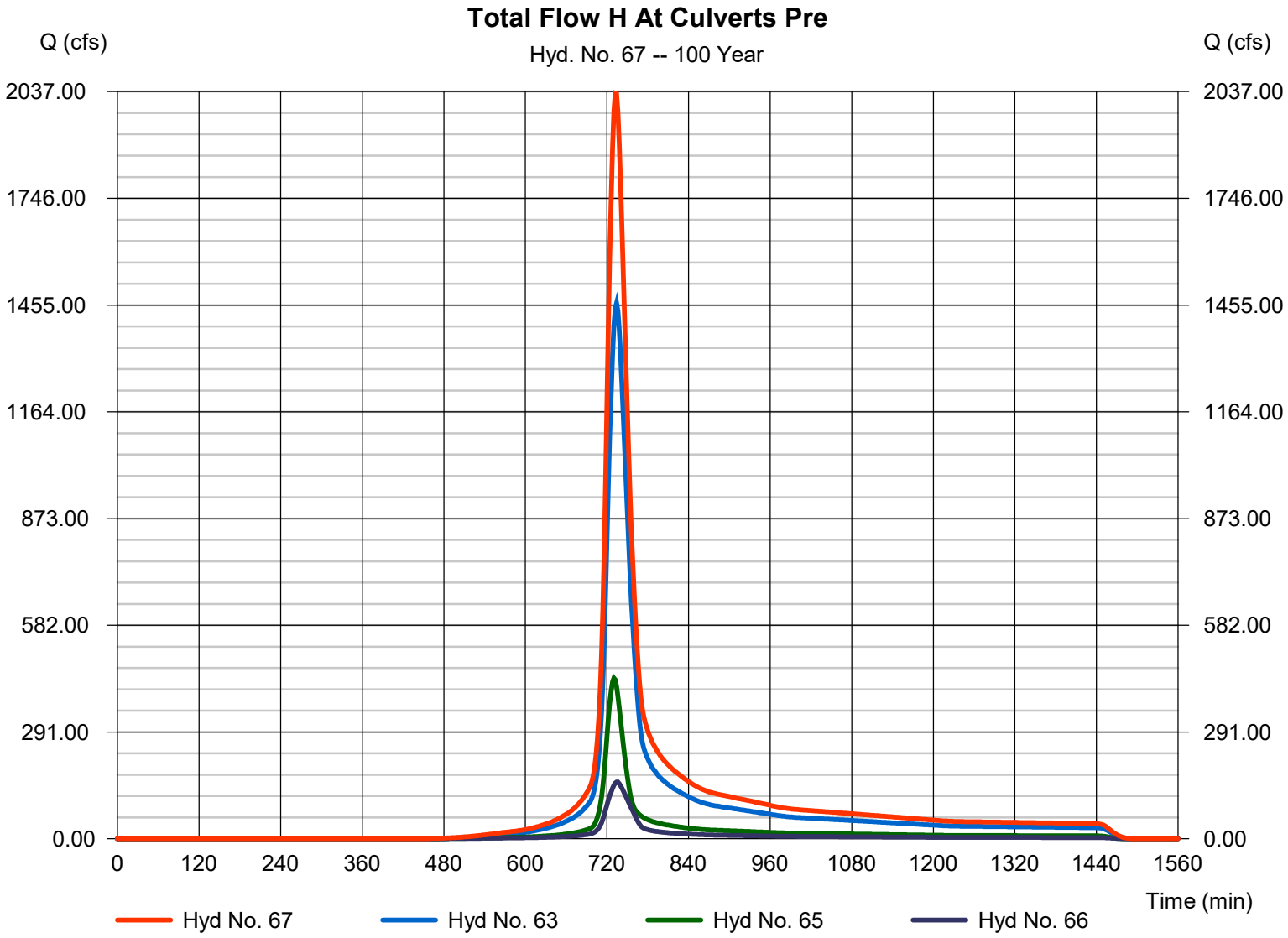


Hydrograph Report

Hyd. No. 67

Total Flow H At Culverts Pre

Hydrograph type	= Combine	Peak discharge	= 2032.24 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 8,451,954 cuft
Inflow hyds.	= 63, 65, 66	Contrib. drain. area	= 43.300 ac

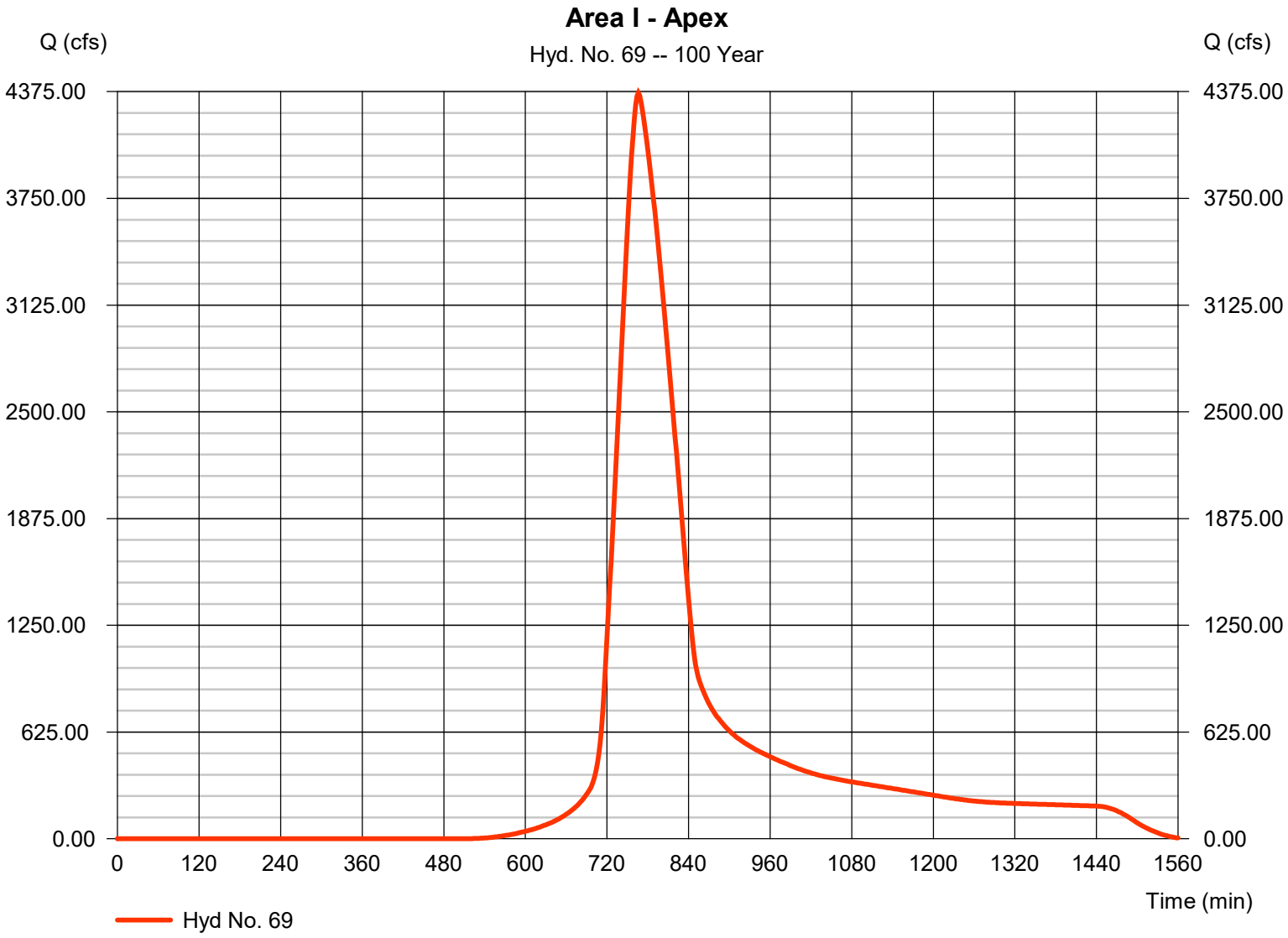


Hydrograph Report

Hyd. No. 69

Area I - Apex

Hydrograph type	= SCS Runoff	Peak discharge	= 4368.08 cfs
Storm frequency	= 100 yrs	Time to peak	= 766 min
Time interval	= 2 min	Hyd. volume	= 37,141,272 cuft
Drainage area	= 2637.000 ac	Curve number	= 67.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 87.40 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



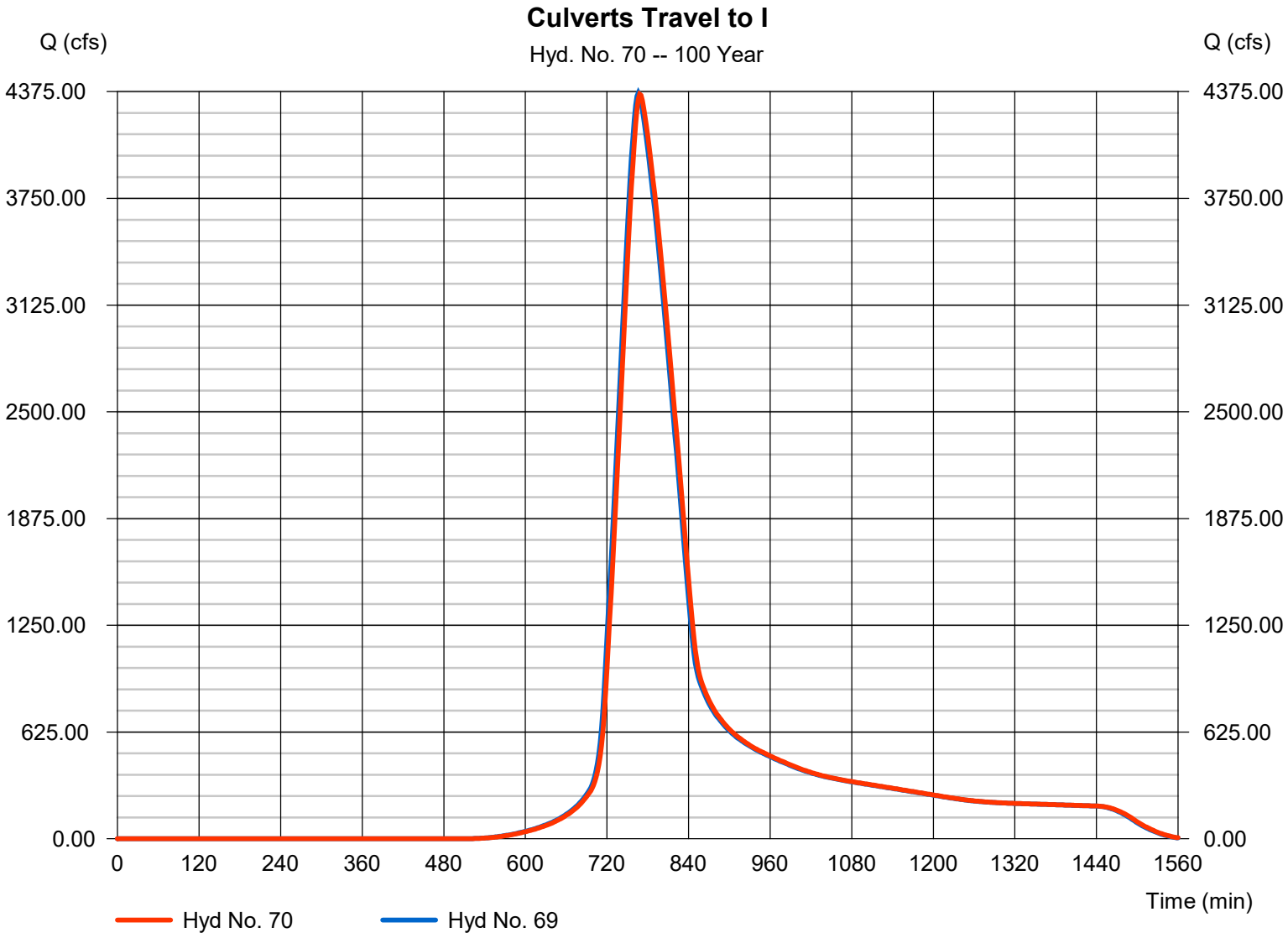
Hydrograph Report

Hyd. No. 70

Culverts Travel to I

Hydrograph type	=	Reach	Peak discharge	=	4360.76 cfs
Storm frequency	=	100 yrs	Time to peak	=	768 min
Time interval	=	2 min	Hyd. volume	=	37,141,256 cuft
Inflow hyd. No.	=	69 - Area I - Apex	Section type	=	Trapezoidal
Reach length	=	1670.0 ft	Channel slope	=	0.7 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	1.509	Rating curve m	=	1.374
Ave. velocity	=	13.22 ft/s	Routing coeff.	=	0.7897

Modified Att-Kin routing method used.

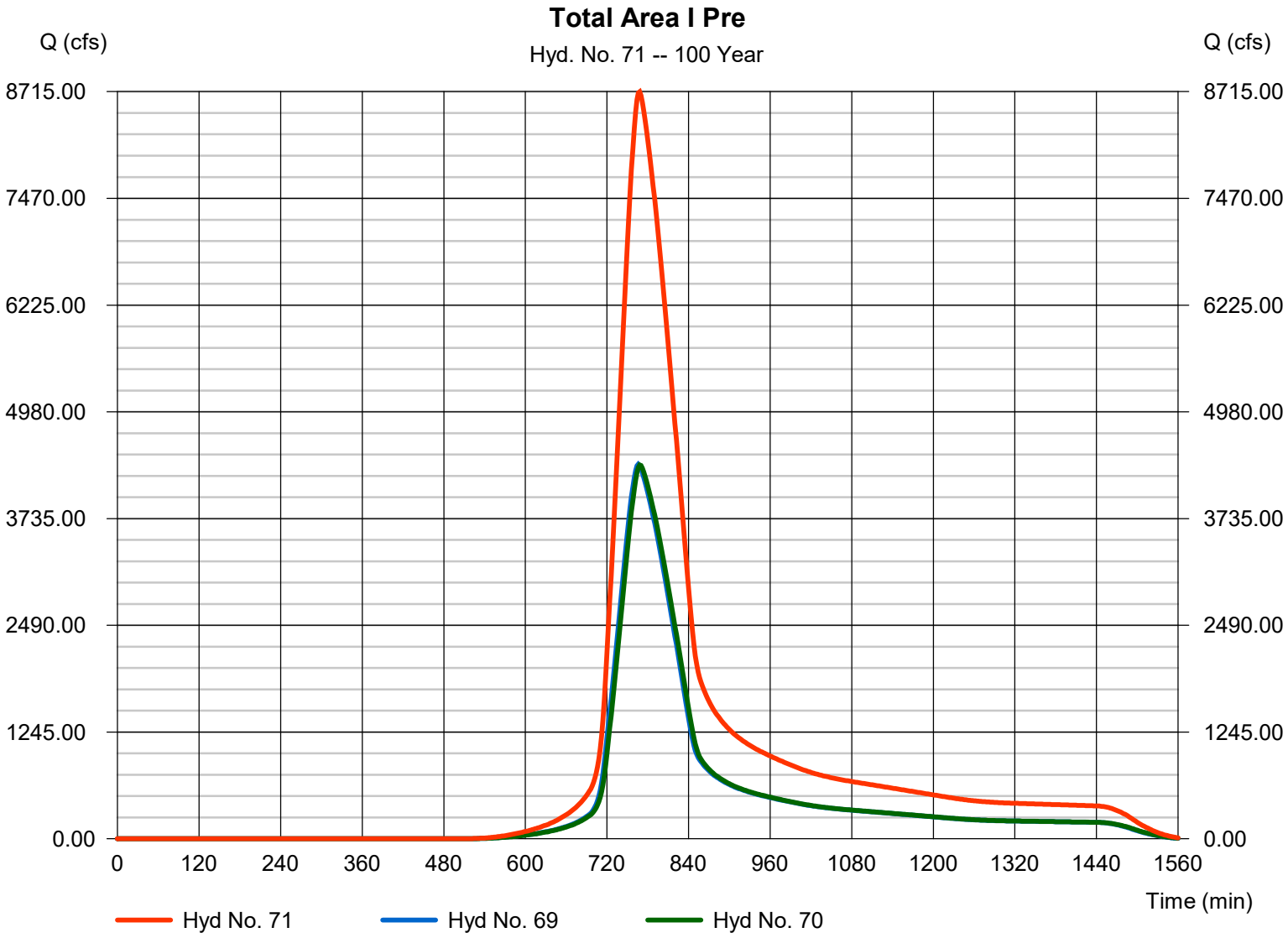


Hydrograph Report

Hyd. No. 71

Total Area I Pre

Hydrograph type	= Combine	Peak discharge	= 8713.51 cfs
Storm frequency	= 100 yrs	Time to peak	= 768 min
Time interval	= 2 min	Hyd. volume	= 74,282,512 cuft
Inflow hyds.	= 69, 70	Contrib. drain. area	= 2637.000 ac

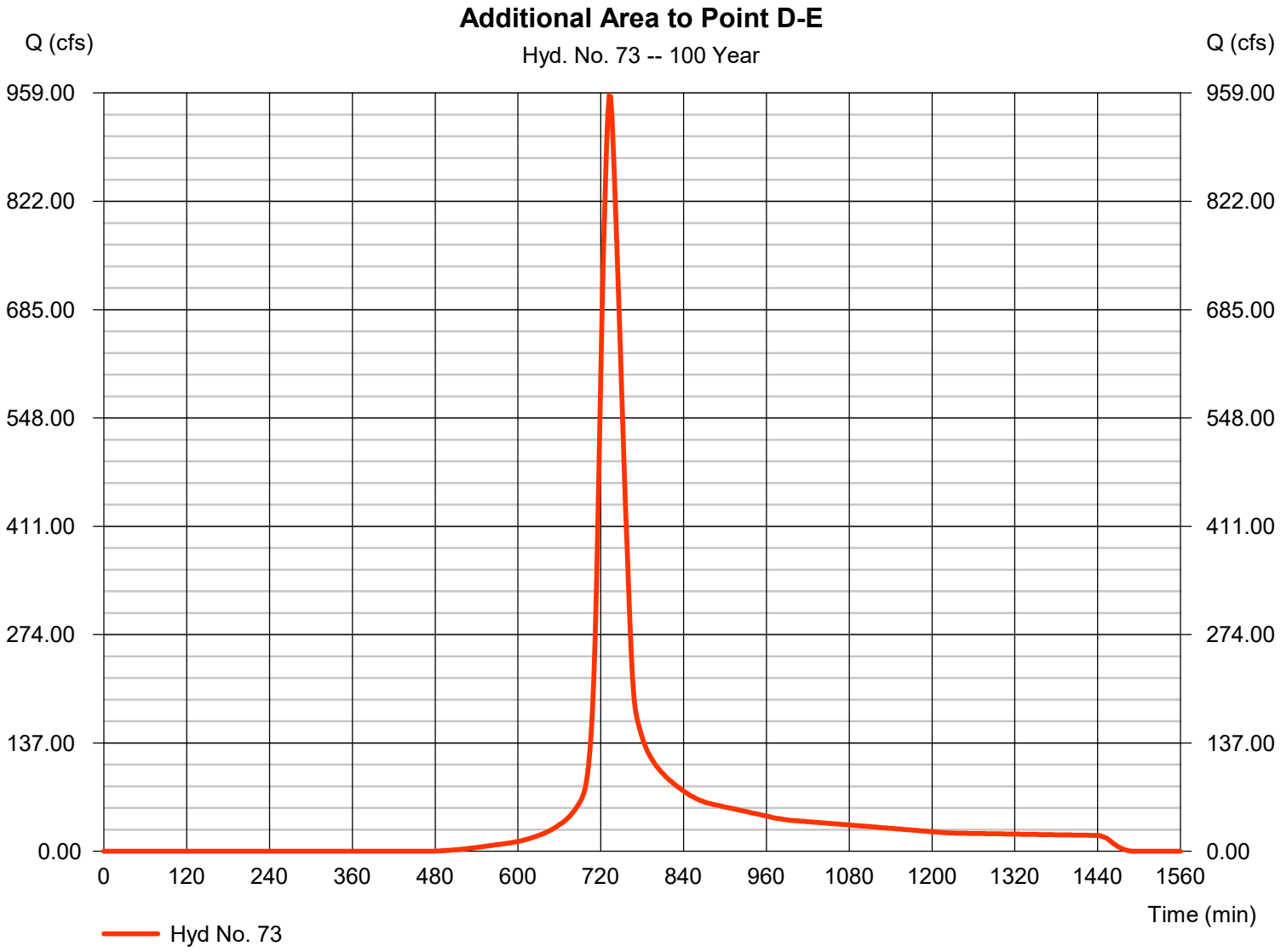


Hydrograph Report

Hyd. No. 73

Additional Area to Point D-E

Hydrograph type	=	SCS Runoff	Peak discharge	=	955.12 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	4,136,777 cuft
Drainage area	=	271.000 ac	Curve number	=	70.2
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	32.50 min
Total precip.	=	7.61 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

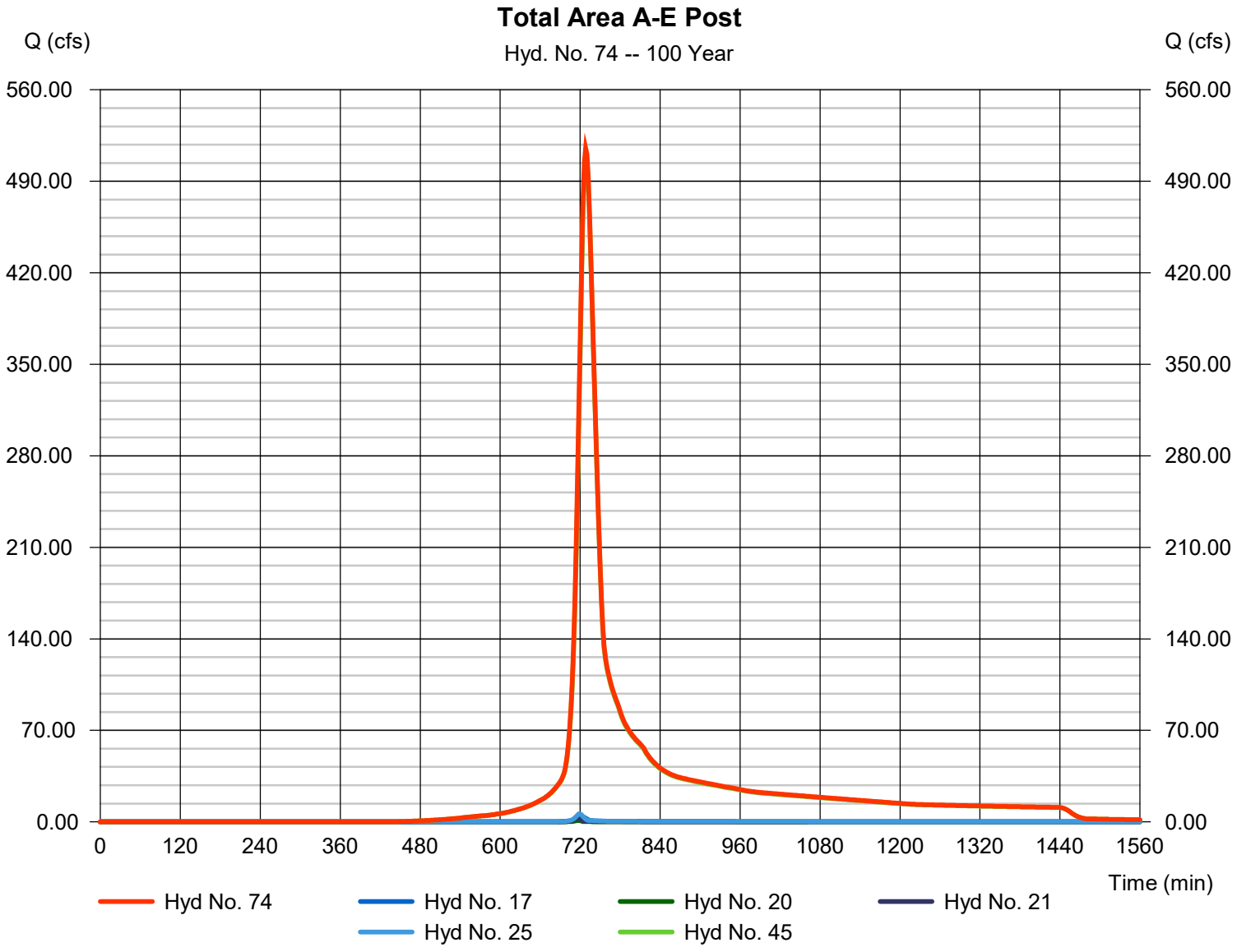


Hydrograph Report

Hyd. No. 74

Total Area A-E Post

Hydrograph type	= Combine	Peak discharge	= 515.48 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 2,284,765 cuft
Inflow hyds.	= 17, 20, 21, 25, 45	Contrib. drain. area	= 3.290 ac

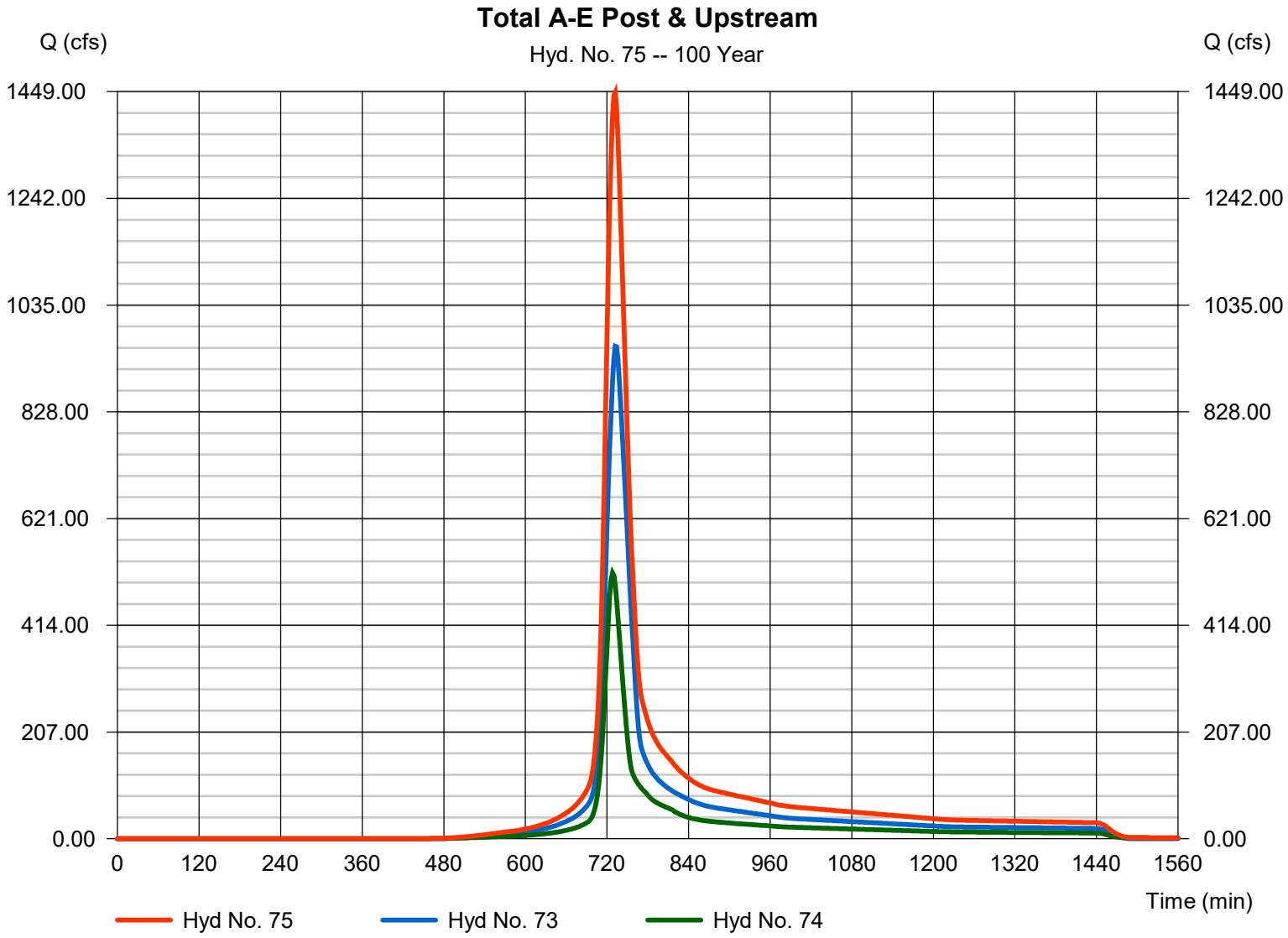


Hydrograph Report

Hyd. No. 75

Total A-E Post & Upstream

Hydrograph type	= Combine	Peak discharge	= 1447.73 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 2 min	Hyd. volume	= 6,421,542 cuft
Inflow hyds.	= 73, 74	Contrib. drain. area	= 271.000 ac



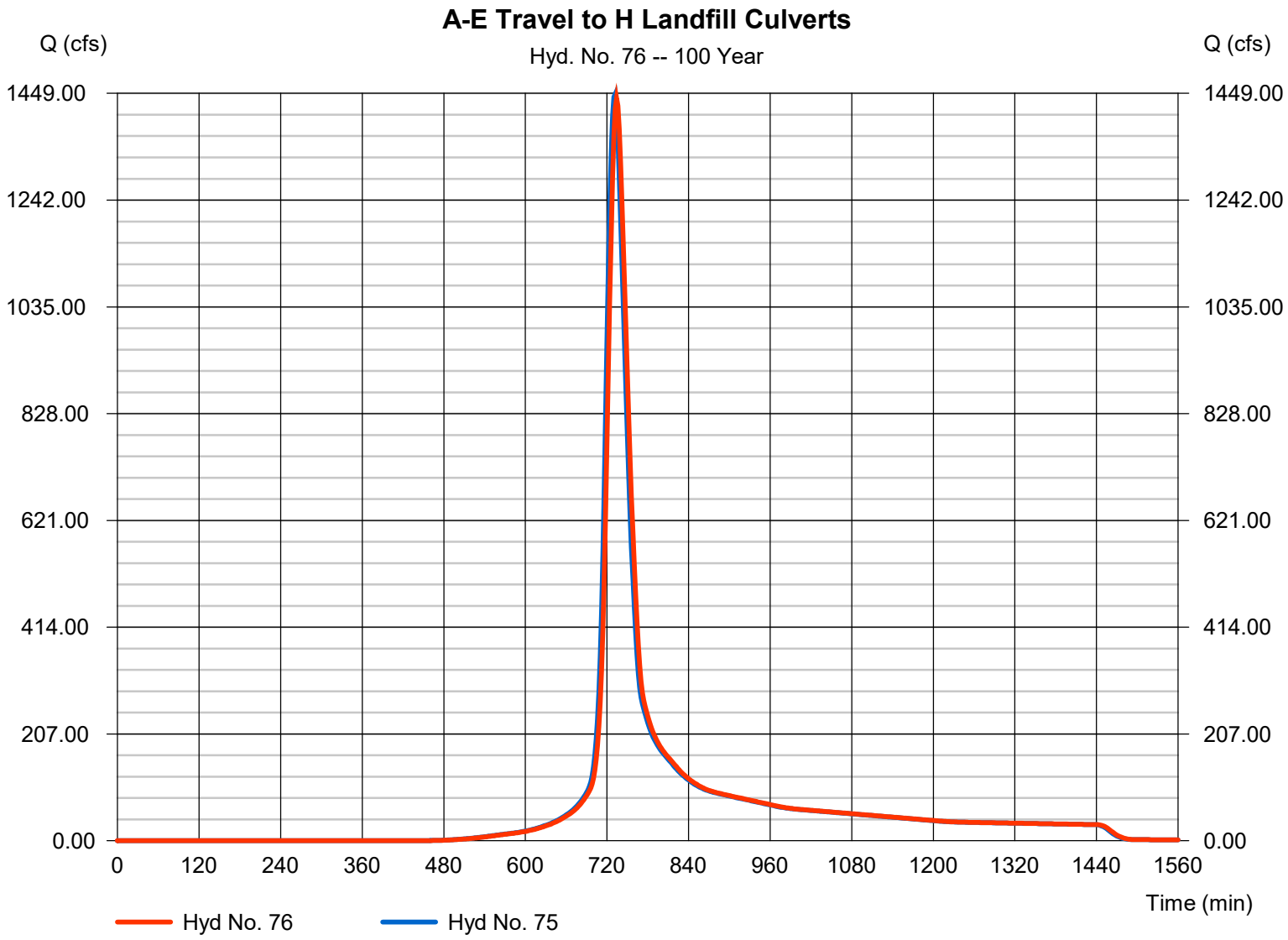
Hydrograph Report

Hyd. No. 76

A-E Travel to H Landfill Culverts

Hydrograph type	=	Reach	Peak discharge	=	1439.33 cfs
Storm frequency	=	100 yrs	Time to peak	=	734 min
Time interval	=	2 min	Hyd. volume	=	6,421,509 cuft
Inflow hyd. No.	=	75 - Total A-E Post & Upstream	Section type	=	Trapezoidal
Reach length	=	1500.0 ft	Channel slope	=	0.7 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	1.509	Rating curve m	=	1.374
Ave. velocity	=	9.79 ft/s	Routing coeff.	=	0.6995

Modified Att-Kin routing method used.

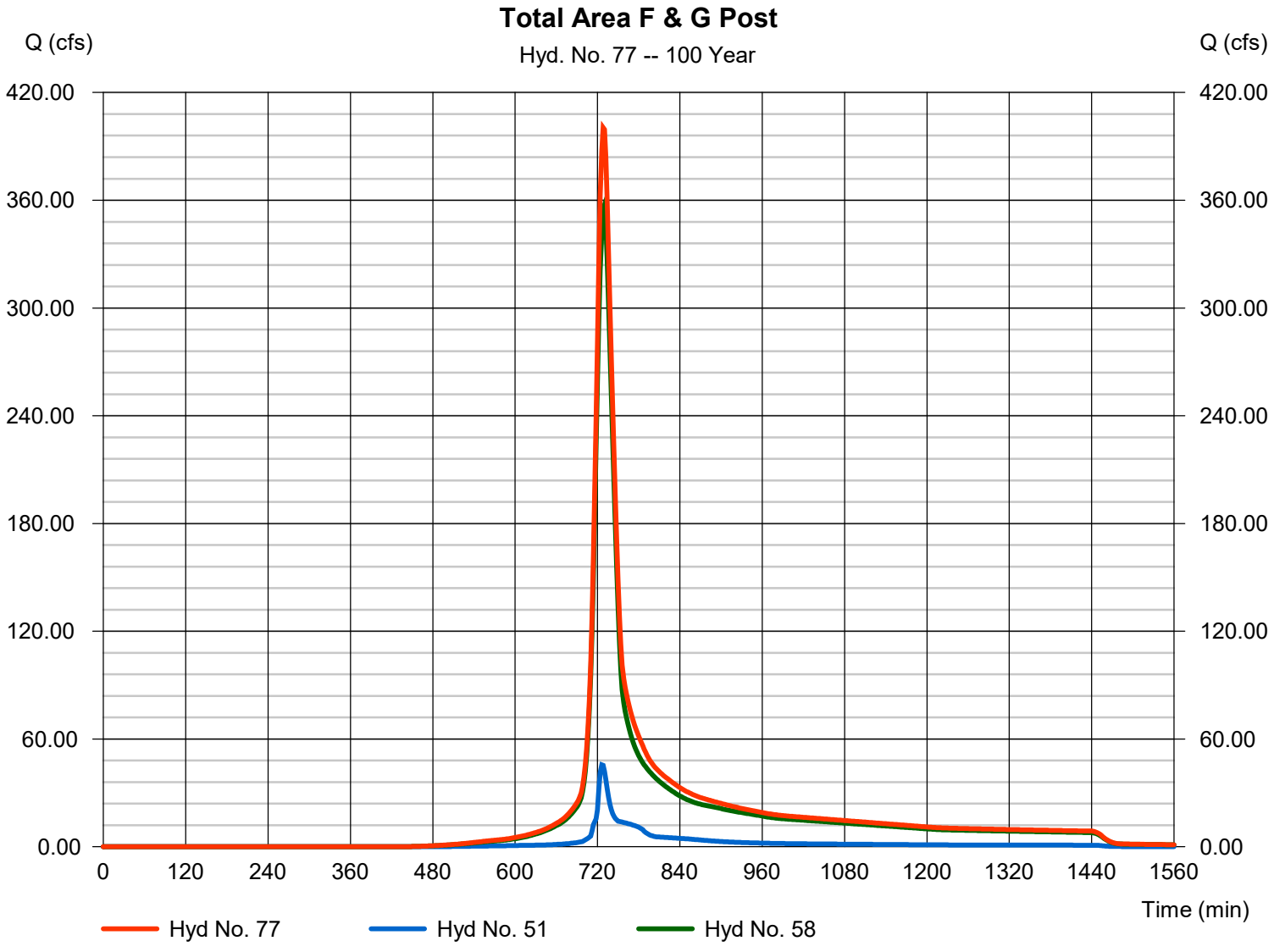


Hydrograph Report

Hyd. No. 77

Total Area F & G Post

Hydrograph type	= Combine	Peak discharge	= 400.44 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 1,751,525 cuft
Inflow hyds.	= 51, 58	Contrib. drain. area	= 0.000 ac



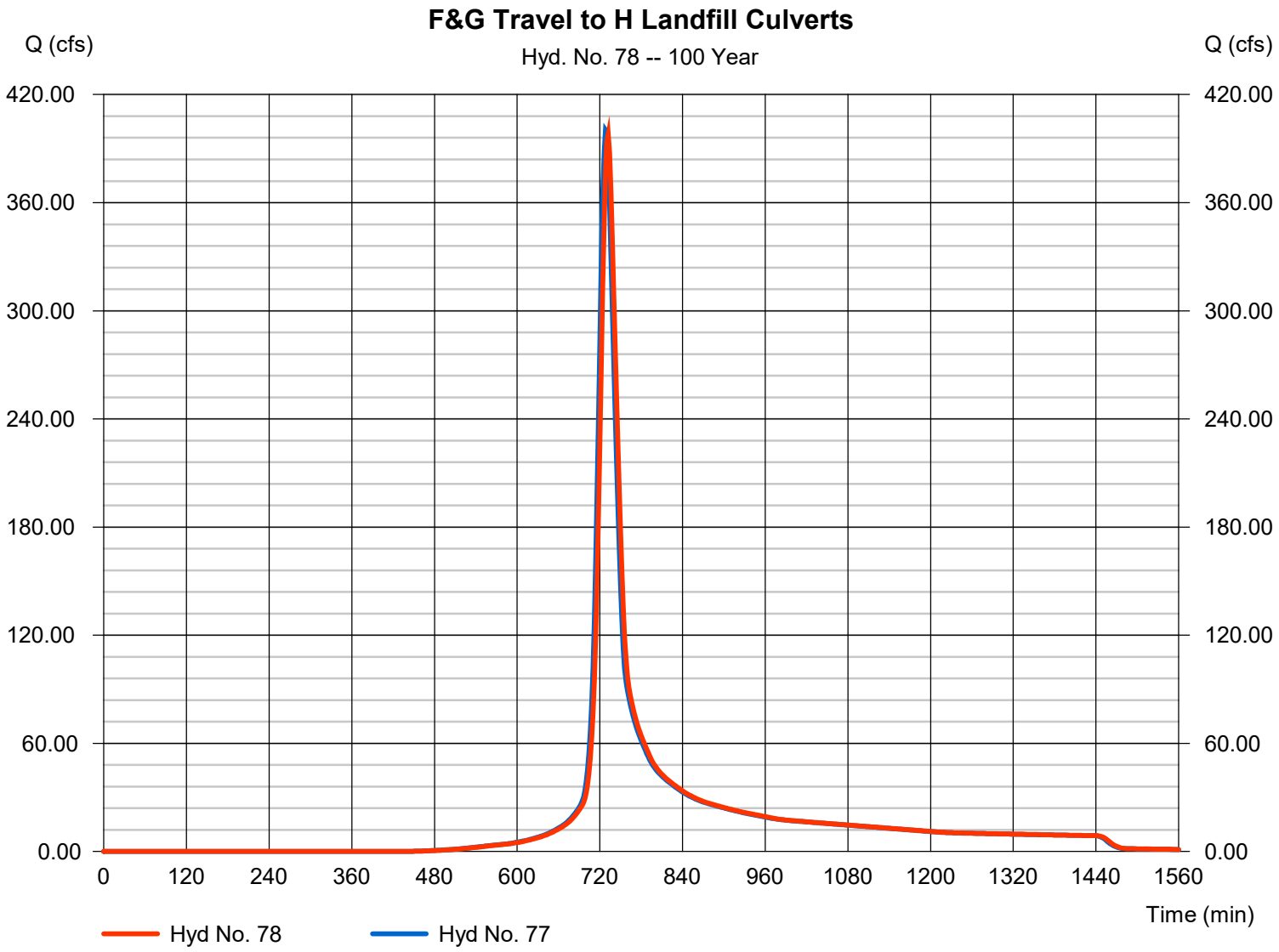
Hydrograph Report

Hyd. No. 78

F&G Travel to H Landfill Culverts

Hydrograph type	=	Reach	Peak discharge	=	398.03 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	2 min	Hyd. volume	=	1,751,480 cuft
Inflow hyd. No.	=	77 - Total Area F & G Post	Section type	=	Trapezoidal
Reach length	=	1300.0 ft	Channel slope	=	1.5 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	2.209	Rating curve m	=	1.374
Ave. velocity	=	9.10 ft/s	Routing coeff.	=	0.7319

Modified Att-Kin routing method used.

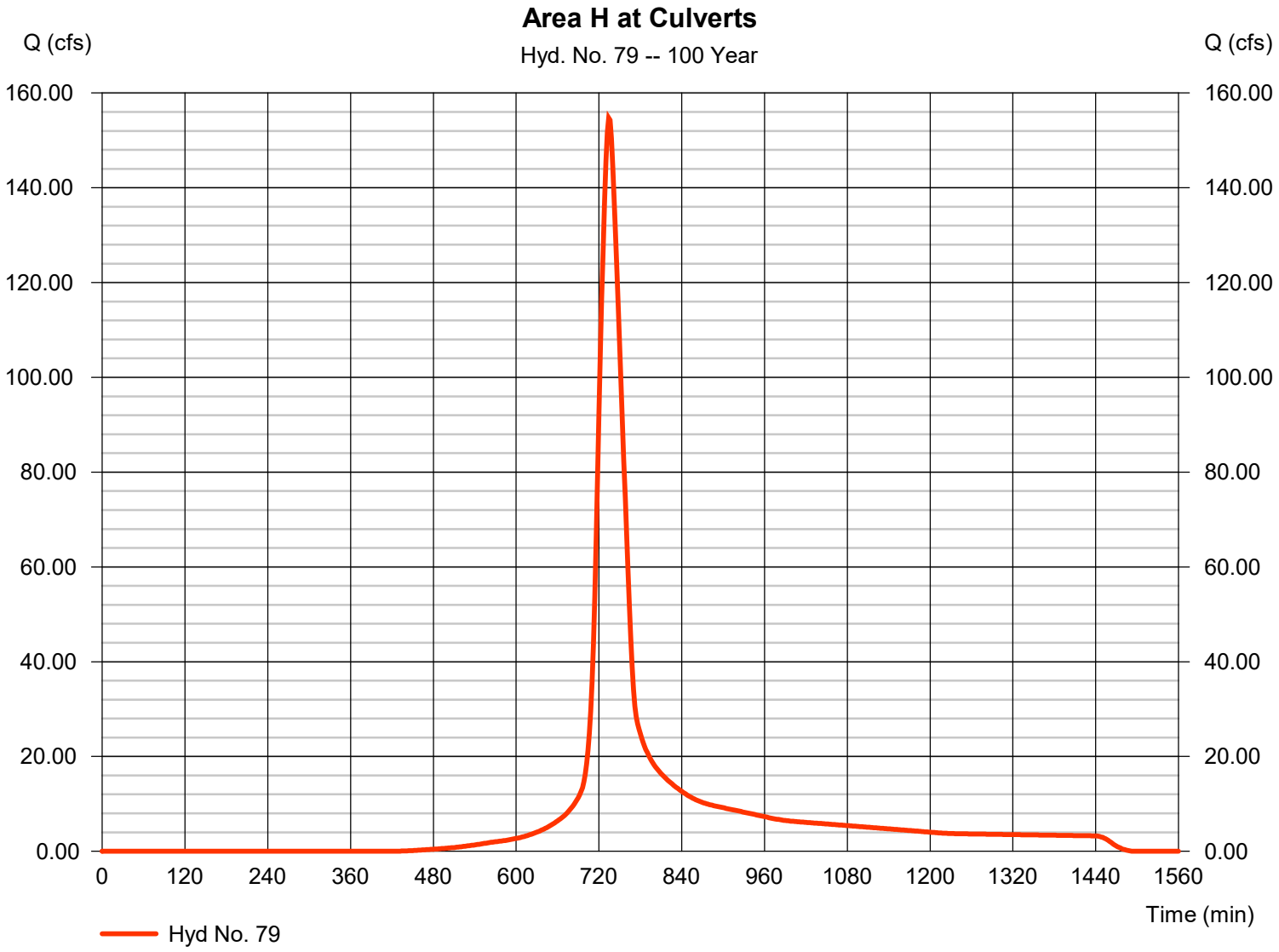


Hydrograph Report

Hyd. No. 79

Area H at Culverts

Hydrograph type	= SCS Runoff	Peak discharge	= 154.76 cfs
Storm frequency	= 100 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 700,964 cuft
Drainage area	= 43.300 ac	Curve number	= 73.4
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 35.10 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

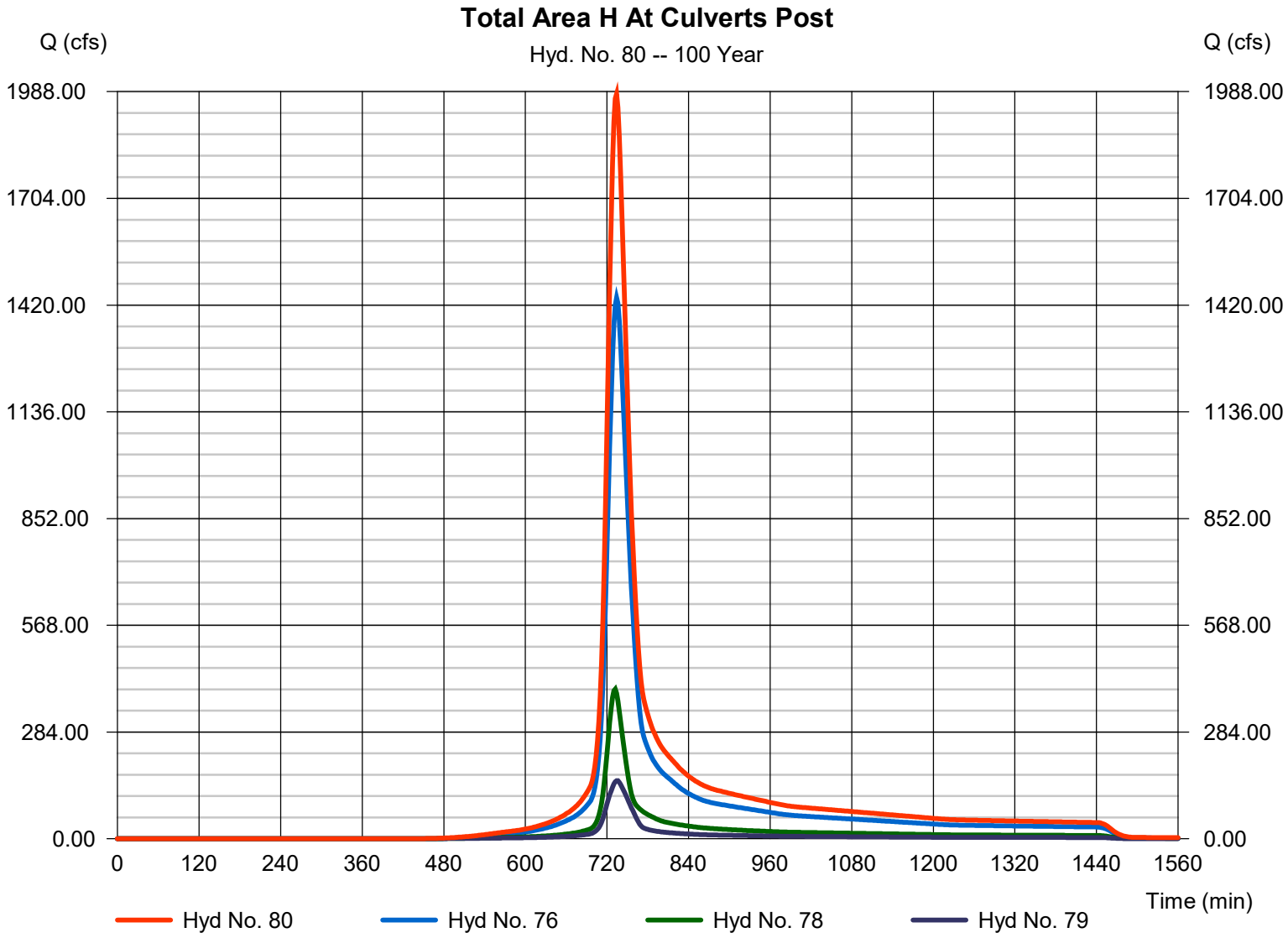


Hydrograph Report

Hyd. No. 80

Total Area H At Culverts Post

Hydrograph type	= Combine	Peak discharge	= 1981.70 cfs
Storm frequency	= 100 yrs	Time to peak	= 734 min
Time interval	= 2 min	Hyd. volume	= 8,873,954 cuft
Inflow hyds.	= 76, 78, 79	Contrib. drain. area	= 43.300 ac



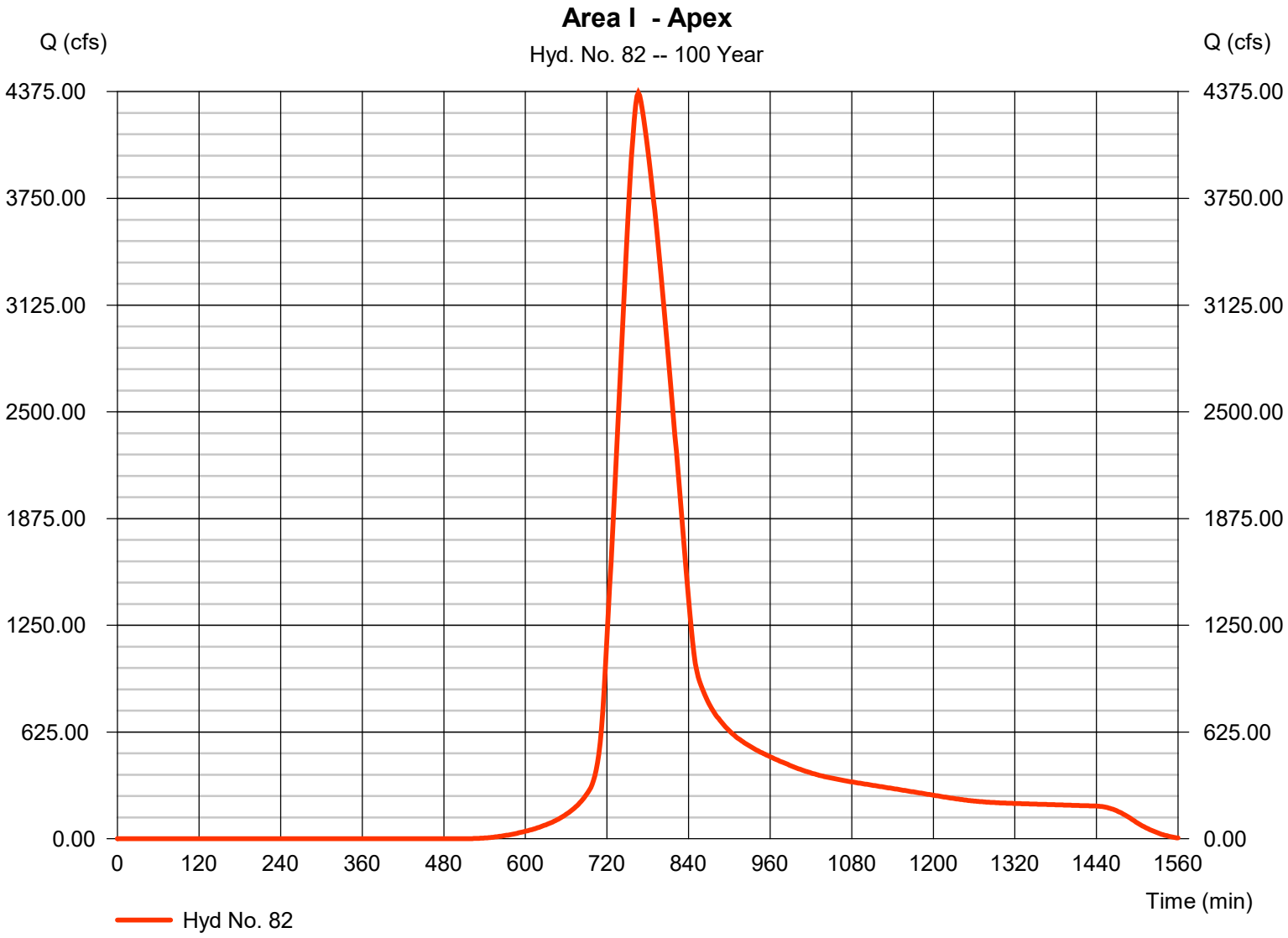
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021 Friday, 02 / 12 / 2021

Hyd. No. 82

Area I - Apex

Hydrograph type	= SCS Runoff	Peak discharge	= 4368.08 cfs
Storm frequency	= 100 yrs	Time to peak	= 766 min
Time interval	= 2 min	Hyd. volume	= 37,141,272 cuft
Drainage area	= 2637.000 ac	Curve number	= 67.9
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 87.40 min
Total precip.	= 7.61 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484



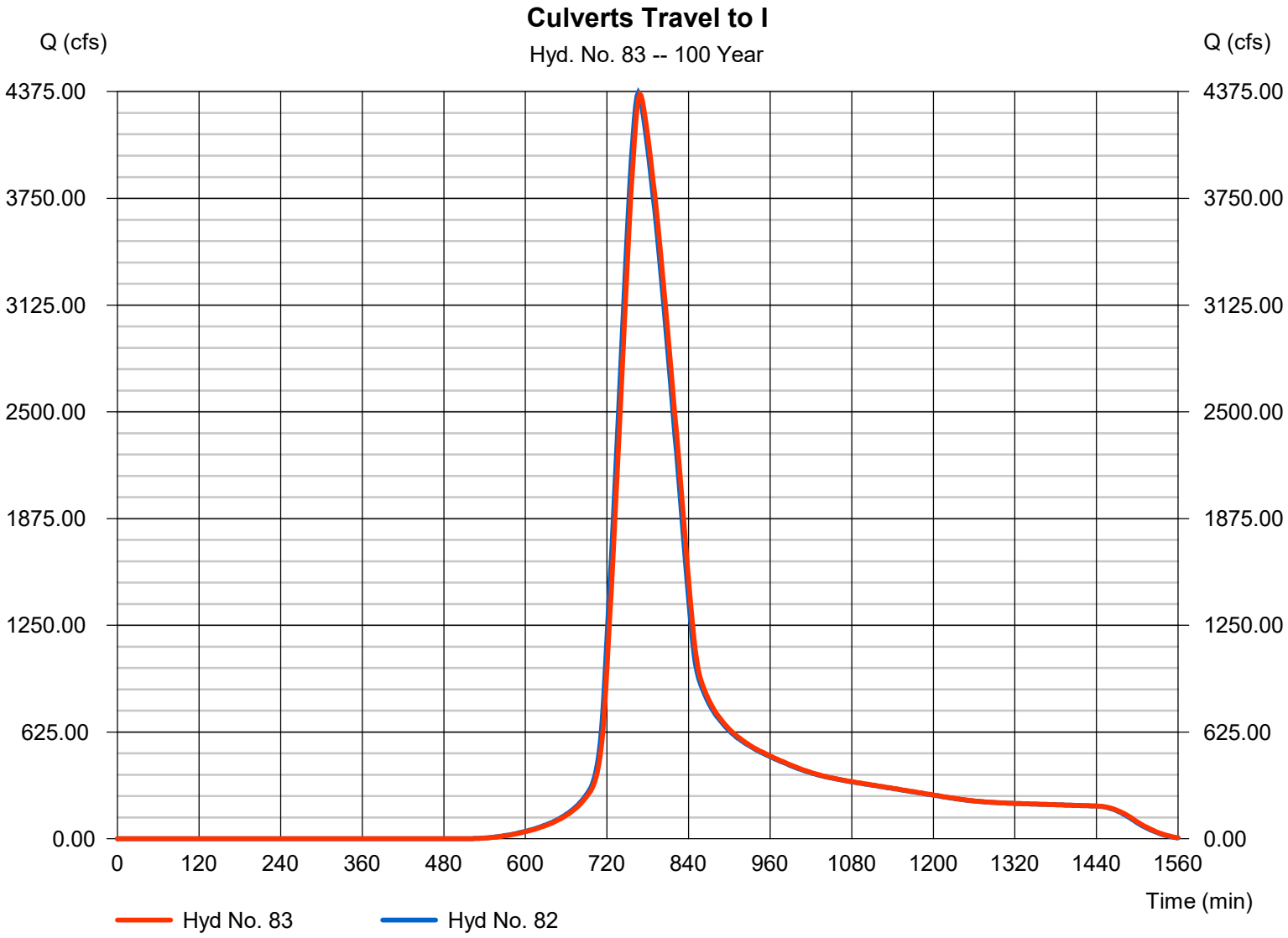
Hydrograph Report

Hyd. No. 83

Culverts Travel to I

Hydrograph type	=	Reach	Peak discharge	=	4360.76 cfs
Storm frequency	=	100 yrs	Time to peak	=	768 min
Time interval	=	2 min	Hyd. volume	=	37,141,256 cuft
Inflow hyd. No.	=	82 - Area I - Apex	Section type	=	Trapezoidal
Reach length	=	1670.0 ft	Channel slope	=	0.7 %
Manning's n	=	0.025	Bottom width	=	6.0 ft
Side slope	=	2.0:1	Max. depth	=	2.0 ft
Rating curve x	=	1.509	Rating curve m	=	1.374
Ave. velocity	=	13.22 ft/s	Routing coeff.	=	0.7897

Modified Att-Kin routing method used.

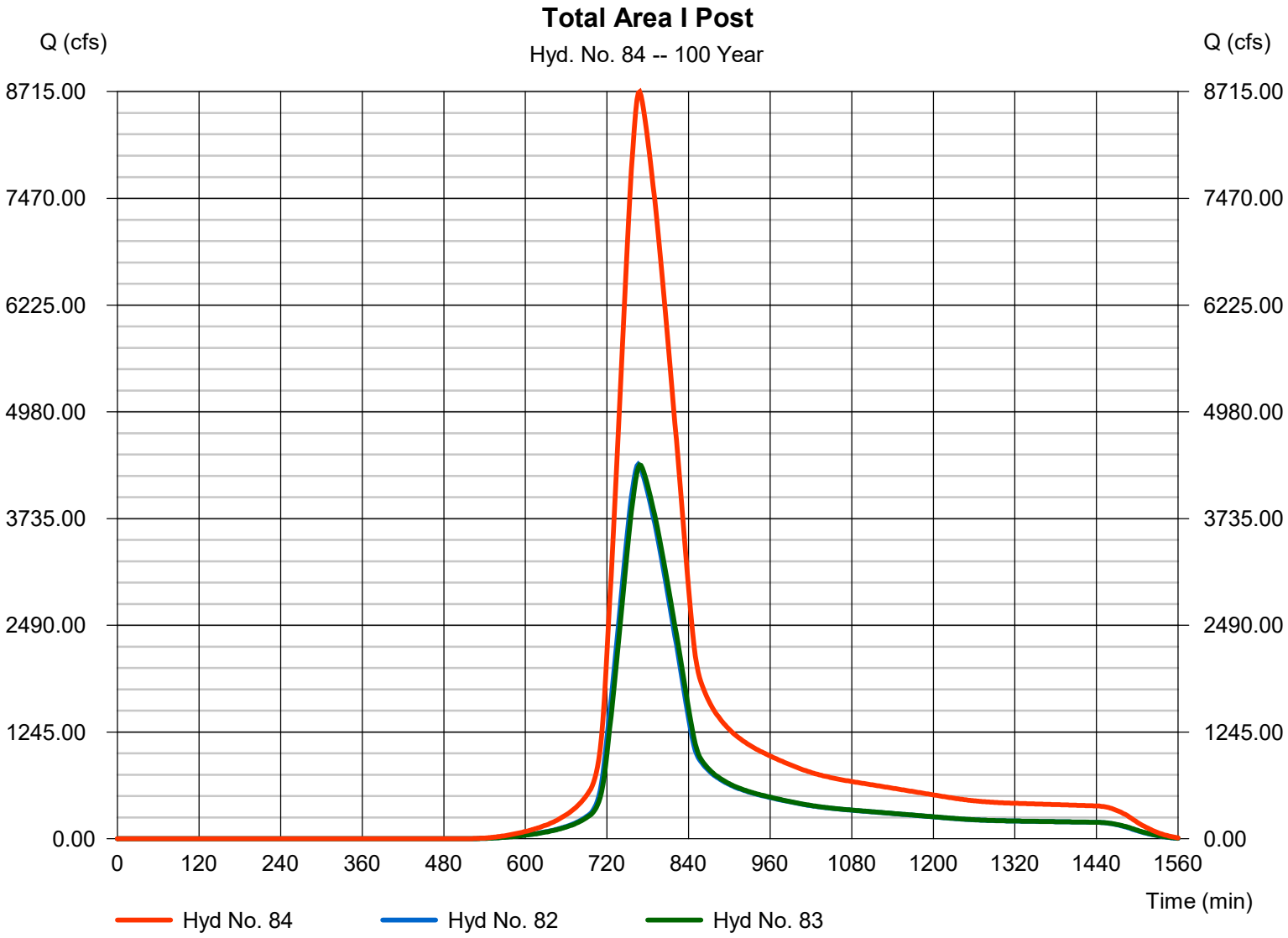


Hydrograph Report

Hyd. No. 84

Total Area I Post

Hydrograph type	= Combine	Peak discharge	= 8713.51 cfs
Storm frequency	= 100 yrs	Time to peak	= 768 min
Time interval	= 2 min	Hyd. volume	= 74,282,512 cuft
Inflow hyds.	= 82, 83	Contrib. drain. area	= 2637.000 ac



| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: PUBLIC HEARING

Meeting Date: April 27, 2021

Item Details

Presenter(s): Sarah Van Every, Senior Planner

Department(s): Planning & Community Development

Requested Motion

Public Hearing and possible motion to approve Rezoning Application #21CZ08 Cash Corporate Center Amendment. The applicants, Town of Apex and Jack 1, LLC., seek to rezone approximately 121.30 acres located at 0 Pristine Water Drive, 2100 Production Drive, 0 and 1201 Burma Drive (PINs 0751138504, 0751244221, 0751143089, and a portion of former PIN 0751136687) from Light Industrial-Conditional Zoning (LI-CZ #18CZ19) to Light Industrial-Conditional Zoning (PUD-CZ).

Approval Recommended?

The Planning and Community Development Department recommends approval.

The Planning Board held a Public hearing on April 12, 2021 and recommended approval, with the conditions as offered by the applicant, by a vote of 6-0.

Item Details

Attachments

- Staff Report
- Vicinity Map
- Application

All property owners within 300 feet of this rezoning have been notified per UDO Sec. 2.2.11 *Public Notification*.

BACKGROUND INFORMATION:

Location: 2100 Production Drive, 0 Pristine Water Drive, 0 & 1201 Burma Drive
Applicant/Owners: Town of Apex/Jack 1, LLC & Town of Apex

PROJECT DESCRIPTION:

Acreage: 121.30 ± acres
PINs: 0751244221, 0751138504, 0751143089, portion of former PIN 0751136687
Current Zoning: Light Industrial-Conditional Zoning (LI-CZ #18CZ19)
Proposed Zoning: Light Industrial-Conditional Zoning (LI-CZ)
2045 Land Use Map: Industrial Employment
Town Limits: Inside corporate limits

Adjacent Zoning & Land Uses:

	Zoning	Land Use
North:	Light Industrial-Conditional Use (LI-CU #90CU09)	Light Industrial (Pinnacle Park)
South:	Light Industrial (LI); Light-Industrial-Conditional Zoning (LI-CZ #17CZ19)	Light Industrial (Reclamation, concrete); vacant
East:	Rural Residential (RR)	Recreation (Knight's Play Golf Course)
West:	Light Industrial (LI)	Light Industrial (Raleigh Paving); vacant

Existing Conditions:
The subject properties are located south of Burma and Production Drives, east of Lufkin Road and north of Jessie Drive. The properties are vacant and wooded.

Neighborhood Meeting:
The applicant conducted a neighborhood meeting on March 1, 2021. The neighborhood meeting report is attached.

2045 LAND USE MAP:
The 2045 Land Use Map identifies the properties subject to this rezoning as Industrial Employment. The proposed rezoning to Light Industrial-Conditional Zoning is consistent with that land use classification.

PERMITTED USES:
The applicant is proposing to add the following uses to the permitted uses:

1. Security of caretaker quarters
2. Government Service
3. Heliport or helipad
14. Laboratory, industrial research
15. Machine or welding shop
16. Woodworking or cabinetmaking

4. Transportation facility
5. Utility, Minor
6. Regional recreation complex
7. Broadcasting statin (radio and television)
8. Radio and television studio
9. Medical or dental office or clinic
10. Medical or dental laboratory
11. Office, business or professional
12. Pilot plant
13. Research facility
17. Wholesaling, general
18. Brewery
19. Distillery
20. Dry cleaning and dyeing plant
21. Laundry plant
22. Manufacturing and processing
23. Microbrewery
24. Microdistillery
25. **Botanical Garden**

PROPOSED ZONING CONDITIONS:

The applicant is proposing the following changes (shown in **bold** for additions) with this amendment:

1. EIFS cornices and parapet trim may be used. EIFS and stucco shall not be used within four (4) feet of the ground and shall be limited to 25% of each building façade.
2. The front façade and any façade that faces a collector street shall be **a minimum of 60%** masonry. **The remainder of such facades shall be high-quality aluminum composite metal panels or similar.**
3. The developer shall dedicate 30' of public right-of-way along the southern property line for future construction of Pristine Water Drive in accordance with the Apex Transportation Plan.
4. No buffer shall be required along major and minor collector streets.
5. A continuous 10' **Side Path** within the public right-of-way or 10' Greenway within a 20' Public Greenway Easement shall be constructed from Burma Drive at the northern property boundary to future Production Drive at the southern property boundary.
6. **The minimum parking requirement shall either be in accordance with UDO Sec. 8.3.2 *Off-Street Parking Requirements* or 1 parking space per employee on the maximum shift plus 2% additional for visitors, whichever is greater.**
7. **With the exception of development on Lots 1 and 2, each development shall provide two (2) electric vehicle charging spaces. These spaces count toward minimum parking standards.**
8. **Greenhouses accessory to a Research facility shall be exempt from the following:**
    a. **The building material and color standards of Sec. 4.5.3 *Accessory Structures, Non-Residential Zoning Districts*; and**
    b. **The limitation on percent of yard area occupied and setback requirements of Sec. 5.2.7.B *Dimensional Standards for Detached Accessory Structures, Percentage of Required Yard Occupied and Required Setbacks.***

PLANNING STAFF RECOMMENDATION:

Planning staff recommends approval of #21CZ08 Cash Corporate Center Amendment with the conditions as offered by the applicant.

PLANNING BOARD RECOMMENDATION:

The Planning Board heard this rezoning at their April 12, 2021 meeting and voted to recommend approval, with the conditions as offered by the applicant, by a vote of 6-0.

ANALYSIS STATEMENT OF THE REASONABLENESS OF THE PROPOSED REZONING:

This Statement will address consistency with the Town's comprehensive and other applicable plans, reasonableness, and effect on public interest:

Approval of the rezoning is reasonable because the proposed Light Industrial-Conditional Zoning district is consistent with the Industrial Employment land use classification on the 2045 Land Use Map.

The proposed rezoning is reasonable and in the public interest because will provide flexibility necessary to ensure cohesive development plans for future Economic Development Projects.

CONDITIONAL ZONING STANDARDS:
The Town Council shall find the Light Industrial-Conditional Zoning (LI-CZ) designation demonstrates compliance with the following standards. Sec. 2.3.3.F:

Legislative Considerations
The applicant shall propose site-specific standards and conditions that take into account the following considerations, which are considerations that are relevant to the legislative determination of whether or not the proposed conditional zoning district rezoning request is in the public interest. These considerations do not exclude the legislative consideration of any other factor that is relevant to the public interest.

1) *Consistency with 2045 Land Use Map.* The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and consistency with the purposes, goals, objectives, and policies of the 2045 Land Use Map.

2) *Compatibility.* The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and compatibility with the character of surrounding land uses.

3) *Zoning district supplemental standards.* The proposed Conditional Zoning (CZ) District use's compliance with Sec. 4.4 *Supplemental Standards,* if applicable.

4) *Design minimizes adverse impact.* The design of the proposed Conditional Zoning (CZ) District use's minimization of adverse effects, including visual impact of the proposed use on adjacent lands; and avoidance of significant adverse impacts on surrounding lands regarding trash, traffic, service delivery, parking and loading, odors, noise, glare, and vibration and not create a nuisance.

5) *Design minimizes environmental impact.* The proposed Conditional Zoning District use's minimization of environmental impacts and protection from significant deterioration of water and air resources, wildlife habitat, scenic resources, and other natural resources.

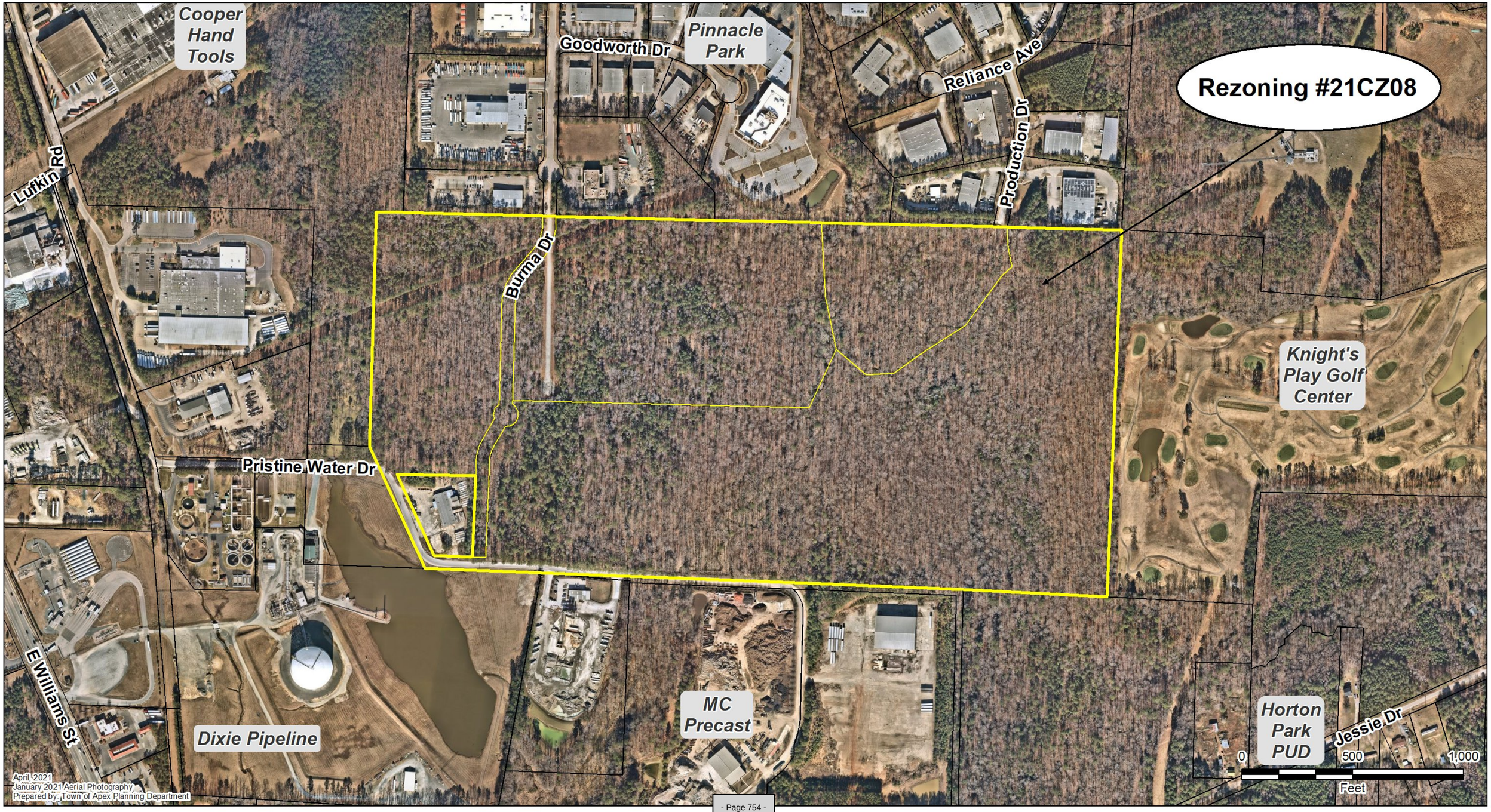
6) *Impact on public facilities.* The proposed Conditional Zoning (CZ) District use's avoidance of having adverse impacts on public facilities and services, including roads, potable water and wastewater facilities, parks, schools, police, fire and EMS facilities.

7) *Health, safety, and welfare.* The proposed Conditional Zoning (CZ) District use's effect on the health, safety, or welfare of the residents of the Town or its ETJ.

8) *Detrimental to adjacent properties.* Whether the proposed Conditional Zoning (CZ) District use is substantially detrimental to adjacent properties.

9) *Not constitute nuisance or hazard.* Whether the proposed Conditional Zoning (CZ) District use constitutes a nuisance or hazard due to traffic impact or noise, or because of the number of persons who will be using the Conditional Zoning (CZ) District use.

10) *Other relevant standards of this Ordinance.* Whether the proposed Conditional Zoning (CZ) District use complies with all standards imposed on it by all other applicable provisions of this Ordinance for use, layout, and general development characteristics.


Rezoning #21CZ08
Cooper Hand Tools
Lufkin Rd
Goodworth Dr
Pinnacle Park
Reliance Ave
Production Dr
Burma Dr
Pristine Water Dr
Knight's Play Golf Center
E Williams St
Dixie Pipeline
MC Precast
Horton Park PUD
Jessie Dr
0
500
1,000
Feet
April, 2021
January 2021 Aerial Photography
Prepared by: Town of Apex Planning Department

PETITION TO AMEND THE OFFICIAL ZONING MAP & 2045 LAND USE MAP

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Application #: #21CZ08 Submittal Date:

2045 LUM Amendment: Fee Paid:

Project Information

Project Name: Cash Corporate Center

Address(es): 0 Pristine Water Drive; 2100 Production Drive;1201 Burma Drive

PIN(s): 0751138504; 0751244221; 0751143089 and Burma Drive Extension (portion of former PIN 0751136687)

Acreage: 121.3

Current Zoning: LI-CZ #18CZ19 Proposed Zoning: LI-CZ

Current 2045 LUM Designation: Industrial Employment

Proposed 2045 LUM Designation: N/A

See next page for LUM Amendment.

If any portion of the project is shown as mixed use (3 or more stripes on the 2045 Land Use Map) provide the following:

Area classified as mixed use: Acreage:

Area proposed as non-residential development: Acreage:

Percent of mixed use area proposed as non-residential: Percent:

Applicant Information

Name: Town of Apex - Joanna Helms, Director, Apex Economic Development

Address: 73 Hunter Street

City: Apex State: NC Zip: 27502

Phone: 919-372-7461 E-mail: joanna.helms@apexnc.org

Owner Information

Name: JACK1, LLC (ALSO SEE BELOW)

Address: 738 Cash Street

City: Apex State: NC Zip: 27502

Phone: E-mail:

Agent Information

Name: N/A

Address:

City: State: Zip:

Phone: E-mail:

Other contacts: OTHER OWNERS:

Town of Apex	Protein Production LLC
73 Hunter Street	315 Academy Street, Suite 201
Apex, NC 27502	Cary, NC 27513

PETITION TO AMEND THE OFFICIAL ZONING MAP & 2045 LAND USE MAP

Application #: #21CZ08 Submittal Date: _____

2045 LAND USE MAP AMENDMENT (IF APPLICABLE)

The applicant does hereby respectfully request the Town Council amend the 2045 Land Use Map. In support of this request, the following facts are shown:

The area sought to be amended on the 2045 Land Use Map is located at:

N/A

Current 2045 Land Use Classification: _____

Proposed 2045 Land Use Classification: _____

What condition(s) justifies the passage of the amendment to the 2045 Land Use Map? Discuss the existing use classifications of the subject area in addition to the adjacent land use classifications. Use additional pages as needed.

PETITION INFORMATION

Application #: #21CZ08 **Submittal Date:** _____

An application has been duly filed requesting that the property described in this application be rezoned from LI-CZ #18CZ19 to LI-CZ. It is understood and acknowledged that if the property is rezoned as requested, the property described in this request will be perpetually bound to the use(s) authorized and subject to such conditions as imposed, unless subsequently changed or amended as provided for in the Unified Development Ordinance. It is further understood and acknowledged that final plans for any specific development to be made pursuant to any such Conditional Zoning shall be submitted for site or subdivision plan approval. Use additional pages as needed.

PROPOSED USES:

The Rezoned Lands may be used for, and only for, the uses listed immediately below. The permitted uses are subject to the limitations and regulations stated in the UDO and any additional limitations or regulations stated below. For convenience, some relevant sections of the UDO may be referenced; such references do not imply that other sections of the UDO do not apply.

1		21	
2		22	
3	See attached list	23	
4		24	
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20		40	

Cash Corporate Center
2100 Production Drive, 0 Pristine Water Drive, 0 & 1201 Burma Drive
Light Industrial - Conditional Zoning Uses

1. Security or Caretaker quarters
2. Government Service
3. Heliport or Helipad
4. Transportation Facility
5. Utility, minor
6. Regional Recreation complex
7. Broadcasting Station (radio and television)
8. Radio and television recording studio
9. Medical or dental office or clinic
10. Medical or dental laboratory
11. Office, business or professional
12. Pilot plant
13. Research facility
14. Laboratory, industrial research
15. Machine or welding shop
16. Woodworking or cabinetmaking
17. Wholesaling, general
18. Brewery
19. Distillery
20. Dry cleaning and dyeing plant
21. Laundry plant
22. Manufacturing and processing
23. Microbrewery
24. Microdistillery
25. **Botanical Garden**

PETITION INFORMATION

Application #: #21CZ08 Submittal Date:

PROPOSED CONDITIONS:

The applicant hereby requests that the Town Council of the Town of Apex, pursuant to the Unified Development Ordinance, approve the Conditional Zoning for the above listed use(s) subject to the following condition(s). Use additional pages as needed.

SEE ATTACHED

LEGISLATIVE CONSIDERATIONS - CONDITIONAL ZONING

The applicant shall propose site-specific standards and conditions that take into account the following considerations, which are considerations that are relevant to the legislative determination of whether or not the proposed conditional zoning district rezoning request is in the public interest. These considerations do not exclude the legislative consideration of any other factor that is relevant to the public interest. Use additional pages as needed.

1) *Consistency with 2045 Land Use Map.* The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and consistency with the purposes, goals, objectives, and policies of the 2045 Land Use Map.

The proposed rezoning is a permitted district within the Industrial Employment designation on the 2045 Land Use Map.

2) *Compatibility.* The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and compatibility with the character of surrounding land uses.

The surrounding land uses and zoning districts are industrial in nature, so the proposed LI-CZ district is appropriate and compatible with the surrounding properties.

Cash Corporate Center
2100 Production Drive, 0 Pristine Water Drive,
0 & 1201 Burma Drive
Proposed Conditions

Shown below are the current zoning conditions with revisions/additions shown in **bold:**

1. EIFS cornices and parapet trim may be used. EIFS and stucco shall not be used within four (4) feet of the ground and shall be limited to 25% of each building façade.
2. The front façade and any façade that faces a collector street shall be **a minimum of 60%** masonry. **The remainder of such facades shall be high-quality aluminum composite metal panels or similar.**
3. The developer shall dedicate 30' of public right-of-way along the southern property line for future construction of Pristine Water Drive in accordance with the Apex Transportation Plan.
4. No buffer shall be required along major and minor collector streets.
5. A continuous 10' **Side Path** within the public right-of-way or 10' Greenway within a 20' Public Greenway Easement shall be constructed from Burma Drive at the northern property boundary to future Production Drive at the southern property boundary.
6. **The minimum parking requirement shall either be in accordance with UDO Sec. 8.3.2 *Off-Street Parking Requirements* or 1 parking space per employee on the maximum shift plus 2% additional for visitors, whichever is greater.**
7. **With the exception of development on Lots 1 and 2 (PINs 0751244221 and 0751143089), each development shall provide two (2) electric vehicle charging spaces. These spaces count toward minimum parking standards.**
8. **Greenhouses accessory to a Research facility shall be exempt from the following:**
   a. **The building material and color standards of Sec. 4.5.3 *Accessory Structures, Non-Residential Zoning Districts*; and**
   b. **The limitation on percent of yard area occupied and setback requirements of Sec. 5.2.7.B *Dimensional Standards for Detached Accessory Structures, Percentage of Required Yard Occupied and Required Setbacks.***

PETITION INFORMATION

Application #: #21CZ08 Submittal Date:

3) Zoning district supplemental standards. The proposed Conditional Zoning (CZ) District use's compliance with Sec 4.4 *Supplemental Standards*, if applicable.

The uses proposed will comply with any applicable supplemental standards listed in UDO Section 4.4.

4) *Design minimizes adverse impact.* The design of the proposed Conditional Zoning (CZ) District use's minimization of adverse effects, including visual impact of the proposed use on adjacent lands; and avoidance of significant adverse impacts on surrounding lands regarding trash, traffic, service delivery, parking and loading, odors, noise, glare, and vibration and not create a nuisance.

As required by the UDO, the uses proposed will be designed to minimize any adverse impacts.

5) *Design minimizes environmental impact.* The proposed Conditional Zoning District use's minimization of environmental impacts and protection from significant deterioration of water and air resources, wildlife habitat, scenic resources, and other natural resources.

As required by the UDO, the uses proposed will minimize environmental impacts.

6) *Impact on public facilities.* The proposed Conditional Zoning (CZ) District use's avoidance of having adverse impacts on public facilities and services, including roads, potable water and wastewater facilities, parks, schools, police, fire and EMS facilities.

As required by the UDO, the uses proposed will avoid any adverse impacts on public facilities.

7) *Health, safety, and welfare.* The proposed Conditional Zoning (CZ) District use's effect on the health, safety, or welfare of the residents of the Town or its ETJ.

The uses proposed will not have a negative impact on the health, safety or welfare of the residents of the Town or it's ETJ.

8) *Detrimental to adjacent properties.* Whether the proposed Conditional Zoning (CZ) District use is substantially detrimental to adjacent properties.

The uses proposed will not be substantially detrimental to any adjacent properties.

9) *Not constitute nuisance or hazard.* Whether the proposed Conditional Zoning (CZ) District use constitutes a nuisance or hazard due to traffic impact or noise, or because of the number of persons who will be using the Conditional Zoning (CZ) District use.

The uses proposed will not constitute a nuisance or hazard.

10) *Other relevant standards of this Ordinance.* Whether the proposed Conditional Zoning (CZ) District use complies with all standards imposed on it by all other applicable provisions of this Ordinance for use, layout, and general development characteristics.

The uses proposed will comply with all relevant standards of the Town's UDO.

CERTIFIED LIST OF NEIGHBORING PROPERTY OWNERS

Application #: #21CZ08 Submittal Date: _____

Provide a certified list of property owners subject to this application and all property owners within 300' of the subject property and HOA Contacts.

	Owner's Name	PIN
1.		
2.		
3.		
4.		
5.		
6.		
7.	SEE ATTACHED LIST	
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		

I, Joanna S. Helms, certify that this is an accurate listing of all property owners and property owners within 300' of the subject property.

Date: 3/2/21 By: Joanna S. Helms

COUNTY OF WAKE STATE OF NORTH CAROLINA

Sworn and subscribed before me, Barbara J. Belicic, a Notary Public for the above State and County, on this the 2 day of March, 2021.

Barbara J Belicic
Notary Public

Barbara J. Belicic
Print Name

My Commission Expires: 7/29/2025

SEAL

BARBARA J BELICIC NOTARY PUBLIC WAKE COUNTY, NC

CASH CORPORATE CENTER

0 Production Drive and 2100 Production Drive

Certified List of Neighboring Property Owners

PIN_NUM	OWNER
0751033230	SMITH, JAMES STEPHEN
0751044654	TEAM PROPERTIES LP
0751029412	EAGLE ROCK CONCRETE LLC
0741932178	APEX TOWN OF
0751113934	RALEIGH RECLAMATION LLC
0751113934	LOT 17 PRODUCTION DRIVE (Bobbitt Design)
0751341664 ext. 001	IPEARL HOLDINGS LLC
0751341664 ext. 002	2031 PRODUCTION REALTY LLC
0751222279	560 PRISTINE PARTNERS LLC
0751158052	RED DIRT PROPERTIES LLC
0741933676	EASTERN SERVICES HOLDINGS LLC
0751359861	VERTICAL BRIDGE AM II LLC
0751359861 ext. 800	TVX OF RALEIGH DURHAM
0741929413	DIXIE PIPE LINE COMPANY
0751130961	JACK 1, LLC
0751257024	PRODUCTION RELIANCE LLC
0751532815	CAREY C JONES MEMORIAL PARK INC
0751141725	COUSINS INVESTMENTS I LLC
0751054189	PURYEAR PROPERTIES LLC
0741938441	DIXIE PIPE LINE COMPANY
0751323228	TRINITY APEX NORTH 100 LLC
0751245667	HEIA LLC
0751244900	RELIANCE AVE LLC
0741942224	LM LUFKIN ROAD LLC
0751234512	JACK 1, LLC
0751342839	PRODUCTION DRIVE BUSINESS CENTER (ABCZ)
0751342839 ext. 001	BUILDERS RESOURCE SERVICES INC
0751342839 ext. 002, 003	A&E REAL ESTATE ENTERPRISES LLC
0751342839 ext. 004, 005	ED PROPERTIES LLC
0751342839 ext. 006	CONSTANCE F SCIOLINO/JOSEPH C SCIOLINO
0751342839 ext. 007	JJKL INVESTMENTS LLC II
0751342839	BSS, LLC
0751144975	ALVES & PEREIRA LLC
0741954413	APEX TOOL U.S. REAL ESTATE HOLDING, LLC

AGENT AUTHORIZATION FORM

Application #: #21CZ08 Submittal Date: _____

JACK1, LLC - Fred Gray Cash III is the owner* of the property for which the attached application is being submitted:

- ☐ Land Use Amendment
- ☑ Rezoning: For Conditional Zoning and Planned Development rezoning applications, this authorization includes express consent to zoning conditions that are agreed to by the Agent which will apply if the application is approved.
- ☐ Site Plan
- ☐ Subdivision
- ☐ Variance
- ☐ Other: _____

The property address is: 0 Production Drive and 2100 Production Drive

The agent for this project is: _____

☒ I am the owner of the property and will be acting as my own agent

Agent Name: Fred Gray Cash III

Address: 738 Cash Street, Apex, NC 27502

Telephone Number: (919) 610-2489

E-Mail Address: gray.cash@erg.com

Signature(s) of Owner(s)*

Fred Gray Cash III — 2/23/21

Type or print name — Date

_____

_____ _____

Type or print name — Date

Attach additional sheets if there are additional owners.

*Owner of record as shown on the latest equalized assessment rolls of Wake County. An option to purchase does not constitute ownership. If ownership has been recently transferred, a copy of the deed must accompany this authorization.

Pursuant to Article 40 of Chapter 66 of the North Carolina General Statutes (the Uniform Electronic Transactions Act) this application and all documents related hereto containing an electronic or digitized signature are legally binding in the same manner as are hard copy documents executed by hand signature. The parties hereby consent to use electronic or digitized signatures in accordance with the Town's Electronic Signature Policy and intend to be bound by the application and any related documents. If electronic signatures are used the application shall be delivered in an electronic record capable of retention by the recipient at the time of receipt.

AFFIDAVIT OF OWNERSHIP

Application #: #21CZ08 Submittal Date: _____

The undersigned, JACK1, LLC (the "Affiant") first being duly sworn, hereby swears or affirms as follows:

1. Affiant is over eighteen (18) years of age and authorized to make this Affidavit. The Affiant is the sole owner, or is the authorized agent of all owners, of the property located at O Production Drive and 2100 Production Drive and legally described in **Exhibit "A"** attached hereto and incorporated herein (the "Property").

2. This Affidavit of Ownership is made for the purpose of filing an application for development approval with the Town of Apex.

3. If Affiant is the owner of the Property, Affiant acquired ownership by deed, dated 11/13/17 and 11/15/17, and recorded in the Wake County Register of Deeds Office on 11/15/17, in Book 16969 Page 2025 and 2028.

4. If Affiant is the authorized agent of the owner(s) of the Property, Affiant possesses documentation indicating the agency relationship granting the Affiant the authority to apply for development approval on behalf of the owner(s).

5. If Affiant is the owner of the Property, from the time Affiant was deeded the Property on 11/15/17, Affiant has claimed sole ownership of the Property. Affiant or Affiant's predecessors in interest have been in sole and undisturbed possession and use of the property during the period of ownership. Since taking possession of the Property on 11/15/17, no one has questioned Affiant's ownership or right to possession nor demanded any rents or profits. To Affiant's knowledge, no claim or action has been brought against Affiant (if Affiant is the owner), or against owner(s) (if Affiant is acting as an authorized agent for owner(s)), which questions title or right to possession of the property, nor is any claim or action pending against Affiant or owner(s) in court regarding possession of the Property.

This the 23 day of February, 2021.

Fred Gray Cash III (seal)

Fred Gray Cash III
Type or print name

STATE OF NORTH CAROLINA
COUNTY OF Wake

I, the undersigned, a Notary Public in and for the County of Wake, hereby certify that Fred Gray Cash, Affiant, personally known to me or known to me by said Affiant's presentation of said Affiant's Drivers License, personally appeared before me this day and acknowledged the due and voluntary execution of the foregoing Affidavit.

BARBARA J BELICIC NOTARY PUBLIC WAKE COUNTY, NC [NOTARY SEAL]

Barbara J Belicic
Notary Public
State of North Carolina
My Commission Expires: 7/29/2025

AFFIDAVIT OF OWNERSHIP: EXHIBIT A – LEGAL DESCRIPTION

Application #: #21CZ08 Submittal Date:

Insert legal description below.

0 Production Drive
PIN # 0751136687

BEGINNING at an existing iron pipe bearing NAD-83(2007) N.C. grid coordinate values of N= 713,497.28 U.S. Survey Feet, E= 2,050,001.96 U.S. Survey Feet; thence South 24 30' 26" East, 605.21 feet to a mathematical point (not set); thence South 87 50' 56" East, 525.35 feet to an existing iron pipe; thence South 87 47' 38" East, 399.89 feet to an existing iron pipe; thence South 87 47' 30" East, 860.33 feet to an existing iron stake (bolt); thence South 87 40' 34" East, 644.33 feet to an existing iron pipe (existing iron stake witness); thence South 86 54' 14" East, 649.73 feet to an existing iron pipe (existing concrete monument witness); thence North 02 18' 58" East, 1658.75 feet to an existing concrete monument; thence North 88 36' 28" West, 1048.94 feet to an existing iron pipe; thence North 88 37' 36" West, 789.90 feet to an existing iron pipe; thence North 88 34' 50" West, 714.82 feet to an existing iron pipe; thence North 88 38' 58" West, 60.06 feet to an existing iron pipe; thence North 88 37' 07" West, 629.13 feet to an existing concrete monument; thence North 88 26' 26" West, 122.43 feet to an existing iron pipe; thence South 01 39' 26" West, 1059.71 feet to the BEGINNING containing 121.3050 acres more or less, which excludes the area contained in D.B. 11112, PG. 1446.

2100 Production Drive

PIN # 0751244221

Beginning at a new iron pipe, said pipe being North 88°36'36" West 515.21 feet from concrete monument, said monument having NC grid coordinates of N=714,474.6391, E=2,053,396.6293, thence from said beginning point along a curve to the left having a radius of 370.00 feet, an arc length of 110.78 feet, and a chord bearing and distance of South 03°18'36" East 110.36 feet to a new iron pipe, thence South 11°53'13" East 68.24 feet to a new iron pipe, thence South 46°39'19" West 63.68 feet to a new iron pipe, thence South 36°18'22" West 277.70 feet to a new iron pipe, thence South 58°10'29" West 158.89 feet to a new iron pipe, thence South 56° 57'20" West 89.85 feet to a new iron pipe, thence South 53°55'29" West 136.26 feet to a new iron pipe, thence South 85°28'50" West 127.09 feet to a new iron pipe, thence North 49°43'33" West 179.01 feet to a new iron pipe, thence North 11°22'26" West 243.83 feet to a new iron pipe, thence North 03°02'45" West 333.46 feet to an existing iron pipe with a cap, thence South 88°37'59" East 306.37 feet to an existing iron pipe with a cap, thence South 88°36'36" East 533.72 feet to the point and place of beginning containing 10.00 acres (435,604 sq ft) more or less.

AFFIDAVIT OF OWNERSHIP

Application #: #21CZ08 Submittal Date: _____

The undersigned, Protein Production LLC (W. Kyle Greer) (the "Affiant") first being duly sworn, hereby swears or affirms as follows:

1. Affiant is over eighteen (18) years of age and authorized to make this Affidavit. The Affiant is the sole owner, or is the authorized agent of all owners, of the property located at 2100 Production Drive, Apex NC and legally described in **Exhibit "A"** attached hereto and incorporated herein (the "Property").

2. This Affidavit of Ownership is made for the purpose of filing an application for development approval with the Town of Apex.

3. If Affiant is the owner of the Property, Affiant acquired ownership by deed, dated March 23, 2021, and recorded in the Wake County Register of Deeds Office on March 23, 2021, in Book 18413 Page 1500 & 1502.

4. If Affiant is the authorized agent of the owner(s) of the Property, Affiant possesses documentation indicating the agency relationship granting the Affiant the authority to apply for development approval on behalf of the owner(s).

5. If Affiant is the owner of the Property, from the time Affiant was deeded the Property on March 23, 2021, Affiant has claimed sole ownership of the Property. Affiant or Affiant's predecessors in interest have been in sole and undisturbed possession and use of the property during the period of ownership. Since taking possession of the Property on March 23,2021, no one has questioned Affiant's ownership or right to possession nor demanded any rents or profits. To Affiant's knowledge, no claim or action has been brought against Affiant (if Affiant is the owner), or against owner(s) (if Affiant is acting as an authorized agent for owner(s)), which questions title or right to possession of the property, nor is any claim or action pending against Affiant or owner(s) in court regarding possession of the Property.

This the 8 day of April, 2021.

W. Kyle Greer (seal)

W. Kyle Greer

Type or print name

STATE OF NORTH CAROLINA
COUNTY OF ORANGE

I, the undersigned, a Notary Public in and for the County of ORANGE, hereby certify that W. Kyle Greer, Affiant, personally known to me or known to me by said Affiant's presentation of said Affiant's W. Kyle Greer, personally appeared before me this day and acknowledged the due and voluntary execution of the foregoing Affidavit.

[NOTARY SEAL] DIANNA GRACE NOTARY PUBLIC ORANGE COUNTY, NC

Diana Grace

Notary Public
State of North Carolina
My Commission Expires: 6/25/2022

AFFIDAVIT OF OWNERSHIP: EXHIBIT A – LEGAL DESCRIPTION

Application #: #21CZ08 Submittal Date: _____

Insert legal description below.

Beginning at a new iron pipe, said pipe being North 88°36'36" West 515.21 feet from concrete monument, said monument having NC grid coordinates of N=714,474.6391, E=2,053,396.6293, thence from said beginning point along a curve to the left having a radius of 370.00 feet, an arc length of 110.78 feet, and a chord bearing and distance of South 03°18'36" East 110.36 feet to a new iron pipe, thence South 11°53'13" East 68.24 feet to a new iron pipe, thence South 46°39'19" West 63.68 feet to a new iron pipe, thence South 36°18'22" West 277.70 feet to a new iron pipe, thence South 58°10'29" West 158.89 feet to a new iron pipe, thence South 56° 57'20" West 89.85 feet to a new iron pipe, thence South 53°55'29" West 136.26 feet to a new iron pipe, thence South 85°28'50" West 127.09 feet to a new iron pipe, thence North 49°43'33" West 179.01 feet to a new iron pipe, thence North 11°22'26" West 243.83 feet to a new iron pipe, thence North 03°02'45" West 333.46 feet to an existing iron pipe with a cap, thence South 88°37'59" East 306.37 feet to an existing iron pipe with a cap, thence South 88°36'36" East 533.72 feet to the point and place of beginning containing 10.00 acres (435,604 sq ft) more or less.

AFFIDAVIT OF OWNERSHIP

Application #: #21CZ08 Submittal Date: _____

The undersigned, Town of Apex - Ralph Clark, Interim Town Manager (the "Affiant") first being duly sworn, hereby swears or affirms as follows:

1. Affiant is over eighteen (18) years of age and authorized to make this Affidavit. The Affiant is the sole owner, or is the authorized agent of all owners, of the property located at O Burma Drive (portion of former PIN 0751136687) and legally described in **Exhibit "A"** attached hereto and incorporated herein (the "Property").
2. This Affidavit of Ownership is made for the purpose of filing an application for development approval with the Town of Apex.
3. If Affiant is the owner of the Property, Affiant acquired ownership by deed, dated March 22, 2021, and recorded in the Wake County Register of Deeds Office on March 22, 2021, in Book 18409 Page 1411-1415.
4. If Affiant is the authorized agent of the owner(s) of the Property, Affiant possesses documentation indicating the agency relationship granting the Affiant the authority to apply for development approval on behalf of the owner(s).
5. If Affiant is the owner of the Property, from the time Affiant was deeded the Property on March 22, 2021, Affiant has claimed sole ownership of the Property. Affiant or Affiant's predecessors in interest have been in sole and undisturbed possession and use of the property during the period of ownership. Since taking possession of the Property on March 22, 2021, no one has questioned Affiant's ownership or right to possession nor demanded any rents or profits. To Affiant's knowledge, no claim or action has been brought against Affiant (if Affiant is the owner), or against owner(s) (if Affiant is acting as an authorized agent for owner(s)), which questions title or right to possession of the property, nor is any claim or action pending against Affiant or owner(s) in court regarding possession of the Property.

This the 8th day of April, 2021.

Ralph A Clark (seal)

Ralph A. Clark
Type or print name

STATE OF NORTH CAROLINA
COUNTY OF Wake

I, the undersigned, a Notary Public in and for the County of Wake, hereby certify that Ralph A. Clark, Affiant, personally known to me or known to me by said Affiant's presentation of said Affiant's Driver's License, personally appeared before me this day and acknowledged the due and voluntary execution of the foregoing Affidavit.

BARBARA J BELICIC NOTARY PUBLIC [NOTARY SEAL] WAKE COUNTY, NC

Barbara J Belicic
Notary Public
State of North Carolina
My Commission Expires: 7/29/2025

AFFIDAVIT OF OWNERSHIP: EXHIBIT A – LEGAL DESCRIPTION

Application #: #21CZ08 Submittal Date: _____

Insert legal description below.

Beginning at a point, said point having NC grid coordinates (NAD 83 - 2011) of N=714,536.550, E=2,050,844.007, thence from said beginning point South 01°21'02" West 40.96 feet to a point, thence along a curve to the right having a radius of 230.00 feet, an arc length of 159.01 feet, and a chord bearing and distance of South 21°09'22" West 155.86 feet to a point, thence South 40°57'43" West 130.21 feet to a point, thence along a curve to the left having a radius of 170.00 feet, an arc length of 117.32 feet, and a chord bearing and distance of South 21°11'26" West 115.01 feet to a point, thence South 01°25'10" West 440.59 feet to a point, thence along a curve to the right having a radius of 230.00 feet, an arc length of 15.93 feet, and a chord bearing and distance of South 03°24'14" West 15.93 feet to a point, thence along a curve to the right having a radius of 55.00 feet, an arc length of 143.65 feet, and a chord bearing and distance of South 18°36'58" West 106.16 feet to a point, thence South 29°22'14" West 101.46 feet to a point, thence along a curve to the left having a radius of 170.00 feet, an arc length of 80.69 feet, and a chord bearing and distance of South 15°46'22" West 79.94 feet to a point, thence South 02°10'29" West 426.53 feet to a point, thence North 87°52'36" West 60.00 feet to a point, thence North 02°10'29" East 426.58 feet to a point, thence along a curve to the right having a radius of 230.00 feet, an arc length of 109.17 feet, and a chord bearing and distance of North 15°46'22" East 108.15 feet to a point, thence North 29°22'14" East 109.30 feet to a point, thence along a curve to the right having a radius of 55.00 feet, an arc length of 74.04 feet, and a chord bearing and distance of North 18°45'11" East 68.58 feet to a point, thence along a curve to the left having a radius of 170.00 feet, an arc length of 16.85 feet, and a chord bearing and distance of North 04°15'35" East 16.85 feet to a point, thence North 01°25'10" East 440.59 feet to a point, thence along a curve to the right having a radius of 230.00 feet, an arc length of 158.73 feet, and a chord bearing and distance of North 21°11'26" East 155.60 feet to a point, thence North 40°57'43" East 130.21 feet to a point, thence along a curve to the left having a radius of 170.00 feet, an arc length of 117.53 feet, and a chord bearing and distance of North 21°09'22" East 115.20 feet to a point, thence North 01°21'02" East 40.95 feet to a point, thence South 88°39'34" East 60.00 feet to the point and place of beginning containing 2.310 acres (100,642 SF) more or less.

AFFIDAVIT OF CONDUCTING AN ELECTRONIC NEIGHBORHOOD MEETING AND ISSUES/RESPONSES SUBMITTAL

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

I, Joanna S. Helms/Town of Apex, do hereby declare as follows:
Print Name

1. I have conducted an Electronic Neighborhood Meeting for the proposed Rezoning, Major Site Plan, Residential Master Subdivision Plan, or Special Use Permit in accordance with UDO Sec. 2.2.7 *Neighborhood Meeting*.

2. The meeting invitations were mailed to the Apex Planning Department, all property owners within 300 feet of the subject property and any neighborhood association that represents citizens in the area via first class mail a minimum of 10 days in advance of the Electronic Neighborhood Meeting.

3. The meeting was conducted via VIRTUAL (electronic meeting link provided) (indicate format of meeting) on March 1, 2021 (date) from 5:00 pm (start time) to 7:00 pm (end time).

4. I have included the mailing list, meeting invitation, attendance sheet issue/response summary, and zoning map/reduced plans with the application.

5. I have prepared these materials in good faith and to the best of my ability.

3/2/21
Date

By: Joanna S. Helms

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Barbara J. Belicic a Notary Public for the above State and County, on this the 2 day of March, 20 21.

SEAL

BARBARA J BELICIC NOTARY PUBLIC WAKE COUNTY, NC

Barbara J. Belicic
Notary Public

Barbara J. Belicic
Print Name

My Commission Expires: 7/29/2025

NOTICE OF ELECTRONIC NEIGHBORHOOD MEETING

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

2/19/21
Date

Dear Neighbor:

You are invited to an electronic neighborhood meeting to review and discuss the development proposal at

0 Production Drive and 2100 Production Drive (Address(es)) 0751136687 and 0751244221 (PIN(s))

in accordance with the Town of Apex Electronic Neighborhood Meeting procedures. This meeting is intended to be a way for the applicant to discuss the project and review the proposed plans with adjacent neighbors and neighborhood organizations before the submittal of an application to the Town. This provides neighbors an opportunity to raise questions and discuss any concerns about the impacts of the project before it is officially submitted. If you are unable to attend, you may contact the applicant before or after the meeting is held. Once an application has been submitted to the Town, it may be tracked using the Interactive Development Map or the Apex Development Report located on the Town of Apex website at www.apexnc.org. If at all feasible given emergency declarations, limits on in-person gatherings, and social distancing, an additional in-person Neighborhood Meeting may be scheduled and held prior to a public hearing or staff decision on the application.

An Electronic Neighborhood Meeting is required because this project includes (check all that apply):

	Application Type	Approving Authority
☉	Rezoning (including Planned Unit Development)	Town Council
○	Major Site Plan	Town Council (QJPH*)
○	Special Use Permit	Town Council (QJPH*)
○	Residential Master Subdivision Plan (excludes exempt subdivisions)	Technical Review Committee (staff)

*Quasi-Judicial Public Hearing: The Town Council cannot discuss the project prior to the public hearing.

The following is a description of the proposal (also see attached map(s) and/or plan sheet(s)):

The Town of Apex is seeking to rezone the parcels listed above to potentially add uses and amend conditions; such as change condition on allowable facade materials; add condition to increase maximum allowable parking; add condition to require EV parking; add warehousing as an allowable use; add greenhouses for R&D purposes as an allowable accessory facility, and amend design standards for certain accessory structures.

Estimated submittal date: March 2, 2021`

MEETING INFORMATION:

Property Owner(s) name(s):	JACK1, LLC
Applicant(s):	Town of Apex
Contact information (email/phone):	Joanna S. Helms - joanna.helms@apexnc.org (919) 372-7461
Electronic Meeting invitation/call in info:	https://bit.ly/3qy8DD5
Date of meeting**:	March 1, 2021
Time of meeting**:	5:00 pm - 7:00 pm

MEETING AGENDA TIMES:

Welcome: 5:05 pm Project Presentation: 5:10 pm Question & Answer: 5:25 pm

**Meetings shall occur between 5:00 p.m.-9:00 p.m. on a Monday through Thursday (excluding Town recognized holidays). If you have questions about the general process for this application, please contact the Planning Department at 919-249-3426. You may also find information about the Apex Planning Department and on-going planning efforts at http://www.apexnc.org/180/Planning.

Dixie Pipeline Company
PO Box 4018
Houston TX 77210-4018

LM Lufkin Road LLC
Jared Marcus
37 W 39th St, RM 402
New York, NY 10018-3888

James Stephen Smith
1069 Alderman Circle
Raleigh, NC 27603-2067

Raleigh Reclamation LLC
2310 Garner Road
Raleigh, NC 27610-4612

Alves & Pereira LLC
1040 Goodworth Drive
Apex, NC 27539-3869

Reliance Avenue LLC
2000 S Grove Ave Ste B
Ontario, CA 91761-4800

Trinity Apex North 100 LLC
106 Island View Drive
Beaufort, NC 28516-9108

2031 Production Realty LLC
407 Catlin Road
Cary, NC 27519-5982

A&E Real Estate Enterprises LLC
PO Box 162
Apex, NC 27502-0162

Carey C Jones Memorial Park Inc
PO Box 781
Apex, NC 27502-0781

Town of Apex
PO Box 250
Apex, NC 27502

Apex Tool US Real Estate
Holding, LLC
910 Ridgebrook Rd
Sparks, MD 21152-9389

Team Properties LP
2411 River Hill
Irving, TX 75061-8909

JACK 1 LLC
738 Cash Street
Apex, NC 27502-1302

Red Dirt Properties LLC
1031 Goodworth Drive
Apex, NC 27539-3869

Heia LLC
PO Box 1396
Elmira NY 14902-1396

Bobbitt Design Build
600 Germantown Rd
Raleigh, NC 27607-5144

Vertical Bridge AM II LLC
750 Park of Commerce Dr, Ste 200
Boca Raton, FL 33487-3650

ED Properties LLC
2019 Production Drive, Ste 104
Apex, NC 27539-6356

ABCZ Properties LLC
2511 Reliance Avenue
Apex, NC 27539-6347

Eastern Services Holdings LLC
Raleigh Paving
800 Lufkin Road
Apex, NC 27539-7050

Eagle Rock Concrete LLC
8310 Bandford Way
Raleigh, NC 27615-2752

Puryear Properties LLC
5844 Lease Lane
Raleigh, NC 27617-4708

Cousins Investments I LLC
PO Box 30007
Charlotte, NC 28230-0007

560 Pristine Partners LLC
550 Corporate Center Drive
Raleigh, NC 27607-0153

Production Reliance LLC
PO Box 33284
Raleigh, NC 27636-3284

IPearl Holdings LLC
2025 Production Drive
Apex, NC 27539-6349

Builders Resource Services Inc
PO Box 1356
Holly Springs, NC 27540-1356

Constance F Sciolino
Joseph C Sciolino
184 American Ct
Apex, NC 27523-6725

BSS, LLC
2015 Production Drive, Unit 100
Apex, NC 27539-6349

JJKL Investments LLC II
125 Hills of the Haw
Pittsboro, NC 27312-8583

TVX of Raleigh Durham
3012 Highwoods Blvd
Raleigh, NC 27604-1037

Apex Planning Dept.
PO Box 250
Apex, NC 27502

JACK1, LLC (Cash Corporate Center) Rezoning
Neighborhood Meeting
March 1, 2021
5:00 – 7:00 p.m.

A G E N D A

Facilitator: Joanna Helms, Director – Apex Economic Development

I. WELCOME (Attendee Sign-In)

II. PROJECT PRESENTATION

A. Explanation of Process: Rezoning

Current Zoning – LI-CZ #18CZ19 **Proposed Zoning – LI-CZ**

B. Explanation of Proposal

Below are the current zoning conditions with revisions/additions shown in **bold:**

1. EIFS cornices and parapet trim may be used. EIFS and stucco shall not be used within four (4) feet of the ground and shall be limited to 25% of each building façade.
2. The front façade and any façade that faces a collector street shall be **a minimum of 60%** masonry. **The remainder of such facades shall be high-quality aluminum composite metal panels or similar.**
3. The developer shall dedicate 30' of public right-of-way along the southern property line for future construction of Pristine Water Drive in accordance with the Apex Transportation Plan.
4. No buffer shall be required along major and minor collector streets.
5. A continuous 10' Multi-Use Path (MUP) within the public right-of-way or 10' Greenway within a 20' Public Greenway Easement shall be constructed from Burma Drive at the northern property boundary to future Production Drive at the southern property boundary.
6. **The minimum parking requirement shall either be in accordance with UDO Sec. 8.3.2 *Off-Street Parking Requirements* or 1 parking space per employee on the maximum shift plus 2% additional for visitors, whichever is greater.**
7. **With the exception of development on Lots 1 and 2, each development shall provide two (2) electric vehicle charging spaces. These spaces count toward minimum parking standards.**
8. **Greenhouses accessory to a Research facility shall be exempt from the following:**
   a. **The building material and color standards of Sec. 4.5.3 *Accessory Structures, Non-Residential Zoning Districts*; and**
   b. **The limitation on percent of yard area occupied and setback requirements of Sec. 5.2.7.B *Dimensional Standards for Detached Accessory Structures, Percentage of Required Yard Occupied and Required Setbacks.***

Below are the current allowable uses with the proposed additional use shown in **bold:**

1. Security or Caretaker quarters
2. Government Service
3. Heliport or Helipad
4. Transportation Facility
5. Utility, minor
6. Regional Recreation complex
7. Broadcasting Station (radio and television)
8. Radio and television recording studio
9. Medical or dental office or clinic
10. Medical or dental laboratory
11. Office, business or professional
12. Pilot plant
13. Research facility
14. Laboratory, industrial research
15. Machine or welding shop
16. Woodworking or cabinetmaking
17. Wholesaling, general
18. Brewery
19. Distillery
20. Dry cleaning and dyeing plant
21. Laundry plant
22. Manufacturing and processing
23. Microbrewery
24. Microdistillery
25. **Botanical Garden**

C. Explanation of Future Meetings
- No additional neighborhood meetings are planned.
- Planning Board will review the rezoning request at their April 12 meeting (4:30 p.m.).
- Town Council will review and vote on the rezoning request at their April 27 meeting (6:00 p.m.).

III. QUESTION & ANSWER

ELECTRONIC NEIGHBORHOOD MEETING ATTENDANCE SHEET

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Meeting Format: VIRTUAL (electronic meeting link provided)

Date of meeting: March 1, 2021 Time of meeting: 5:00 pm - 7:00 pm

Property Owner(s) name(s): JACK1, LLC

Applicant(s): Town of Apex

Please list Electronic Neighborhood Meeting Attendees who provided their name and/or contact information either during the meeting or via phone/email before or after the meeting.

	NAME/ORGANIZATION	ADDRESS	PHONE #	EMAIL	SEND PLANS & UPDATES
1.	Steve Smith	401 Pristine Water Drive	919-608-0684	[redacted]	yes
2.	Mike Pail	2301 Production Drive	919-412-7058		yes
3.	Theresa Horne	560 Pristine Water Drive	919-801-2343		yes
4.	Theresa Horne	(550 Corporate Ctr. Dr. Raleigh 27607)	*Note: Use this mailing address*		
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					

Use additional sheets, if necessary.

SUMMARY OF DISCUSSION FROM THE ELECTRONIC NEIGHBORHOOD MEETING

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Property Owner(s) name(s): JACK1, LLC

Applicant(s): Town of Apex

Contact information (email/phone): joanna.helms@apexnc.org (919) 372-7461

Meeting Format: VIRTUAL (electronic meeting link provided)

Date of meeting: March 1, 2021 Time of meeting: 5:00 pm - 7:00 pm

Please summarize the questions/comments and your response from the Electronic Neighborhood Meeting in the spaces below (attach additional sheets, if necessary). Please state if/how the project has been modified in response to any concerns. The response should not be "Noted" or "No Response". There has to be documentation of what consideration the neighbor's concern was given and justification for why no change was deemed warranted.

Question/Concern #1:
Are windows also factored into the percentage of a building facade that must be masonry?

Applicant's Response:
Windows are not considered in the building material restrictions.

Question/Concern #2:
Can you explain what is going on at Site/Tract 1 and Site/Tract 2?

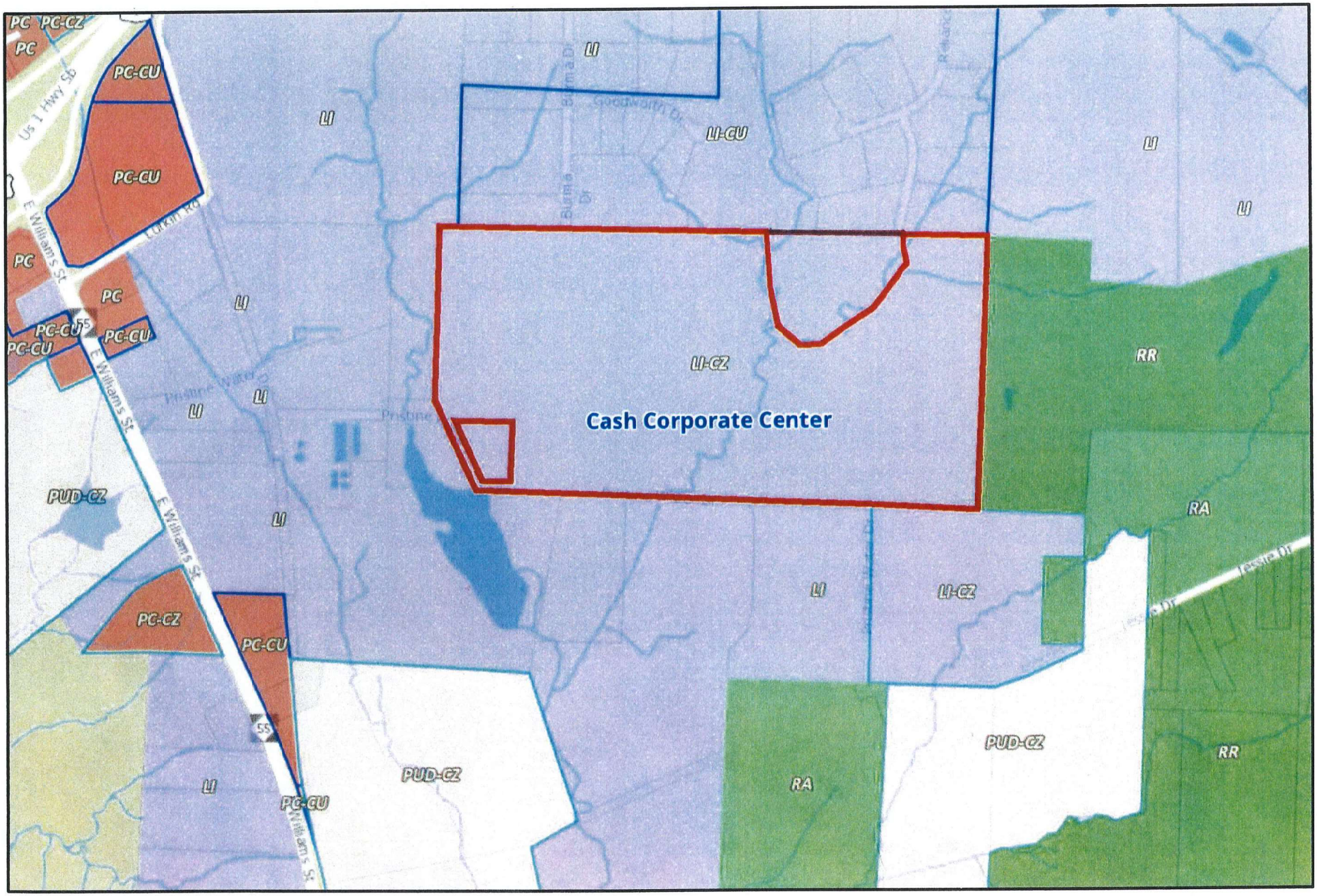
Applicant's Response:
Site/Tract 1 is 10 acres and is proposed for a life science project that would construct a 30-40,000 sf facility and employ 40 persons.
Site/Tract 2 is 26 acres and is proposed for a distribution project that would construct a 300,000 sf facility and employ 220 persons.

Question/Concern #3:
Is "Conceptual B" as shown on a marketing brochure what the development will look like?
When will the closing occur for Site/Tract 2?

Applicant's Response:
No. That is an outdated brochure. The maps you were provided in the meeting packet show the current proposed layout of the two proposed project sites. In addition, Burma Drive is proposed to extend into the interior of the site.
We anticipate the closing for Site/Tract 2 to occur in Q2 of 2021.

Question/Concern #4:
When will site work begin on Site/Tract 1 and will it involve logging trucks to remove the trees?

Applicant's Response:
We anticipate work to begin on Site/Tract 1 in March/April 2021 and yes it will involve construction truck traffic.



Cash Corporate Center - Zoning Map

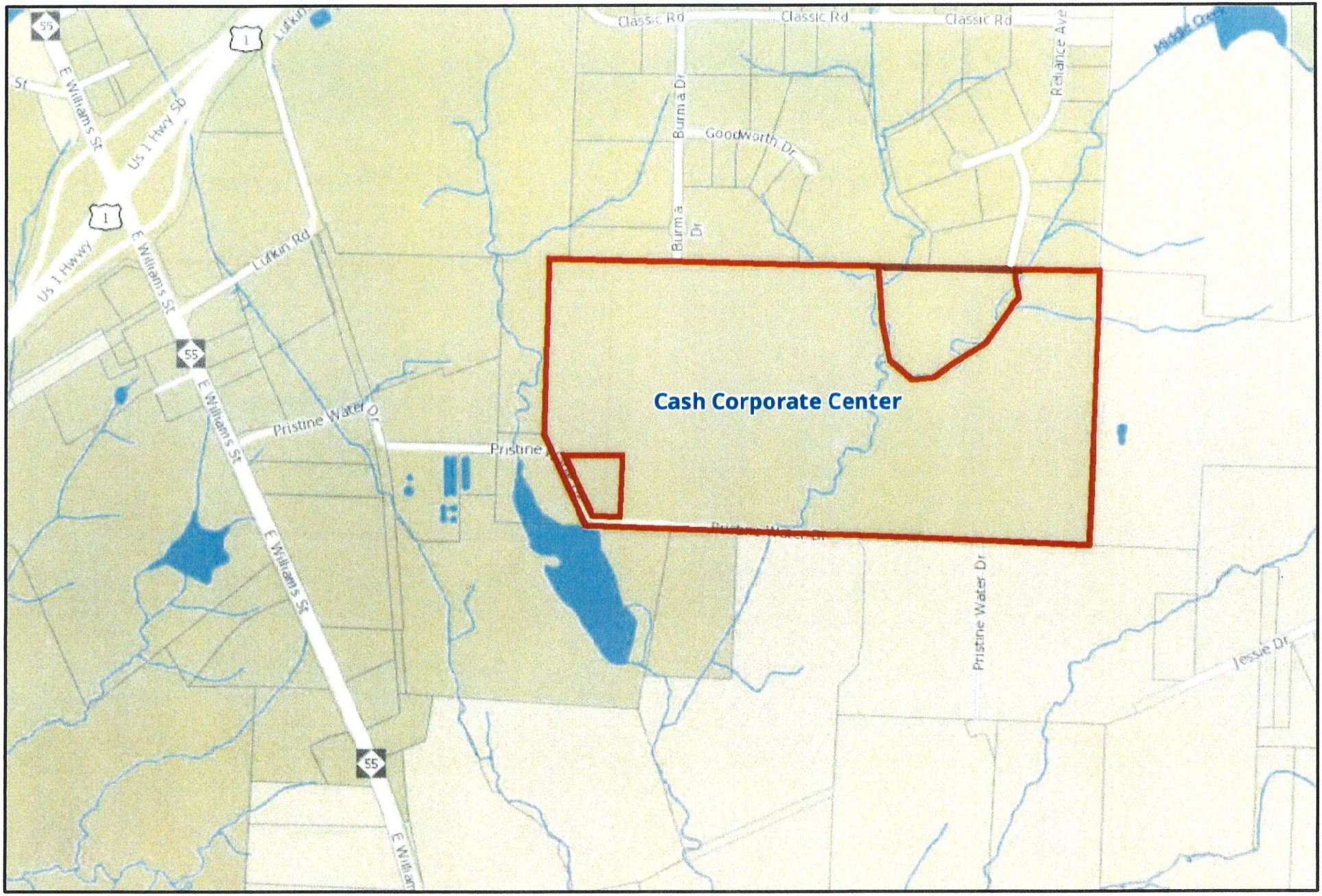
N

0 425 850 1,700 ft

1 inch = 800 feet

Disclaimer

*iMaps makes every effort to produce and publish the most current and accurate information possible. However, the maps are produced for information purposes, and are **NOT** surveys. No warranties, expressed or implied ,are provided for the data therein, its use,or its interpretation.*



Cash Corporate Center - Street Vacinity Map

N

0 425 850 1,700 ft

1 inch = 800 feet

Disclaimer

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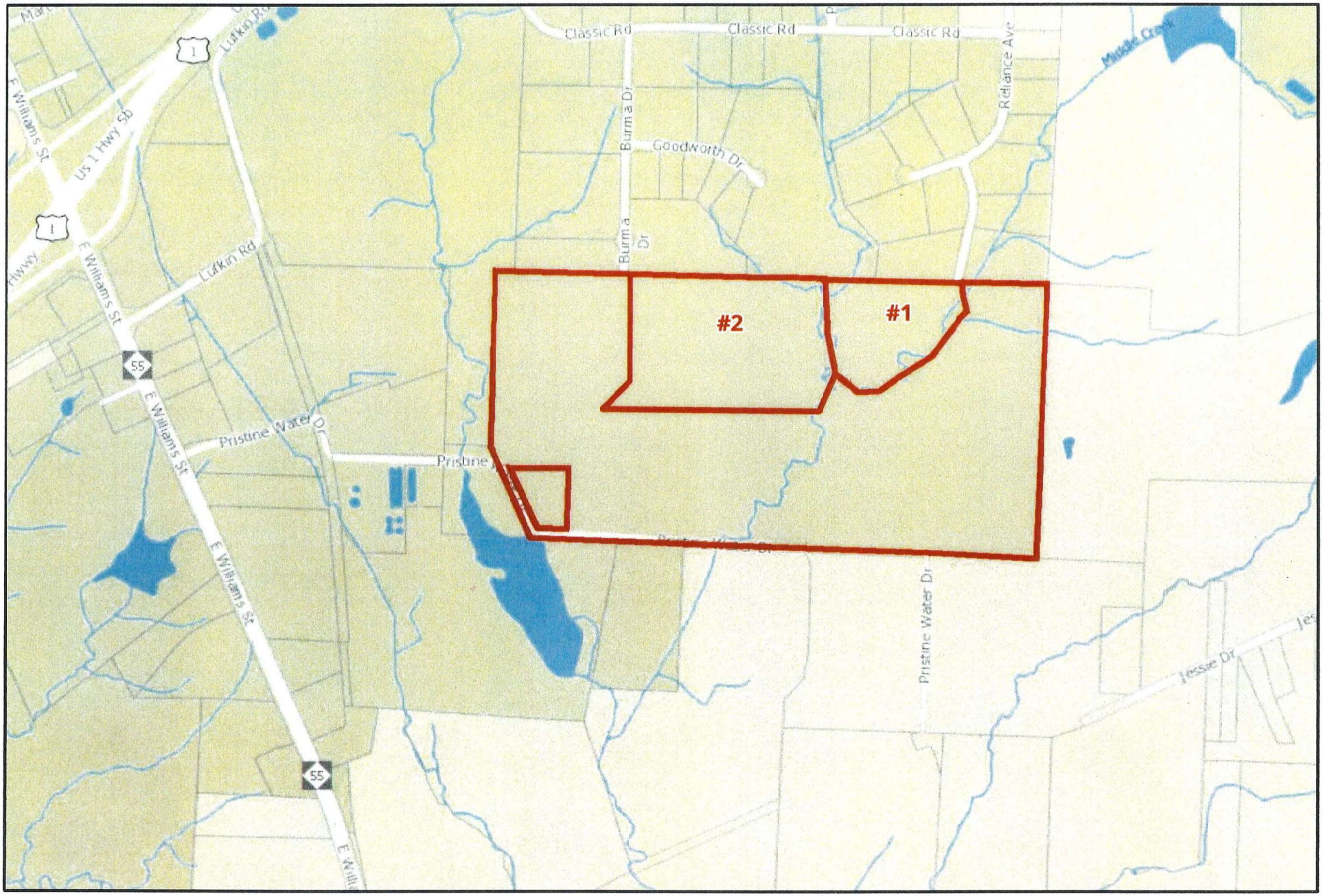

Cash Corporate Center - Tracts 1 & 2

N

0 425 850 1,700 ft

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PLANNING BOARD REPORT TO TOWN COUNCIL

Rezoning Case: 21CZ08 Cash Corporate Center Amendment

Planning Board Meeting Date: April 12, 2021

Report Requirements:

Per NCGS §160D-604(b), all proposed amendments to the zoning ordinance or zoning map shall be submitted to the Planning Board for review and comment. If no written report is received from the Planning Board within 30 days of referral of the amendment to the Planning Board, the Town Council may act on the amendment without the Planning Board report. The Town Council is not bound by the recommendations, if any, of the Planning Board.

Per NCGS §160D-604(d), the Planning Board shall advise and comment on whether the proposed action is consistent with all applicable officially adopted plans, and provide a written recommendation to the Town Council that addresses plan consistency and other matters as deemed appropriate by the Planning Board, but a comment by the Planning Board that a proposed amendment is inconsistent with the officially adopted plans shall not preclude consideration or approval of the proposed amendment by the Town Council.

PROJECT DESCRIPTION:

Acreage: ±121.30 acres

PIN(s): 0751136687 & 0751244221

Current Zoning: LI-CZ #18CZ19

Proposed Zoning: LI-CZ

2045 Land Use Map: Industrial Employment

Town Limits: Inside Corporate Limits

Applicable Officially Adopted Plans:

The Board must state whether the project is consistent or inconsistent with the following officially adopted plans, if applicable. Applicable plans have a check mark next to them.

☑ 2045 Land Use Map
☑ Consistent ☐ Inconsistent Reason: _____

☑ Apex Transportation Plan
☑ Consistent ☐ Inconsistent Reason: _____

☐ Parks, Recreation, Open Space, and Greenways Plan
☐ Consistent ☐ Inconsistent Reason: _____

Legislative Considerations:

The applicant shall propose site-specific standards and conditions that take into account the following considerations, which are considerations that are relevant to the legislative determination of whether or not the proposed conditional zoning district rezoning request is in the public interest. These considerations do not exclude the legislative consideration of any other factor that is relevant to the public interest.

1. *Consistency with 2045 Land Use Plan*. The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and consistency with the purposes, goals, objectives, and policies of the 2045 Land Use Plan.
   ☑ Consistent ☐ Inconsistent Reason: _____

2. *Compatibility.* The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and compatibility with the character of surrounding land uses.
   ☑ Consistent ☐ Inconsistent Reason: _____

3. *Zoning district supplemental standards*. The proposed Conditional Zoning (CZ) District use's compliance with Sec. 4.4 *Supplemental Standards*, if applicable.
   ☑ Consistent ☐ Inconsistent Reason: _____

4. *Design minimizes adverse impact.* The design of the proposed Conditional Zoning (CZ) District use's minimization of adverse effects, including visual impact of the proposed use on adjacent lands; and avoidance of significant adverse impacts on surrounding lands regarding trash, traffic, service delivery, parking and loading, odors, noise, glare, and vibration and not create a nuisance.
   ☑ Consistent ☐ Inconsistent Reason: _____

5. *Design minimizes environmental impact.* The proposed Conditional Zoning District use's minimization of environmental impacts and protection from significant deterioration of water and air resources, wildlife habitat, scenic resources, and other natural resources.
   ☑ Consistent ☐ Inconsistent Reason: _____

6. *Impact on public facilities.* The proposed Conditional Zoning (CZ) District use's avoidance of having adverse impacts on public facilities and services, including roads, potable water and wastewater facilities, parks, schools, police, fire and EMS facilities.
   ☑ Consistent ☐ Inconsistent Reason: _____

7. *Health, safety, and welfare.* The proposed Conditional Zoning (CZ) District use's effect on the health, safety, or welfare of the residents of the Town or its ETJ.
   ☑ Consistent ☐ Inconsistent Reason: _____

8. *Detrimental to adjacent properties.* Whether the proposed Conditional Zoning (CZ) District use is substantially detrimental to adjacent properties.
   ☑ Consistent ☐ Inconsistent Reason: _____

9. *Not constitute nuisance or hazard.* Whether the proposed Conditional Zoning (CZ) District use constitutes a nuisance or hazard due to traffic impact or noise, or because of the number of persons who will be using the Conditional Zoning (CZ) District use.
   ☑ Consistent ☐ Inconsistent Reason: _____

10. *Other relevant standards of this Ordinance.* Whether the proposed Conditional Zoning (CZ) District use complies with all standards imposed on it by all other applicable provisions of this Ordinance for use, layout, and general development characteristics.
    ☑ Consistent ☐ Inconsistent Reason: _____

Planning Board Recommendation:

Motion: To recommend approval as proposed by applicant.

Introduced by Planning Board member: Reginald Skinner

Seconded by Planning Board member: Mark Steele

☐ *Approval*: the project is consistent with all applicable officially adopted plans and the applicable legislative considerations listed above.

☑ *Approval with conditions*: the project is not consistent with all applicable officially adopted plans and/or the applicable legislative considerations as noted above, so the following conditions are recommended to be included in the project in order to make it fully consistent:

Conditions as proposped by applicant.

☐ *Denial*: the project is not consistent with all applicable officially adopted plans and/or the applicable legislative considerations as noted above.

With 6 Planning Board Member(s) voting "aye"

With 0 Planning Board Member(s) voting "no"

Reasons for dissenting votes:

This report reflects the recommendation of the Planning Board, this the 12th day of April 2021.

Attest:

Michael Marks Digitally signed by Michael Marks Date: 2021.04.12 17:28:25 -04'00'

Michael Marks, Planning Board Chair

Dianne Khin Digitally signed by Dianne Khin Date: 2021.04.12 16:48:47 -04'00'

Dianne Khin, Director of Planning and Community Development

Legal Notice of Public Hearings / AGENDA

apexnc.org/DocumentCenter/View/35272/21CZ08-Cash-Corporate-CTR-AMDMT-PB-only-Regular-Public-Notice-Conditional-Zoning-REVISED?bidId=

AGENDA 1 / 1 40%

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

REVISED PUBLIC NOTIFICATION OF PUBLIC HEARINGS
CONDITIONAL ZONING #21CZ08
Cash Corporate Center Amendment

Pursuant to the provisions of North Carolina General Statutes §160D-602 and to the Town of Apex Unified Development Ordinance (UDO) Section 2.2.11, notice is hereby given of public hearings before the Planning Board of the Town of Apex. The purpose of these hearings is to consider the following:

Applicant: Joanna Helms, Town of Apex,
Authorized Agent: Fred Gray Cash, III
Property Addresses: ~~0 &~~ 2100 Production Drive, 0 Pristine Water Drive, 0 & 1201 Burma Drive
Acreage: ±121.30 acres
Property Identification Numbers (PINs): ~~0751126687 &~~ 0751244221, 0751138504, 0751143089, portion of former PIN 0751136687
2045 Land Use Map Designation: Industrial Employment
Existing Zoning of Properties: Light Industrial-Conditional Zoning (LI-CZ #18CZ19)
Proposed Zoning of Properties: Light Industrial-Conditional Zoning (LI-CZ)

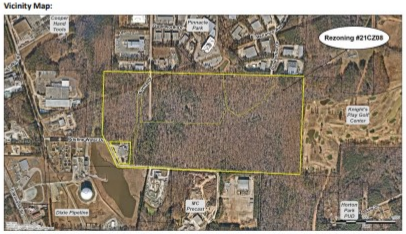
Public Hearing Location: Apex Town Hall
Council Chamber, 2nd Floor
73 Hunter Street, Apex, North Carolina

Planning Board Public Hearing Date and Time: April 12, 2021 4:30 PM
If you would like to speak during the public hearing, you may sign-in ahead of time by emailing your name and address to bonnie.brock@apexnc.org. You may attend the meeting in person or view the meeting through the Town's YouTube livestream at: https://www.youtube.com/c/townofapexgov.

If you are unable to attend, you may provide comments no later than noon on Friday, April 9, 2021 by email (public.hearing@apexnc.org, 350-word limit) or voicemail (919-362-7300, 3-minute limit) according to the Remote Participation Policy at: http://www.apexnc.org/DocumentCenter/View/31397/. You must provide your name and address for the record. These comments will be read during the Planning Board meeting.

A separate notice of the Town Council public hearing on this project will be mailed and posted in order to comply with State public notice requirements.

Vicinity Map:



Property owners within 300 feet of the proposed conditional zoning have been sent this notice via first class mail. All interested parties may submit comments with respect to the application by the means specified above. In addition to the above map, the location of the property may be viewed online at https://maps.raleighnc.gov/imaps. The 2045 Land Use Map may be viewed online at www.apexnc.org/DocumentCenter/View/478. You may call 919-249-3426, Department of Planning and Community Development, with questions or for further information. To view the petition and related documents on-line: https://www.apexnc.org/DocumentCenter/View/34744.

Dianne F. Khin, AICP
Director of Planning and Community Development

Published Dates: ~~March 29~~ April 9 12, 2021

10:09 AM
4/9/2021

TOWN OF APEX

POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

PUBLIC NOTIFICATION OF PUBLIC HEARINGS

CONDITIONAL ZONING #21CZ08
Cash Corporate Center Amendment

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Applicant: Joanna Helms, Town of Apex,
Authorized Agent: Fred Gray Cash, III
Property Addresses: 0 & 2100 Production Drive
Acreage: ±121.30 acres
Property Identification Numbers (PINs): 0751136687 & 0751244221
2045 Land Use Map Designation: Industrial Employment
Existing Zoning of Properties: Light Industrial-Conditional Zoning (LI-CZ #18CZ19)
Proposed Zoning of Properties: Light Industrial-Conditional Zoning (LI-CZ)

Public Hearing Location: Apex Town Hall
Council Chamber, 2nd Floor
73 Hunter Street, Apex, North Carolina

Planning Board Public Hearing Date and Time: April 12, 2021 4:30 PM

If you would like to speak during the public hearing, you may sign-in ahead of time by emailing your name and address to bonnie.brock@apexnc.org. You may attend the meeting in person or view the meeting through the Town's YouTube livestream at: https://www.youtube.com/c/townofapexgov.

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A separate notice of the Town Council public hearing on this project will be mailed and posted in order to comply with State public notice requirements.

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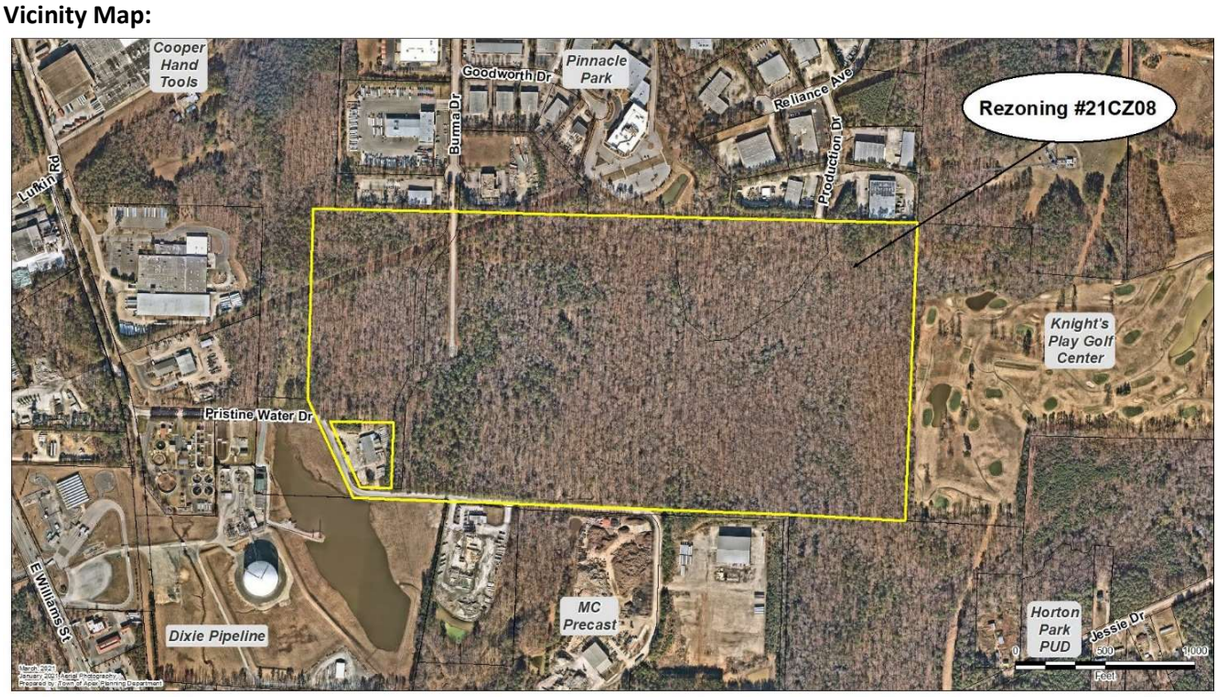

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Dianne F. Khin, AICP
Director of Planning and Community Development

Published Dates: March 29-April 12, 2021

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

AFFIDAVIT CERTIFYING
Public Notification – Written (Mailed) Notice

Section 2.2.11
Town of Apex Unified Development Ordinance

Project Name:	Conditional Zoning #21CZ08 Cash Corporate Center Amendment
Project Location:	0 & 2100 Production Drive
Applicant or Authorized Agent:	Joanna Helms
Firm:	Town of Apex

This is to certify that I, as Director of Planning and Community Development, mailed or caused to have mailed by first class postage for the above mentioned project on March 29, 2021, a notice containing the time and place, location, nature and scope of the application, where additional information may be obtained, and the opportunity for interested parties to be heard, to the property owners within 300' of the land subject to notification. I further certify that I relied on information provided to me by the above-mentioned person as to accuracy and mailing addresses of property owners within 300' of the land subject to notification.

3/29/2021
Date

Sarah Van Everen for Diane Khin
Director of Planning and Community Development

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Jeri Chastain Pederson, a Notary Public for the above State and County, this the 29 day of March, 2021.

JERI CHASTAIN PEDERSON
Notary Public
Wake County, North Carolina
My Commission Expires
March 10, 2024
SEAL

Jeri Chastain Pederson
Notary Public

My Commission Expires: 03/10/2024

http://www.apexnc.org/DocumentCenter/View/35229/21CZ08-Cash-Corporate-Center-TC-only-Regular-Public-Notice-Conditional-Zc
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Convert Select
Apex, NC - Official Websit... Planning Department Ma... Planning Department Ma... Permit Center IDT Real Estate Search Unified Development Ordi... Applications & Schedules ...

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

PUBLIC NOTIFICATION
OF PUBLIC HEARINGS
CONDITIONAL ZONING #21CZ08
Cash Corporate Center Amendment

Pursuant to the provisions of North Carolina General Statutes §160D-602 and to the Town of Apex Unified Development Ordinance (UDO) Section 2.2.11, notice is hereby given of public hearings before the Town Council of the Town of Apex. The purpose of these hearings is to consider the following:

Applicant: Joanna Helms, Town of Apex
Authorized Agent: Fred Gray Cash, III
Property Addresses: 0 & 2100 Production Drive
Acreage: ±121.30 acres
Property Identification Numbers (PINs): 0751136687 & 075124422
2045 Land Use Map Designation: Industrial Employment
Existing Zoning of Properties: Light Industrial-Conditional Zoning (LI-CZ #18CZ19)
Proposed Zoning of Properties: Light Industrial-Conditional Zoning (LI-CZ)

Public Hearing Location: Apex Town Hall
Council Chamber, 2nd Floor
73 Hunter Street, Apex, North Carolina

Comments received prior to or during the Planning Board public hearing will not be read during the Town Council public hearing. Separate comments must be provided for the two public hearings in the time frames specified below.

Town Council Public Hearing Date and Time: April 27, 2021 6:00 PM

You may attend the meeting in person or view the meeting through the Town's YouTube livestream at: https://www.youtube.com/c/townofapexgov.

If you are unable to attend, you may provide comments no sooner than Friday, April 9, 2021 at noon but no later than noon on Monday, April 26, 2021 by email (public.hearing@apexnc.org, 350-word limit) or voicemail (919-362-7300, 3-minute limit) according to the Remote Participation Policy at: http://www.apexnc.org/DocumentCenter/View/31397/. You must provide your name and address for the record. These comments will be read during the Town Council meeting.

Vicinity Map:

Property owners within 300 feet of the proposed conditional zoning have been sent this notice via first class mail. All interested parties may submit comments with respect to the application by the means specified above. In addition to the above map, the location of the property may be viewed online at https://maps.raleighnc.gov/imaps. The 2045 Land Use Map may be viewed online at www.apexnc.org/DocumentCenter/View/478. You may call 919-249-3426, Department of Planning and Community Development, with questions or for further information. To view the petition and related documents on-line: https://www.apexnc.org/DocumentCenter/View/34744.

Dianne F. Khin, AICP
Director of Planning and Community Development

Published Dates: April 13, 27, 2021

11:43 AM
4/5/2021

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

PUBLIC NOTIFICATION OF PUBLIC HEARINGS

CONDITIONAL ZONING #21CZ08
Cash Corporate Center Amendment

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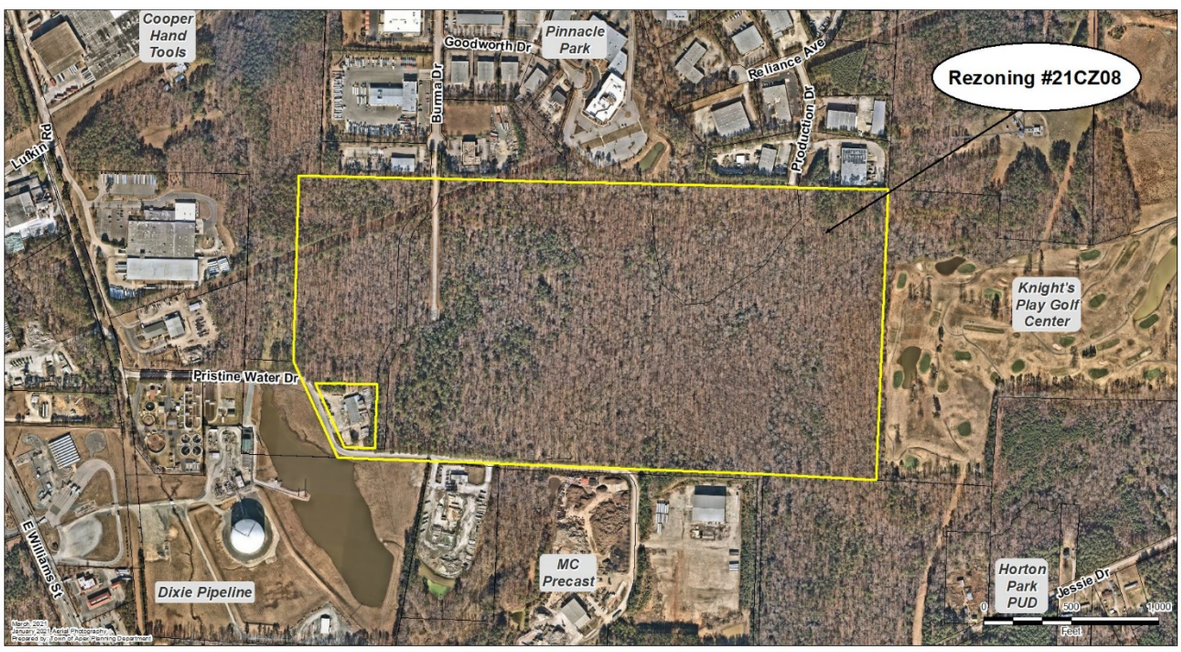

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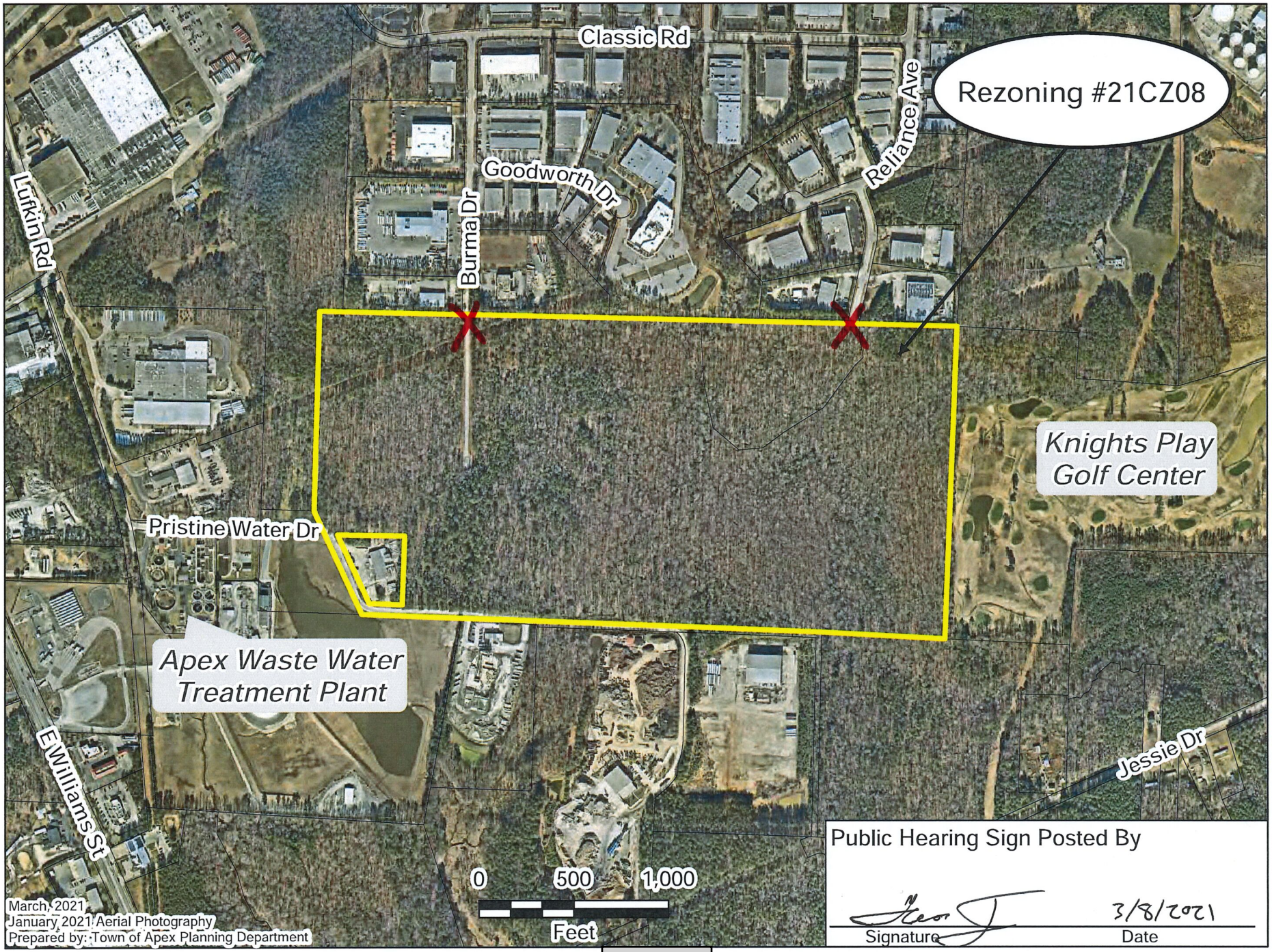
Dianne F. Khin, AICP
Director of Planning and Community Development

Published Dates: April 5-27, 2021



Public Hearing Sign Posted By

Signature

3/8/2021

Date

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

AFFIDAVIT CERTIFYING
Public Notification – Written (Mailed) Notice

Section 2.2.11
Town of Apex Unified Development Ordinance

Project Name:	Conditional Zoning #21CZ08 Cash Corporate Center Amendment
Project Location:	0 & 2100 Production Drive
Applicant or Authorized Agent:	Joanna Helms
Firm:	Town of Apex

This is to certify that I, as Director of Planning and Community Development, mailed or caused to have mailed by first class postage for the above mentioned project on April 5, 2021, a notice containing the time and place, location, nature and scope of the application, where additional information may be obtained, and the opportunity for interested parties to be heard, to the property owners within 300' of the land subject to notification. I further certify that I relied on information provided to me by the above-mentioned person as to accuracy and mailing addresses of property owners within 300' of the land subject to notification.

4-5-2021
Date

Lauren Staudenmaier for Dianne Khin
Director of Planning and Community Development

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Jeri Chastain Pederson, a Notary Public for the above State and County, this the 5 day of April, 2021.

Jeri Chastain Pederson
Notary Public

JERI CHASTAIN PEDERSON
Notary Public
Wake County, North Carolina
My Commission Expires
March 10, 2024

My Commission Expires: 03/10/2024

Legal Notice of Public Hearings / AGENDA / AGENDA

apexnc.org/DocumentCenter/View/35271/21CZ08-Cash-Corporate-Center-TC-only-Regular-Public-Notice-Conditional-Zoning-REVISED?bidId=

AGENDA 1 / 1 40%

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

REVISED PUBLIC NOTIFICATION OF PUBLIC HEARINGS
CONDITIONAL ZONING #21CZ08
Cash Corporate Center Amendment

Pursuant to the provisions of North Carolina General Statutes §160D-602 and to the Town of Apex Unified Development Ordinance (UDO) Section 2.2.11, notice is hereby given of public hearings before the Town Council of the Town of Apex. The purpose of these hearings is to consider the following:

Applicant: Joanna Helms, Town of Apex
Authorized Agent: Fred Gray Cash, III
Property Addresses: ~~0 &~~ 2100 Production Drive, 0 Pristine Water Drive, 0 & 1201 Burma Drive
Acreage: ±121.30 acres
Property Identification Numbers (PINs): ~~0751136687 &~~ 0751244221, 0751138504, 0751143089, portion of former PIN 0751136687
2045 Land Use Map Designation: Industrial Employment
Existing Zoning of Properties: Light Industrial-Conditional Zoning (LI-CZ #18CZ19)
Proposed Zoning of Properties: Light Industrial-Conditional Zoning (LI-CZ)

Public Hearing Location: Apex Town Hall
Council Chamber, 2nd Floor
73 Hunter Street, Apex, North Carolina

Comments received prior to or during the Planning Board public hearing will not be read during the Town Council public hearing. Separate comments must be provided for the two public hearings in the time frames specified below.

Town Council Public Hearing Date and Time: April 27, 2021 6:00 PM
You may attend the meeting in person or view the meeting through the Town's YouTube livestream at: https://www.youtube.com/c/townofapexnc.

If you are unable to attend, you may provide comments no sooner than Friday, April 9, 2021 at noon but no later than noon on Monday, April 26, 2021 by email (public.hearing@apexnc.org, 350-word limit) or voicemail (919-362-7300, 3-minute limit) according to the Remote Participation Policy at: http://www.apexnc.org/DocumentCenter/View/31397. You must provide your name and address for the record. These comments will be read during the Town Council meeting.

Vicinity Map:

Property owners within 300 feet of the proposed conditional zoning have been sent this notice via first class mail. All interested parties may submit comments with respect to the application by the means specified above. In addition to the above map, the location of the property may be viewed online at https://maps.raleighnc.gov/imaps. The 2045 Land Use Map may be viewed online at www.apexnc.org/DocumentCenter/View/478. You may call 919-249-3426, Department of Planning and Community Development, with questions or for further information. To view the petition and related documents on-line: https://www.apexnc.org/DocumentCenter/View/34744.

Dianne F. Khin, AICP
Director of Planning and Community Development

Published Dates: April ~~20~~ 27, 2021

10:09 AM
4/9/2021

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

REVISED PUBLIC NOTIFICATION OF PUBLIC HEARINGS

CONDITIONAL ZONING #21CZ08
Cash Corporate Center Amendment

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Authorized Agent: Fred Gray Cash, III
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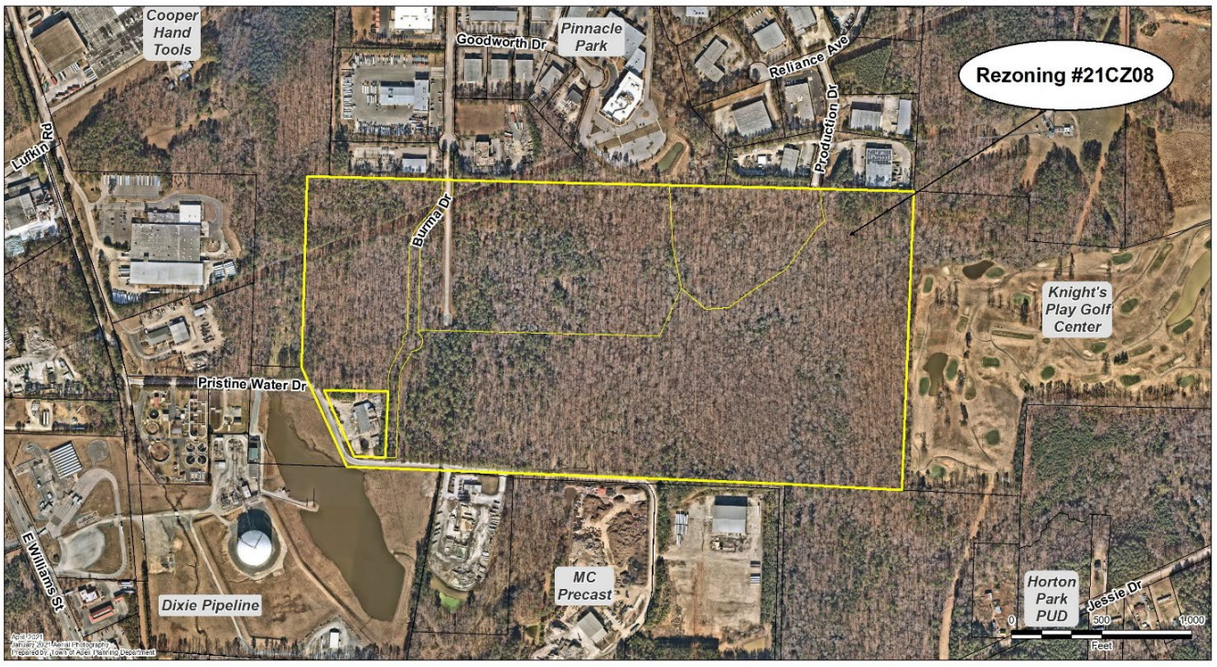
Vicinity Map:



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Dianne F. Khin, AICP
Director of Planning and Community Development

Published Dates: April ~~5~~9-27, 2021

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: PUBLIC HEARING

Meeting Date: April 27, 2021

Item Details

Presenter(s): Vance Holloman, Finance Director

Department(s): Finance Department

Requested Motion

Public hearing concerning the validity and advisability of issuing up to $42 million of General Obligation Street and Sidewalk Improvement Bonds and a possible motion to adopt and publish the bond order introduced at the April 13th Council meeting.

Approval Recommended?

Yes

Item Details

The Notice of Public Hearing was published on April 17, 2021. The Public Hearing will include a staff presentation describing the projects anticipated to be financed from bond proceeds. Following the Public Hearing Council will consider a possible motion to adopt the Bond Order and instruct staff to publish notice of adoption of the Order.

Attachments

- Presentation from Transportation CIP Workshop
- Bond-Council Survey Priority Summary
- Town Council retreat Bond Excepts 2/12/21
- Public Hearing Apex 2021 Referendum
- Publication of Bond Order

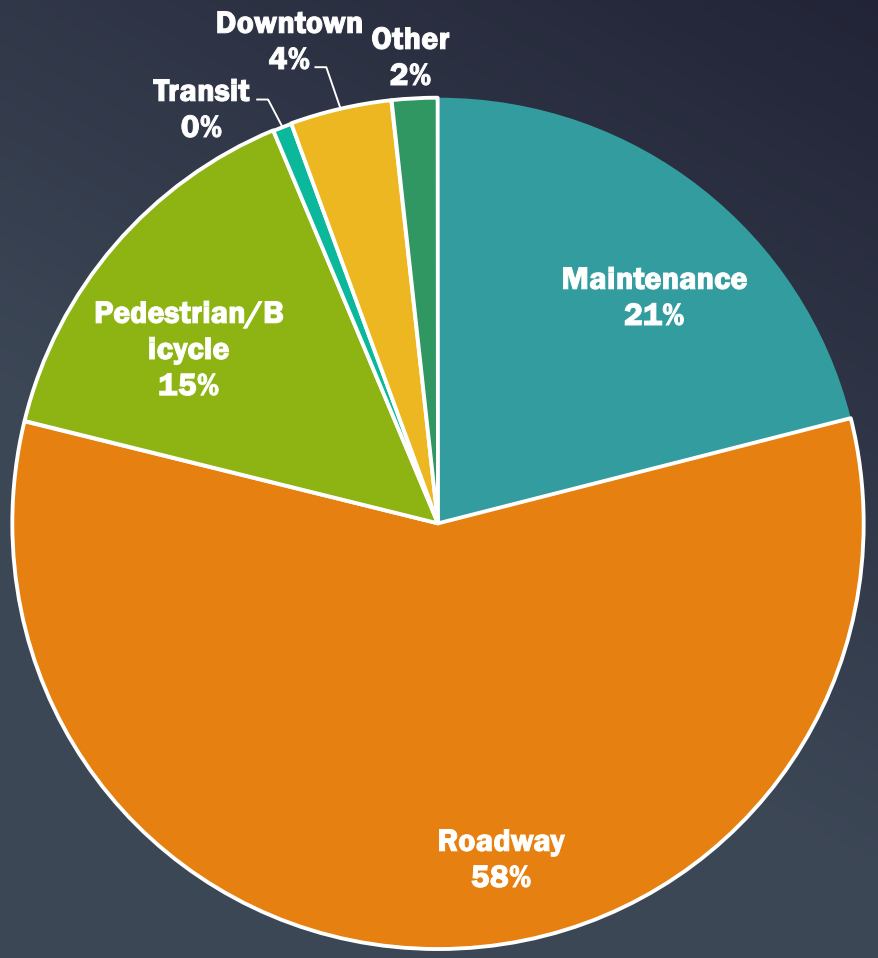
New Business #1

Transportation Capital Improvement Program
Updates and Requests

Agenda

- **Transportation Project CIP Requests >$1 Million (excluding Downtown projects)**
  - **What is the project?**
  - **Why is it important?**
  - **What is the CIP request?**
    - **Phasing recommendations may coincide with LAPP and other funds**
- **Locally-Managed Projects Update**

Overview



	Project Name
PWT 1	Annual Pavement Management
PWT 3	Annual Miscellaneous Drainage Improvements
PWT 4	**Pavement Management Backlog of Projects**
PWT 7	GPS Emergency Vehicle Preemption
PWT 8	**Wayfinding Signage Fabrication & Installation**
PWT 10	Downtown - Alley Improvements
PWT 11	Downtown - Saunders Street Parking Lot Expansion
PWT 12	Downtown - Salem Street Streetscape & Resurfacing
PWT 9	**ED - Burma Drive Extension Phase 1**
PWT 13	**ED - Burma Dr Phase 2/Pristine Water Dr to Lufkin Road**
PWT 14	**ED - Production Drive Extension to Jessie Drive**
PWT 6	Ten Ten Rd at Jessie Dr Left Turn Lane Extension Cost Share
PWT 5	**LAPP - Jessie Drive Phase 1 (no LAPP) & Phase 2 (LAPP)**
PWT 19	**LAPP - Davis Dr at Salem Church Rd Realignment**
PWT 20	**LAPP - Apex Peakway North Widening**
PWT 21	WCPSS - Felton Grove HS Collector Street Cost Share
PWT 22	Lynch Street Extension
PWT 23	**LAPP - Apex Peakway Southeast Connector**
PWT 24	LAPP/CFA - GoApex Transit Program
PWT 15	**LAPP - Tingen Road Pedestrian Bridge**
PWT 16	**LAPP - Center St RR Crossing Improvements & Sidewalk**
PWT 17	**LAPP - Chatham St RR Crossing Improvements & Sidewalk**
PWT 18	**LAPP - W Williams St Sidewalk**
PWT 25	SRTS Baucom ES Phase 1
PWT 26	SRTS Thales Academy JH/HS Phase 1
PWT 27	LAPP - SRTS Baucom ES Phase 2
PWT 28	SRTS Baucom ES Phase 3 & Thales ES
PWT 29	SRTS Apex MS Phase 1
PWT 30	SRTS Apex MS Phase 2
PWT 2	Annual Miscellaneous Road and Sidewalk Improvements
PWT 31	**NCDOT U-5301 US 64 Cost Share**
PWT 32	**NCDOT U-5825 Ten Ten Rd/Center St Cost Share**
PWT 33	**NCDOT U-2901 NC 55 Sidewalk Cost Share**

Overview

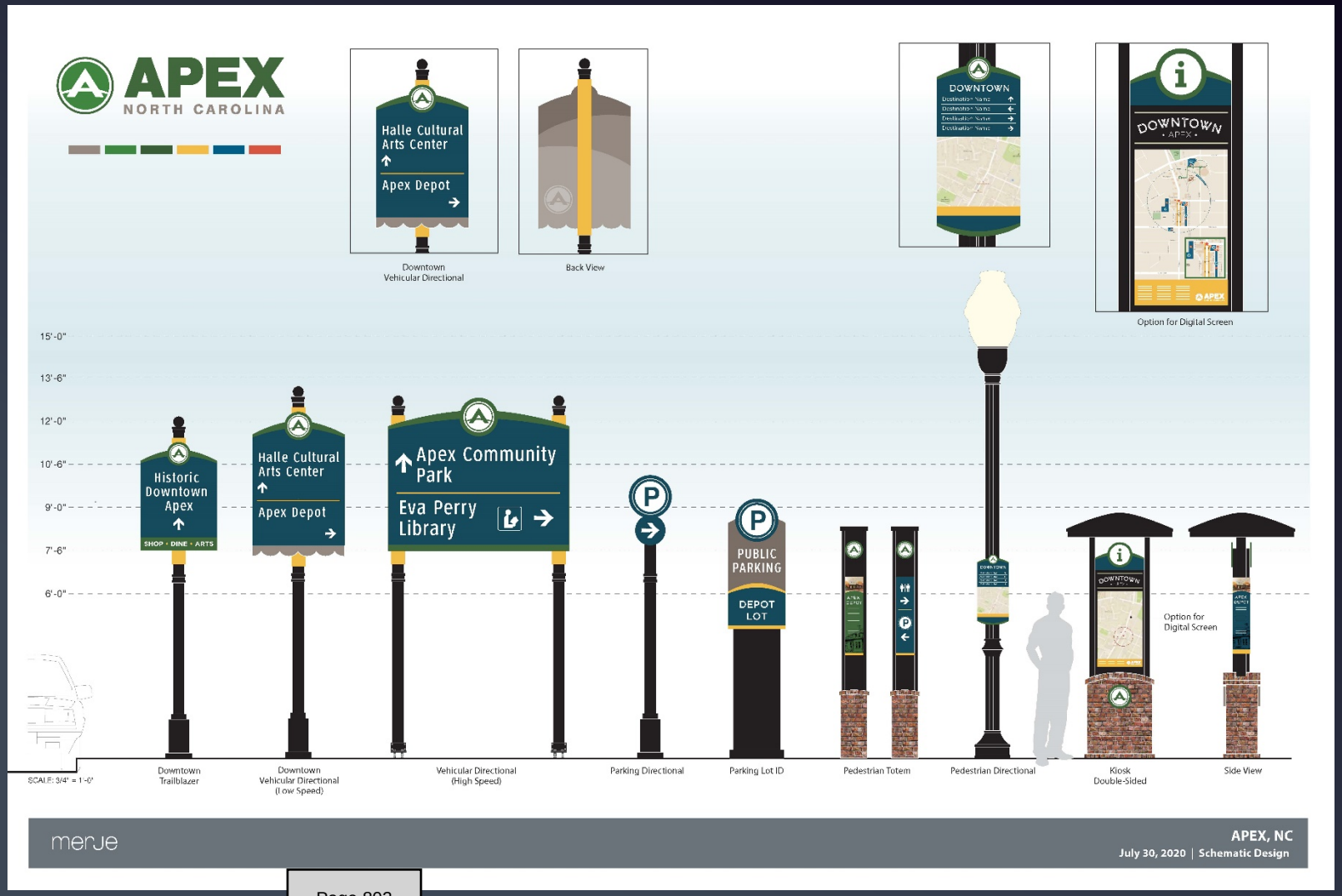
- **Roadways**
  - Includes 4 high-priority projects from Advance Apex
  - Includes a package of projects for economic development
- **Transit**
  - Includes funding for one new local route or enhanced frequency/service
- **Bicycle and Pedestrian**
  - Does not address the highest priority (non-greenway) projects from Bike Apex
  - Follows policy recommendation to prioritize projects serving schools
  - Follows policy recommendation to leverage NCDOT projects
- **Other**
  - Addresses recommendation for Wayfinding from both the Downtown Plan and Bike Apex

Brief review:
Non-roadway projects

Wayfinding Signage Fabrication & Install

FY	$
21-22	$155K
22-23	$190K
23-24	$340K
24-25	$330K
25-26	$155K
TOTAL	$1.2M

- ✓ Downtown Plan
- ✓ Bike Apex
- ✓ Peak Plan 2030
- ✓ Branding Study



Tingen Road Pedestrian Bridge

Phase	FY	$
Study	22-23	$150K
Design	23-24	$500K
CON	24-25	$3M
SUBTOTAL		$3.7M
Potential grant		($1.5M)
TOTAL		$2.2M

- ✓ Advance Apex
- ✓ Bike Apex
- ✓ Safe Routes to School

Center Street RR Crossing Improvement & Sidewalk

Phase	FY	$
Design	22-23	$100K
CON	23-24	$700K
SUBTOTAL		$800K
Potential grant		($490K)
TOTAL		$310K

- ✓ Downtown Plan
- ✓ Advance Apex
- ✓ Quiet Zone application

Chatham Street RR Crossing Improvement & Sidewalk

Phase	FY	$
Design	22-23	$150K
ROW	23-24	$40K
CON	23-24	$1.1M
SUBTOTAL		$1.3M
Potential grant		($760K)
TOTAL		$515K

- ✓ Downtown Plan
- ✓ Advance Apex
- ✓ Safe Routes to School
- ✓ Quiet Zone application

NCDOT Projects Participation

Phase	FY	$
U-5301 US 64	Future	$2M
U-5825 Ten Ten Road	Future	$2M
U-2901 NC 55	Future	$2M
TOTAL		$6M

Major projects

Pavement Management Backlog

FY	$
21-22	$1.9M
22-23	$2M
23-24	$2M
24-25	$2.1M
25-26	$2.2M
TOTAL	$10.2M

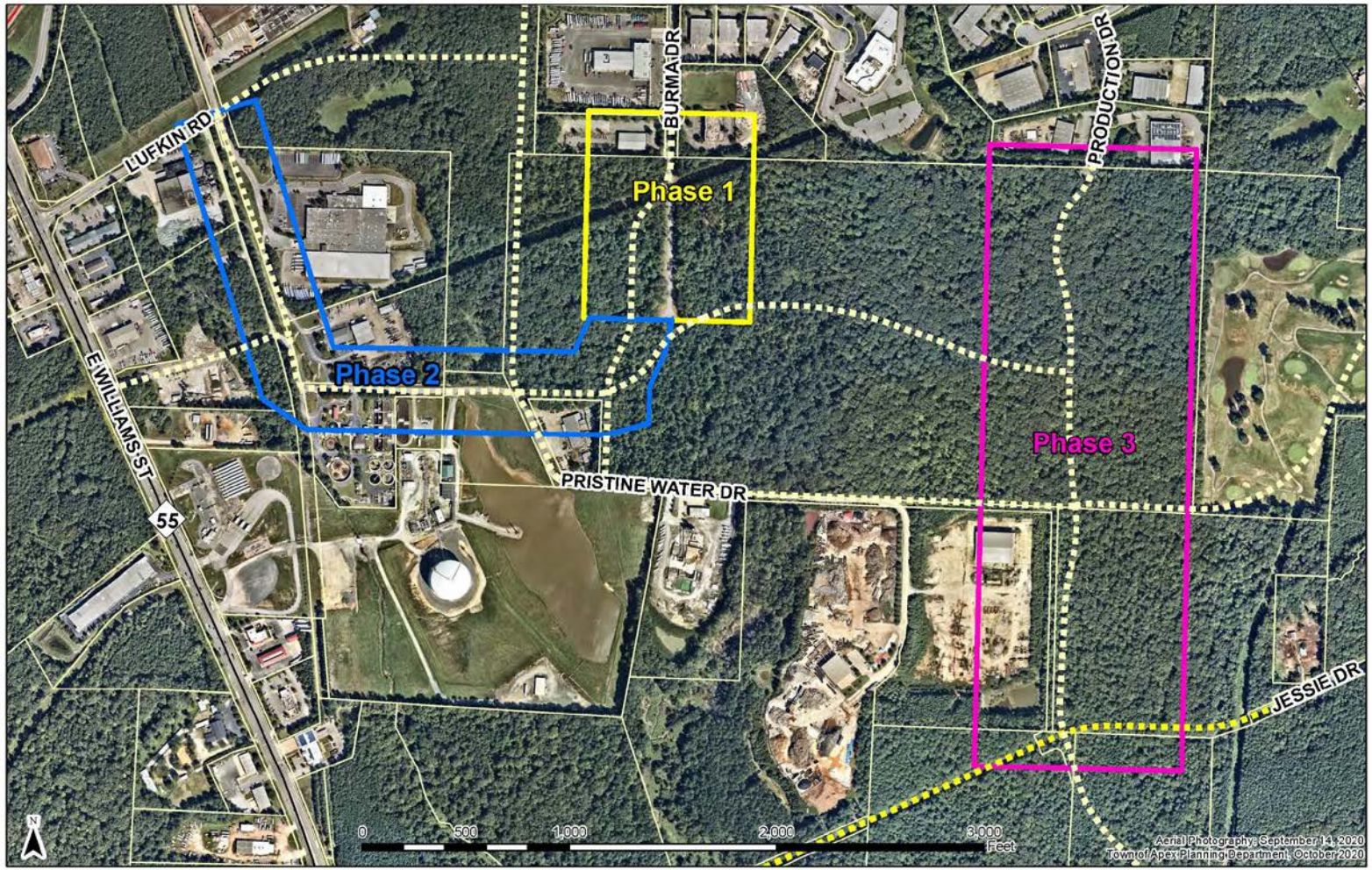
These **are** images of Apex streets.

Cash Corporate Center Projects

Phase	Project	FY	$
CON	Burma Ext. to Project Delta	21-22	$800K
Design	Burma Ext. to Pristine Water + Pristine Water to Lufkin	22-23	$600K
CON	Burma Ext. to Pristine Water + Pristine Water to Lufkin	23-24	$3M
Design	Production Ext. to Jessie	22-23	$400K
CON	Production Ext. to Jessie	23-24	$4M
TOTAL			$8.8M

- ✓ Economic Development
- ✓ Production Drive – Advance Apex priority

Cash Corporate Center Projects



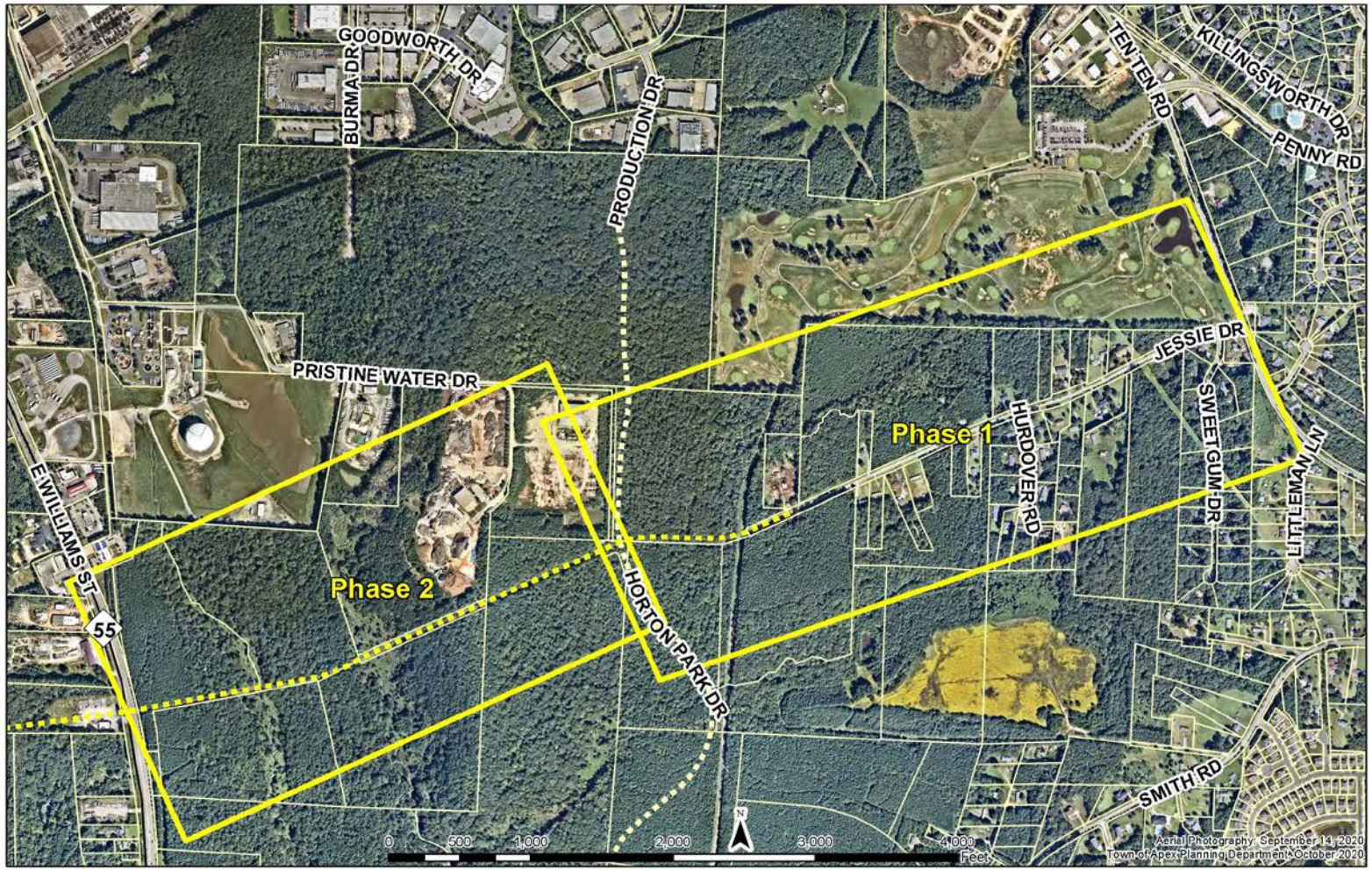
Jessie Drive Extension & Improvement

Phase	Project	FY	$
Design	Ten Ten to Production	20-21	$1M
CON	Ten Ten to Production	22-23	$7.5M
Design	Production to NC 55	23-24	$1.5M
CON	Production to NC 55	Future	$12M
SUBTOTAL			$22M
Potential grant (Production to NC 55)			($6M)
TOTAL			$16M

- ✓ Advance Apex priority
- ✓ Economic development
- ✓ Freight route
- ✓ Alternate route to NC 55/US 1 for Ten Ten Road project

ROADWAY

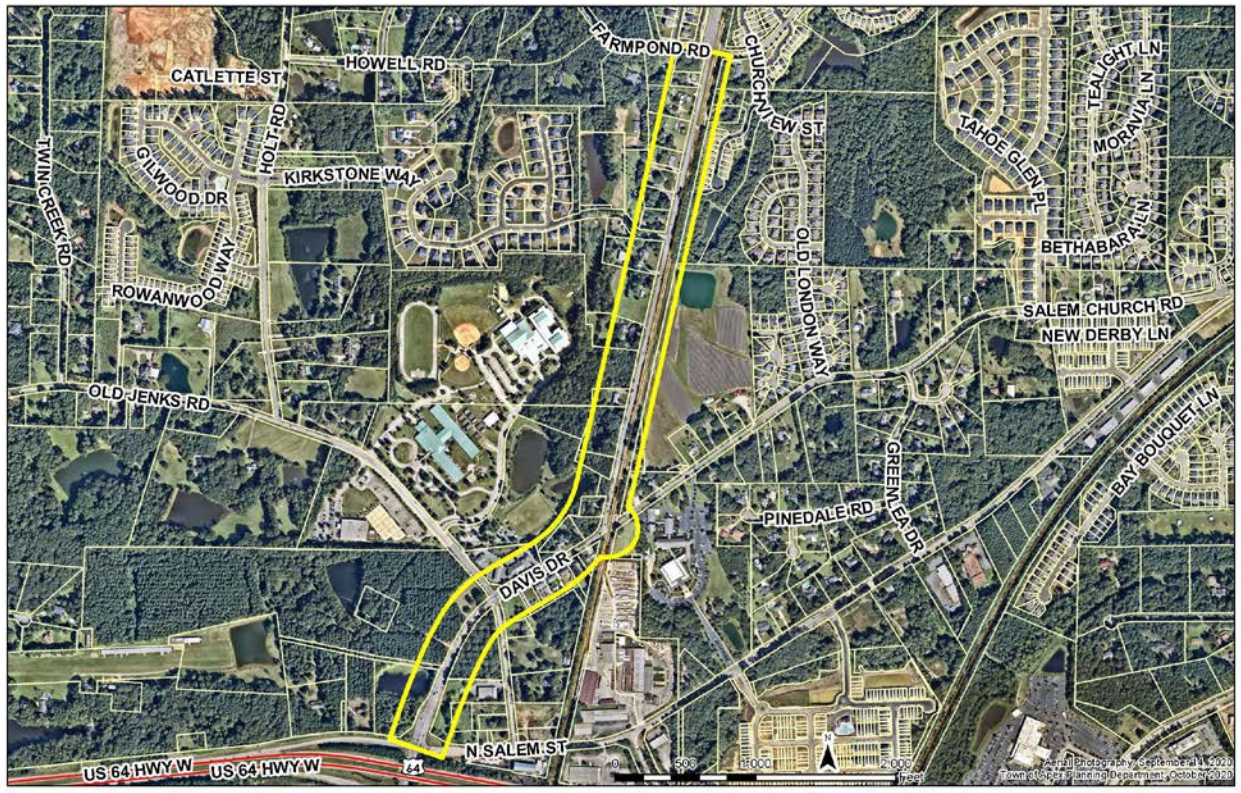
Jessie Drive Extension & Improvement



Davis Drive Realignment & Widening

Phase	FY	$
Study	22-23	$200K
Design	23-24	$500K
ROW	24-25	$2M
CON	25-26	$5M
SUBTOTAL		$7.7M
Potential grant		($3.5M)
TOTAL		$4.2M

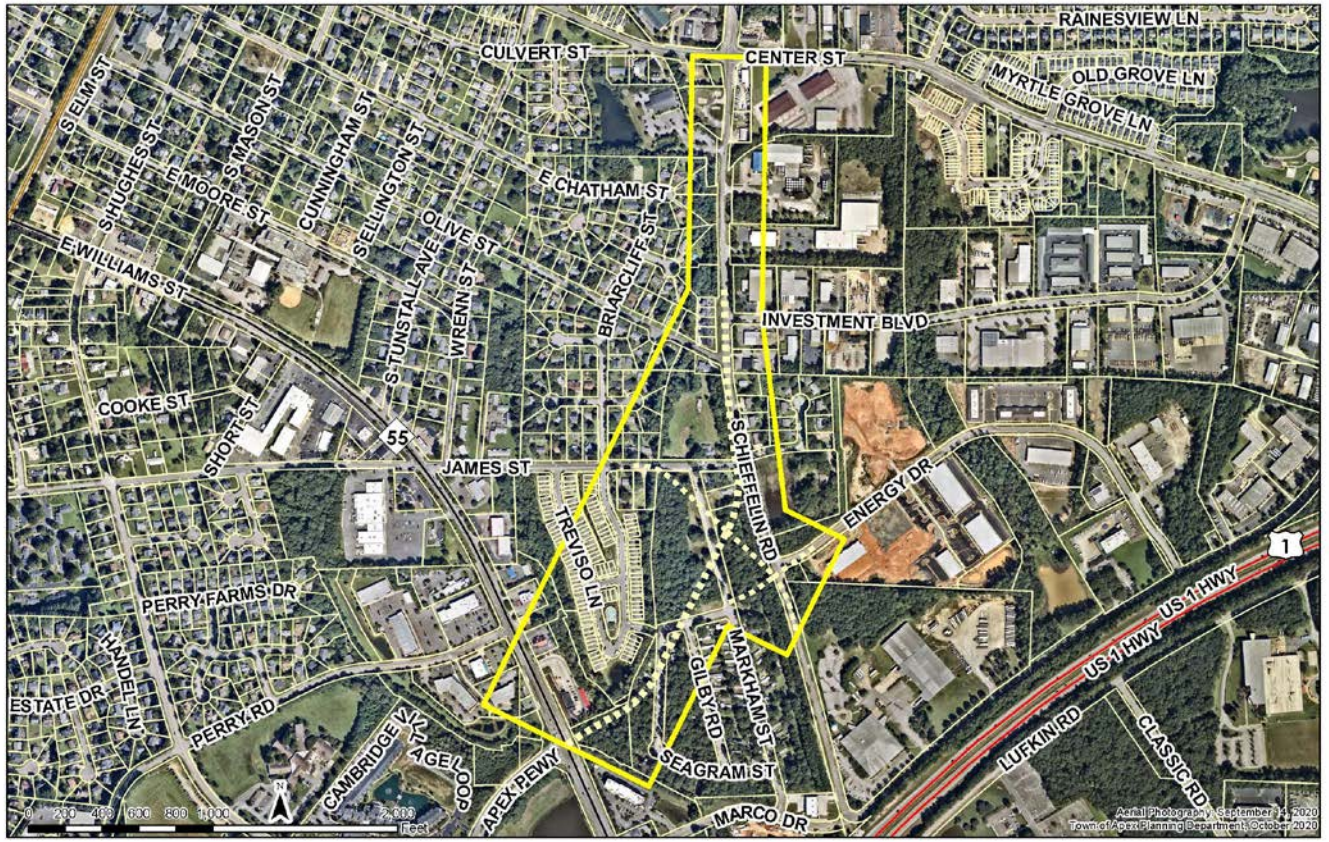
- ✓ Advance Apex priority
- ✓ At-grade railroad crossing improvement



Apex Peakway Southeast Connector

Phase	FY	$
Design	24-25	$1.7M
ROW	25-26	$3.1M
CON	Future	$14M
TOTAL		$18.8M

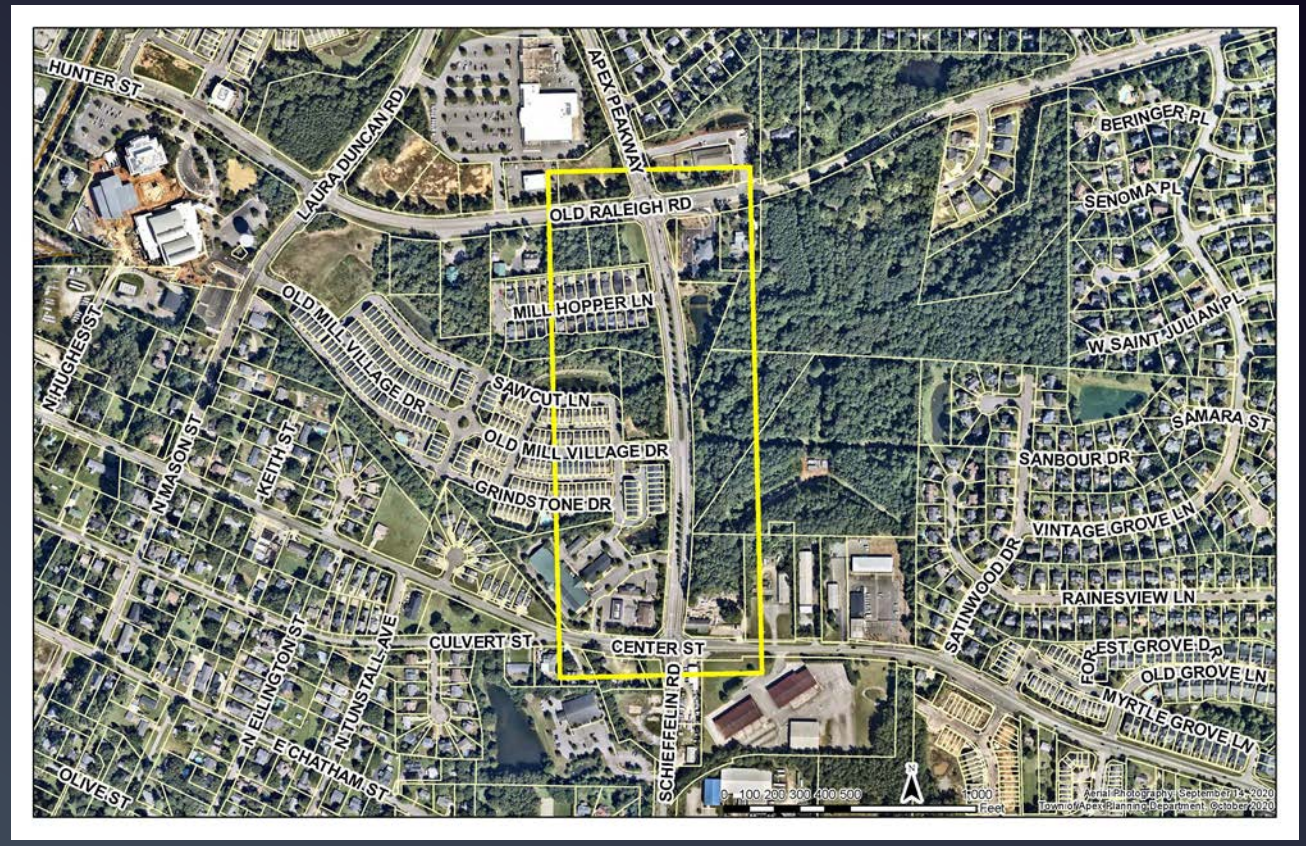
- ✓ Advance Apex priority
- ✓ Provides improved eastern bypass route for NC 55 project



Apex Peakway North Widening

Phase	FY	$
Design	23-24	$350K
ROW & CON	24-25	$5M*
SUBTOTAL		$5.4M
Potential grant		($2.3M)
TOTAL		$3.1M

✓ Advance Apex priority



Locally-administered projects update

Overview of active projects

- **Award, Obligation, Reimbursement – what's the difference?**

Project	Anticipated Request	Approximate Funding Commitment		Estimated Shortfall
		Other	Local	
U-5537 Lake Pine Drive	Obligated	$1M	$130K	$2M
U-5530AC James to Downtown	Obligated	$460K	$220K	
C-5604AC Kelly & Apex BBQ Pedestrian	12/2020*	$650K	$280K	
U-5928 Apex Peakway SW	5/2021	$2.5M	$2.5M	$20M
EB-5895 E Williams St Sidewalk	11/2020	$480K	$120K	
EB-6091 Beaver Creek Greenway	3/2021	$1M	$3.3M	

*Previously submitted construction authorization request and put on hold. Environmental consultation needed due to delay.

Overview of active projects

Project	Anticipated Request	Approximate Funding Commitment		Estimated Shortfall
		Other	Local	
EB-6019 Laura Duncan Pedestrian project	11/2020	$390K	$170K	
EB-6046 W Chatham Street sidewalk	6/2021	$380K	$570K	
TM-0026 GoApex Bus Stops	2/2021	$620K	$0	

Project Options				
Project #	FY	Project Title	Cost	
4	FY 24-25	LAPP - Apex Peakway North Widening (Center St to Old Raleigh Rd)	$ 5,400,000	4
5	FY 22-23	LAPP - Jessie Drive Phase 1 (Ten-Ten to Production)	$ 8,500,000	6
6	Future	LAPP - Jessie Drive Phase 2 (Production to 55)	$ 13,500,000	1
7	FY 23-24	LAPP - Center St RR Crossing Improvements & Sidewalk	$ 800,000	4
9	FY 25-26	LAPP - W Williams St Sidewalk	$ 850,000	4
10	FY 23-24	LAPP - Chatham St RR Crossing Improvements & Sidewalk	$ 1,300,000	4
11	FY 23-24	ED - Production Drive Extension to Jessie Drive	$ 4,400,000	1
12	FY 24-25	LAPP - Davis Dr at Salem Church Rd Realignment	$ 7,700,000	1
13	FY 21-22	Pavement Management Backlog	$ 5,000,000	5
15	FY 21-22	ED - Burma Drive Extension Phase 1	$ 800,000	4
16	FY 23-24	ED - Burma Dr Phase 2/Pristine Water Dr to Lufkin Road	$ 3,600,000	2
17	FY 24-25	LAPP - Tingen Road Pedestrian Bridge	$ 3,700,000	2
18	FY 24-25	LAPP - Apex Peakway Southwest	$ 15,500,000	5
19	FY 24-25	Apex Peakway Southeast Connector	$ 18,800,000	3
			$ 89,850,000	

APEX
NORTH CAROLINA

Town Council Budget Retreat

FEBRUARY 12, 2021

Agenda

Time	Topic	Presenter
8:30 am	Check In	
9:00 am	Stormwater Utility	Marty, Mike
10:15 am	Break	-
10:30 am	How Sidewalk Needs are Identified & Prioritized	Jenna, Shannon
11:15 am	Proposed Bond Referendum	Vance, Amanda, Shawn
12:00 pm	Lunch	-
12:45 pm	Financial Condition Review	Vance
1:15 pm	Capital Project Prioritization Results & Discussion	Amanda, Kathryn
2:30 pm	Break	-
2:45 pm	Council Goals, Initiatives, & Indicators	Shawn, Amanda
4:30 pm	Wrap-up & Adjourn	

APEX NORTH CAROLINA

Proposed Bond Referendum

- What are the financial and tax rate effects of the bonds?
- What are the final projects for the referendum?*

Debt Calendar Under Consideration

- Issuance of $5 million of $12 million authorized and unissued Street and Sidewalk Bonds
  - To be used for paving, 10 year amortization period
  - Expected to be issued by private placement before June 30, 2021
- Issuance of $8 million installment financing for PSS 6 and other projects
  - Spring/summer issuance
- LGC approval of a $42 million GO referendum for streets and sidewalks
  - Spring/summer approval
  - Referendum in November 2021

Tax Supported Debt Service Limits

- The Town's policy limits debt service to 12% of the General Fund budget/expenditures
- Moody's does not give percentage guidance
  - Adjustment for "very high or low level"
- S&P gives percentage guidance
  - 8% to 15% - Strong
  - 15% to 25% - Adequate
- Rating agencies look at debt service as a % of expenditures less capital outlay and debt service

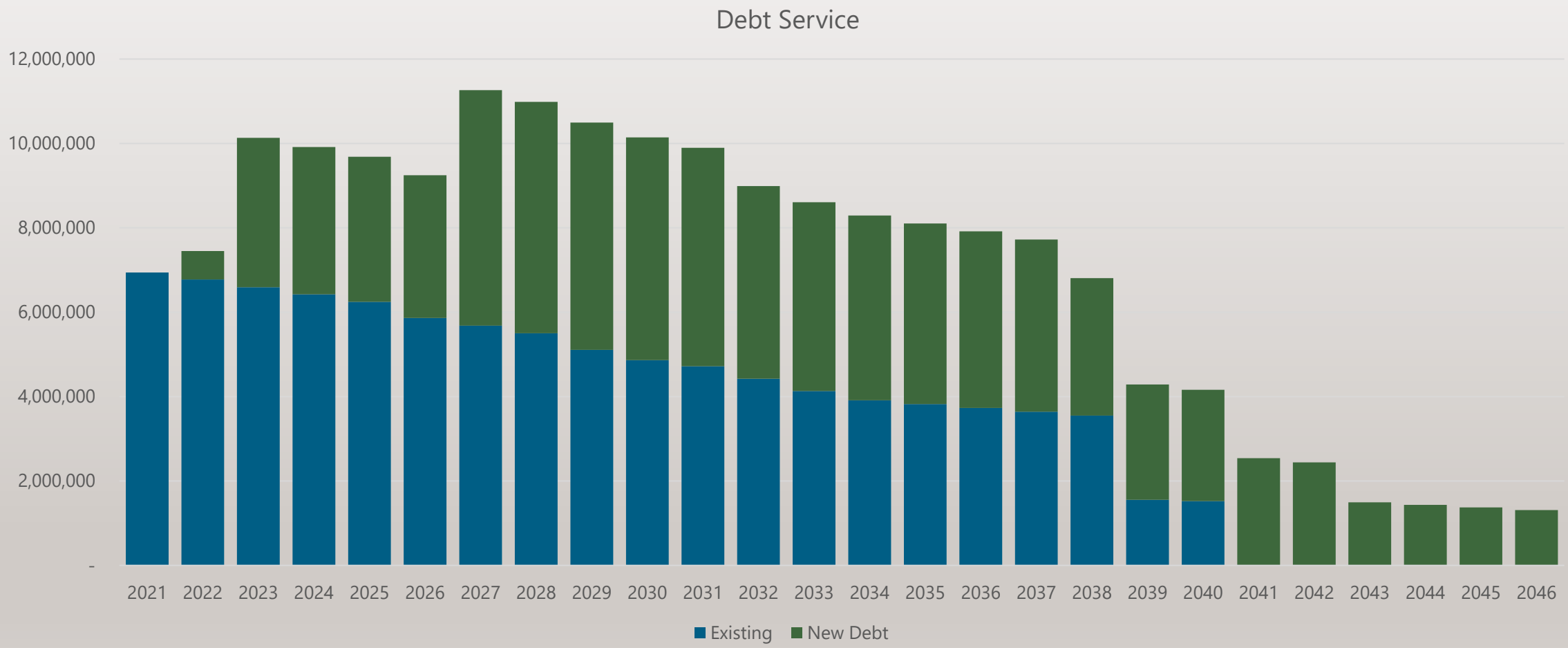
Debt Capacity -Tax Supported Debt

- Based upon projections of future budgets and interest rates, we project the amount of tax supported debt capacity to be:
  - Currently – $17 million
  - FY 2026 – An additional $25 million
  - The maximum tax increase needed to $42 million of new bonds would be 3.14 cents in FY 2027
- This projection assumes issuance of $12 million of currently authorized but unissued general obligation bonds and an $8 million installment financing for other Town projects.
- This would take us to the 12% limit in the Town's Fiscal Policy for debt service as a percentage of the GF budget.
  - Issuance of the $5 million for paving would take us to 12.07% in 2023 due to shorter amortization period, about $60,000 over limit. Back under 12% in 2024.
- This would take the Town into the "Adequate" range for two years (16.60% maximum in 2023), based upon how the rating agencies calculate this percentage.

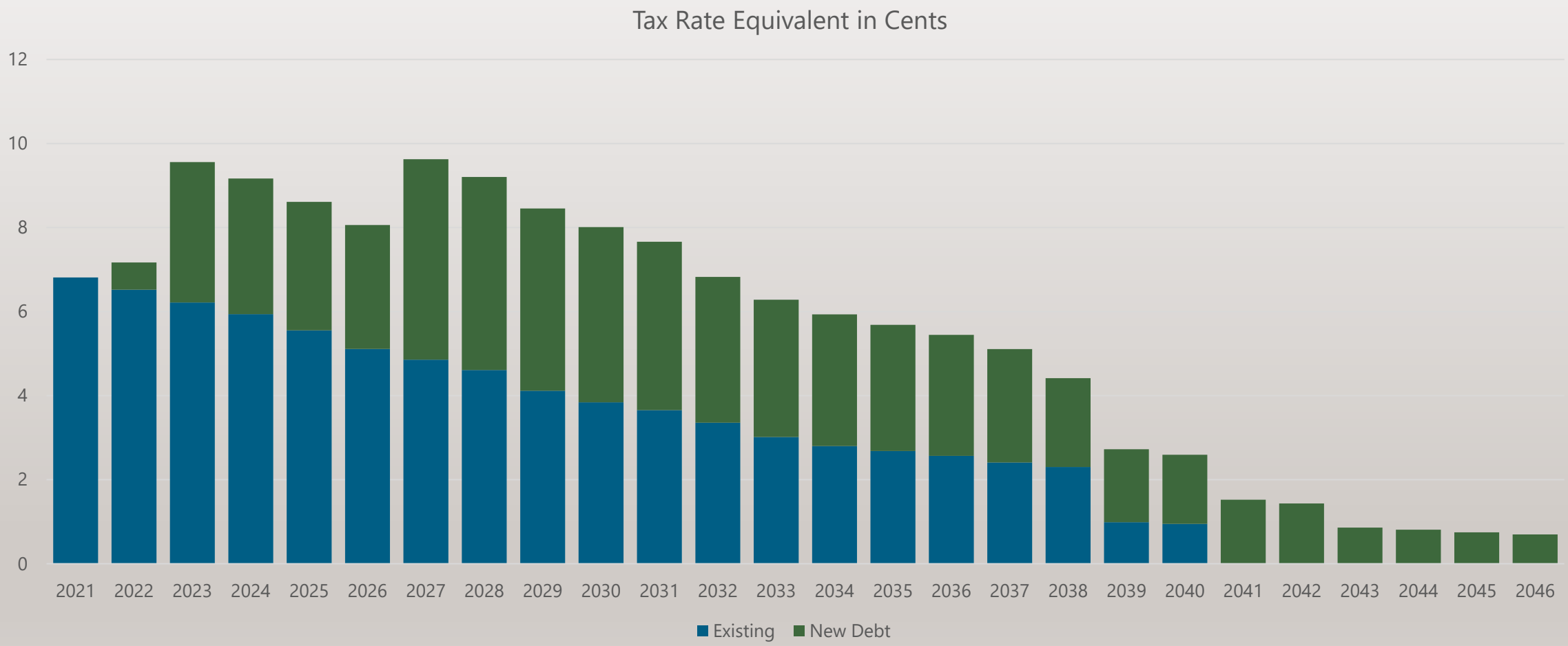
Tax Rate Equivalent of $17M and $25M GO's

Fiscal Year	TRE $17 Million GO's (Cents)	TRE $25 Million GO's (Cents)	Total TRE (Cents)
2023	1.45		1.45
2024	1.39		1.39
2025	1.32		1.32
2026	1.27		1.27
2027	1.21	1.93	3.14
2028	1.17	1.86	3.03
2029	1.10	1.75	2.85
2030	1.05	1.69	2.74
2031	1.01	1.62	2.63
2032	.96	1.56	2.52

Tax Supported Debt Service



Tax Rate Equivalent General Fund Debt Service



Proposed Bond Referendum

Bond Option 1			
Project Title	**Cost**	**FY21 Issue**	**FY26 Issue**
Apex Peakway North Widening (Center St. to Old Raleigh Rd.)	$5,400,000		X
Apex Peakway Southwest Connector	$15,500,000	X	
Center St RR Crossing Improvements & Sidewalk	$800,000	X	
Chatham St. RR Crossing Improvements & Sidewalk	$1,300,000	X	
Jessie Dr. Phase 1 (Ten-Ten to Production)	$8,500,000		X
Pavement Management Backlog	$5,000,000		X
W. Williams St. Sidewalk	$850,000		X
Totals	**$37,350,000**	**$17,600,000****	**$19,750,000**

**Capital funds or bond premium expected to cover $600,000 to reduce bond issue to $17 million.

Bond Option 2			
Project Title	**Cost**	**FY21 Issue**	**FY26 Issue**
Apex Peakway North Widening (Center St. to Old Raleigh Rd.)	$5,400,000		X
Apex Peakway Southwest Connector	$15,500,000	X	
Center St RR Crossing Improvements & Sidewalk	$800,000	X	
Chatham St. RR Crossing Improvements & Sidewalk	$1,300,000	X	
Jessie Dr. Phase 1 (Ten-Ten to Production)	$8,500,000		X
Pavement Management Backlog	$5,000,000		X
W. Williams St. Sidewalk	$850,000		X
Burma Dr. Phase 2/Pristine Water Dr. to Lufkin Rd.^	$3,600,000		X^
Tingen Rd. Pedestrian Bridge^	$3,700,000		X^
Production Dr. Extension to Jessie Dr.^	$4,400,000		X^
Totals	**$41,000,000^**	**$17,600,000****	**$24,000,000**

**Capital funds or bond premium expected to cover $600,000 to reduce bond issue to $17 million.
^One of these three projects can be selected. If the total amount exceeds $41 million, capital funds or bond premium may be used to cover the difference.

Proposed Bond Referendum

Bond Option 3			
Project Title	**Cost**	**FY21 Issue**	**FY26 Issue**
Apex Peakway Southwest Connector	$15,500,000	X	
Pavement Management Backlog	$1,000,000	X	
SRTS Projects	$1,000,000	X	
Center St RR Crossing Improvements & Sidewalk	$800,000		X
Chatham St. RR Crossing Improvements & Sidewalk	$1,300,000		X
Apex Peakway North Widening (Center St. to Old Raleigh Rd.)	$5,400,000		X
Jessie Dr. Phase 1 (Ten-Ten to Production)	$8,500,000		X
SRTS Projects	$5,000,000		X
Pavement Management Backlog	$4,000,000		X
W. Williams St. Sidewalk	$850,000		X
Totals	**$43,350,000**	**$17,500,000***	**$25,850,000****

*Capital funds or bond premium expected to cover $500,000 to reduce bond issue to $17 million.

**Capital funds or bond premium expected to cover $850,000 to reduce bond issue to $25 million.

The Town Council of the Town of Apex, North Carolina met in a regular meeting in the Council Chambers of the Town Hall located at 73 Hunter Street in Apex, North Carolina, the regular place of meeting, at 6:00 p.m. on April 27, 2021.

Present: Mayor Jacques Gilbert, presiding, and Council Members

Absent: Council Members

Also present:

* * * * * *

The Mayor announced that this was the hour and day fixed by the Town Council for a public hearing upon the order entitled "ORDER AUTHORIZING $42,000,000 STREET AND SIDEWALK IMPROVEMENT BONDS" and that the Town Council would immediately hear anyone who might wish to be heard on the questions of the validity of said order or the advisability of issuing said bonds.

No one appeared, either in person or by attorney, to be heard on the questions of the validity of said order or the advisability of issuing said bonds and the Town Clerk announced that no written statement relating to said questions had been received, except as set forth in Exhibit A attached hereto.

Thereupon, upon motion of Council Member _____, seconded by Council Member _____, the order introduced and adopted on first reading on April 13, 2021 entitled "ORDER AUTHORIZING $42,000,000 STREET AND SIDEWALK

IMPROVEMENT BONDS" was read a second time and placed upon its final adoption. The vote upon the final adoption of said order was:

Ayes:_____

_____

Noes:_____

_____

The Town Clerk was thereupon directed to publish said order, together with the appended statement as required by The Local Government Bond Act, as amended, once in The News and Observer.

* * * * * *

I, Donna B. Hosch, Town Clerk of the Town of Apex, North Carolina, DO HEREBY CERTIFY that the foregoing is a true copy of so much of the proceedings of the Town Council of said Town at a regular meeting held on April 27, 2021, as it relates in any way to the holding of a public hearing and the adoption of a bond order authorizing general obligation bonds of said Town and that said proceedings are to be recorded in the minutes of said Town Council.

I DO HEREBY FURTHER CERTIFY that proper notice of such regular meeting was given as required by North Carolina law.

WITNESS my hand and official seal of said Town this 27th day of April, 2021.

_____
Town Clerk

[SEAL]

EXHIBIT A

[A list of any persons making comments and a summary of such comments to be attached. If no comments are made, please insert "None".]

TO THE PUBLISHER OF THE NEWS AND OBSERVER:

Please publish the following once in The News and Observer on Friday, April 30, 2021:

ORDER AUTHORIZING
$42,000,000 STREET AND SIDEWALK IMPROVEMENT BONDS

BE IT ORDERED by the Town Council of the Town of Apex, North Carolina:

1. That, pursuant to The Local Government Bond Act, as amended, the Town of Apex, North Carolina is hereby authorized to contract a debt, in addition to any and all other debt which said Town may now or hereafter have power or authority to contract, and in evidence thereof to issue Street and Sidewalk Improvement Bonds in an aggregate principal amount not exceeding $42,000,000 for the purpose of providing funds, together with any other available funds, to construct, extend, widen, resurface and improve streets, sidewalks and multi-use paths inside and outside the corporate limits of said Town, including, without limitation, any related land, easements, rights of way and streetscape, traffic signal and utility improvements.

2. That taxes shall be levied in an amount sufficient to pay the principal of and the interest on said bonds.

3. That a sworn statement of the debt of said Town has been filed with the Town Clerk and is open to public inspection.

4. That this order shall take effect when approved by the voters of said Town at a referendum as provided in said Act.

The foregoing order was adopted on the 27th day of April, 2021, and is hereby published this 30th day of April, 2021. Any action or proceeding questioning the validity of the order must be begun within 30 days after the date of publication of this notice. The Finance Director of said Town has filed a statement estimating that the total amount of interest that will be paid on the proposed bonds over the expected term of the bonds, if issued, is $19,199,250. The estimate is preliminary, is for general informational purposes only, and may differ from the actual interest paid on such bonds. Such statement of estimated interest includes certain assumptions upon which such estimate is based, and there is no assurance that the circumstances included in such assumptions will occur. The validity of the proposed bonds is not subject to challenge on the grounds that the actual interest cost on the bonds when issued is different than the estimated interest amount set forth above.

By: Donna B. Hosch
Town Clerk
Town of Apex, North Carolina

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: PUBLIC HEARING

Meeting Date: April 27, 2021

Item Details

Presenter(s): Liz Loftin, Senior Planner

Department(s): Planning and Community Development

Requested Motion

Public hearing and possible motion to adopt an Ordinance on the Question of Annexation – Apex Town Council's intent to annex Edwin A. Goodwin, Testamentary Trust/Judy G. Hackney, Trustee (Hackney Tracts) property containing 2.867 acres located at 2600 Olive Chapel Road, Annexation #701 into the Town's corporate limits.

Approval Recommended?

Yes, by the Planning and Community Development Department.

Item Details

This item was continued from the March 25, 2021 meeting.

The Town Clerk certifies to the investigation of said annexation.

Attachments

- Annexation Ordinance
- Annexation Petition
- Legal Description
- Map

TOWN OF APEX, NORTH CAROLINA
Municipality No. 333

After recording, please return to:
Donna Hosch, MMC, NCCMC, Town Clerk
Town of Apex
P.O. Box 250
Apex, NC 27502

ORDINANCE NO. 2021-0427-10
ANNEXATION PETITION NO. #701
Edwin A. Goodwin Testamentary Trust and Judy G. Hackney, Trustee (Hackney Tracts)

AN ORDINANCE TO EXTEND THE CORPORATE LIMITS
OF THE TOWN OF APEX, NORTH CAROLINA
P.O. Box 250, Apex, North Carolina 27502

WHEREAS, the Apex Town Council has been petitioned under G.S.§160A-31, as amended, to annex the area described herein; and

WHEREAS, the Apex Town Council has by Resolution directed the Town Clerk to investigate the sufficiency of said petition; and

WHEREAS, the Town Clerk has certified the sufficiency of said petition and a public hearing on the question of this annexation was held at Apex Town Hall at 6:00 p.m. on March 23, 2021 after due notice by posting to the Town of Apex website, http://www.apexnc.org/news/public-notices-legal-ads; and

WHEREAS, the Apex Town Council does hereby find as a fact that said petition meets the requirements of G.S.§160A-31, as amended.

NOW, THEREFORE, BE IT ORDAINED by the Town Council of Apex, North Carolina:

Section 1. By virtue of the authority granted by G.S.§160A-31, as amended, the territory described in the attached property description and also shown as "Annexation Area" on the below identified survey plat is hereby annexed and made part of the Town of Apex, North Carolina, as of the date of adoption of this Ordinance on April 27, 2021. The survey plat that describes the annexed territory is that certain survey plat entitled Insert "Annexation Map for the Town of Apex., WithersRavenel Engineers, Planners, Surveyors dated November 2, 2020" and recorded in Book of Maps book number 2021 and page number , Wake County Registry.

Section 2. Upon and after the adoption of this ordinance, the territory described herein and its citizens and property shall be subject to all debts, laws, ordinances and regulations in force in the Town of Apex, North Carolina, and shall be entitled to the same privileges and benefits as other parts of the Town of Apex. Said territory shall be subject to municipal taxes according to G.S.§160A-58.10, as amended.

Section 3. The Clerk of the Town of Apex, North Carolina shall cause to be recorded in the Office of the Register of Deeds of Wake County and in the Office of the Secretary of State at Raleigh, North Carolina and in the Office of the Wake County Board of Elections an accurate map of the annexed territory, described in Section 1 hereof, together with a duly certified copy of this Ordinance.

Adopted this the 27th day of April 2021.

_____
Jacques K. Gilbert
Mayor

ATTEST:

_____
Donna B. Hosch, MMC, NCCMC
Town Clerk

APPROVED AS TO FORM:

_____
Laurie L. Hohe
Town Attorney

Legal Description

Beginning at an Existing Iron Pipe Located on the Northern Right of Way of Olive Chapel Road (SR#1160) and having North Carolina Grid Coordinates (NAD83, 2011), N: 719,361.07', E: 2,023,999.59'; said Iron Pipe also being the Southeast corner of Common Area 2, "Haley at Smith Farms", Book of Maps 2018, Page 934, Wake County Registry. Thence leaving said Right of Way, North 02°31'13" East, 385.44' to a point, Thence South 62°35'47" East, 49.52' to a point, Thence South 64°57'29" East, 454.32' to a point, Thence South 44°47'18" East, 40.09' feet to a point located in the centerline of Olive Chapel Road,
Thence South 70°19'56" West, 26.36' feet to a point in the centerline of the road, Thence South 01°02'11" West, 37.60' feet to a point located on the Southern Right of Way of Olive Chapel Road, Thence continuing along the Right of Way of Olive Chapel Road, South 70°23'37" West, 98.86' feet to a point, Thence South 70°22'07" West, 100.00' feet to a point, Thence South 70°21'56" West, 214.57' feet to a point, Thence North 03°31'36" West, 5.21' feet to a point, Thence South 70°19'30" West, 94.12' feet to a point, Thence Leaving the Southern Right of Way of Olive Chapel Road North 02°31'13" East, 32.27' feet to a point, Thence North 02°31'13" East, 32.69' feet to a point, Thence North 02°31'13" East, 5.41' feet to an Existing Iron Pipe, the point and place of Beginning and containing an area of 2.867 Acres, (124,897 sf), more or less.

STATE OF NORTH CAROLINA

COUNTY OF WAKE

CLERK'S CERTIFICATION

I, Donna B. Hosch, MMC, NCCMC, Town Clerk, Town of Apex, North Carolina, do hereby certify the foregoing is a true and correct copy of Annexation Ordinance No. 2021-0427-10, adopted at a meeting of the Town Council, on the 27th day of April, 2021, the original of which will be on file in the Office of the Town Clerk of Apex, North Carolina.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official Seal of the Town of Apex, North Carolina, this the 28th day of April 2021.

_____
Donna B. Hosch, MMC, NCCMC
Town Clerk

(SEAL)

PETITION FOR VOLUNTARY ANNEXATION

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Application #: 701 Submittal Date: 11/2/2020

Fee Paid $ 200.00 Check # Visa

TO THE TOWN COUNCIL APEX, NORTH CAROLINA

1. We, the undersigned owners of real property, respectfully request that the area described in Part 4 below be annexed to the Town of Apex, Wake County, North Carolina.
2. The area to be annexed is ☒ contiguous, ☐ non-contiguous (satellite) to the Town of Apex, North Carolina and the boundaries are as contained in the metes and bounds description attached hereto.
3. If contiguous, this annexation will include all intervening rights-of-way for streets, railroads and other areas as stated in G.S. 160A-31(f), unless otherwise stated in the annexation amendment.

Owner Information

Edwin A. Goodwin Testamentary Trust — Owner Name (Please Print)

0721492629 — Property PIN or Deed Book & Page #

913-362-7372 — Phone

E-mail Address

Judy G. Hackney, Trustee — Owner Name (Please Print)

c/o the Edwin A. Goodwin Testamentary Trust

Property PIN or Deed Book & Page #

Phone

E-mail Address

Owner Name (Please Print)

Property PIN or Deed Book & Page #

Phone

E-mail Address

Surveyor Information

Surveyor: WithersRavenel

Phone: Fax:

E-mail Address:

Annexation Summary Chart

Property Information		Reason(s) for annexation (select all that apply)	
Total Acreage to be annexed:	2.867	Need water service due to well failure	☐
Population of acreage to be annexed:	0 ac.	Need sewer service due to septic system failure	☐
Existing # of housing units:	0	Water service (new construction)	☑
Proposed # of housing units:	Approx. 5	Sewer service (new construction)	☑
Zoning District*:	R-80W	Receive Town Services	☑

*If the property to be annexed is not within the Town of Apex's Extraterritorial Jurisdiction, the applicant must also submit a rezoning application with the petition for voluntary annexation to establish an Apex zoning designation. Please contact the Planning Department at 919-249-3426 for questions.

PETITION FOR VOLUNTARY ANNEXATION

Application #: 701 Submittal Date: 11/2/2020

COMPLETE IF SIGNED BY INDIVIDUALS:

All individual owners must sign. (If additional signatures are necessary, please attach an additional sheet.)

Judy G Hackney, Trustee of — Judy G. Hackney - Trustee
Please Print — Signature

the Edwin A. Goodwin Testamentary Trust
Please Print — Signature

Please Print — Signature

Please Print — Signature

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Paul Stam, a Notary Public for the above State and County, this the 27 day of October, 2020.

Notary Public

SEAL

PAUL STAM NOTARY PUBLIC My Commission Expires 05-08-2024 WAKE COUNTY, NC

My Commission Expires: May 8 2024

COMPLETE IF A CORPORATION:

In witness whereof, said corporation has caused this instrument to be executed by its President and attested by its Secretary by order of its Board of Directors, this the _____ day of _____, 20_____.

Corporate Name _____

SEAL

By: _____
President (Signature)

Attest:

_____
Secretary (Signature)

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, _____, a Notary Public for the above State and County, this the _____day of _____, 20____.

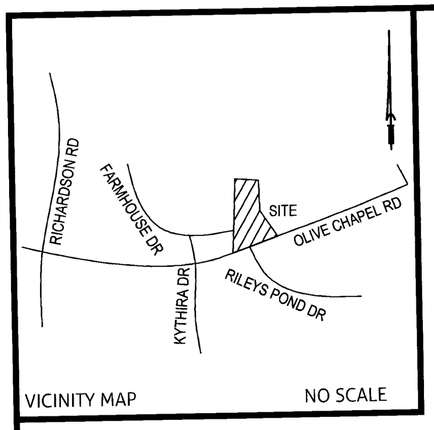
_____
Notary Public

SEAL

My Commission Expires: _____

Hackney Annexation Legal Description

Beginning at an Existing Iron Pipe Located on the Northern Right of Way of Olive Chapel Road (SR#1160) and having North Carolina Grid Coordinates (NAD83, 2011), N: 719,361.07', E: 2,023,999.59'; said Iron Pipe also being the Southeast corner of Common Area 2, "Haley at Smith Farms", Book of Maps 2018, Page 934, Wake County Registry. Thence leaving said Right of Way, North 02°31'13" East, 385.44' to a point, Thence South 62°35'47" East, 49.52' to a point, Thence South 64°57'29" East, 454.32' to a point, Thence South 44°47'17" East, 40.09' feet to a point located in the centerline of Olive Chapel Road, Thence South 70°19'56" West, 26.36' feet to a point in the centerline of the road, Thence South 01°02'11" West, 37.60' feet to a point located on the Southern Right of Way of Olive Chapel Road, Thence continuing along the Right of Way of Olive Chapel Road, South 70°23'37" West, 98.86' feet to a point, Thence South 70°22'07" West, 100.00' feet to a point, Thence South 70°21'56" West, 214.57' feet to a point, Thence North 03°31'36" West, 5.21' feet to a point, Thence South 70°19'30" West, 94.12' feet to a point, Thence Leaving the Southern Right of Way of Olive Chapel Road North 02°31'13" East, 32.27' feet to a point, Thence North 02°31'13" East, 32.69' feet to a point, Thence North 02°31'13" East, 5.41' feet to an Existing Iron Pipe, the point and place of **Beginning** and containing an area of 2.867 Acres, (124,897 sf), more or less.



VICINITY MAP NO SCALE

PIN No. 0722411102
JUDY G. HACKNEY
DB 1400, PG 236
BM 1983, PG 57

PIN No. 0722406699
CHARLES L. HACKNEY
JUDY G. HACKNEY
DB 3195, PG 151
BM 1982, PG 1057

N.C. GRID NORTH NAD 83(2011)

S 85°35'51" E
339.02'

PT

N 02°31'45" E
382.15'

S 00°56'41" E
436.43'

POND

PIN No. 0721492629
JUDY G. HACKNEY, TRUSTEE OF THE
EDWIN A. GOODWIN TESTAMENTARY
TRUST
DB 3195, PG 149
BM 1983, PG 57
9.526 ACRES (OUTSIDE R/W)
0.481 ACRES (WITHIN R/W)
10.007 (TOTAL ACRES)
ADDRESS: 2600 OLIVE CHAPEL ROAD

PIN No. 0722411102
JUDY G. HACKNEY
DB 1400, PG 236
BM 1983, PG 57

TOWN OF APEX CORPORATE LIMITS (OUT) (IN) EIP

ROWBOAT ROAD
50' PUBLIC RIGHT OF WAY
BM 2018, PG 934

N 02°31'13" E
288.73'

SMITH FARMS OF APEX
HOMEOWNERS ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 3
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0722309093

PT S 62°35'47" E
49.52'

PT

PROPOSED CORPORATE LIMITS
S 64°57'29" E
454.32'

S 34°12'20" E
445.67'

PT

TOWN OF APEX CORPORATE LIMITS (IN) (OUT)

N 02°31'13" E
385.44'

FARMHOUSE DRIVE
50' PUBLIC RIGHT OF WAY
BM 2018, PG 934

SMITH FARMS OF APEX HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 2
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN NO. 0721397362

POINT OF BEGINNING
EXISTING IRON PIPE
NC GRID COORDINATES
NAD 83(2011)
N: 719,361.07'
E: 2,023,999.59'

IPS

PT

OLIVE CHAPEL ROAD (SR#1160)
VARIABLE WIDTH PUBLIC RIGHT OF WAY

S 70°19'30" W
94.12'

TOWN OF APEX CORPORATE LIMITS (IN) (OUT)

S 70°21'56" W
214.57'

TOWN OF APEX CORPORATE LIMITS (IN) (OUT)

RILEY'S POND DRIVE
50' PUBLIC RIGHT OF WAY

S 70°22'07" W
100.00'

S 70°19'56" W
533.57'

S 70°19'56" W
507.03'

S 70°23'37" W
96.86'

PT

PT

S 70°19'56" W
175.55'

S 70°19'56" W
169.20'

TOWN OF APEX CORPORATE LIMITS (OUT) (IN)

PT

ANNEXATION AREA
(HATCHED AREA)
2.867 ACRES
124,897 SF

LINE TABLE		
LINE	DIRECTION	DISTANCE
L1	S 44°47'18" E	6.65'
L2	S 44°47'18" E	33.43'
L3	S 70°19'56" W	26.36'
L4	S 01°02'11" W	37.60'
L5	N 03°31'36" W	5.21'
L6	N 02°31'13" E	32.27'
L7	N 02°31'13" E	32.69'
L8	N 02°31'13" E	5.41'
L9	S 34°12'20" E	31.27'

GENERAL NOTES
1. BASIS OF BEARINGS: NC STATE PLANE GRID COORDINATES, NAD83(2011).
2. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES IN U.S. SURVEY FEET UNLESS OTHERWISE NOTED.
3. AREAS SHOWN HEREON WERE COMPUTED USING THE COORDINATE METHOD.
4. LINES NOT SURVEYED ARE SHOWN AS BROKEN LINES FROM INFORMATION REFERENCED ON THE FACE OF THIS PLAT.
5. NO EVIDENCE OF EARTH MOVING WAS OBSERVED IN THE PROCESS OF CONDUCTING FIELDWORK ON SUBJECT PARCEL.
6. NO EVIDENCE OF RECENT STREET OR SIDEWALK CONSTRUCTION OR REPAIRS OBSERVED IN THE PROCESS OF CONDUCTING FIELDWORK.
7. NO EVIDENCE OF BURIAL GROUNDS WAS OBSERVED IN THE PROCESS OF CONDUCTING FIELDWORK.
8. SUBJECT PROPERTY IS NOT LOCATED WITHIN A FLOOD HAZARD AREA ACCORDING TO FLOOD INSURANCE RATE MAP 3720072200J DATED MAY 2, 2006.
8. IRON PIPES SET AT ALL CORNERS UNLESS OTHERWISE NOTED.

SURVEYOR'S CERTIFICATE
"I, BENJAMIN E. DAYTON, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTION RECORDED IN BOOK SEE MAP, PAGE _____, THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION FOUND IN BOOK SEE MAP, PAGE ____; THAT THE RATIO OF PRECISION OR POSITIONAL ACCURACY AS CALCULATED IS 1:40,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AMENDED. WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER AND SEAL THIS 23RD DAY OF NOVEMBER, A.D., 2020.

DocuSigned by:
Benjamin Dayton
3BBD04AE5AEB4E7...
BENJAMIN E. DAYTON, PLS L-4390

11/23/2020

NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-4390 BENJAMIN E. DAYTON

OWNER(s):
JUDY G. HACKNEY, TRUSTEE
OF THE EDWIN A. GOODWIN
TESTAMENTARY TRUST
2505 OLIVE CHAPEL ROAD
APEX, NC 27502

ANNEXATION #_____

"I, DONNA B. HOSCH, MMC, NCCMC, TOWN CLERK, APEX, NORTH CAROLINA CERTIFY THIS A TRUE AND EXACT

MAP OF ANNEXATION ADOPTED THE _____ DAY OF _____, 20___, BY THE TOWN COUNCIL. I

SET MY HAND AND SEAL OF THE TOWN OF APEX, _____
DAY/MONTH/YEAR

_____
DONNA B. HOSCH, MMC, NCCMC, TOWN CLERK

-SEAL-

LEGEND

(EIP)-EXISTING IRON PIPE
(IPS)-IRON PIPE SET
(PT)-COMPUTED POINT (NO MONUMENT FOUND OR SET)
(FHYD)-FIRE HYDRANT
(WV)-WATER VALVE
(LP)-LIGHT POLE
(PP)-POWER POLE
(EPD)-ELECTRIC PEDESTAL
(WM)-WATER METER
(MB)-MAILBOX
(EOP)-EDGE OF PAVEMENT
(TLP)-TLELPHONE PEDESTAL
(SSMH)-SANITARY SEWER MANHOLE
(CMP)-CORRUGATED METAL PIPE
(RCP)-REINFORCED CONCRETE PIPE

80' 40' 0' 80' 160' 240'
SCALE IN FEET

REVISED 11-13-2020 - REVISE PIN NUMBER IN TITLE BLOCK

DATE: 11/2/2020	
SCALE: 1"=80'	
SURVEYED BY: AB	
DRAWN BY: BD	
CHECK & CLOSURE BY: BD	
CAD FILE: ANNEXATION PLAT.DWG	
PROJECT NO: 02180517.10	

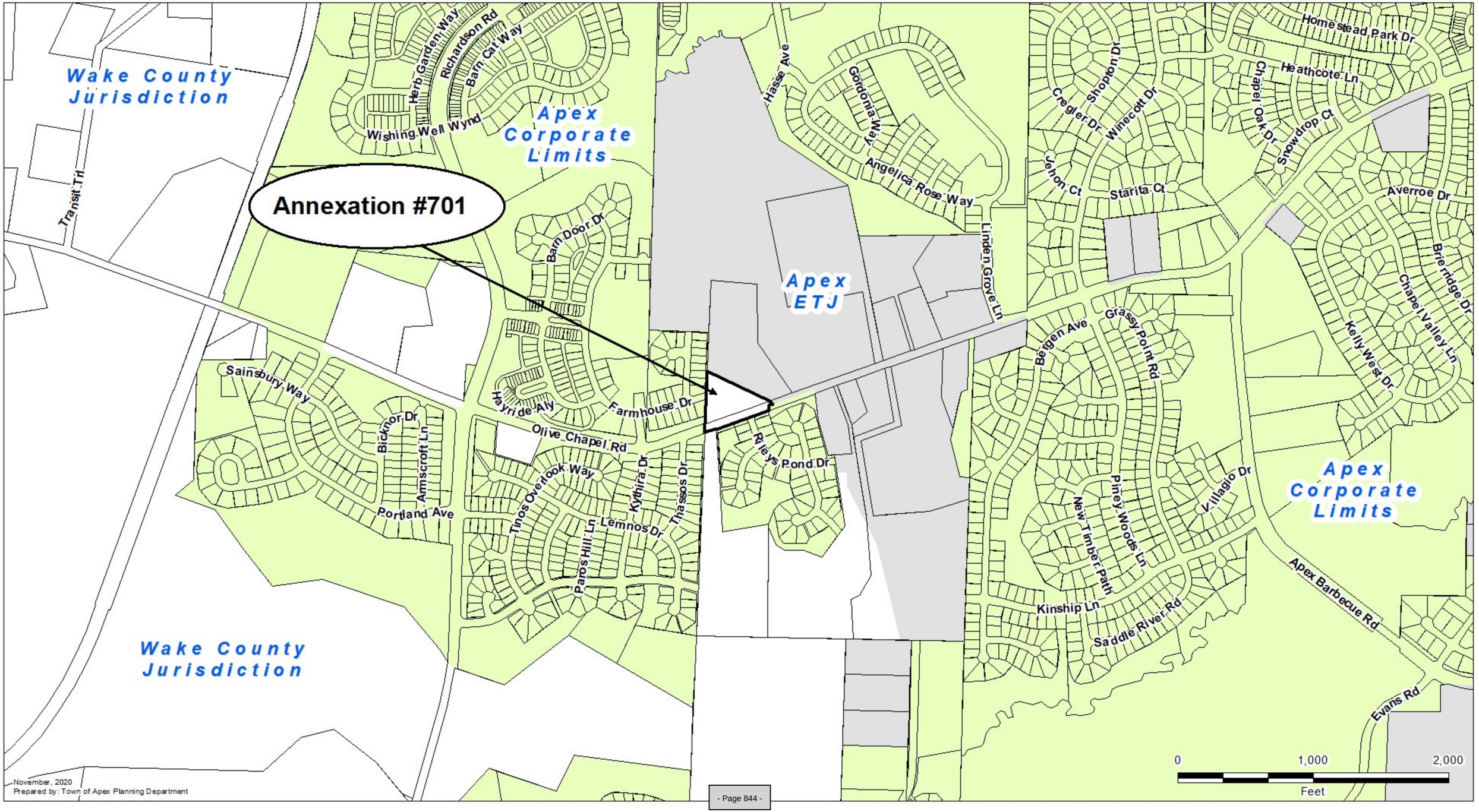
ANNEXATION MAP for the TOWN OF APEX

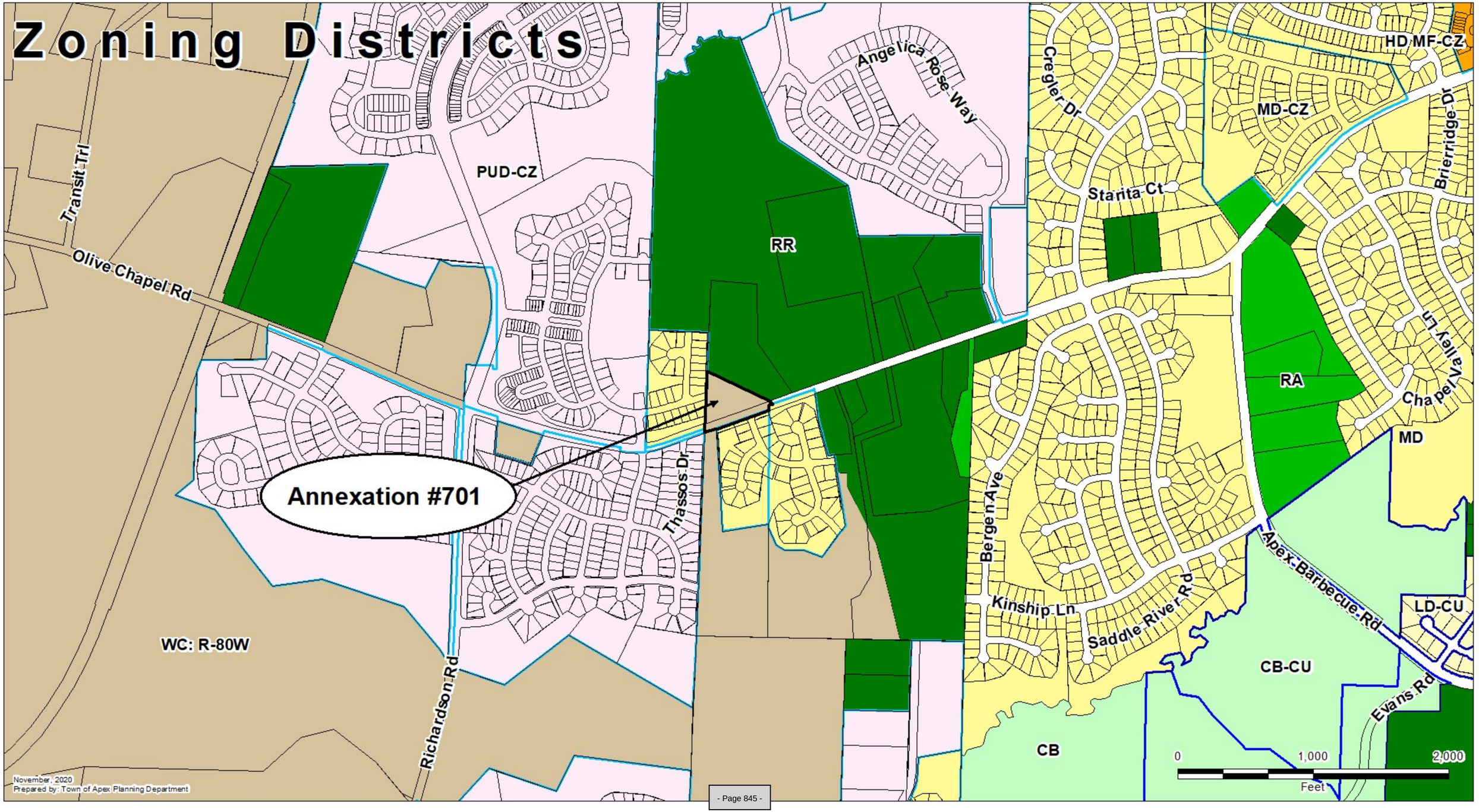
JUDY G. HACKNEY, TRUSTEE OF THE EDWIN A. GOODWIN TESTAMENTARY TRUST

TOWNSHIP: WHITE OAK	COUNTY: WAKE	STATE: NORTH CAROLINA
ZONE: RR and R-80W (PER GIS)	P.I.N. 0721492629	

WithersRavenel
Engineers | Planners | Surveyors
115 MacKenan Drive | Cary, NC 27511
t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

Annexation #701
Smith Farm, Phase 1
Cornfield Aly
Great Lawn Rd
Everbloom Aly
Milkthistle Aly
Sunflower Rd
Barn Door Dr
Hayride Aly
Livestock Aly
Haley Farms
Rowboat Rd
Farmhouse Dr
Olive Chapel Rd
Arcadia West
Tinos Overlook Way
Kythira Dr
Thassos Dr
Lemnos Dr
Riley's Pond
Braden Overlook Ct
Rileys Pond Dr
Baxter Ridge Ct
November, 2020
September 2020 Aerial Photography
Prepared by: Town of Apex Planning Department
0
250
500
Feet


Annexation #701
Wake County Jurisdiction
Apex Corporate Limits
Apex ETJ
Wake County Jurisdiction
Apex Corporate Limits
Transit Trl
Herb Garden Way
Richardson Rd
Barn Cat Way
Wishing Well Wynd
Hasse Ave
Gordonia Way
Angelica Rose Way
Linden Grove Ln
Homestead Park Dr
Heathcote Ln
Creigler Dr
Shopton Dr
Winecott Dr
Chapel Oak Dr
Snowdrop Ct
Jenon Ct
Starita Ct
Averroe Dr
Bridge Dr
Chapel Valley Ln
Kelly West Dr
Barn Door Dr
Sainsbury Way
Hayride Aly
Farmhouse Dr
Olive Chapel Rd
Bicknor Dr
Armscroft Ln
Portland Ave
Tinos Overlook Way
Paros Hill Ln
Lemnos Dr
Kythira Dr
Thassos Dr
Riley's Pond Dr
Bergen Ave
Grassy Point Rd
New Timber Path
Piney Woods Ln
Villagio Dr
Kinship Ln
Saddle River Rd
Apex Barbecue Rd
Evans Rd
0
1,000
2,000
Feet
November, 2020
Prepared by: Town of Apex Planning Department


Zoning Districts
Transit Trl
Olive Chapel Rd
PUD-CZ
RR
Angelica Rose Way
Cregler Dr
HD MF-CZ
MD-CZ
Brierridge Dr
Starita Ct
Chapel Valley Ln
RA
MD
Annexation #701
Thassos Dr
Bergen Ave
Kinship Ln
Saddle River Rd
Apex Barbecue Rd
LD-CU
CB-CU
Evans Rd
CB
WC: R-80W
Richardson Rd
November, 2020
Prepared by: Town of Apex Planning Department
0
1,000
2,000
Feet

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: UNFINISHED BUSINESS

Meeting Date: April 27,2021

Item Details

Presenter(s): Liz Loftin, Senior Planner

Department(s): Planning and Community Development

Requested Motion

Possible motion to approve Rezoning Application #20CZ14 Hackney PUD and Ordinance. The applicant, Brendie Vega, WithersRavenel, seeks to rezone approximately 73.64 acres located at 0, 2500, and 2600 Olive Chapel Road (PINs 0721492629, 0722406699, & 0722411102) from Rural Residential (RR) and Wake County R-80W to Planned Unit Development-Conditional Zoning (PUD-CZ). This item was continued from the March 25, 2021 meeting.

Approval Recommended?

The Planning and Community Development Department recommends approval.

Item Details

The Planning Board held a Public Hearing on March 8, 2021 and voted to recommend approval, with the conditions as offered by the application, by a vote of 6-0.

Attachments

- Staff Report
- Vicinity Map
- Application
- Ordinance

All property owners and neighborhood associations within 300 feet of this rezoning have been notified per UDO Sec. 2.2.11 *Public Notification*.

BACKGROUND INFORMATION:

Location: 0, 2500, & 2600 Olive Chapel Road
Applicant/Agent: Brendie Vega, WithersRavenel
Owners: Charles & Judy Hackney and Edwin Goodwin

PROJECT DESCRIPTION:

Acreage: ±73.64 acres
PINs: 0721492629, 0722406699, & 0722411102
Current Zoning: Rural Residential (RR) & R-80W
Proposed Zoning: Planned Unit Development-Conditional Zoning (PUD-CZ)
2045 Land Use Map Designation: Medium Density Residential
Town Limits: ETJ and Outside (annexation of portion in Wake County is required with rezoning)

Adjacent Zoning & Land Uses:

	Zoning	Land Use
North:	Planned Unit Development-Conditional Zoning(PUD-CZ #17CZ21& #16CZ26)	Single Family Residential (Sweetwater and Linden subdivisions)
South:	Rural Residential (RR); Medium Density Residential-Conditional Zoning (MD-CZ #13CZ26 & #13CZ08); Wake Co. R-80W	Olive Chapel Road; Single Family Residential (Riley's Pond and large lot single-family)
East:	Rural Residential (RR); Planned Unit Development-Conditional Zoning (PUD-CZ #16CZ26)	Single Family Residential (Linden subdivision and large lot single-family)
West:	Planned Unit Development-Conditional Zoning (PUD-CZ #15CZ32) & Medium Density Residential-Conditional Zoning (MD-CZ #16CZ10)	Single Family Residential (Smith Farm and Haley Farm subdivisions)

EXISTING CONDITIONS:
The site consist of three (3) parcels on the north side of Olive Chapel Road totaling ±73.64 acres. The site has one single family residence, several sheds/barns, and two existing ponds. Along the north boundary there is a 100' stream buffer from Reedy Branch.

NEIGHBORHOOD MEETING:
The applicant conducted a neighborhood meeting on October 29, 2020. The neighborhood meeting report is attached.

WCPSS Coordination:
A Letter of Impact from Wake County Public School System (WCPSS) was received for this rezoning and is included in the staff report packet. WCPSS indicates that elementary and high schools within the current assignment area for this rezoning/development are anticipated to have insufficient capacity for future students; transportation to schools outside of the current assignment area should be anticipated. School expansion or construction within the next five years may address concerns at the high school level. Possible long-term solutions may include capping students out to schools with available seats (not very proximate), reassignments, or calendar changes.

2045 LAND USE MAP:
The 2045 Land Use Map designates the properties as Medium Density Residential. The proposed PUD is consistent with the Land Use Map designation.

PLANNED UNIT DEVELOPMENT PLAN:

The applicant is proposing a Planned Unit Development Plan with uses and development standards as follows:

Permitted Uses:

The Rezoned Lands may be used for, and only for, the uses listed immediately below. The permitted uses are subject to the limitations and regulations stated in the UDO and any additional limitations or regulations stated below. For convenience, some relevant sections of the UDO may be referenced; such references do not imply that other sections of the UDO do not apply.

Residential:

- Single Family
- Accessory Dwelling Unit
- Townhouse

Non-Residential:

- Utility, minor
- Greenway
- Park, active
- Park, passive

Proposed Design Controls:

Maximum Density: 3.5 units per acre*
*The residential density will be a maximum of 3.5 dwelling units per acre this is a change from 4 units per acre.

Maximum Building Height: 50 feet

Maximum Built-Upon Area: 70%

Setbacks

		Proposed PUD-CZ minimum setbacks	MD zoning district minimum setbacks
Single-family	Front	5' from façade 20' from garage to back of sidewalk	25'
	Side	5'	6' min/16' total
	Rear	10'	20'
	Corner side	8'	15'
			HDSF zoning district minimum setbacks
Townhouse, front loaded	Front	10' from façade 20' from garage to back of sidewalk	15'
	Side	5'	0' (8' between buildings)
	Rear	10'	15'
	Corner side	10'	15'
			HDSF zoning district minimum setbacks
Townhouse, alley loaded	Front	10' from front facade	15'
	Side	5'	0' (8' between buildings)
	Rear	5'	15'
	Corner side	10'	15'

Buffers

The proposed PUD meets or exceeds the buffers required by the UDO.

Perimeter Buffers:	UDO Required	Proposed
Northern property boundary	15' Type A	200' stream buffer**
Eastern property boundary	20' Type B	20' Type A
Western property boundary	15' Type A	20' Type A
Olive Chapel Road	30' Type B	30' Type E*

*A 30' Type B buffer shall be provided if homes along Olive Chapel Road are not alley-loaded.
** In addition to the 100' riparian buffer to the north, an additional 100' buffer will be established. This additional 100' may include utilities, trails and other active or passive recreation.

Architectural Standards

The proposed development offers the following architectural controls to ensure a consistency of character throughout the development, while allowing for enough variety to create interest and avoid monotony. Changes to the exterior materials, roof, windows, doors, process, trim, etc. are

allowable with administrative approval at the staff level. Further details shall be provided at the time of Residential Master Subdivision Plan submittal. The following conditions shall apply:

1. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
2. The roofline cannot be a single mass; it must be broken up horizontally and vertically between every unit.
3. Garage doors must have windows, decorative details or carriage-style adornments on them.
4. The rear and side elevations of the units that can be seen from the right-of-way shall have trim around the windows.
5. The visible side of a townhome on a corner lot facing the public street shall contain at least 2 decorative elements such as, but not limited to, the following elements:
   - Windows
   - Bay window
   - Recessed window
   - Decorative window
   - Trim around the windows
   - Wrap-around porch or side porch
   - Two or more building materials
   - Column
   - Portico
   - Balcony
   - Dormer
   - Decorative brick/stone
   - Decorative trim
   - Decorative shake
   - Decorative air vents on gable
   - Decorative gable
   - Decorative cornice
6. The garage cannot protrude more than 1-foot from either the front façade or porch.

Resource Conservation Area
The Hackney PUD is south and west of NC 540 and is therefore required to provide 30% of the gross site as RCA. If the single-family portion of the PUD is mass graded, that portion of the project will be required to provide an additional 5% RCA. They propose to meet these requirements.

Tree Replanting
Existing deciduous trees greater than 18" in diameter (DBH), as identified in the tree survey, that are removed by site development shall be replaced by planting a 1.5" caliper native tree from the *Town of Apex Design and Development Manual* as a street tree or as other required landscaping. Excess required tree replacement will occur in common open space areas.

Clean Energy
Residential dwelling units will be provided with solar conduit to accommodate the future installation of solar panels.

Water Quality
1. Signs will be installed near SCMs in order to:
   - Reduce pet water near SCM drainage areas
   - Reduce fertilizer near SCM drainage areas
2. Installation of Pet Waste Stations in common areas will occur within the neighborhood

Planting and Landscaping

1. Install Warm Season grasses (Bermuda, Zoysia, etc) in lawn areas to reduce the need for irrigation and chemicals.
2. Install required Street Trees, Buffer, and Re-Vegetation plantings that consist of a variety of native plant materials recognized by the New Hope Audubon Society or the NCSU manual for Landscaping for Wildlife with Native Plants as being bird and pollinator friendly; as allowed by the Town of Apex Deign & Development Manual or approved by Apex staff.
3. Specify pocket park plantings that are recognized by the NC Wildlife Federation as being Native Pollinator Plants as part of the Statewide Butterfly Highway initiative.
4. Include at least 4 hardwood tree varieties in the proposed plantings, as allowed by the Apex Design and Development Manual.

Environmental Resources

Parking

Parking and loading will comply with all applicable requirements of UDO Sec. 8.3 *Parking and Loading*. Per UDO Section 8.3.4 of the UDO, guest parking shall be designated within common areas and be distributed throughout the project. Striped on-street parking may be counted toward guest parking requirements. For townhouses, guest parking shall be distributed so that there is at least one parking space within 200' of each townhouse lot.

Public Facilities

The project's construction will consist of the extension of public facilities to serve the site. All public facilities and infrastructure shall comply with the Town of Apex Sewer and Water Master Plans and the Town of Apex Standards and Specifications. Public facilities include:

Water/Sanitary Sewer:
All lines will be designed according to Town of Apex Standards and Specifications.

Other Utilities:
Electric service shall be provided by the Town of Apex. Gas, telephone, and cable shall be provided by the builder as coordinated with the appropriate utility companies.

Stormwater Management

Two ponds exist on the parcels and drain to Reedy Branch Creek, eventually feeding into Jordan Lake. The proposed development plan will require stormwater management measures in accordance with Sections 6.1 and 7.5.7 in the Town of Apex Unified Development Ordinance. Stormwater captured on the site will be conveyed to proposed Stormwater Control Measures, which will be identified on plans during the major subdivision or site plan approval stage. Post-development peak runoff shall not exceed pre-development peak runoff for the 24-hour, 1-year and 10-year storm events in accordance with the Unified Development Ordinance. Treatment for the first 1-inch of runoff will be provided such that the removal of 85% Total Suspended Solids is achieved. All stormwater devices will meet the design requirements of NCDENR and the Town of Apex.

APEX TRANSPORTATION PLAN/ACCESS and CIRCULATION:

The Site will require an internal public roadway network and parking spaces. The onsite transportation circulation system shall be consistent with the Town of Apex Transportation Plan and the Town of Apex Standard Specifications and Standard Details. The following conditions shall apply:

1. Hasse Avenue will be constructed between Olive Chapel Road and its current terminus north of the project.
2. Olive Chapel Road will be widened to include construction of a 100-foot eastbound left-turn lane with appropriate deceleration length and taper and a 100-foot westbound right-turn lane with appropriate deceleration length and taper on Olive Chapel Road, subject to NCDOT review and approval.
3. The Olive Chapel Road turn lane widening will be completed prior to platting Hasse Avenue access to Olive Chapel Road and the connection to Hasse Avenue north of the project will be completed prior to the last plat in the subdivision.
4. A 6-foot bike lane and 5-foot paved shoulder will be located on the north side of Olive Chapel Road per the Bicycle and Pedestrian System Plan Map.
5. Alleys may be proposed to vary from Town standards in order to accommodate water and sewer utilities, provided they maintain the same or greater width of pavement and right of way, subject to staff review and approval at the time of subdivision and construction plans.
6. There will be no private driveways permitted along Olive Chapel Road.

Pedestrian Facilities

1. The development plan will incorporate sidewalk infrastructure along Olive Chapel Road as well as the internal street network.
2. A trail will serve as a connection from the western portion of the community to the Reedy Branch Greenway.
3. Sidewalks will be provided on both sides of all streets for single-family detached homes.
4. There will be a 10-foot side path provided along minor collector road as shown on the Bicycle and Pedestrian Systems Plan Map.
5. Prior platting the 75th lot in the neighborhood, the Developer will extend a 5’ sidewalk approximately 860 feet along the north side of Olive Chapel to western limits of the Linden Subdivision. Developer will attempt to obtain the required right-of-way and/or easements for construction of this sidewalk from the adjacent property owners. If the required right-of-way and/or easements cannot be obtained by that time, a Fee-in-Lieu in the amount of 125% of the estimated cost of construction plus fair market value of the property to be acquired, shall be assessed. Any performance guarantee provided for this section of sidewalk shall be released upon acceptance of said fee-in-lieu by the Town.

Affordable Housing

If the Town of Apex has a fund or other mechanism in place to receive donations to construct, subsidize, or participate in the development of affordable housing units (the “Fund”), the developer will contribute $215 per lot to this Fund prior to the first residential Certificate of Occupancy. In the event the Fund has not been established by the Town of Apex, the money will be conveyed to a local non-profit working on affordable housing initiatives. The developer will work with the Town of Apex to identify a mutually acceptable local non-profit organization to receive these funds.

ENVIRONMENTAL ADVISORY BOARD:
This rezoning was submitted before the Environmental Advisory Board began holding pre-application meetings on rezonings.

PARKS, RECREATION, AND CULTURAL RESOURCES ADVISORY COMMISSION:
The Parks, Recreation, and Cultural Resources Advisory Commission reviewed this item at their December 9, 2020 meeting and unanimously recommended a fee-in-lieu of dedication with credit for construction of greenway which connects side path along Hasse Ave to the west connecting to the Reedy Branch Greenway in Smith Farm. The fee rate will be set at the time of Town Council approval and the credit of construction will be calculated prior to construction plan approval. Per UDO Article 14, the greenway must be completed and accepted prior to 25% of the building permits for the project being issued.

PLANNING BOARD RECOMMENDATION:
The Planning Board held a Public Hearing on March 8, 2021 and voted to recommend approval, with the conditions as offered by the applicant, by a vote of 6-0.

PLANNING STAFF RECOMMENDATION:
Planning staff recommends approval of rezoning #20CZ14 Hackney PUD with the conditions as proposed by the applicant.

ANALYSIS STATEMENT OF THE REASONABLENESS OF THE PROPOSED REZONING:
This Statement will address consistency with the Town's comprehensive and other applicable plans, reasonableness, and effect on public interest:

The 2045 Land Use Map designates the site as Medium Density Residential. The proposed PUD is consistent with that land use classification.

Approval of the rezoning is reasonable and in the public interest because the site will act a transition between higher and lower residential densities. The proposed rezoning also provides for increased stream buffers, higher planting standards, and a contribution to affordable housing.

The proposed rezoning is also reasonable and in the public interest because it will allow this property to develop in a way that is consistent with the surrounding areas and will build side path along the minor collector that will be constructed through the site to Olive Chapel Road.

PLANNED UNIT DEVELOPMENT DISTRICT AND CONDITIONAL ZONING STANDARDS:
Standards
In return for greater flexibility in site design requirements, Planned Development (PD) Districts are expected to deliver exceptional quality community designs that preserve critical environmental resources; provide high quality community amenities; incorporate creative design in the layout of buildings, Resource Conservation Area and circulation; ensure compatibility with surrounding land uses and neighborhood character; provide high quality architecture; and provide greater efficiency in the layout and provision of roads, utilities, and other infrastructure. The Planned Development (PD) Districts shall not be used as a means of circumventing the Town's adopted land development regulations for routine developments.

1) *Planned Unit Development (PUD-CZ) District*
In approving a Planned Development (PD) Zoning District designation for a PUD-CZ, the Town Council shall find the PUD-CZ district designation and PD Plan for PUD-CZ demonstrates compliance with the following standards:

a) *Development parameters*

(i) The uses proposed to be developed in the PD Plan for PUD-CZ are those uses permitted in Sec. 4.2.2 *Use Table.*

(ii) The uses proposed in the PD Plan for PUD-CZ can be entirely residential, entirely non-residential, or a mix of residential and non-residential uses, provided a minimum percentage of non-residential land area is included in certain mixed use areas as specified on the 2030 Land Use Map. The location of uses proposed by the PUD-CZ must be shown in the PD Plan with a maximum density for each type of residential use and a maximum square footage for each type of non-residential use.

(iii) The dimensional standards in Sec. 5.1.3 *Table of Intensity and Dimensional Standards, Planned Development Districts* may be varied in the PD Plan for PUD-CZ. The PUD-CZ shall demonstrate compliance with all other dimensional standards of the UDO, North Carolina Building Code, and North Carolina Fire Code.

(iv) The development proposed in the PD Plan for PUD-CZ encourages cluster and compact development to the greatest extent possible that is interrelated and linked by pedestrian ways, bikeways and other transportation systems. At a minimum, the PD Plan must show sidewalk improvements as required by the Apex Transportation Plan and the *Town of Apex Standard Specifications and Standard Details*, and greenway improvements as required by the Town of Apex Parks, Recreation, Greenways, and Open Space Plan and the Apex Transportation Plan. In addition, sidewalks shall be provided on both sides of all streets for single-family detached homes.

v) The design of development in the PD Plan for PUD-CZ results in land use patterns that promote and expand opportunities for walkability, connectivity, public transportation, and an efficient compact network of streets. Cul-de-sacs shall be avoided unless the design of the subdivision and the existing or proposed street system in the surrounding area indicate that a through street is not essential in the location of the proposed cul-de-sac, or where sensitive environmental areas such as streams, floodplains, and wetlands would be substantially disturbed by making road connections.

(vi) The development proposed in the PD Plan for PUD-CZ is compatible with the character of surrounding land uses and maintains and enhances the value of surrounding properties.

(vii) The development proposed in the PD Plan for PUD-CZ has architectural and design standards that are exceptional and provide higher quality than routine developments. All residential uses proposed in a PD Plan for PUD-CZ shall provide architectural elevations representative of the residential structures to be built to ensure the Standards of this Section are met.

b) *Off-street parking and loading*. The PD Plan for PUD-CZ shall demonstrate compliance with the standards of Sec. 8.3 *Off-Street Parking and Loading*, except that variations from these standards may be permitted if a comprehensive parking and loading plan for the PUD-CZ is submitted as part of the PD Plan that is determined to be suitable for the PUD-CZ, and generally consistent with the intent and purpose of the off-street parking and loading standards.

c) *RCA.* The PD Plan for PUD-CZ shall demonstrate compliance with Sec. 8.1.2 Resource Conservation Area, except that the percentage of RCA required under Sec. 8.1.2 may be reduced by the Town Council by no more than ten percent (10%) provided that the PD Plan for PUD-CZ includes one or more of the following:

(i) A non-residential component; or

(ii) An overall density of 7 residential units per acre or more; or

(iii) Environmental measures including but not limited to the following:

(a) The installation of a solar photovoltaic (PV) system on a certain number or percentage of single-family or townhouse lots or on a certain number or percentage of multifamily, mixed-use, or nonresidential buildings. All required solar installation shall be completed or under construction prior to 90% of the building permits being issued for the approved number of lots or buildings. For single-family or townhouse installations, the lots on which these homes are located shall be identified on the Master Subdivision Plat, which may be amended;

(b) The installation of a geothermal system for a certain number or percentage of units within the development; or

(c) Energy efficiency standards that exceed minimum Building Code requirements (i.e. SEER rating for HVAC).

d) *Landscaping*. The PD Plan for PUD-CZ shall demonstrate compliance with the standards of Sec. 8.2 *Landscaping, Buffering and Screening*, except that variations from these standards may be permitted where it is demonstrated that the proposed landscaping sufficiently buffers uses from each other, ensures compatibility with land uses on surrounding properties, creates attractive streetscapes and parking areas and is consistent with the character of the area. In no case shall a buffer be less than one half of the width required by Sec. 8.2 or 10 feet in width, whichever is greater.

e) *Signs.* Signage in the PD Plan for PUD-CZ shall demonstrate compliance with Sec. 8.7 *Signs*, except that the standards can be varied if a master signage plan is submitted for review and approval concurrent with the PD plan and is determined by the Town Council to be suitable for the PUD-CZ and generally consistent with the intent and purpose of the sign standards of the UDO. The master signage plan shall have design standards that are exceptional and provide for higher quality signs than those in routine developments and shall comply with Sec. 8.7.2 *Prohibited Signs*.

f) *Public facilities.* The improvements standards and guarantees applicable to the public facilities that will serve the site shall comply with Article 7: *Subdivision and* Article 14: *Parks, Recreation, Greenways, and Open Space*.

(i) The PD Plan for PUD-CZ demonstrates a safe and adequate on-site transportation circulation system. The on-site transportation circulation system shall be integrated with the off-site transportation circulation system of the Town. The PD Plan for PUD-CZ shall be consistent with the Apex Transportation Plan and the *Town of Apex Standard Specifications and Standard Details* and show required right-of-way widths and road sections. A Traffic Impact Analysis (TIA) shall be required per Sec. 13.19.

(ii) The PD Plan for PUD-CZ demonstrates a safe and adequate on-site system of potable water and wastewater lines that can accommodate the proposed development, and are efficiently integrated into off-site potable water and wastewater public improvement plans. The PD Plan shall include a proposed water and wastewater plan.

(iii) Adequate off-site facilities for potable water supply, sewage disposal, solid waste disposal, electrical supply, fire protection and roads shall be planned and programmed for the development proposed in the PD Plan for PUD-CZ, and the development is conveniently located in relation to schools and police protection services.

(iv) The PD Plan shall demonstrate compliance with the parks and recreation requirements of Sec. Article 14: *Parks, Recreation, Greenways, and Open Space* and Sec. 7.3.1 *Privately-owned Play Lawns* if there is a residential component in the PUD-CZ.

g) *Natural resource and environmental protection.* The PD Plan for PUD-CZ demonstrates compliance with the current regulatory standards of this Ordinance related to natural resource and environmental protection in Sec. 6.1 *Watershed Protection Overlay District*, Sec. 6.2 *Flood Damage Prevention Overlay District*, and Sec. 8.1 *Resource Conservation*.

h) *Storm water management.* The PD Plan shall demonstrate that the post-development rate of on-site storm water discharge from the entire site shall not exceed pre-development levels in accordance with Sec. 6.1.7 of the UDO.

i) *Phasing.* The PD Plan for PUD-CZ shall include a phasing plan for the development. If development of the PUD-CZ is proposed to occur in more than one phase, then guarantees shall be provided that project improvements and amenities that are necessary and desirable for residents of the project, or that are of benefit to the Town, are constructed with the first phase of the project, or, if this is not possible, then as early in the project as is technically feasible.

j) *Consistency with 2045 Land Use Map.* The PD Plan for PUD-CZ demonstrates consistency with the goals and policies established in the Town's 2030 Land Use.

k) *Complies with the UDO.* The PD Plan for PUD-CZ demonstrates compliance with all other relevant portions of the UDO.

Legislative Considerations

The Town Council shall find the PUD-CZ designation demonstrates compliance with the following standards. Sec. 2.3.3.F:

The applicant shall propose site-specific standards and conditions that take into account the following considerations, which are considerations that are relevant to the legislative determination of whether or not the proposed conditional zoning district rezoning request is in the public interest. These considerations do not exclude the legislative consideration of any other factor that is relevant to the public interest.

1) *Consistency with 2030 Land Use Map.* The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and consistency with the purposes, goals, objectives, and policies of the 2030 Land Use Map.

2) *Compatibility.* The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and compatibility with the character of surrounding land uses.

3) *Zoning district supplemental standards.* The proposed Conditional Zoning (CZ) District use's compliance with Sec. 4.4 *Supplemental Standards,* if applicable.

4) *Design minimizes adverse impact.* The design of the proposed Conditional Zoning (CZ) District use's minimization of adverse effects, including visual impact of the proposed use on adjacent lands; and avoidance of significant adverse impacts on surrounding lands regarding trash, traffic, service delivery, parking and loading, odors, noise, glare, and vibration and not create a nuisance.

5) *Design minimizes environmental impact.* The proposed Conditional Zoning District use's minimization of environmental impacts and protection from significant deterioration of water and air resources, wildlife habitat, scenic resources, and other natural resources.

6) *Impact on public facilities.* The proposed Conditional Zoning (CZ) District use's avoidance of having adverse impacts on public facilities and services, including roads, potable water and wastewater facilities, parks, schools, police, fire and EMS facilities.

7) *Health, safety, and welfare.* The proposed Conditional Zoning (CZ) District use's effect on the health, safety, or welfare of the residents of the Town or its ETJ.

8) *Detrimental to adjacent properties.* Whether the proposed Conditional Zoning (CZ) District use is substantially detrimental to adjacent properties.

9) *Not constitute nuisance or hazard.* Whether the proposed Conditional Zoning (CZ) District use constitutes a nuisance or hazard due to traffic impact or noise, or because of the number of persons who will be using the Conditional Zoning (CZ) District use.

10) *Other relevant standards of this Ordinance.* Whether the proposed Conditional Zoning (CZ) District use complies with all standards imposed on it by all other applicable provisions of this Ordinance for use, layout, and general development characteristics.

January 25, 2021

Baohong Wan, Phd, P.E.
VHB Engineering NC
Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
919-829-0328

Subject: **Staff summary and comments for the Hackney Tract Subdivision TIA, 12/22/2020**

Dr. Wan:

Please review the following summary of my comments and recommendations. You may schedule a meeting with me and your client to discuss at your convenience.

Study Area

The TIA studied access to the proposed subdivision development at the following intersection:

- Access #1/Hasse Avenue Extension and Olive Chapel Road

The following four intersections were also studied in the TIA:

- Olive Chapel Road and Richardson Road
- Olive Chapel Road and Apex Barbecue Road
- Richardson Road and Hasse Avenue/Little Gem Lane
- US Highway 64 East at Richardson Road
- US Highway 64 West at U-turn east of Richardson Road

Trip Generation

The proposed development is expected to consist of up to 100 single-family homes and 133 multi-family homes. It's projected to generate approximately 33 new trips entering and 106 new trips exiting the site during the weekday A.M. peak hour and 112 new trips entering and 66 new trips exiting the site during the weekday P.M. peak hour. The development is projected to add an additional 2,005 daily trips onto the adjacent roadway network.

Background traffic

Background traffic consists of 3% annual background traffic growth compounded to build out year 2024, and the following approved developments:

- Saddlebrook - 25% traffic (75% build out)
- Buckhorn Preserve – 50% traffic (50% build out)
- Stillwater -15% traffic (85% build out)
- Westford – 20% traffic (80% build out)
- Smith Farm Residential– 25% traffic (75% build out)
- Linden – 85% traffic (15% build out)
- Sweetwater residential - 20% traffic (80% build out)
- Sweetwater commercial

Trip Distribution and Assignment

The trip distributions to and from the development site are as follows:

- 50% to/from the east via US Highway 64
- 10% to/from the west via US Highway 64
- 25% to/from the east via Olive Chapel Road
- 5% to/from the west via Olive Chapel Road
- 8% to/from the south via Richardson Road
- 2% to/from the south via Apex Barbecue Road

Traffic Capacity Analysis and Recommendations

Level of Service (LOS) is a grade of A through F assigned to an intersection, approach, or movement to describe how well or how poorly it operates. LOS A through D is considered acceptable for peak hour operation. LOS E or F describes potentially unacceptable operation and developers may be required to mitigate their anticipated traffic impact to improve LOS based on the Apex Unified Development Ordinance (UDO).

Tables 1 through 8 describe the levels of service (LOS) for the scenarios analyzed in the TIA. "*NA"* is shown when the scenario does not apply. The scenarios are as follows:

- **Existing 2020** - Existing year 2020 traffic.
- **No Build 2024** – Projected year (2024) with background growth, approved development traffic from others, and committed transportation improvements by others where applicable.
- **Build 2024 –** Projected year (2024) with background traffic, background improvements, and site build-out including recommended improvements where applicable.

Access #1/Hasse Avenue Extension and Olive Chapel Road (Unsignalized)

Table 1. A.M. / P.M. Unsignalized Peak Hour Levels of Service Access #1/Hasse Avenue Extension and Olive Chapel Road	
	Build 2024
Overall	NA
Eastbound (Olive Chapel Road)	*A / A*[2]
Westbound (Olive Chapel Road)	*NA*
Southbound (Access #1/Hasse Avenue Extension)	*C / D*[1]

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends construction of Future Access #1/Hasse Avenue to consist of one inbound lane and one outbound lane. The TIA also recommends construction of a dedicated left-turn lane on eastbound Olive Chapel Road with 100 feet of storage length and appropriate taper, and a dedicated right-turn lane on westbound Olive Chapel Road with 100 feet of storage length and appropriate taper.

Apex staff recommendations:

- Apex staff concur with the recommendations. The stop-controlled southbound approach is projected to operate at LOS D or better with delays of 16 and 25 seconds per vehicle in the AM and PM peak hours. The turn lanes proposed on Olive Chapel Road are projected to provide enough capacity to store queues into the development during both peak hours.

Olive Chapel Road and Richardson Road

Table 2. A.M. / P.M. Peak Hour Levels of Service Olive Chapel Road and Richardson Road			
	Unsignalized	**Signalized**	
	Existing 2020	**No Build 2024**	**Build 2024**
Overall	NA	A / A	A / A
Eastbound (Olive Chapel Road)	*B / B*[2]	*A / B*	*A / B*
Westbound (Olive Chapel Road)	*B / B*[2]	*B / B*	*B / B*
Northbound (Richardson Road)	*B / B*[1]	*B / B*	*B / B*
Southbound (Richardson Road)	*B / C*[1]	*A / B*	*A / B*

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends no improvements at this intersection.

Apex staff recommendations:

- Apex staff concur with the recommendations in the TIA. When signalized, this intersection is projected to operate at LOS A in both peak hours in the Build 2024 scenario. A traffic signal has been approved by NCDOT at this intersection, and is committed by adjacent development for installation prior to the build out of this development.

Olive Chapel Road and Apex Barbecue Road (Unsignalized)

Table 3. A.M. / P.M. Unsignalized Peak Hour Levels of Service Olive Chapel Road and Apex Barbecue Road			
	Existing 2020	**No Build 2024**	**Build 2024**
Overall	NA	NA	NA
Eastbound (Olive Chapel Road)	*NA*	*NA*	*NA*
Westbound (Olive Chapel Road)	*A / A*[2]	*A / B*[2]	*A / B*[2]
Northbound (Apex Barbecue Road)	*B / C*[1]	*C / F*[1]	*C / F*[1]

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends no improvements at this intersection.

Apex staff recommendations:

- Apex staff concur with the recommendations in the TIA. The stop-controlled northbound approach is projected to operate at LOS F in the PM peak hour with delays of 135 seconds per vehicle and 95th percentile queues of 250 feet. However the development is not anticipated to add more than 3% to the overall intersection traffic volume, therefore no improvements are recommended per the UDO. This intersection is identified for future realignment in the Town's Transportation Plan, but no funded project is identified at this time and both roadways are state-maintained.

Richardson Road and Hasse Avenue/Little Gem Lane (Unsignalized)

Table 4. A.M. / P.M. Unsignalized Peak Hour Levels of Service Richardson Road and Hasse Avenue/Little Gem Lane			
	Existing 2020	**No Build 2024**	**Build 2024**
Overall	NA	NA	NA
Eastbound (Little Gem Lane)	*A / B*[1]	*C / C*[1]	*C / D*[1]
Westbound (Hasse Avenue)	*A / A*[1]	*C / C*[1]	*C / C*[1]
Northbound (Richardson Road)	*A / A*[2]	*A / A*[2]	*A / A*[2]
Southbound (Richardson Road)	*A / A*[2]	*A / A*[2]	*A / B*[2]

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends no improvements at this intersection.

Apex staff recommendations:

- Apex staff concur with the recommendations in the TIA. The minor street approaches are projected to operate at LOS D or better during both peak hours of operation, with 95th percentile queues not exceeding 50 feet on any approach.

US Highway 64 East at Richardson Road

Table 5. A.M. / P.M. Peak Hour Levels of Service US Highway 64 East at Richardson Road			
	Unsignalized	**Signalized**	
	Existing 2020	**No Build 2024**	**Build 2024**
Overall	NA	C / D	C / D
Eastbound (US Hwy 64)	*NA*	*C / D*	*C / E*
Westbound Left (US Hwy 64)	*F / F*[2]	*B / B*	*A / B*
Northbound Right (Richardson Road)	*C / C*[1]	*C / D*	*C / D*

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends no improvements at this intersection.

Apex staff recommendations:

- Apex staff concur with the recommendations in the TIA. When signalized with dual westbound left and dual northbound right turn lanes, this intersection is projected to operate at LOS C and D in the AM and PM peak hours of operation with average intersection delays of 22 seconds and 44.5 seconds per vehicle. The eastbound approach is projected to operate at LOS E in the PM peak hour. However, the development is not anticipated to add more than 4% to the overall intersection traffic volume, therefore no improvements are recommended per the UDO. A traffic signal has been approved by NCDOT at this intersection, and is committed by adjacent development along with the additional turn lanes for installation prior to the build out of this development.

US Highway 64 West at U-turn east of Richardson Road

Table 6. A.M. / P.M. Peak Hour Levels of Service US Highway 64 West at U-turn east of Richardson Road			
	Unsignalized	**Signalized**	
	Existing 2020	**No Build 2024**	**Build 2024**
Overall	NA	B / C	B / C
Eastbound U-turn (US Hwy 64)	*B / C*[2]	*C / E*	*C / E*
Westbound (US Hwy 64)	*NA*	*A / C*	*B / C*

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn or U-turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends no improvements at this intersection.

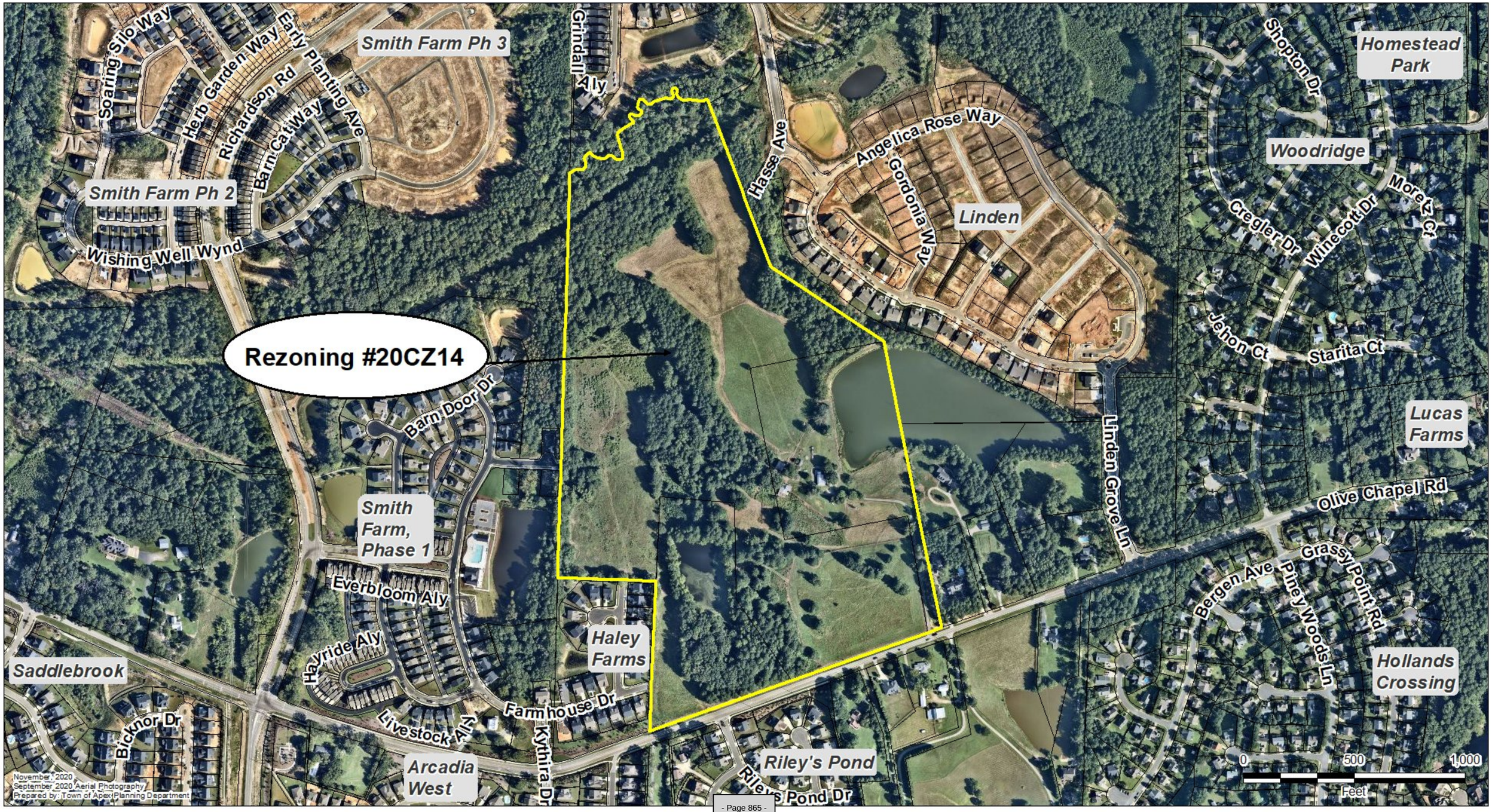
Apex staff recommendations:

- Apex staff concur with the recommendations in the TIA. When signalized with dual eastbound U-turn lanes, this intersection is projected to operate at overall LOS C or better in both peak hours in the Build 2024 scenario. A traffic signal has been approved by NCDOT at this intersection, and is committed by adjacent development along with the additional U-turn lane for installation prior to the build out of this development.

Please coordinate with the NCDOT District Engineer's Office concerning recommended improvements. Town staff will be available for meetings with NCDOT staff to discuss improvements on state maintained roadways as needed. All recommendations are subject to review by Town Council prior to approval.

Sincerely,

Serge Grebenschikov
Traffic Engineer
919-372-7448


Rezoning #20CZ14
Smith Farm Ph 3
Smith Farm Ph 2
Soaring Silo Way
Herb Garden Way
Early Planting Ave
Richardson Rd
Barn Cat Way
Wishing Well Wynd
Grindall Aly
Hasse Ave
Angelica Rose Way
Gordonia Way
Linden
Homestead Park
Shopton Dr
Woodridge
Cregler Dr
Winecott Dr
Moretz Ct
Jehon Ct
Starita Ct
Lucas Farms
Linden Grove Ln
Olive Chapel Rd
Grassy Point Rd
Piney Woods Ln
Bergen Ave
Hollands Crossing
Barn Door Dr
Smith Farm, Phase 1
Everbloom Aly
Hayride Aly
Haley Farms
Saddlebrook
Bicknor Dr
Livestock Aly
Farmhouse Dr
Kythira Dr
Arcadia West
Riley's Pond
Riley's Pond Dr
November, 2020
September, 2020 Aerial Photography
Prepared by: Town of Apex Planning Department
0
500
1,000
Feet

PLANNED UNIT DEVELOPMENT-CONDITIONAL ZONING DISTRICT PETITION
2045 LAND USE MAP AMENDMENT PROCESS INFORMATION

PD PLAN/PUD-CZ PETITION SUBMISSION: Applications are due by 12:00 pm on the first business day of each month. See the PUD Plan Schedule on the website for more details.

PD PLAN/PUD-CZ PETITION FEES:
PUD-CZ Request: $1,500.00 + $10 an acre
PD Plan Amendment not requiring full TRC Review: $500.00
2045 Land Use Map Amendment: $700.00

PRE-APPLICATION MEETING: A pre-application meeting with members of the Technical Review Committee is required to be scheduled prior to the submittal of a PD Plan for PUD-CZ. Pre-application meetings are typically scheduled on the 1st, 2nd and 5th Thursdays of the month.

To schedule a meeting, applicants must e-mail a pdf map, drawing, model, site or sketch plan to Planner Lauren Staudenmaier (lauren.staudenmaier@apexnc.org) no later than five (5) working days prior to the desired meeting day.

PURPOSE OF A PUD-CZ (UDO Section 3.3.3(C)): The purpose of the PUD-CZ is to permit variations in order to allow flexibility for landowners to creatively plan for a site specific, higher quality overall development of their land in a way that is not possible through the strict application of the minimum standards of this Ordinance. This is done through the application of performance standards that: integrate and mix uses where a mix of uses is proposed, possess interconnectivity, reflect the small-town character of Apex, expand opportunities for public transportation, preserve of natural features, integrate resource conservation area into plan for development, and that public facilities are available.

NEIGHBORHOOD MEETING: Neighborhood meetings are required per UDO Section 2.2.7 prior to application submission. The applicant is required to notify property owners and any neighborhood association that represents citizens within that area within 300 feet of the subject property via first class mail a minimum of 10 days in advance of the neighborhood meeting. The applicant shall use their own return address on the envelopes as the meeting is a private meeting between the developer and the neighbors. The applicant shall submit the "Certified List of Property Owners" and "Neighborhood Meeting Packet" forms included in this application packet with their initial submittal. The Neighborhood Meeting Packet is located at the very end of this document.

ANNEXATION REQUIREMENTS: If a property or portion thereof subject to the PUD is outside the corporate limits and ETJ, an annexation petition is **REQUIRED** to be submitted on the same day as this application.

Electronic Submittal Requirements (submit in IDT): Click here to access IDT Plans Website

- PUD-CZ Application
- PD Plan Text (pdf & Word versions)
- Colored Rendering of Building Elevations – 11"x17"
- Transportation Impact Analysis

Site Plan Set
- 24" x 36" size
- Scale not less than: 1" = 50' horizontal, 1" = 5' vertical
- Saved as pdf – no scanned plans

Hard Copy Submittal Requirements: Submit to Planning Department

- PUD-CZ Petition Application
- Petition Fee
- One (1) hardcopy PD Plan Text
- Three (3) bound Site Plan Sets – 24" x 36" size
- Colored Rendering of Building Elevations
- Legal Description (metes and bounds)
- Certified List of Property Owners within 300 feet of subject property
- Development Name Approval Application
- Town of Apex Utilities Offer & Agreement
- Agent Authorization Form
- WCPSS Residential Development Notice
- Neighborhood Meeting Packet
- If applicable: Annexation Petition, map, legal description and $200.00 fee
- Two (2) bound copies of the Transportation Impact Analysis and 1 copy of the TIA & traffic analysis files on disk or FTP site at first submittal (if applicable)
- One (1) set of envelopes addressed to Certified List of Property Owners within 300 feet of subject property and all the HOAs of those properties within 300' of the subject property. Planning staff may require an additional set of envelopes based on the timing of the Planning Board and Town Council meetings.
- Addresses must be from a current list obtained from the Wake County GIS Map Services. A buffer report service is offered for $1 per page. Please contact them at 919-856-6360 or http://www.wakegov.com/tax/Pages/default.aspx
- Affixed with first class stamps & the following return address:
  Town of Apex Planning Department
  P.O. Box 250
  Apex, NC 27502

PETITION PROCESS INFORMATION

NEIGHBORHOOD MEETING: Neighborhood meetings are required per UDO Section 2.2.7 prior to application submission. The applicant is required to notify property owners and any neighborhood association that represents citizens within that area within 300 feet of the subject property via first class mail a minimum of 10 days in advance of the neighborhood meeting. The applicant shall use their own return address on the envelopes as the meeting is a private meeting between the developer and the neighbors. The applicant shall submit the "Certified List of Property Owners" and "Neighborhood Meeting Packet" forms included in this application packet with their initial submittal. The Neighborhood Meeting Packet is located at the very end of this document.

REVIEW FOR SUFFICIENCY: Incomplete plans will be returned to the applicant and sufficiently complete applications are forwarded to the planning staff for review.

REVIEW BY STAFF: Planning staff reviews the application to determine compliance with the Unified Development Ordinance (UDO). If the application is determined not to be compliant with the UDO, comments will be sent to the applicant. The applicant must address all staff comments before any public hearings are scheduled.

PUBLIC HEARING NOTIFICATION: Notification of the public hearing will take place by three different methods. A written notice will be sent to nearby property owners not more than 25 days nor less than 14 days prior to the public hearings, as required by the UDO. The Planning Department will prepare these written notifications for all property owners of the land subject to the application and all property owners within 300 feet of the land subject to the application. A notice will be published on the Town of Apex website (www.apexnc.org) no less than 10 days, but not more than 25 days, prior to the public hearings, and a notice will be posted at the land subject to the application at least 14 days prior to the public hearings.

1ST PUBLIC HEARING/PLANNING BOARD MEETING: The Planning Board will consider the application, relevant support materials, the Staff Report and public testimony given at the public hearing. After the public hearing the Planning Board will make a recommendation to the Town Council. The Planning Board may recommend approval, approval with conditions or disapproval. The application is then forwarded to the Town Council. The Planning Board meets at 4:30 p.m. in the Town Hall Council Chambers on the date indicated on the Rezoning Schedule.

2ND PUBLIC HEARING/TOWN COUNCIL MEETING: The Town Council will consider the application, relevant support materials, the Staff Report, the Planning Board recommendation and public testimony given at the public hearing. After the public hearing the Town Council will vote to approve, approve with conditions or disapprove the rezoning. The Town Council meets at 6:00 p.m. in the Town Council Chambers on the date indicated on the Rezoning Schedule.

PLANNED UNIT DEVELOPMENT APPLICATION

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Application #:	#20CZ14	Submittal Date:	11-2-21
Fee Paid	$ 2,300	Check #	credit card

PETITION TO AMEND THE OFFICIAL ZONING DISTRICT MAP

Project Name: Hackney Tracts

Address(es): 2600 Olive Chapel Road, 2500 Olive Chapel Road, & 0 Olive Chapel Road

PIN(s) 0721492629, 0722406699, & 0722411102

Acreage: 73.64 ac.

Current Zoning: RR & R-80W Proposed Zoning: PUD-CZ

Current 2045 LUM Designation: Med. Density Residential

Requested 2045 LUM Designation: Med. Density Residential

See next page for LUM amendment

If any portion of the project is shown as mixed use (3 or more stripes on the 2045 Land Use Map) provide the following:

Area classified as mixed use:	Acreage:	0 ac.
Area proposed as non-residential development:	Acreage:	0 ac.
Percent of mixed use area proposed as non-residential:	Percent:	0%

Applicant Information

Name: WithersRavenel

Address: 137 S. Wilmington Street, Suite 200

City: Raleigh State: NC Zip: 27601

Phone: 919.469.3340 E-mail: bvega@withersravenel.com

Owner Information

PIN: 0721492629 Owner: GOODWIN, EDWIN A Address: Judy Hackney. 2505 Olive Chapel Rd., Apex, NC 27502	PIN: 0722406699 Owner: HACKNEY, CHARLES LEON HACKNEY, JUDY G Address: 2505 Olive Chapel Rd., Apex, NC 27502	PIN: 0722411102 Owner: HACKNEY, JUDY G Address: 2505 Olive Chapel Rd., Apex, NC 27502

Agent Information

Name: Brendie Vega, WithersRavenel

Address: 137 S. Wilmington Street, Suite 200

City: Raleigh State: NC Zip: 27601

Phone: 919.469.3340 E-mail: bvega@withersravenel.com

Other contacts: Glenda Toppe

PLANNED UNIT DEVELOPMENT APPLICATION

Application #: #20CZ14 Submittal Date: 11-2-21

2045 LAND USE MAP AMENDMENT (if applicable)

The applicant does hereby respectfully request the Town Council amend the 2045 Land Use Map. In support of this request, the following facts are shown:

The area sought to be amended on the 2045 Land Use Map is located at:

Not applicable. No proposed change in classification.

Current 2045 Land Use Classification: Med. Density Residential

Proposed 2045 Land Use Classification: Med. Density Residential

What conditions justify the passage of the amendment to the 2045 Land Use Map? Discuss the existing use classifications of the subject area in addition to the adjacent land use classifications.

Not applicable. No proposed change in classification.

Legal description for Tract 1 Hackney Property

Beginning at an Existing Iron Pipe located at the Southwest corner of Lot 1, “William E. Gerringer Subdivision”, Recorded at Map Book 1982, Page 24, Wake County Registry. Said Existing Iron Pipe having North Carolina Geodetic Coordinates (NAD 83, 2011) N: 719,823.90’, E: 2,025,316.49’ Said point is also located on the Northern Margin of Olive Chapel Road, Thence, following the Northern Margin of Olive Chapel Road; South 70°32'42" West, 65.39 feet to a point, said point being the **True Point of Beginning.** Thence, following the Northern Margin of Olive Chapel Road, South 70°31'17" West, 649.92 feet to a point, Thence, Leaving Said Road, North 34°12'20" West, 445.67 feet to a point; Thence, North 00°58'41" West, 436.43 feet to a point; Thence, North 85°35'51" West, 339.02 feet to an Existing Iron Pipe; Thence, South 02°31'45" West, 382.15 feet to an Existing Iron Pipe; Thence, North 87°46'36" West, 443.92 feet to an Existing Iron Pipe; Thence, North 01°42'56" East, 1,191.60 feet to an Existing Iron Pipe; Thence, North 01°42'19" East, 635.94 feet to a point located in the centerline of a creek, Said point being located South 01°42’19” West, 8.02 feet from an Existing Iron Pipe found on the North bank of the creek; Thence, along the centerline of the creek the following seventy-eight (78) calls:
North 62°12'20" East, 26.95 feet to a point; Thence, North 85°25'51" East, 12.16 feet to a point; Thence, South 89°25'18" East, 9.95 feet to a point; Thence, North 72°42'15" East, 16.28 feet to a point; Thence, North 35°12'38" East, 17.29 feet to a point; Thence, North 04°12'00" East, 12.96 feet to a point; Thence, North 21°34'14" West, 18.72 feet to a point; Thence, North 09°03'47" West, 8.16 feet to a point, Thence, North 41°28'27" East, 26.53 feet to a point, Thence, South 84°15'14" East, 11.15 feet to a point, Thence, South 44°43'11" East, 19.83 feet to a point, Thence, South 71°15'05" East, 13.95 feet to a point, Thence, South 74°11'34" East, 15.85 feet to a point, Thence, South 74°44'51" East, 12.72 feet to a point, Thence, South 83°49'13" East, 3.99 feet to a point, Thence, North 64°08'10" East, 16.34 feet to a point, Thence, North 47°07'30" East, 15.60 feet to a point, Thence, South 78°20'55" East, 15.26 feet to a point, Thence, South 56°02'16" East, 5.33 feet to a point, Thence, South 19°19'09" East, 6.90 feet to a point, Thence, South 56°44'29" East, 12.49 feet to a point, Thence, South 83°31'01" East, 16.05 feet to a point, Thence, North 59°49'27" East, 15.58 feet to a point, Thence, North 16°43'28" East, 6.92 feet to a point, Thence, North 01°57'42" West, 8.52 feet to a point, Thence, North 19°34'33" West, 8.53 feet to a point, Thence, North 22°27'53" West, 25.52 feet to a point, Thence, North 08°13'00" West, 17.60 feet to a point, Thence, North 13°08'01" West, 25.39 feet to a point, Thence, North 19°34'33" West, 12.83 feet to a point, Thence, North 00°51'00" East, 8.68 feet to a point, Thence, North 37°09'53" East, 11.70 feet to a point, Thence, North 49°22'35" East, 26.46 feet to a point, Thence, North 62°21'20" East, 30.37 feet to a point, Thence, North 67°46'29" East, 19.95 feet to a point, Thence, North 02°19'02" West, 8.02 feet to a point, Thence, North 48°37'20" West, 9.79 feet to a point, Thence, North 51°28'51" West, 14.82 feet to a point, Thence, North 10°18'42" West, 10.15 feet to a point, Thence, North 29°53'30" East, 7.06 feet to a point, Thence, North 67°41'49" East, 9.59 feet to a point, Thence, South 56°14'07" East, 5.77 feet to a point, Thence, South 63°24'14" East, 9.29 feet to a point, Thence, South 76°41'34" East, 9.25 feet to a point, Thence, North 77°10'45" East, 14.30 feet to a point, Thence, North 49°00'07" East, 13.34 feet to a point, Thence, North 10°50'19" West, 12.26 feet to a point, Thence, North 64°58'17" West, 15.90 feet to a point, Thence, North 31°59'29" West, 7.02 feet to a point, Thence, North 01°03'18" West, 7.87 feet to a point, Thence, North 17°34'16" East, 24.60 feet to a point, Thence, North 26°59'18" East, 8.17 feet to a point, Thence, South 81°51'44" East, 16.60 feet to a point, Thence, South 33°48'00" East, 15.96 feet to a point, Thence, South 49°25'00" East, 16.68 feet to a point, Thence, North 78°59'30" East, 12.42 feet to a point, Thence, North 50°28'53" East, 20.42 feet to a point, Thence, North 70°44'43" East, 46.11 feet to a point, Thence, South 89°01'57" East, 16.84 feet to a point, Thence, South 73°56'31" East, 11.76 feet to a point, Thence, North 66°33'30" East, 13.41 feet to a point, Thence, North 10°20'58" East, 8.36 feet to a point, Thence, North 17°44'49" West, 19.09 feet to a point, Thence, North 07°53'24" East, 12.39 feet to a point, Thence, North 59°58'19" East, 13.53 feet to a point, Thence, South 42°16'28" East, 13.69 feet to

a point, Thence, South 04°17'52" West, 12.70 feet to a point, Thence, South 10°35'03" West, 9.31 feet to a point, Thence, South 32°25'41" East, 5.70 feet to a point, Thence, South 46°46'35" East, 17.73 feet to a point, Thence, South 60°06'25" East, 16.74 feet to a point, Thence, North 86°29'56" East, 19.64 feet to a point, Thence, North 81°25'49" East, 16.54 feet to a point, Thence, South 80°06'27" East, 29.38 feet to a point, Thence, South 84°39'29" East, 22.26 feet to a point, Thence, North 58°33'23" East, 13.24 feet to a point, Thence, North 74°43'49" East, 8.91 feet to a point, Thence, leaving the centerline of said creek, South 20°58'05" East, 22.05 feet to a point, Thence, South 20°45'12" East, 790.03 feet to an Existing Iron Pipe, Thence, South 56°33'25" East, 611.03 feet to an Existing Iron Pipe, Thence, South 78°41'14" West, 615.50 feet to a point, Thence, South 11°18'46" East, 791.04 feet to a point, Thence, North 78°41'14" East, 566.96 feet to a point, Thence, South 09°38'52" East, 536.92 feet to a point, being the **True Point of Beginning**, and having an area of 51.280 Acres, more or less.

Together with the following area located within the public right of way of Olive Chapel Road

Beginning at an Existing Iron Pipe located at the Southwest corner of Lot 1, “William E. Gerringer Subdivision”, Recorded at Map Book 1982, Page 24, Wake County Registry. Said Existing Iron Pipe having North Carolina Geodetic Coordinates (NAD 83, 2011) N: 719,823.90’, E: 2,025,316.49’ Said point is also located on the Northern Margin of Olive Chapel Road, Thence, following the Northern Margin of Olive Chapel Road; South 70°32'42" West, 65.39 feet to a point, said point being the **True Point of Beginning.** Thence, South 70°29'55" West, 636.77 feet to a point; Thence, North 34°12'20" West, 31.27 feet to a point; Thence, North 70°31'17" East, 649.92 feet to a point; Thence, South 09°38'52" East, 30.43 feet to a point; being the **True Point of Beginning**, and having an area of 0.445 Acres (19,375 sf), more or less.

Legal description for Tract 2 Hackney Property

Beginning at an Existing Iron Pipe located at the Southwest corner of Lot 1, “William E. Gerringer Subdivision”, Recorded at Map Book 1982, Page 24, Wake County Registry. Said Existing Iron Pipe having North Carolina Geodetic Coordinates (NAD 83, 2011) N: 719,823.90’, E: 2,025,316.49’ Said point is also located on the Northern Margin of Olive Chapel Road, Thence, following the Northern Margin of Olive Chapel Road; South 70°32'42" West, 65.39 feet to a point; Thence, South 70°31’17” West, 649.92 feet to a point, said point being the **True Point of Beginning.**
Thence, following the Northern Margin of Olive Chapel Road, South 70°19'56" West, 682.58 feet to a New Iron Pipe, Thence, Leaving Said Right of Way, Thence, North 02°31'13" East, 5.41 feet to an Existing Iron Pipe; Thence, North 02°31'13" East, 674.17 feet to an Existing Iron Pipe; Thence, North 02°31'45" East, 382.15 feet to an Existing Iron Pipe; Thence, South 85°35'51" East, 339.02 feet to a point, Thence, South 00°58'41" East, 436.43 feet to a point; Thence, South 34°12'20" East, 445.67 feet to a point, being the **True Point of Beginning**, and having an area of 9.526 Acres, more or less.

Together with the following area located within the public right of way of Olive Chapel Road

Beginning at an Existing Iron Pipe located at the Southwest corner of Lot 1, “William E. Gerringer Subdivision”, Recorded at Map Book 1982, Page 24, Wake County Registry. Said Existing Iron Pipe having North Carolina Geodetic Coordinates (NAD 83, 2011) N: 719,823.90’, E: 2,025,316.49’ Said point is also located on the Northern Margin of Olive Chapel Road, Thence, following the Northern Margin of Olive Chapel Road; South 70°32'42" West, 65.39 feet to a point; Thence, South 70°31’17” West, 649.92 feet to a point, said point being the **True Point of Beginning.**
Thence, South 34°12'20" East, 31.27 feet to a point; Thence, South 70°19'56" West, 702.77 feet to a point; Thence, North 02°31'13" East, 32.69 feet to a New Iron Pipe; Thence, North 70°19'56" East, 682.58 feet to a point; being the **True Point of Beginning**, and having an area of 0.481 Acres (20,967 sf), more or less.

Legal description for Tract 3 Hackney Property

Beginning at an Existing Iron Pipe located at the Southwest corner of Lot 1, “William E. Gerringer Subdivision”, Recorded at Map Book 1982, Page 24, Wake County Registry. Said Existing Iron Pipe having North Carolina Geodetic Coordinates (NAD 83, 2011) N: 719,823.90’, E: 2,025,316.49’ Said point is also located on the Northern Margin of Olive Chapel Road, Thence, following the Northern Margin of Olive Chapel Road; South 70°32'42" West, 65.39 feet to a point; Thence, Leaving said Right of Way, North 09°38'52" West, 536.92 feet to a point; Thence, South 78°41'14" West, 566.96 feet to a point; Thence, North 11°18'46" West, 791.04 feet to a point; Thence, North 78°41'14" East, 615.50 feet to an Existing Iron Pipe; Thence, South 11°18'46" East, 500.58 feet to an Existing Iron Pipe; Thence, South 11°21'53" East, 392.29 feet to an Existing Iron Pipe; Thence, South 11°20'41" East, 425.59 feet to an Existing Iron Pipe, being the Point of **Beginning**, and having an area of 11.871 Acres, more or less.

Together with the following area located within the public right of way of Olive Chapel Road

Beginning at an Existing Iron Pipe located at the Southwest corner of Lot 1, “William E. Gerringer Subdivision”, Recorded at Map Book 1982, Page 24, Wake County Registry. Said Existing Iron Pipe having North Carolina Geodetic Coordinates (NAD 83, 2011) N: 719,823.90’, E: 2,025,316.49’ Said point is also located on the Northern Margin of Olive Chapel Road; Thence, South 11°20'41" East, 30.29 feet to a point; Thence, South 70°32'42" West, 66.30 feet to a point; Thence, North 09°38'52" West, 30.43 feet to a point; Thence, North 70°32'42" East, 65.39 feet to an Existing Iron Pipe, being the Point of Beginning, and having an area of 0.045 acres (1,975 sf), more or less.

AGENT AUTHORIZATION FORM

Application #: 20CZ14 Submittal Date: 11-2-20

Hackney, Judy G is the owner* of the property for which the attached application is being submitted:

- ☐ Land Use Amendment
- ☑ Rezoning: For Conditional Zoning and Planned Development rezoning applications, this authorization includes express consent to zoning conditions that are agreed to by the Agent which will apply if the application is approved.
- ☐ Site Plan
- ☑ Subdivision
- ☐ Variance
- ☐ Other:

The property address is: 0 Olive Chapel Road (PIN 0722411102)

The agent for this project is: WithersRavenel

☐ I am the owner of the property and will be acting as my own agent

Agent Name: Brendie Vega

Address: 137 S. Wilmington Street, Suite 200

Telephone Number: 919.535.5212

E-Mail Address: bvega@withersravenel.com

Signature(s) of Owner(s)*

Judy G. Hackney

Judy G. Hackney — Type or print name

Oct 27, 2020 — Date

Type or print name

Date

Attach additional sheets if there are additional owners.

*Owner of record as shown on the latest equalized assessment rolls of Wake County. An option to purchase does not constitute ownership. If ownership has been recently transferred, a copy of the deed must accompany this authorization.

Pursuant to Article 40 of Chapter 66 of the North Carolina General Statutes (the Uniform Electronic Transactions Act) this application and all documents related hereto containing an electronic or digitized signature are legally binding in the same manner as are hard copy documents executed by hand signature. The parties hereby consent to use electronic or digitized signatures in accordance with the Town's Electronic Signature Policy and intend to be bound by the application and any related documents. If electronic signatures are used the application shall be delivered in an electronic record capable of retention by the recipient at the time of receipt.

AGENT AUTHORIZATION FORM

Application #: 20CZ14 Submittal Date: 11-2-20

Hackney, Charles Leon Hackney, Judy G is the owner* of the property for which the attached application is being submitted:

- ☐ Land Use Amendment
- ☑ Rezoning: For Conditional Zoning and Planned Development rezoning applications, this authorization includes express consent to zoning conditions that are agreed to by the Agent which will apply if the application is approved.
- ☐ Site Plan
- ☑ Subdivision
- ☐ Variance
- ☐ Other:

The property address is: 2500 Olive Chapel Road (PIN 0722406699)

The agent for this project is: WithersRavenel

☐ I am the owner of the property and will be acting as my own agent

Agent Name: Brendie Vega

Address: 137 S. Wilmington Street, Suite 200

Telephone Number: 919.535.5212

E-Mail Address: bvega@withersravenel.com

Signature(s) of Owner(s)*

v Charles Leon Hackney, Sr

Charles Leon Hackney — Type or print name — Oct 27, 2020 — Date

v Judy G. Hackney

Judy G. Hackney — Type or print name — Oct 27, 2020 — Date

Attach additional sheets if there are additional owners.

*Owner of record as shown on the latest equalized assessment rolls of Wake County. An option to purchase does not constitute ownership. If ownership has been recently transferred, a copy of the deed must accompany this authorization.

Pursuant to Article 40 of Chapter 66 of the North Carolina General Statutes (the Uniform Electronic Transactions Act) this application and all documents related hereto containing an electronic or digitized signature are legally binding in the same manner as are hard copy documents executed by hand signature. The parties hereby consent to use electronic or digitized signatures in accordance with the Town's Electronic Signature Policy and intend to be bound by the application and any related documents. If electronic signatures are used the application shall be delivered in an electronic record capable of retention by the recipient at the time of receipt.

AGENT AUTHORIZATION FORM

Application #: 20CZ14 Submittal Date: 11-2-20

Goodwin, Edwin A is the owner* of the property for which the attached application is being submitted:

- ☐ Land Use Amendment
- ☑ Rezoning: For Conditional Zoning and Planned Development rezoning applications, this authorization includes express consent to zoning conditions that are agreed to by the Agent which will apply if the application is approved.
- ☐ Site Plan
- ☑ Subdivision
- ☐ Variance
- ☐ Other:

The property address is: 2600 Olive Chapel Road (PIN 0721492629)

The agent for this project is: WithersRavenel

☐ I am the owner of the property and will be acting as my own agent

Agent Name: Brendie Vega

Address: 137 S. Wilmington Street, Suite 200

Telephone Number: 919.535.5212

E-Mail Address: bvega@withersravenel.com

Signature(s) of Owner(s)*

✓ Judy G. Hackney, Trustee

Judy G. Hackney, Trustee of the Edwin A. Goodwin Testamentary Trust — Type or print name — Date

Charles Leon Hackney, Sr.

✓ Charles Leon Hackney, Sr. — Type or print name — Oct 27, 2020 — Date

Attach additional sheets if there are additional owners.

*Owner of record as shown on the latest equalized assessment rolls of Wake County. An option to purchase does not constitute ownership. If ownership has been recently transferred, a copy of the deed must accompany this authorization.

Pursuant to Article 40 of Chapter 66 of the North Carolina General Statutes (the Uniform Electronic Transactions Act) this application and all documents related hereto containing an electronic or digitized signature are legally binding in the same manner as are hard copy documents executed by hand signature. The parties hereby consent to use electronic or digitized signatures in accordance with the Town's Electronic Signature Policy and intend to be bound by the application and any related documents. If electronic signatures are used the application shall be delivered in an electronic record capable of retention by the recipient at the time of receipt.

AFFIDAVIT OF OWNERSHIP

Application #: 20CZ14 Submittal Date: 11-2-20

The undersigned, Judy G. Hackney (the "Affiant") first being duly sworn, hereby swears or affirms as follows:

1. Affiant is over eighteen (18) years of age and authorized to make this Affidavit. The Affiant is the sole owner, or is the authorized agent of all owners, of the property located at _____ and legally described in **Exhibit "A"** attached hereto and incorporated herein (the "Property").

2. This Affidavit of Ownership is made for the purpose of filing an application for development approval with the Town of Apex.

3. If Affiant is the owner of the Property, Affiant acquired ownership by deed, dated _____, and recorded in the Wake County Register of Deeds Office on _____, in Book _____ Page _____.

4. If Affiant is the authorized agent of the owner(s) of the Property, Affiant possesses documentation indicating the agency relationship granting the Affiant the authority to apply for development approval on behalf of the owner(s).

5. If Affiant is the owner of the Property, from the time Affiant was deeded the Property on _____, Affiant has claimed sole ownership of the Property. Affiant or Affiant's predecessors in interest have been in sole and undisturbed possession and use of the property during the period of ownership. Since taking possession of the Property on _____, no one has questioned Affiant's ownership or right to possession nor demanded any rents or profits. To Affiant's knowledge, no claim or action has been brought against Affiant (if Affiant is the owner), or against owner(s) (if Affiant is acting as an authorized agent for owner(s)), which questions title or right to possession of the property, nor is any claim or action pending against Affiant or owner(s) in court regarding possession of the Property.

This the 27 day of October, 2020.

Judy G. Hackney (seal)

Judy G. Hackney individually and as Trustee

Type or print name

Charles Leon Hackney, Sr.

STATE OF NORTH CAROLINA
COUNTY OF Wake

I, the undersigned, a Notary Public in and for the County of Wake, hereby certify that Judy G. Hackney and Charles Leon Hackney Sr. Affiant, personally known to me or known to me by said Affiant's presentation of said Affiant's N/A personally appeared before me this day and acknowledged the due and voluntary execution of the foregoing Affidavit.

PAUL STANLEY NOTARY PUBLIC WAKE COUNTY, NC My Commission Expires 05-08-2024

[NOTARY SEAL]

Notary Public
State of North Carolina
My Commission Expires: May 8, 2024

TOWN OF APEX UTILITIES OFFER AND AGREEMENT

Application #: 20CZ14 Submittal Date: 11-2-20

Town of Apex
73 Hunter Street
P.O. Box 250 Apex, NC 27502
919-249-3400

WAKE COUNTY, NORTH CAROLINA CUSTOMER SELECTION AGREEMENT

Wake County PINs: 0721492629, 0722411102, 0722406699

0, 2500, 2600 Olive Chapel Road

(the "Premises")

The Town of Apex offers to provide you with electric utilities on the terms described in this Offer & Agreement. If you accept the Town's offer, please fill in the blanks on this form and sign and we will have an Agreement once signed by the Town.

Hackney, Judy et al, the undersigned customer ("Customer") hereby irrevocably chooses and selects the Town of Apex (the "Town") as the permanent electric supplier for the Premises. Permanent service to the Premises will be preceded by temporary service if needed.

The sale, delivery, and use of electric power by Customer at the Premises shall be subject to, and in accordance with, all the terms and conditions of the Town's service regulations, policies, procedures and the Code of Ordinances of the Town.

Customer understands that the Town, based upon this Agreement, will take action and expend funds to provide the requested service. By signing this Agreement the undersigned signifies that he or she has the authority to select the electric service provider, for both permanent and temporary power, for the Premises identified above.

Any additional terms and conditions to this Agreement are attached as Appendix 1. If no appendix is attached this Agreement constitutes the entire agreement of the parties.

Acceptance of this Agreement by the Town constitutes a binding contract to purchase and sell electric power.

Please note that under North Carolina General Statute §160A-332, you may be entitled to choose another electric supplier for the Premises.

Upon acceptance of this Agreement, the Town of Apex Electric Utilities Division will be pleased to provide electric service to the Premises and looks forward to working with you and the owner(s).

ACCEPTED:

CUSTOMER: Hackney, Judy, et. al	TOWN OF APEX
BY: Brendie Vega (Brendie Vega)	BY:
Authorized Agent	Authorized Agent
DATE: 11/2/2020	DATE:

DEVELOPMENT NAME APPROVAL APPLICATION

Application #: 20CZ14 Submittal Date: 11-2-20

Fee for Initial Submittal: No Charge Fee for Name Change after Approval: $500*

Purpose

To provide a consistent and clearly stated procedure for the naming of subdivisions and/or developments and entrance roadways (in conjunction with *Town of Apex Address Policy*) so as to allow developers to define and associate the theme or aesthetics of their project(s) while maintaining the Town's commitment to preserving the quality of life and safety for all residents of Apex proper and extraterritorial jurisdiction.

Guidelines

- ✓ The subdivision/development name shall not duplicate, resemble, or present confusion with an existing subdivision/development within Apex corporate limits or extraterritorial jurisdiction except for the extension of an existing subdivision/development of similar or same name that shares a continuous roadway.
- ✓ The subdivision/development name shall not resemble an existing street name within Apex corporate limits or extraterritorial jurisdiction unless the roadway is a part of the subdivision/development or provides access to the main entrance.
- ✓ The entrance roadway of a proposed subdivision/development shall contain the name of the subdivision/development where this name does not conflict with the Town of Apex *Road Name Approval Application* and *Town of Apex Address Policy* guidelines.
- ✓ The name "Apex" shall be excluded from any new subdivision/development name.
- ✓ Descriptive words that are commonly used by existing developments will be scrutinized more seriously in order to limit confusion and encourage distinctiveness. A list of commonly used descriptive words in Apex's jurisdiction is found below.
- ✓ The proposed subdivision/development name must be requested, reviewed and approved during preliminary review by the Town.
- ✓ A $500.00 fee will be assessed to the developer if a subdivision/development name change is requested after official submittal of the project to the Town.*

*The imposed fee offsets the cost of administrative changes required to alleviate any confusion for the applicant, Planning staff, other Town departments, decision-making bodies, concerned utility companies and other interested parties. There is no charge for the initial name submittal.

Existing Development Titles, Recurring

	Residential	Non-Residential
10 or more	Creek, Farm(s), Village(s),	Center/Centre
6 to 9	Crossing(s), Park, Ridge, Wood(s)	Commons, Park
3 to 5	Acres, Estates, Glen(s), Green•, Hills	Crossing(s), Plaza, Station, Village(s)

•excludes names with Green Level

CERTIFIED LIST OF NEIGHBORING PROPERTY OWNERS

Application #: _____ Submittal Date: 11-2-20

Provide a certified list of property owners subject to this application and all property owners within 300' of the subject property and HOA Contacts.

	Owner's Name	PIN
1.	See Attachment.	
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		

I, Brendie Vega, certify that this is an accurate listing of all property owners and property owners within 300' of the subject property.

Date: 11/2/2020 By: Brendie Vega

COUNTY OF WAKE STATE OF NORTH CAROLINA

Sworn and subscribed before me, Jeri Chastain Pederson, a Notary Public for the above State and County, on this the 2 day of November, 2020.

Jeri Chastain Pederson
Notary Public

Jeri Chastain Pederson
Print Name

SEAL

JERI CHASTAIN PEDERSON
Notary Public
Wake County, North Carolina
My Commission Expires
March 10, 2024

My Commission Expires: 03/10/2024

Certified List of Neighboring Property Owners		
#	OWNER	PIN
1	GARWOOD, MARGARET GARWOOD, JOHN J	721396377
2	CENIS, NATHAN T CENIS, EMILY ANNE	721396585
3	HURLEY, SONIA R HURLEY, ROBERT	721397152
4	HORNEY, DIANNA HORNEY, JOEY MICHAEL	721397339
5	SMITH FARM OF APEX HOMEOWNERS ASSOCIATION, INC.	721397362
6	RILEY, JAMES EDWARD JR DODSON, JILLIAN SMITH	721397491
7	KOSHY, SIBY VARKEY KOSHY, THARU SARA	721397536
8	ZHOU, QUAN LIU, SHUZHANG	721397599
9	LABRU, VINEET UCHIL, SHRUTI KARUNAKAR	721398442
10	KONAKATI, VIKRAM BHIMAVARAPU, PRATHYUSHA	721399015
11	SAMPATH, PRABHU PRABHU, DEEPA	721399121
12	MATTHEWS, JOHN HENRY III	721399127
13	ARCADIA RIDGE HOMEOWNERS ASSOCIATION, INC.	721399233
14	LACOSTE, FABRICE SANROMAN, STEPHANIE	721399404
15	DE SOUSA, ALDO SILVIO CARNEIRO	721399466
16	LEDESMA, FELIPE ATENCIO, IBELISE MARIA	721399630
17	MARKS, REBECCA R MARKS, JONATHAN A	721399646
18	RUBIN, BEVERLY L	721482119
19	AUSTVOLD, SHAWN AUSTVOLD, JENNIFER	721491084
20	RILEY'S POND HOMEOWNERS ASSOCIATION INC	721491103
21	CAVERO, CLAUDIA MARIANA BENAVIDES	721491270
22	RILEY'S POND HOMEOWNERS ASSOCIATION INC	721491342
23	LEWIS, ANGEL SPENCE LEWIS, COURTNEY DEVON	721492100
24	RILEY'S POND HOMEOWNERS ASSOCIATION INC	721492366
25	WEBB, XAVIER JOHAN	721492372
26	JOYCE, JOHN D JOYCE, ROSEMARY	721493109
27	ALJADER, MAYSAM ALJADER, LORI	721493206
28	LEARY, BRAD LEARY, BRENDA	721494283
29	BAKER, SCOTT J BAKER, MARLO L H	721495137
30	SMITH FARM OF APEX HOMEOWNERS ASSOCIATION, INC.	721396648
31	RAJAN, SUNIL KUMAR OLIPARAMBIL PREMRAJ, RITHU	721396847
32	GANJI, BHAGYA LATHA RAMPA, IMMANUEL	721396870
33	GARABEDIAN, MATTHEW KANG, EY JUNG	721396975
34	BALAPURE, LAXMIKANT MALVI, VISHAKHA	721397746
35	ESBJORN, ROBERT ESBJORN, AUDREY	721397948
36	CHEN, DANDAN WANG, YANG	721398717
37	MCCALL, NATHAN RF GIULIANI, TRACY J	721398917
38	SIDDIQUI, ALI SIDDIQUI, TARANNUM	721399742
39	PANDEY, ROSHAN RAJ	721399757
40	WILSON, BENJAMIN THOMAS THOMAS, JULIE ELIZABETH	721399853
41	PANDEY, NAMIT JOSHI, TARA	721399859
42	BRUMFIELD, RYAN MATTHEW BRUMFIELD, AMANDA PLOCH	721399954
43	MOCK, CHRISTOPHER RICHARD MOCK, ELENA BARRIO	721399969
44	BOLJESIC, JONATHON ELLIS BOLJESIC, VINCA PURI	721494337
45	MARTIN, JOANNE H	721494350

Certified List of Neighboring Property Owners		
#	OWNER	PIN
46	RILEY'S POND HOMEOWNERS ASSOCIATION INC	721494411
47	DONALDSON, MARK R DONALDSON, HEATHER M	721495361
48	GOTUR, RAGHAVENDER THAMMISETTY, RADHIKA	721495379
49	KENT, THOMAS L. KENT, LEIGH R.	721496224
50	CHOI, KENNY JUNG, JIN	721496464
51	SINGH, SUNIL SINGH, PANCHALI	721497298
52	LEDESMA, ROBERTO LEDESMA, CARMEN	721497385
53	RILEY'S POND HOMEOWNERS ASSOCIATION INC	721497414
54	KUMAR VARMA, CHITRA DILEEP ADUKKATH, BISHAK	721497452
55	KNAPP, GEARY W KNAPP, SUSAN	721499346
56	LENNAR CAROLINAS, LLC	722219077
57	LENNAR CAROLINAS, LLC	722229350
58	LENNAR CAROLINAS, LLC	722303175
59	SMITH FARM OF APEX HOMEOWNERS ASSC INC	722303478
60	BAITER, STEVE MICHAEL BAITER, REAGAN	722303663
61	JOSEPH, BIKKU B VALIYAVEETIL, SAJIN J	722303770
62	BROCK, SIMON PAUL BROCK, ELISA SAYURI JISAK	722303779
63	NICOLAU, DANIEL NICOLAU, MARIA SIMONA	722303837
64	SANDBERG, GEOFFREY ERIK SANDBERG, RACHEL ANN	722304905
65	PITMAN, WESLEY SZYDLOWSKI, JESSICA	722305447
66	DYK, SHAUN M BIGELOW DYK, MELINDA M	722305656
67	SMITH FARM OF APEX HOMEOWNERS ASSOCIATION, INC.	722309093
68	PIKULIK, KENNETH CHARLES GUARD-PIKULIK, MEGAN THAYER	722313076
69	KLEIN, CAROLINE KLEIN, STEVEN	722327144
70	FEDERICO, MICHELLE EDERY, ARIEL	722327201
71	SWEETWATER PROPERTY OWNERS ASSOCIATION, INC	722327341
72	RUTIGLIANO, JOHN P RUTIGLIANO, KAREN E	722327354
73	PAYNE, DEAN ALAN PAYNE, LISA O'HARA	722327358
74	CLEARY, MICHAEL CLEARY, MAUREEN	722327452
75	FERGUSON, MICHAEL R FERGUSON, JESSICA J	722327455
76	FAIRHURST, JOSHUA FAIRHURST, AMANDA L	722327459
77	DUFFMAN, MARY WEBB	722329579
78	BENNETT, JESSICA SOPHIA BENNETT, RYAN CLARK	722416567
79	SMITH, SCOTT ROBERT SMITH, KIMBERLY DAWN	722416644
80	CRESCENT APEX LLC	722416751
81	CRESCENT APEX LLC	722416778
82	CRESCENT APEX LLC	722416847
83	VLADIMIROVA, ANNA V HOBBS, MERLIN E	722417467
84	DUDDUKURI, VENKATA SANDEEP KUMAR ALLU, SOWMYA	722417511
85	CRESCENT APEX LLC	722418579
86	CRESCENT APEX LLC	722418624
87	CRESCENT APEX LLC	722419526
88	CRESCENT APEX LLC	722419572
89	CRESCENT APEX LLC	722419696

Certified List of Neighboring Property Owners		
#	OWNER	PIN
90	LAHRMAN, GREGORY E TRUSTEE GREGORY E. LAHRMAN REVOCABLE LIVING TRUST	722420650
91	SWEETWATER PROPERTY OWNERS ASSOCIATION, INC	722421400
92	FUNNA, KUCHI FUNNA, KUCHI M	722421612
93	CRESCENT APEX LLC	722424038
94	CRESCENT APEX LLC	722429361
95	PILLA, ANTHONY MICHAEL PILLA, ANGELA	722510428
96	ASPNES, DAVID E BALL, CYNTHIA J	721487120
97	GOODWIN, EDWIN A	721492629
98	FOSTER FARM LLC	721585231
99	MICHALSKI, TIMOTHY MICHALSKI, RHIANNON	721590573
100	FOSTER FARM LLC	721592562
101	FOSTER, FRANK A COPELAND, REBECCA	721595134
102	HACKNEY, CHARLES LEON HACKNEY, JUDY G	722406699
103	HACKNEY, JUDY G	722411102
104	CRESCENT APEX LLC	722418369
105	PALANIAPPAN, RAMANATHAN VIJAYAKUMAR, HARIPRABHA	722418413
106	CRESCENT APEX LLC	722419315
107	MULLEN, RICHARD ANDREW MULLEN, ELIZABETH CATHERINE	722419361
108	PERKINS, ELIZABETH E	722503152
109	BASS, MICHAEL E BASS, SHERRIE L	722503445
110	BASS, MICHAEL E	722505167
111	DUGGAN, KIM-MARIE DUGGAN, DOMINICK	722510237
112	CRESCENT APEX LLC	722510474
113	MONGONE, MERRIDITH MONGONE, FRANK	722511203
114	CRESCENT APEX LLC	722511431
115	CRESCENT APEX LLC	722512006
116	TRUSTEES OF THE PINOT PARTNERS REVOCABLE LIVING TR	722512179
117	OGNIBENE, DOMINICK OGNIBENE, MARIE ELENA	722512201
118	CRESCENT APEX LLC	722513145
119	CRESCENT APEX LLC	722513341
120	CRESCENT APEX LLC	722514101
121	CRESCENT APEX LLC	722528250

DEVELOPMENT NAME APPROVAL APPLICATION

Application #: 20CZ14 Submittal Date: 11-2-20

Proposed Subdivision/Development Information

Description of location: 2600, 2500, & 0 Olive Chapel Road

Nearest intersecting roads: Olive Chapel Road / Kythira Drive

Wake County PIN(s): 0721492629, 0722406699, & 0722411102

Township: Apex

Contact Information (as appropriate)

Contact person: Brendie Vega

Phone number: 919.535.5212 Fax number:

Address: 137 S. Wilmington Street, Suite 200

E-mail address: bvega@withersravenel.com

Owner:

Phone number: Fax number:

Address:

E-mail address:

Proposed Subdivision/Development Name

1st Choice: TBD at time of Subdivision

2nd Choice *(Optional)*:

Town of Apex Staff Approval:

Town of Apex Planning Department Staff Date

NOTICE OF ELECTRONIC NEIGHBORHOOD MEETING

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

10/16/2020
Date

Dear Neighbor:
You are invited to an electronic neighborhood meeting to review and discuss the development proposal at

2600, 2500, and 0 Olive Chapel Road — Address(es)

0721492629, 0722406699, & 0722411102 — PIN(s)

in accordance with the Town of Apex Electronic Neighborhood Meeting procedures. This meeting is intended to be a way for the applicant to discuss the project and review the proposed plans with adjacent neighbors and neighborhood organizations before the submittal of an application to the Town. This provides neighbors an opportunity to raise questions and discuss any concerns about the impacts of the project before it is officially submitted. If you are unable to attend, you may contact the applicant before or after the meeting is held. Once an application has been submitted to the Town, it may be tracked using the Interactive Development Map or the Apex Development Report located on the Town of Apex website at www.apexnc.org. If at all feasible given emergency declarations, limits on in-person gatherings, and social distancing, an additional in-person Neighborhood Meeting may be scheduled and held prior to a public hearing or staff decision on the application.

An Electronic Neighborhood Meeting is required because this project includes (check all that apply):

	Application Type	Approving Authority
☒	Rezoning (including Planned Unit Development)	Town Council
☐	Major Site Plan	Town Council (QJPH*)
☐	Special Use Permit	Town Council (QJPH*)
☐	Residential Master Subdivision Plan (excludes exempt subdivisions)	Technical Review Committee (staff)

*Quasi-Judicial Public Hearing: The Town Council cannot discuss the project prior to the public hearing.

The following is a description of the proposal (also see attached map(s) and/or plan sheet(s)):

This project involves the proposed rezoning of parcels zoned RR and R-80W to be zoned to PUD-CZ.

The proposed development is intended to be a residential development with a mix of housing products.

(A concept plan will be posted on the project website the day of the meeting.)

Estimated submittal date: 11.02.2020

MEETING INFORMATION:

Property Owner(s) name(s):	Goodwin, Edwin A; Hackney, Charles Leon Hackney, Judy G; & Hackney, Judy G
Applicant(s):	WithersRavenel
Contact information (email/phone):	bvega@withersravenel.com / 919.535.5212
Electronic Meeting invitation/call in info:	Meeting Website: https://withersravenel.com/meeting/hackney-tracts-rezoning-neighborhood-meeting/ Call-In Option: 1-415-655-0001 Event number: 171 659 8744
Date of meeting**:	10.29.2020
Time of meeting**:	5:00pm - 7:00pm

MEETING AGENDA TIMES:

Welcome: 5:00pm Project Presentation: 5:10pm Question & Answer: 6:30pm

**Meetings shall occur between 5:00 p.m.-9:00 p.m. on a Monday through Thursday (excluding Town recognized holidays). If you have questions about the general process for this application, please contact the Planning Department at 919-249-3426. You may also find information about the Apex Planning Department and on-going planning efforts at http://www.apexnc.org/180/Planning.

PROJECT CONTACT INFORMATION

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Development Contacts:

Project Name: Hackney Tracts Zoning: RR & R-80W (Prop. PUD-CZ)

Location: 2600, 2500, & 0 Olive Chapel Road

Property PIN(s): 0721492629, 0722406699, & 0722411102 Acreage/Square Feet: 79.79 ac. / 3,475,652 sq. ft.

Property Owner: Goodwin, Edwin A; Hackney, Charles Leon Hackney, Judy G; & Hackney, Judy G

Address: 2505 Olive Chapel Road

City: Apex State: NC Zip: 27502

Phone: Email:

Developer: Glenda S. Toppe and Associates

Address: 4139 Gardenlake Drive

City: Raleigh State: NC Zip: 27612

Phone: Fax: Email:

Engineer: WithersRavenel

Address: 137 S. Wilmington Street, Suite 200

City: Raleigh State: NC Zip: 27601

Phone: 919.535.5212 Fax: Email: bvega@withersravenel.com

Builder (if known):

Address:

City: State: Zip:

Phone: Fax: Email:

Please note that Town staff will not have complete information about a proposed development until the application is submitted for review. If you have a question about Town development standards and how they relate to the proposed development, please contact the appropriate staff person listed below.

Town of Apex Department Contacts

Planning Department Main Number (Provide development name or location to be routed to correct planner)	(919) 249-3426
Parks, Recreation & Cultural Resources Department Angela Reincke, Parks Planner	(919) 249-7468
Public Works - Transportation Russell Dalton, Senior Transportation Engineer	(919) 249-3358
Water Resources Department Jessica Bolin, Senior Engineer (Stormwater, Sedimentation & Erosion Control) Stan Fortier, Senior Engineer (Stormwater, Sedimentation & Erosion Control) James Gregg, Utility Engineer (Water & Sewer)	 (919) 249-3537 (919) 249-1166 (919) 249-3324
Electric Utilities Division Rodney Smith, Electric Technical Services Manager	(919) 249-3342

Providing Input to Town Council:

Each Town Council meeting agenda includes a Public Forum time when anyone is permitted to speak for three (3) minutes on any topic with the exception of items listed as Public Hearings for that meeting. The Town Council meets on the 1st and 3rd Tuesdays of each month at 6:00 p.m. (except for holidays, see schedule of meetings at http://www.apexnc.org/838/Agendas-Minutes). You may also contact Town Council by e-mail at AllCouncil@apexnc.org.

Private Agreements and Easement Negotiation:

The Town of Apex cannot enforce private agreements between developers and neighbors and is not a party to the easement and right-of-way negotiation that occurs between developers and neighboring property owners for easements or rights-of-way that are necessary to build the project.

It is recommended that all private agreements be made in writing and that if a property owner feels it necessary, they should obtain private legal counsel in order to protect their interests in both private agreements and during easement negotiations. The only conditions that the Town of Apex can enforce are those conditions that are made a part of the conditional zoning of the property by agreement of the developer and the Town.

As an example, if a developer offers to build a fence for a neighbor to mitigate some impact, the Town can only enforce the construction of the fence if the fence becomes a condition of the rezoning. This would occur by the developer offering the condition as part of their conditional zoning application package or at the Town Council public hearing on the conditional zoning and the Town accepting it as a condition. Private agreements regarding a fence being constructed will not be enforced by the Town.

To request that any agreement with a developer is made a part of the conditional zoning at the time of approval, you may ask at the Town Council public hearing if the agreement is included in the conditions. If it is not, you may request that the Town Council not approve the rezoning without the agreement being included in the conditions (note that it is up to Town Council whether to approve or deny the rezoning but they cannot impose conditions that the applicant does not agree to add). The developer's proposed conditions can be viewed any time after a rezoning is submitted on the Interactive Development Map at: http://apexnc.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=fa9ba2017b784030b15ef4da27d9e795

Documentation:

Neighbors to a requested new development and/or rezoning are strongly encouraged to fully document (such as through dated photographs) the condition of their property before any work is initiated for the new development. Stormwater controls installed on developed property are not designed to and will likely not remove 100% of the soil particles transported by stormwater runoff. As a result, creeks and ponds could become cloudy for a period of time after rain events.

COMMON CONSTRUCTION ISSUES & WHO TO CALL

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Noise & Hours of Construction: **Non-Emergency Police** **919-362-8661**

Noise from tree removal, grading, excavating, paving, and building structures is a routine part of the construction process. The Town generally limits construction hours from 7:00 a.m. to 8:30 p.m. so that there are quiet times even during the construction process. Note that construction outside of these hours is allowed with special permission from the Town when it makes more sense to have the construction occur at night, often to avoid traffic issues. In addition, the Town limits hours of blasting rock to Monday through Friday from 8:00 a.m. to 5:00 p.m. Report violations of construction hours and other noise complaints to the Non-Emergency Police phone number at 919-362-8661.

Construction Traffic: **James Misciagno** **919-372-7470**

Construction truck traffic will be heavy throughout the development process, including but not limited to removal of trees from site, loads of dirt coming in and/or out of the site, construction materials such as brick and wood brought to the site, asphalt and concrete trucks come in to pave, etc. The Town requires a construction entrance that is graveled to try to prevent as much dirt from leaving the site as possible. If dirt does get into the road, the Town can require they clean the street (see "Dirt in the Road" below).

Road Damage & Traffic Control: **Water Resources – Infrastructure Inspections** **919-362-8166**

There can be issues with roadway damage, roadway improvements, and traffic control. Potholes, rutting, inadequate lanes/signing/striping, poor traffic control, blocked sidewalks/paths are all common issues that should be reported to Water Resources – Infrastructure Inspections at 919-249-3427. The Town will get NCDOT involved if needed.

Parking Violations: **Non-Emergency Police** **919-362-8661**

Unless a neighbor gives permission, there should be no construction parking in neighbors' driveways or on their property. Note that parking in the right-of-way is allowed, but Town regulations prohibit parking within 15 feet of driveways so as not to block sight triangles. Trespassing and parking complaints should be reported to the Non-Emergency Police phone number at 919-362-8661.

Dirt in the Road: **James Misciagno** **919-372-7470**

Sediment (dirt) and mud gets into the existing roads due to rain events and/or vehicle traffic. These incidents should be reported to James Misciagno. He will coordinate the cleaning of the roadways with the developer.

Dirt on Properties or in Streams: **James Misciagno** **919-372-7470**
Danny Smith **Danny.Smith@ncdenr.gov**

Sediment (dirt) can leave the site and get onto adjacent properties or into streams and stream buffers; it is typically transported off-site by rain events. These incidents should be reported to James Misciagno at 919-372-7470 so that he can coordinate the appropriate repairs with the developer. Impacts to the streams and stream buffers should also be reported to Danny Smith (danny.smith@ncdenr.gov) with the State.

Dust: **James Misciagno** **919-372-7470**

During dry weather dust often becomes a problem blowing into existing neighborhoods or roadways. These incidents should be reported to James Misciagno at 919-372-7470 so that he can coordinate the use of water trucks onsite with the grading contractor to help control the dust.

Trash: **James Misciagno** **919-372-7470**

Excessive garbage and construction debris can blow around on a site or even off of the site. These incidents should be reported to James Misciagno at 919-372-7470. He will coordinate the cleanup and trash collection with the developer/home builder.

Temporary Sediment Basins: **James Misciagno** **919-372-7470**

Temporary sediment basins during construction (prior to the conversion to the final stormwater pond) are often quite unattractive. Concerns should be reported to James Misciagno at 919-372-7470 so that he can coordinate the cleaning and/or mowing of the slopes and bottom of the pond with the developer.

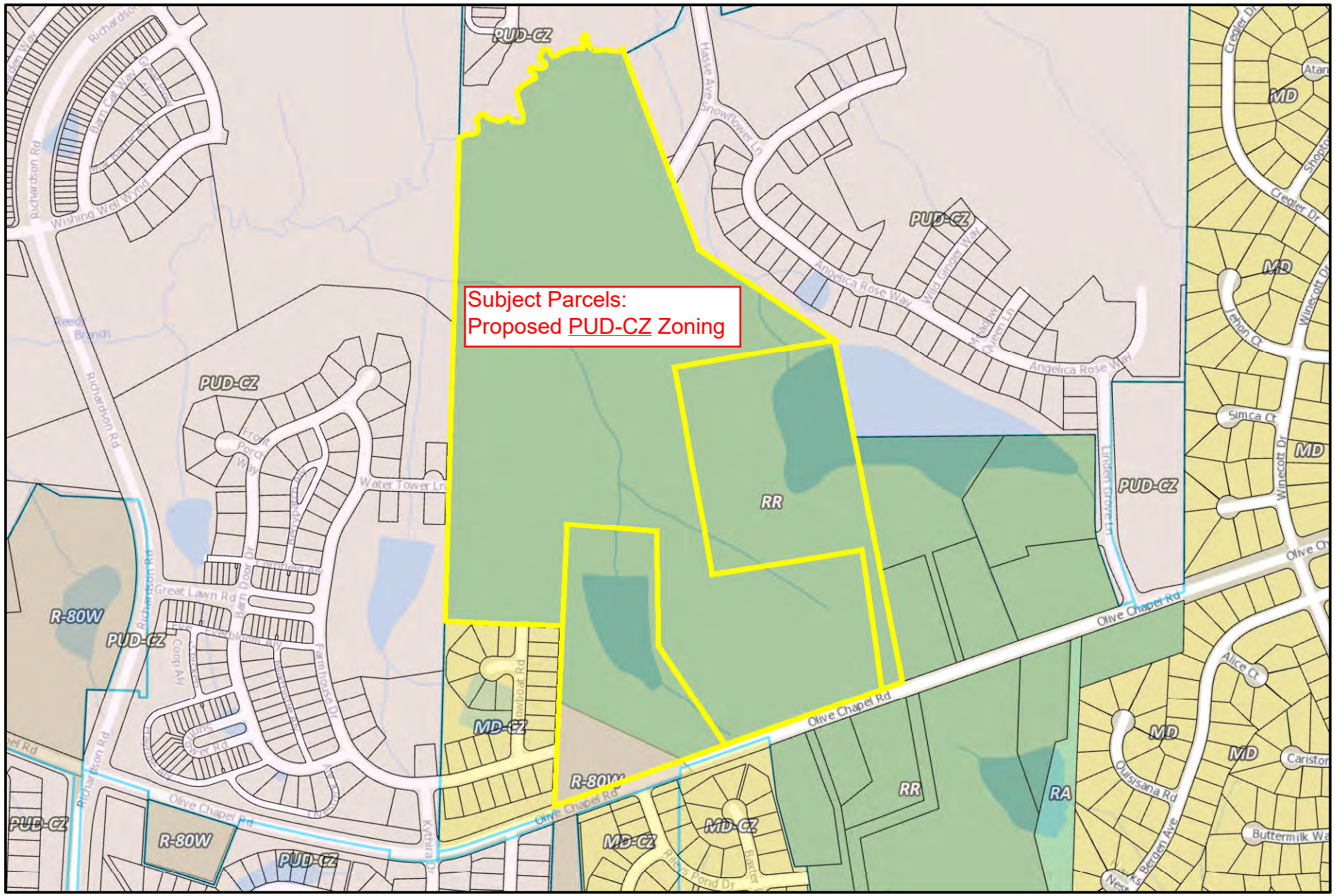
Stormwater Control Measures: **Jessica Bolin** **919-249-3537**

Post-construction concerns related to Stormwater Control Measures (typically a stormwater pond) such as conversion and long-term maintenance should be reported to Mike Deaton at 919-249-3413.

Electric Utility Installation: **Rodney Smith** **919-249-3342**

Concerns with electric utility installation can be addressed by the Apex Electric Utilities Department. Contact Rodney Smith at 919-249-3342.

Olive Chapel Rd
Richardson Rd
Snowflower Ln
Angelica Rose Way
Wild Ginger Way
Meadow Green Ln
Linden Grove Ln
Front Porch Way
Barn Door Dr
Barnyard Aly
Water Tower Ln
Cornfield Aly
Great Lawn Rd
Everbloom Aly
Treeswing Ct
Rocking Horse Rd
Sunflower Aly
Windmill Farmhouse Dr
Livestock Aly
Portland Ave
Sainsbury Way
Bicknor Dr
Armscroft Ln
Beechcroft Ln
Patmos Island Ln
Lemnos Dr
Samos Island Dr
Karpathos Ct
Paros Hill Ln
Kinship Ln
Andros Ct
Beaver Creek
Transit Trl
Autumn Leaves Aly
Yellow Corn Aly
Well Wynd
Barn Cat Wk
Milk Bottle Aly
Herb Garden Wk
Early Planting Ave
Summer Silo Way
Winter Cover Wk
Richardson Rd
Reedy Branch
Grindal Aly
Gullrock Aly
Brown Velvet Ln
Richardson Rd
Little Gem Ln
Poultney Aly
Russet Ln
Whale Bone Aly
Gloriosa St
Sea Level Path
Ruff Aly
Lowland St
Timken Forest Dr
Goliath Ln
Squirrelwood Ct
Rotunwood Ct
Hillantree Ln
Happy Days Ct
Shining Star Ct
Hambridge Ct
Steele Creek Ct
Homestead Park Dr
Rock Island Dr
Shannon Dr
Atlando Ct
Gregler Dr
Winscott Dr
Yorkmont Dr
Starita Ct
Simca Ct
Tamora Ct
Heathcote Ln
Covington Dr
Olive Chapel Rd
Atkinson Ct
Walnut Hill Ct
Caristonia Way
Buttermilk Way
Grazing Meadows Ct
Woolard Way
Hearthside Ct
Kinship Ln
Saddle River Rd
Blushing Rose Way
Apex Barbecue Rd
Bergen Ave
Alice Ct
Pond Ridge Ct
Baxter Glen Ln
Camsteen Ln
Lythria Dr
Paros Ct
Andros Ct
Pond Ridge Ct
Overlook Way
Thassos Dr
Lemnos Dr
Patmos Island Ln
Karpathos Ct
Kinship Ln
Richardson Rd
Olive Chapel Rd
Olive Chapel Rd
Olive Chapel



Zoning Exhibit

WithersRavenel
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Disclaimer

*iMaps makes every effort to produce and publish the most current and accurate information possible. However, the maps are produced for information purposes, and are **NOT** surveys. No warranties, expressed or implied ,are provided for the data therein, its use,or its interpretation.*

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Attendance Count	First Name	Last Name	Affiliation	Email
1	Brendie	Vega	Project Team	[redacted]
2	Nick	Antrilli	Project Team	
3	Bryant	Inge	Project Team	
4	Glenda	Toppe	Project Team	
5	Daniel	Rauh	Project Team	
6	Jaime	Hackney	Neighbor	
7	Cynthia	Ball	Neighbor	
8	Jaime	Hackney	Neighbor	
9	Cynthia	Ball	Neighbor	
10	maysam	aljader	Neighbor	
11	Andrew	Suriano	Neighbor	
12	Randy	King	Neighbor	
13	Chris	Mock	Neighbor	
14	Melinda	Dyk	Neighbor	
15	David	Aspnes	Neighbor	
16	Ryan	Brumfield	Neighbor	
17	Thomas	Ball	Neighbor	
18	Kenny	Choi	Neighbor	
19	Beverly	Rubin	Neighbor	
20	Tracy	Giuliani	Neighbor	
21	Wes	Pitman	Neighbor	
22	Shruti	Uchil	Neighbor	
23	Maureen	Schmitt	Neighbor	
24	Fabrice	Lacoste	Neighbor	
25	Steven	McNally	Neighbor	
26	Felipe	Ledesma	Neighbor	
27	Pieter	de Ridder	Neighbor	

Hackney PUD Rezoning: Virtual Neighborhood Notification Meeting

October 29, 2020 5:00pm-7:00pm

Project Representatives:

- Brendie Vega
- Glenda Toppe
- Daniel Rauh
- Nick Antrilli
- Bryant Inge

Meeting Slides:

- Welcome
- Vicinity Map
- Jurisdiction Map
- Current Zoning
- Floodplains Map
- Future Land Use Map
- Future Transportation Maps
- Conceptual Layout
- Schedule of Project

Neighbor Questions:

Q: What does the MD-CZ zoning mean? Our house is within that so what does that mean for us?

A: Medium Density Conditional Zoning. Medium density residential zoning with specific conditions imparted on the land that are determined during the rezoning process. Your land is subject to the zoning conditions of the land.

Q: We live at 2800 Treeswing - what is happening with the piece of land behind us with the deer stand?

A: That is part of the rezoning parcels. Specific site features are not yet determined as we are early in the rezoning process.

Q: Is there any possibility the existing pond south of Hasse would be filled in?

A: It is too early to tell what features will be kept or modified on the site. There is no current intent to drain it.

Q: On the conceptual layout slide, are the lighter blue areas water retention ponds? If so, is it a city requirement that they would need to be fenced in for child safety?

A: There is no municipal requirement to fence these features.

Q: Will the 2 existing large ponds be accessible to the community?

A: It is too early to tell what the programming of the internal amenities will look like. Land will probably be turned over to the HOA.

Q: Where will the entrances be located on Olive Chapel Road? Will the road be widened?

A: The developer will be required to install ½ of the road widening as designated on the future transportation plan. The conceptual drawings show an early proposed entrance.

Q: When will a detailed road network and home layout be developed and available for review?

A: This will be up to the developers. If it happens soon, it would come out around the beginning of the year.

Q: (There were numerous questions concerning the internal connections within and throughout the site)

A: Using the Town of Apex Future Thoroughfare Map, we explained that the connections into and out of the site will be required to follow the transportation map. The conceptual layout demonstrated a conceptual internal roadway connection through the site.

Q: (There were multiple questions concerning when the project would begin.)

A: We expect the project to begin within 12 – 15 months, although this is dependent on many factors.

Q: I have a few questions. 1) is a builder planned yet. 2) We do not have a road ext sign on Water Tower Lane. We were told when we bought unless it was Lennar, other builders were not required to connect.

A: No builder planned yet. The developer generally will not have an impact on whether or not a road extension is provided. That is generally guided by the future transportation maps of the municipality.

Q: Will bordering communities have a say on the design of the community (location of Townhomes vs single family)?

A: Please reach out to us with your input and we will pass it along to the developer once one is identified.

Q: What are the construction hours in Apex.

A: 7:00am to 7:00pm during the normal work week. Weekends and holidays vary.

Q: What is going to happen to the trees in the lot?

A: There are no detailed plans for the site yet. There are certain environmental protection areas in place where trees will remain.

Q: There are some very old ok trees bordering hackney and Lennar preservation. Literally on the border. Greater than 50" diameter. Will these be preserved?

A: We are required to do a tree survey and protect trees above a certain caliper. Additionally, if the trees are located near the site border, then they should be protected.

Q: What elementary school would serve this community?

A: (Answered by another Neighbor) It's currently Olive Chapel (capped) followed by Salem (capped) and then Turner Creek.

Q: (There was a question concerning the western pond near Rowboat Road and future development.)

A: There is probably not going to be road or home development in that area, although there are no finalized plans at this time.

Q: Would perimeter buffers be maintained or would the development be opened up?

A: Buffers are required between neighborhoods.

Neighborhood Comments:

C: Don't fill the ponds.

C: Like to Like: Single-family should be designed adjacent to existing single-family homes.

C: Support townhomes along proposed main thoroughfare.

AFFIDAVIT OF CONDUCTING AN ELECTRONIC NEIGHBORHOOD MEETING AND ISSUES/RESPONSES SUBMITTAL

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

I, Brendie Vega, do hereby declare as follows:
Print Name

1. I have conducted an Electronic Neighborhood Meeting for the proposed Rezoning, Major Site Plan, Residential Master Subdivision Plan, or Special Use Permit in accordance with UDO Sec. 2.2.7 *Neighborhood Meeting*.

2. The meeting invitations were mailed to the Apex Planning Department, all property owners within 300 feet of the subject property and any neighborhood association that represents citizens in the area via first class mail a minimum of 10 days in advance of the Electronic Neighborhood Meeting.

3. The meeting was conducted via WebEx (indicate format of meeting) on 10/29/2020 (date) from 5 pm (start time) to 7 pm (end time).

4. I have included the mailing list, meeting invitation, attendance sheet issue/response summary, and zoning map/reduced plans with the application.

5. I have prepared these materials in good faith and to the best of my ability.

11/02/2020
Date

By: Brendie Vega

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Jeri Chastain Pederson, a Notary Public for the above State and County, on this the 2 day of November, 2020.

SEAL

JERI CHASTAIN PEDERSON
Notary Public
Wake County, North Carolina
My Commission Expires
March 10, 2024

Jeri Chastain Pederson
Notary Public

Jeri Chastain Pederson
Print Name

My Commission Expires: 03/10/2024

PD PLAN

Hackney Planned Unit Development

APEX, NORTH CAROLINA

APPLICANT

WithersRavenel
137 S Wilmington Street Suite 200
Raleigh, NC 27601

Date: March 24, 2021

WithersRavenel
Our People. Your Success.

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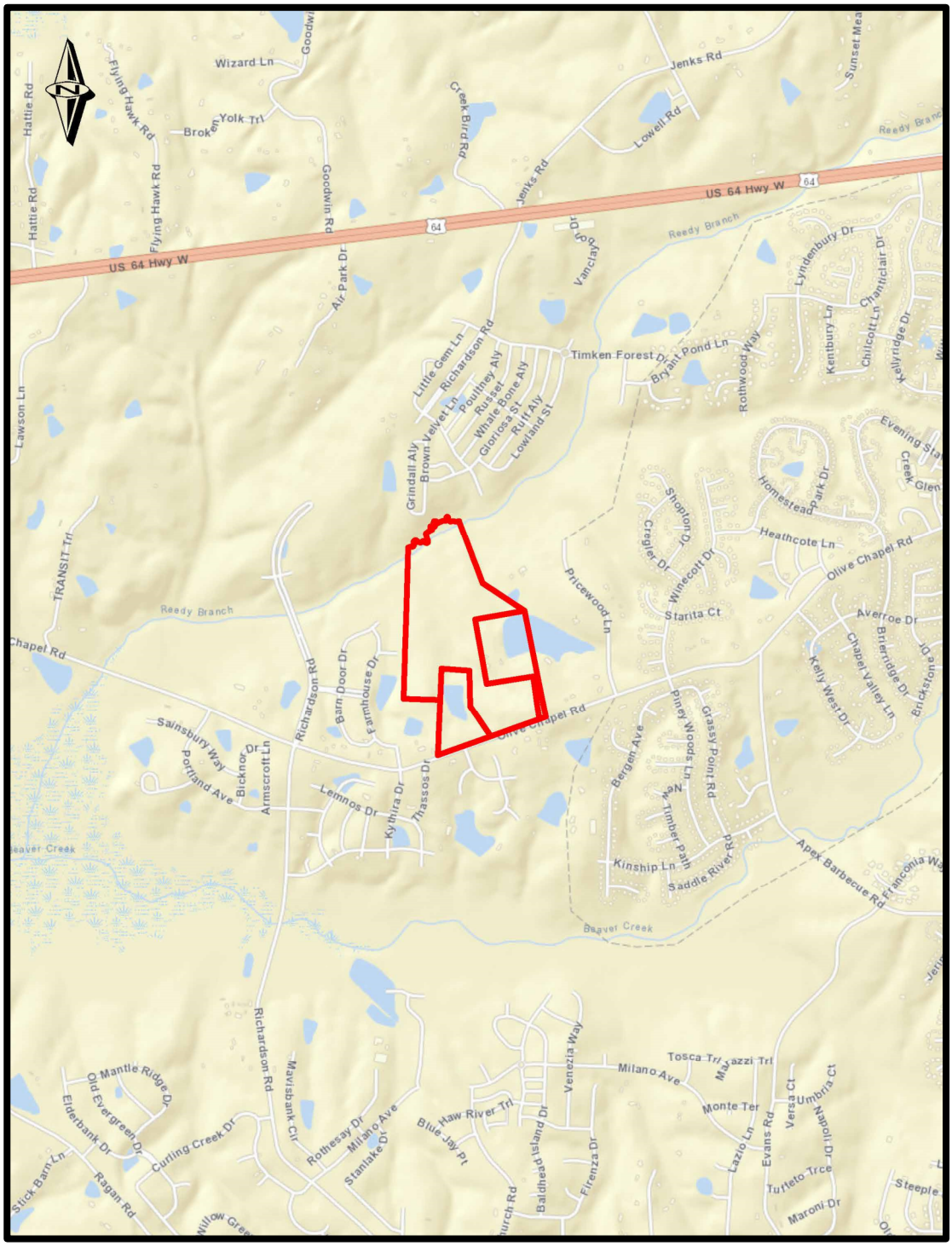
1.0 VICINITY MAP



Project Parcels: Not to Scale

2.0 PROJECT DATA

Name of Project	Hackney Planned Unit Development	
PIN(s)	0721492629 0722406699 0722411102	
Preparer/Owner Information	Prepared by	WithersRavenel 137 S. Wilmington Street, Suite 200 Raleigh, NC 27601 Phone: 919.469.3340 Fax: 919.467.6008 Email: Brendie Vega, AICP, CNU-A bvega@withersravenel.com Bryant Inge, PE binge@withersravenel.com
	Owners	Hackney, Charles Leon Hackney, Judy G Goodwin, Edwin A 2505 Olive Chapel Rd Apex, NC 27502-6788
Current Zoning Designation	Rural Residential (RR) & Residential-80W (R-80W)	
Proposed Zoning Designation	Planned Unit Development (PUD-CZ)	
Current 2045 Land Use Map Designation	Medium Density Residential	
Proposed 2045 Land Use Map Designation	No Proposed Change (Medium Density)	
Area of Tracts (ac.)	10.01, 11.91, & 57.87 (73.64 ac. total)	

3.0 PROPOSED LIST OF USES

The Rezoned Lands may be used for, and only for, the uses listed immediately below. The permitted uses are subject to the limitations and regulations stated in the UDO and any additional limitations or regulations stated below. For convenience, some relevant sections of the UDO may be referenced; such references do not imply that other sections of the UDO do not apply.

Residential

- Single-Family
- Accessory Dwelling Unit
- Townhouse

Non-Residential

- Utility, Minor
- Greenway
- Park, Active
- Park, Passive

4.0 PURPOSE STATEMENT

The Hackney Planned Unit Development Conceptual Layout has been designed in order to help establish appropriately sized residential opportunities along Olive Chapel Road. Development is intended to reflect the neighboring residential communities in both density and product. This residential development philosophy is in line with the 2045 Apex Future Land Use Plan designation of “Medium Density Residential”. The site will provide a mixture of amenities and strategic infrastructure connections for future residents to navigate the community.

5.0 PROPOSED DESIGN AND ARCHITECTURAL CONTROLS

Maximum Densities (du/Acre)	3.5 du/acre		
Maximum Height of Buildings	50 feet		
Setbacks: Single-Family	Front: 5' from façade 20' from garage to back of sidewalk	Side: 5' Corner Side: 8'	Rear: 10'
Setbacks: Townhouse, Front loaded	Front: 10' from façade 20' from garage to back of sidewalk	Side: 5' Building to Building: 10'	Rear: 10'
Setbacks: Townhouse, Alley loaded	Front: 10' from façade	Side: 5' Building to Building: 10'	Rear: 5'
Amount and Percentage of Built Upon Area Allowed	70%		
Amount and Percentage of Proposed Built Upon Area (Max)	70%		

1. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
2. The roofline cannot be a single mass; it must be broken up horizontally and vertically between every unit.
3. Garage doors must have windows, decorative details or carriage-style adornments on them.
4. The rear and side elevations of the units that can be seen from the right-of-way shall have trim around the windows.

5. The visible side of a townhome on a corner lot facing the public street shall contain at least 2 decorative elements such as, but not limited to, the following elements:

- Windows
- Bay window
- Recessed window
- Decorative window
- Trim around the windows
- Wrap-around porch or side porch
- Two or more building materials
- Decorative brick/stone
- Decorative trim
- Decorative shake
- Decorative air vents on gables
- Decorative gable
- Decorative cornice
- Column
- Portico
- Balcony
- Dormer

6. The garage cannot protrude more than 1-foot from either the front façade or porch.

6.0 BUFFERS

Perimeter Buffers shall be designated as such:

North	100' Stream Buffer*
East	20' Type A Buffer
South	30' Type E Buffer**
West	20' Type A Buffer

* In addition to the 100' riparian buffer on the north, an additional 100' buffer will be established. This additional 100' may include utilities, trails and other active or passive recreation.

**A 30' Type B Buffer shall be provided if homes along Olive Chapel Road are not alley-loaded.

7.0 NATURAL RESOURCES AND ENVIRONMENT

Watershed

The Hackney Planned Unit Development is located within the Primary Watershed Protection Overlay District and is therefore subject to the requirements outlined in Section 6.1 of the Town of Apex Unified Development Ordinance.

Floodplain

The parcels that make up the Site do contain a small portion of FEMA designated 100-year floodplains near the site s northern termination according to FEMA FIRM Panel 3720072200J, effective 05/02/2006.

Resource Conservation

The Site is also subject to the Resource Conservation Area requirements outlined in the Town of Apex Unified Development Ordinance.

The PUD will meet the requirements of:

8.1.2.C.1 *Planned Developments.* The RCA for all planned developments shall be determined by the Town Council per Sec. 2.3.4.F.1.c and per Sec. 8.1.2.C.4, 5, 6, 7, or 10 as applicable.

8.1.2.C.4 *Development located south and west of NC 540.* All developments which do not meet the criteria of subsections 8.1.2.C.3 or 10 and which are located south and west of NC 540 shall provide buffers and RCA equal to or greater than 30% of the gross site acreage for single-family and townhome uses and 25% of the gross site acreage for multi-family, mixed-use, and non-residential uses.

Per UDO Section 7.2.5.B.8, if any mass grading is proposed in the single-family sections of the PUD, the following provision will apply to lot coverage area for single-family: An additional five percent (5%) Resource Conservation Area (RCA) shall be set aside. This requirement is added to the standard RCA percentage requirement found in Sec. 8.1.2.C Size of the RCA.

Tree Replanting

Existing deciduous trees greater than 18" in diameter (DBH), as identified in the tree survey, that are removed by site development shall be replaced by planting a 1.5" caliper native tree from the Town of Apex Design and Development Manual as a street tree or as other required landscaping. Excess required tree replacement will occur in common open space areas.

Clean Energy

Residential dwelling units will be provided with solar conduit to accommodate the future installation of solar panels.

If permitted by the electric company, the developer will install photo-voltaic solar panels on the pool house roof for connection to the electrical grid. The photo-voltaic system will be designed to produce 5 kilowatts. The system may be either owned or leased and will be turned over to the HOA.

Water Quality

Signs will be installed near SCMs in order to:

1. Reduce pet waste near SCM drainage areas.
2. Reduce fertilizer near SCM drainage areas.

Installation of Pet Waste Stations in common areas will occur within the neighborhood.

Planting and Landscaping

Install Warm Season grasses (Bermuda, Zoysia, etc) in lawn areas to reduce the need for irrigation and chemicals.

Install required Street Trees, Buffer and Re-Vegetation plantings that consist of a variety of native plant materials recognized by the New Hope Audubon Society or the NCSU manual for Landscaping for Wildlife with Native Plants as being bird and pollinator friendly; as allowed by the Town of Apex Design & Development Manual or approved by Apex Staff.

Specify pocket park plantings that are recognized by the NC Wildlife Federation as being Native Pollinator Plants as part of the Statewide Butterfly Highway initiative.

Include at least 4 native hardwood tree varieties in the proposed plantings, as allowed by the Apex Design and Development Manual.

Environmental Resources

The site will provide the following:

1. Purchase 20 bird houses from the New Hope Audubon Society (or other non-profit) and install in natural areas within the site.
2. Retain the 2 existing ponds if engineering studies confirm that the existing dams are structurally sound and meet regulatory requirements.

Historic Preservation

According to the North Carolina Historic Preservation Office s HPOWEB 2.0 Mapping application, there are no historic structures contained on the Site.

8.0 STORMWATER MANAGEMENT REQUIREMENTS

The parcels on which the development is proposed upon currently consist of a few existing structures, some cleared lands, and wooded lands. Two ponds exist on the parcels and drain to Reedy Branch Creek, eventually feeding into Jordan Lake. The proposed development plan will require stormwater management measures in accordance with Sections 6.1 and 7.5.7 in the Town of Apex Unified Development Ordinance. Stormwater captured on the site will be conveyed to proposed Stormwater Control Measures, which will be identified on plans during the major subdivision or site plan approval stage. Post-development peak runoff shall not exceed pre-development peak runoff for the 24-hour, 1-year and 10-year storm events in accordance with the Unified Development Ordinance. Treatment for the first 1-inch of runoff will be provided such that the removal of 85% Total Suspended Solids is achieved. All stormwater devices will meet the design requirements of NCDENR and the Town of Apex.

9.0 PARKS, RECREATION AND CULTURAL RESOURCES

The Apex Parks, Recreation and Cultural Resources Advisory Commission met on December 9, 2020 and unanimously recommended a fee-in-lieu of dedication with credit for construction of greenway which connects Sidepath along Hasse Ave to the west connecting to the Reedy Branch Greenway in Smith Farm. The fee rate will be set at the time of Town Council Review/ Approval and the credit for construction will be calculated prior to construction plan approval. Per the UDO Art 14, the greenway must be completed and accepted prior to 25% of the building permits for the project being issued.

10.0 PARKING AND LOADING

All parking provided on the Site will comply with the requirements outlined in Section 8.3 of the Town of Apex Unified Development Ordinance. Per 8.3.4(C) of the UDO, guest parking shall be designated within common areas and be distributed throughout residential projects. Striped on-street parking may be counted toward guest parking requirements. For Townhouse, guest parking shall be distributed so that there is at least one parking space within 200' of each townhouse lot.

11.0 SIGNAGE

All signage on the Site will comply with the requirements outlined in Section 8.7 of the Town of Apex Unified Development Ordinance.

12.0 PUBLIC FACILITIES REQUIREMENTS

All utilities shall meet the Town of Apex Master Utility Maps.

Sanitary Sewer Service

All on-site sanitary sewer lines will be extended to the property lines to allow future interconnectivity of properties. The design of the sanitary sewer will be according to the Town of Apex Engineering Standards and Specifications while accounting for downstream capacity and future upstream development. Sanitary Sewer easements will be established for public sewer outside of the Public R/W.

Gas

The Public Service Company of North Carolina (PSNC) will require a revenue analysis based on the proposed development in order to determine the applicable costs to the developer for installation of infrastructure.

Electric Service

The Site is in the service area of both the Town of Apex Electric Utilities and Progress Energy and the applicant will select the Town of Apex to serve as the electric provider.

Roadways

The Site will require an internal public roadway network and parking spaces. The onsite transportation circulation system shall be consistent with the Town of Apex Transportation Plan and the Town of Apex Standard Specifications and Standard Details and show required right-of-way widths and road sections.

Hasse Avenue will be constructed between Olive Chapel Road and its current terminus north of the project. Olive Chapel Road will be widened to include construction of a 100-foot eastbound left-turn lane with appropriate deceleration length and taper and a 100-foot westbound right-turn lane with appropriate deceleration length and taper subject to NCDOT review and approval. The Olive Chapel Road turn lane widening will be completed prior to platting Hasse Avenue access to Olive Chapel Road and the connection to Hasse Avenue north of the project will be completed prior to the last plat in the subdivision.

A 6-foot bike lane and 5-foot paved shoulder will be located on the north side of Olive Chapel Road per the bike/ped systems map.

Per the Long-Range Transportation Map, the following roadway sections apply to this development:

- Olive Chapel Road = 4-Lane with median, widening, 110' ROW, must provide 55' from centerline
- N/S = Future Major Collector, 60' ROW
- E/W = Future Local Connection, 50' ROW

There will be no private driveways permitted along Olive Chapel Road.

Alleys

Alleys may be proposed to vary from Town standards in order to accommodate water and sewer utilities, provided they maintain the same or greater width of pavement and right of way, subject to staff review and approval at the time of subdivision and construction plans.

Water Service

All on-site water lines will be designed according to Town of Apex Engineering Standards and Specifications.

Transit

According to the Apex 2045 Transportation Plan, there are no existing or proposed transit routes designated on or adjacent to the Site.

Pedestrian Facilities

The development plan will incorporate sidewalk infrastructure along Olive Chapel Road as well as the internal street network. A trail will serve as a connection from the western portion of the community to the Reedy Branch Greenway, thus in compliance with the future land use plan.

Sidewalks will be provided on both sides of all streets for single-family detached homes. There will be a 10-foot side path provided along minor collector roads as show on the bike/ped plan.

Prior to platting the 75th lot in the neighborhood, the Developer will extend a 5' sidewalk approximately 860 feet along the north side of Olive Chapel to the western limits of the Linden Subdivision. Developer will attempt to obtain the required right-of-way and/or easements for construction of this sidewalk from the adjacent property owners. If the required right-of-way and/or easements cannot be obtained by that time, a Fee-in-Lieu in the amount of 125% of the estimated cost of construction plus fair market value of the property to be acquired, shall be assessed. Any performance guarantee provided for this section of sidewalk shall be released upon acceptance of said fee-in-lieu by the Town.

13.0 PHASING PLAN

The Hackney Planned Unit Development will be constructed in phases according to economic considerations and infrastructure requirements.

Please note the following considerations for the phasing plan:

1. Access points are preliminary in nature and subject to Town of Apex and NCDOT review and approval.
2. Limits of land disturbance within each phase shall be determined at the master subdivision plan and site plan stages.
3. Public utilities shall be provided for each phase of development.

14.0 CONSISTENCY WITH 2045 LAND USE PLAN

The Apex 2045 Future Land Use Map depicts the future land use of the three parcels as Medium Density Residential. Medium Density Residential lands are described in the Land Use Plan as consisting of single-family homes, duplexes, and townhomes with densities between three (3) and seven (7) dwelling units per acre. It is intended to act as a transition between higher and lower residential densities. The maximum density proposed for the Hackney Planned Unit Development is four (4) dwelling units per acre.

The Hackney Planned Unit Development proposes medium density residential housing options appropriate to its proximity to the Olive Chapel Road thoroughfare and are consistent with uses found in the surrounding communities. The uses proposed for the site are directly in line with the uses stated in the 2045 Future Apex Land Use Plan thus the proposed rezoning is consistent with the Town's future plans for this area.

15.0 CONSISTENCY WITH UNIFIED DEVELOPMENT ORDINANCE

The proposed development is consistent with all applicable requirements of the Town of Apex Unified Development Ordinance.

16.0 ELEVATIONS

Elevations provided are representative of architecture, materials, and housing types. Final elevations submitted at Major Subdivision Plan will meet the requirements of the Architectural Controls in 5.0 of this PD Plan.

17.0 AFFORDABLE HOUSING

If the Town of Apex has a fund or other mechanism in place to receive donations to construct, subsidize, or participate in the development of affordable housing units (the "Fund"), the developer will contribute $215 per lot to this Fund prior to the first residential Certificate of Occupancy. In the event the Fund has not been established by the Town of Apex, the money will be conveyed to a local non-profit working on affordable housing initiatives. The developer will work with the Town of Apex to identify a mutually acceptable local non-profit organization to receive these funds.

PLANNED UNIT DEVELOPMENT

HACKNEY

APEX, NORTH CAROLINA

APRIL 20, 2021

SITE DATA

2045 LAND USE PLAN DESIGNATION	CURRENT	MEDIUM DENSITY RESIDENTIAL			
	PROPOSED	NO CHANGE			
ZONING	CURRENT	RURAL RESIDENTIAL (RR) (R-80W)			
	PROPOSED	PLANNED UNIT DEVELOPMENT (PUD-CZ)			
AREA OF TRACTS IN PROPOSED PUD	0722-41-1102	51.725 ACRES			
	0721-49-2629	10.007 ACRES			
	0722-40-6699	11.916 ACRES			
	TOTAL:	73.648 ACRES			
AREA DESIGNATED AS MIXED-USE ON 2045 LAND USE MAP	0 ACRES				
AREA OF MIXED-USE PROPERTY PROPOSED AS NON-RESIDENTIAL DEVELOPMENT	N/A				
PERCENT OF MIXED-USE PROPERTY PROPOSED AS NON-RESIDENTIAL DEVELOPMENT	N/A				
REQUESTED SEWER CAPACITY	TO BE DETERMINED				
MAXIMUM RESIDENTIAL DENSITY	3.5 DU/ACRE				
MAXIMUM BUILDING HEIGHT	50'-0"				
SETBACKS: SINGLE FAMILY	FRONT: 5 FT FROM FACADE 20 FT FROM GARAGE TO BACK OF SIDEWALK		REAR: 10 FT	SIDE: 5 FT	CORNER SIDE: 8 FT
SETBACKS: TOWNHOUSE, FRONT LOADED	FRONT: 10 FT FROM FACADE 20 FT FROM GARAGE TO BACK OF SIDEWALK		REAR: 10 FT	SIDE: 5 FT	BUILDING TO BUILDING: 10 FT
SETBACKS: TOWNHOUSE, ALLEY LOADED	FRONT: 10 FT FROM FACADE		REAR: 5 FT	SIDE: 5 FT	BUILDING TO BUILDING: 10 FT
WATERSHED	JORDAN LAKE WATERSHED, PRIMARY WATERSHED PROTECTION OVERLAY				
HISTORIC STRUCTURES	N/A				
COMMUNITY AMENITIES	COMMUNITY GATHERING SPACE WITH BENCHES, TOT LOT				
SITE BUFFERS	NORTH	100' RIPARIAN BUFFER *IN ADDITION TO THE 100' RIPARIAN BUFFER ON THE NORTH, AN ADDITIONAL 100' BUFFER WILL BE ESTABLISHED. THIS ADDITIONAL 100' MAY INCLUDE UTILITIES, TRAILS, AND OTHER ACTIVE OR PASSIVE RECREATION.			
	EAST	20' TYPE A BUFFER			
	SOUTH	30' TYPE E BUFFER *A 30' TYPE B BUFFER SHALL BE PROVIDED IF HOMES ALONG OLIVE CHAPEL ROAD ARE NOT ALLEY LOADED.			
	WEST	20' TYPE A BUFFER			

ZONING CONDITIONS

1. THE APEX PARKS, RECREATION AND CULTURAL RESOURCES ADVISORY COMMISSION MET ON DECEMBER 9, 2020 AND UNANIMOUSLY RECOMMENDED A FEE-IN-LIEU OF DEDICATION WITH CREDIT FOR CONSTRUCTION OF GREENWAY WHICH CONNECTS SIDEPATH ALONG HASSE AVE TO THE WEST CONNECTING TO THE REEDY BRANCH GREENWAY IN SMITH FARM. THE FEE RATE WILL BE SET AT THE TIME OF TOWN COUNCIL REVIEW/APPROVAL AND THE CREDIT FOR CONSTRUCTION WILL BE CALCULATED PRIOR TO CONSTRUCTION PLAN APPROVAL. PER THE UDO ART 14, THE GREENWAY MUST BE COMPLETED AND ACCEPTED PRIOR TO 25% OF THE BUILDING PERMITS FOR THE PROJECT BEING ISSUED.

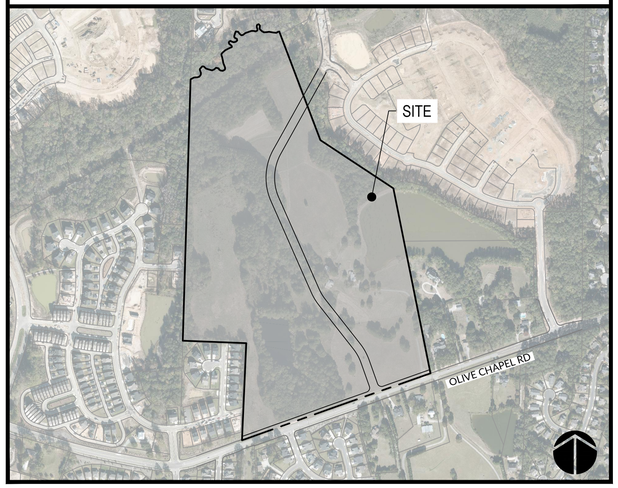
2. HASSE AVENUE WILL BE CONSTRUCTED BETWEEN OLIVE CHAPEL ROAD AND ITS CURRENT TERMINUS NORTH OF THE PROJECT. OLIVE CHAPEL ROAD WILL BE WIDENED TO INCLUDE CONSTRUCTION OF A 100-FOOT EASTBOUND LEFT-TURN LANE WITH APPROPRIATE DECELERATION LENGTH AND TAPER AND A 100-FOOT WESTBOUND RIGHT-TURN LANE WITH APPROPRIATE DECELERATION LENGTH AND TAPER SUBJECT TO NCDOT REVIEW AND APPROVAL. THE OLIVE CHAPEL ROAD TURN LANE WIDENING WILL BE COMPLETED PRIOR TO PLATTING HASSE AVENUE ACCESS TO OLIVE CHAPEL ROAD AND THE CONNECTION TO HASSE AVENUE NORTH OF THE PROJECT WILL BE COMPLETED PRIOR TO THE LAST PLAT IN THE SUBDIVISION.

3. THERE WILL BE NO PRIVATE DRIVEWAYS ALONG OLIVE CHAPEL ROAD.

4. ALLEYS MAY BE PROPOSED TO VARY FROM TOWN STANDARDS IN ORDER TO ACCOMMODATE WATER AND SEWER UTILITIES, PROVIDED THEY MAINTAIN THE SAME OR GREATER WIDTH OF PAVEMENT AND RIGHT-OF-WAY, SUBJECT TO STAFF REVIEW AND APPROVAL AT THE TIME OF SUBDIVISION AND CONSTRUCTION PLANS.

5. PRIOR TO PLATTING THE 75th LOT IN THE NEIGHBORHOOD, THE DEVELOPER WILL EXTEND A 5' SIDEWALK APPROXIMATELY 860 FEET ALONG THE NORTH SIDE OF OLIVE CHAPEL TO THE WESTERN LIMITS OF THE LINDEN SUBDIVISION. THE DEVELOPER WILL ATTEMPT TO OBTAIN THE REQUIRED RIGHT-OF-WAY AND/OR EASEMENTS FOR CONSTRUCTION OF THIS SIDEWALK FROM THE ADJACENT PROPERTY OWNERS. IF THE REQUIRED RIGHT-OF-WAY AND/OR EASEMENTS CANNOT BE OBTAINED BY THAT TIME, A FEE-IN-LIEU IN THE AMOUNT OF 125% OF THE ESTIMATED COST OF CONSTRUCTION PLUS FAIR MARKET VALUE OF THE PROPERTY TO BE ACQUIRED, SHALL BE ASSESSED. ANY PERFORMANCE GUARANTEE PROVIDED FOR THIS SECTION OF SIDEWALK SHALL BE RELEASED UPON ACCEPTANCE OF SAID FEE-IN-LIEU BY THE TOWN.

SITE MAP
1"=500'



VICINITY MAP
1"=2000'

INDEX OF SHEETS

SHEET NUMBER	SHEET TITLE
0.0	COVER
1.0	EXISTING CONDITIONS
2.0	CONCEPTUAL LAYOUT PLAN
3.0	CONCEPTUAL UTILITY PLAN
4.0	CONCEPTUAL STORMWATER MANAGEMENT PLAN

PREPARED BY:

WithersRavenel
Engineers | Planners | Surveyors

115 MacKenan Drive | Cary, NC 27511 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

PLANNER: BRENDIE VEGA, AICP
BVEGA@WITHERSRAVENEL.COM

CIVIL ENGINEER: BRYANT INGE, PE
BINGE@WITHERSRAVENEL.COM

PRELIMINARY
NOT APPROVED FOR CONSTRUCTION

K:\18\18-05105\18051720-Hackney_Trad-Apex\CAD\Drawing Sets\PUD\0.0 COVER.dwg - Tuesday, April 20, 2021 4:17:01 PM - INGE, BRYANT

EXISTING CONDITION NOTES:

1. TOPOGRAPHIC AND UTILITY INFORMATION BASED ON AVAILABLE GIS MAPPING. PRELIMINARY BOUNDARY SURVEY PREPARED BY WITHERSRAVENEL DATED 09/25/20.
2. WETLAND/STREAM INFORMATION BASED ON EVALUATION BY S&EC DATED 09/18/20 (APEX 20-004).
3. REGULATORY FEMA MAPPED FLOODPLAINS EXIST ON SITE PER FIRM MAP #3720072200J (5/2/06).
4. THE SUBJECT PROPERTY IS LOCATED WITHIN THE TOWN OF APEX PRIMARY WATERSHED PROTECTION OVERLAY DISTRICT.
5. ALL EXISTING STRUCTURES ON THE SUBJECT PROPERTY SHALL BE REMOVED PER TOWN OF APEX STANDARDS AND REQUIREMENTS.

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

MICHAEL BASS
SHERRIE BASS
DB 14367, PG 1240
LOT 3
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503445

ELIZABETH PERKINS
DB 14268, PG 331
LOT 1
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503152

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 6
LINDEN SUBDIVISION
BM 2020, PG 1334
PIN No. 0722424038

HASSE AVE
60' R/W

CRESCENT APEX, LLC
DB 17044, PG 924 RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

S 11°18'46" E
300.58

S 11°21'53" E
392.29'

S 11°20'41" E
425.59'

N 09°38'52" W
538.92'

S 20°45'12" E
790.03'

S 85°15'07" E
67.18'

N 78°41'44" E
90.50'

50' BUFFER

EXISTING POND

GRAVEL DRIVE

S 78°41'44" W
306.86'

TRACT 3
PIN No. 0722406699
CHARLES L. HACKNEY
JUDY G. HACKNEY
DB 3195, PG 151
BM 1982, PG 1057
11.871 ACRES (OUTSIDE R/W)
0.045 ACRES (WITHIN R/W)
11.916 (TOTAL ACRES)

SHED

SHED

ONE STORY FRAME
RESIDENCE
#2500 OLIVE CHAPEL RD

BARN

BARN

N 11°18'46" W
797.04'

S 87°41'17" W
406.82'

OLIVE CHAPEL ROAD
(SR 1160)
VARIABLE WIDTH R/W

40' UTILITY AND
PIPELINE EASEMENT
DB 14343, PG 2028

EXISTING 1% ANNUAL
FLOOD ZONE
(ZONE AE)

N 01°36'11" E
2872.71' (TIE LINE)

APPROXIMATE
100' BUFFER

N 01°42'16" E
643.96' TO CL CREEK

643.96' TO EIP

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

FLOODWAY (OUT)

FLOODWAY (IN)

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

EXISTING
WETLANDS

C/L OF STREAM

50' BUFFER

TRACT 1
PIN No. 0722411102
JUDY G. HACKNEY
DB 1400, PG 236
BM 1983, PG 57
51.28 ACRES (OUTSIDE R/W)
0.445 ACRES (WITHIN R/W)
51.725 (TOTAL ACRES)

EXISTING
WETLANDS

S 80°58'41" E
436.47'

S 24°47'28" E
445.61'

S 82°33'11" E
306.62'

TRACT 2
PIN No. 0721492629
EDWIN A. GOODWIN
DB 3195, PG 149 BM 1983, PG 57
9.526 ACRES (OUTSIDE R/W)
0.481 ACRES (WITHIN R/W)
10.007 (TOTAL ACRES)

EXISTING POND

N 02°31'45" E
382.15'

S 01°15'56" W
682.56'

RILEYS
POND DRIVE
50' R/W

PORTION OF PROPERTY
TO BE ANNEXED

TOWN OF APEX ELECTRIC
UTILITY EASEMENT
PER DB 13318, PG 1911

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 924
PIN No. 0722219077

N 01°42'16" E
1151.65'

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 923
PIN No. 0722219077

ROWBOAT ROAD
50' R/W

N 02°31'45" E
204.1'

N 87°28'05" W
49.58'

WATER
TOWER LANE
50' R/W

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"FUTURE REC SITE"
SMITH FARM PUD, PH 1
BM 2018, PG 922 & 923
PIN No. 0722303175

SMITH FARMS OF APEX HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 1
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0721396548

SMITH FARMS OF APEX
HOMEOWNERS
ASSOCIATION, INC
DB 17177, PG 741
COMMON AREA 3
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0722309093

FARMHOUSE DRIVE
50' R/W

SMITH FARMS OF APEX
HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 2
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN NO. 0721397362

THASSOS DRIVE
50' R/W

PRELIMINARY
NOT APPROVED FOR
CONSTRUCTION

TREE LEGEND

- OAK
- POPLAR
- GUM
- MAPLE
- CEDAR
- PINE

EXISTING DECIDUOUS TREES TO BE REMOVED (>18" DBH)

TYPE	QUANTITY
OAK	46
POPLAR	22
GUM	17
MAPLE	5
TOTAL	90

GRAPHIC SCALE

100 0 50 100 200

1 inch = 100 ft.

No.	Revision	Date	By

Designer: WR	Scale: 1" = 100'
Drawn By: WR	Date: 02/26/2021
Checked By: WR	Job No.: 02180517.20

HACKNEY

APEX WAKE COUNTY NORTH CAROLINA

EXISTING CONDITIONS

WithersRavenel
Engineers | Planners | Surveyors
115 MacKenan Drive | Cary, NC 27511 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

Sheet No. 1.0

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NOTES:

1. PLAN SHEETS ARE INTENDED FOR ILLUSTRATIVE USE ONLY.
2. PER 2.3.4(F)(1)(A)(IV) OF THE UDO, SIDEWALKS MUST BE PROVIDED ON BOTH SIDES OF ALL STREETS FOR SINGLE-FAMILY DETACHED HOMES IN PUD-CZ DEVELOPMENT DISTRICTS.
3. PER 2.3.4(F)(1)(F)(I) OF THE UDO, THE PD PLAN FOR PUD-CZ SHALL DEMONSTRATE A SAFE AND ADEQUATE ON-SITE TRANSPORTATION CIRCULATION SYSTEM. THE ON-SITE TRANSPORTATION CIRCULATION SYSTEM SHALL BE INTEGRATED WITH THE OFF-SITE TRANSPORTATION CIRCULATION SYSTEM OF THE TOWN. THE PD PLAN FOR PUD-CZ SHALL BE CONSISTENT WITH THE APEX TRANSPORTATION PLAN AND THE TOWN OF APEX STANDARD SPECIFICATIONS AND STANDARD DETAILS AND SHOW REQUIRED RIGHT-OF-WAY WIDTHS AND ROAD SECTIONS.
4. PER UDO SECTION 7.2.5.B.8, IF ANY MASS GRADING IS PROPOSED IN THE SINGLE-FAMILY SECTIONS OF THE PUD, THE FOLLOWING PROVISION WILL APPLY TO LOT COVERAGE AREA FOR SINGLE-FAMILY: AN ADDITIONAL FIVE PERCENT (5%) RESOURCE CONSERVATION AREA (RCA) SHALL BE SET ASIDE. THIS REQUIREMENT IS ADDED TO THE STANDARD RCA PERCENTAGE REQUIREMENT FOUND IN SEC. 8.1.2.C SIZE OF THE RCA.
5. COLLECTOR ROAD ALIGNMENT LOCATION WILL BE DETERMINED AT THE MAJOR SUBDIVISION PLAN STAGE.
6. EXISTING PONDS WILL BE EVALUATED BY A LICENSED ENGINEER. EVALUATION RECOMMENDATIONS MAY REQUIRE A CHANGE TO SIZE, BOUNDARY OR REMOVAL OF EXISTING PONDS.
7. A 30' TYPE B SHALL BE PROVIDED IF HOMES ALONG OLIVE CHAPEL ROAD ARE NOT ALLEY LOADED.

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

MICHAEL BASS
SHERRIE BASS
DB 14367, PG 1240
LOT 3
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503445

ELIZABETH PERKINS
DB 14268, PG 331
LOT 1
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503152

HASSE AVE
60' R/W

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 6
LINDEN SUBDIVISION
BM 2020, PG 1334
PIN No. 0722424038

CRESCENT APEX, LLC
DB 17044, PG 924 RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

20' TYPE A

EXISTING POND

50' BUFFER

THE PROPOSED WIDENING ON THE NORTH SIDE OF OLIVE CHAPEL ROAD WILL INCLUDE A 6' BIKE LANE AND 5' PAVED SHOULDER.

THE PROPOSED WIDENING OF OLIVE CHAPEL ROAD WILL COMPLY WITH THE TOWN OF APEX THOROUGHFARE PLAN. THE PROPOSED ROAD SECTION ON THE PROJECT SIDE OF THE CENTERLINE WILL BE A MEDIAN DIVIDED 4-LANE SECTION (110' ROW).

OLIVE CHAPEL ROAD
(SR 1160)
VARIABLE WIDTH R/W

40' UTILITY AND PIPELINE EASEMENT DB 14343, PG 2028

SCM #2

EXISTING 1% ANNUAL FLOOD ZONE (ZONE AE)

30' BUFFER SEE NOTE #7

PROVIDE TRAIL CONNECTION FOR COMMUNITY ACCESS TO REEDY BRANCH GREENWAY

THE PROPOSED COLLECTOR ROAD WILL COMPLY WITH THE TOWN OF APEX THOROUGHFARE PLAN. THE PROPOSED ROAD SECTION WILL BE 60' WIDTH RIGHT-OF-WAY AND INCLUDE A 10' WIDTH SIDE PATH ON ONE SIDE.

LANDSCAPED MEDIAN AT SITE ENTRANCE

EXISTING WETLANDS

50' BUFFER

C/L OF STREAM

SCM #3

EXISTING POND

APPROXIMATE 100' BUFFER

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

CONNECTION TO GREENWAY WITHIN SMITH FARM

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

EXISTING WETLANDS

30' BUFFER SEE NOTE #7

SCM #1

THE PROPOSED LOCAL CONNECTIONS WILL COMPLY WITH THE TOWN OF APEX THOROUGHFARE PLAN. THE PROPOSED ROAD SECTION WILL BE 50' WIDTH RIGHT-OF-WAY.

THE PROPOSED LOCAL CONNECTIONS WILL COMPLY WITH THE TOWN OF APEX THOROUGHFARE PLAN. THE PROPOSED ROAD SECTION WILL BE 50' WIDTH RIGHT-OF-WAY.

THE PROPOSED LOCAL CONNECTIONS WILL COMPLY WITH THE TOWN OF APEX THOROUGHFARE PLAN. THE PROPOSED ROAD SECTION WILL BE 50' WIDTH RIGHT-OF-WAY.

FLOODWAY (OUT)
(IN)

FLOODWAY (OUT)
(IN)

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 924
PIN No. 0722219077

20' TYPE A

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 923
PIN No. 0722219077

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"FUTURE REC SITE"
SMITH FARM PUD, PH 1
BM 2018, PG 922 & 923
PIN No. 0722303175

WATER TOWER LANE
50' R/W

ROWBOAT ROAD
50' R/W

FARMHOUSE DRIVE
50' R/W

SMITH FARMS OF APEX HOMEOWNERS ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 1
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0721396648

SMITH FARMS OF APEX HOMEOWNERS ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 3
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0722309093

SMITH FARMS OF APEX HOMEOWNERS ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 2
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN NO. 0721397362

RILEYS
POND DRIVE
50' R/W

THASSOS DRIVE
50' R/W

LEGEND

- RESIDENTIAL
- STREAM
- STREAM BUFFER
- PERIMETER BUFFER
- STREETSCAPE
- EXISTING POND
- S.C.M.
- WETLAND
- ROADWAY CONNECTION
- GREENWAY CONNECTION

GRAPHIC SCALE
100 0 50 100 200
1 inch = 100 ft.

PRELIMINARY
NOT APPROVED FOR CONSTRUCTION

No.	Revision	Date	By

Designer: WR	Scale: 1" = 100'
Drawn By: WR	Date: 02/26/2021
Checked By: WR	Job No.: 02180517.20

HACKNEY

APEX WAKE COUNTY NORTH CAROLINA

CONCEPTUAL LAYOUT PLAN

WithersRavenel
Engineers | Planners | Surveyors
115 MacKenan Drive | Cary, NC 27511 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

Sheet No. 2.0

K:\180\02180517.20\Hackney Tract\Apex\CAD\Drawing Set\PUD\2.0 CONCEPT LAYOUT PLAN.dwg Friday, February 26, 2021 10:31:12 AM - MIKE.BRYANT

UTILITY NOTES:

1. WATER AND SANITARY SEWER WILL BE OWNED AND MAINTAINED BY THE TOWN OF APEX.
2. FIRE HYDRANTS, VALVES, SERVICES, METERS, AND APPURTENANCES SHALL BE DESIGNED PER THE TOWN OF APEX CONSTRUCTION SPECIFICATIONS AND SHALL BE SHOWN ON THE CONSTRUCTION PLANS.
3. ALL UTILITY EASEMENTS SHALL BE PROVIDED AS NECESSARY. DELINEATION WILL BE DETERMINED WITH FINAL DESIGN OF INTERNAL PUBLIC STREETS AT THE SUBDIVISION PLAN STAGE. MINIMUM UNDISTURBED BUFFER WIDTHS SHALL BE EXCLUSIVE OF UTILITY EASEMENTS UNLESS APPROVED BY THE DIRECTOR OF THE PUBLIC WORKS & UTILITIES DEPARTMENT.
4. THE DEVELOPER WILL ACTIVELY WORK WITH THE TOWN OF APEX TO PRESERVE EXISTING TREES ON SITE. THESE AREAS SHALL INCLUDE REQUIRED LANDSCAPE BUFFERS, RCA AREAS, NON-BUFFERED AND NON-RCA AREAS, AREAS OF PROPOSED UTILITY LINES, AND ADJACENT TO THE SUBJECT PROPERTY, TO THE MAXIMUM EXTENT POSSIBLE.
5. UTILITY LAYOUT FOR WATER AND SEWER IS CONCEPTUAL. FINAL DESIGN WILL BE DETERMINED AT THE SUBDIVISION PLAN STAGE.
6. IN NATURAL DRAINAGE WAYS, SEWER SHALL BE EXTENDED TO THE PROPERTY LINES TO READILY ENABLE FUTURE CONNECTIONS TO ADJOINING PROPERTY. SEWER DESIGN SHALL ACCOUNT FOR FUTURE UPSTREAM DEVELOPMENT BASED ON THE CURRENT LAND USE PLAN, AND SHALL INCLUDE EVALUATION OF EXISTING DOWNSTREAM SEWER CAPACITY.

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

MICHAEL BASS
SHERRIE BASS
DB 14367, PG 1240
LOT 3
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503445

ELIZABETH PERKINS
DB 14268, PG 331
LOT 1
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503152

APPROXIMATE LOCATION OF
EXISTING TOWN OF APEX WATERLINE

HASSE AVE
60' R/W

CRESCENT APEX, LLC
DB 17044, PG 924 RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 6
LINDEN SUBDIVISION
BM 2020, PG 1334
PIN No. 0722424038

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

EXISTING POND

SEE UTILITY NOTE 6

50' BUFFER

SEWER LINE

WATER LINE

40' UTILITY AND
PIPELINE EASEMENT
DB 14343, PG 2028

EXISTING 1% ANNUAL
FLOOD ZONE
(ZONE AE)

OLIVE CHAPEL ROAD
(SR 1160)
VARIABLE WIDTH R/W

APPROXIMATE LOCATION OF
EXISTING 12" TOWN OF APEX WATERLINE

EXISTING
WETLANDS

50' BUFFER

C/L OF STREAM

EXISTING POND

APPROXIMATE
100' BUFFER

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

PROPOSED CONNECTION
TO EXISTING MANHOLE

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

EXISTING
WETLANDS

RILEYS
POND DRIVE
50' R/W

FLOODWAY (OUT)

FLOODWAY (IN)

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 924
PIN No. 0722219077

TOWN OF APEX ELECTRIC
UTILITY EASEMENT
PER DB 13318, PG 1911

ROWBOAT ROAD
50' R/W

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 923
PIN No. 0722219077

WATER
TOWER LANE
50' R/W

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"FUTURE REC SITE"
SMITH FARM PUD, PH 1
BM 2018, PG 922 & 923
PIN No. 0722303175

SMITH FARMS OF APEX HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 1
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0721396648

SMITH FARMS OF APEX
HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 3
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0722309093

FARMHOUSE DRIVE
50' R/W

SMITH FARMS OF APEX
HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 2
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN NO. 0721397362

THASSOS DRIVE
50' R/W

GRAPHIC SCALE
100 0 50 100 200
1 inch = 100 ft.

PRELIMINARY
NOT APPROVED FOR
CONSTRUCTION

No.	Revision	Date	By

Designer: WR	Scale: 1" = 100'
Drawn By: WR	Date: 04/20/2021
Checked By: WR	Job No.: 02180517.20

HACKNEY

APEX WAKE COUNTY NORTH CAROLINA

CONCEPTUAL UTILITY PLAN

WithersRavenel
Engineers | Planners | Surveyors
115 MacKenan Drive | Cary, NC 27511 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

Sheet No. 3.0

K:\2018\02180517.20\Hackney Tract Apex\CADD\Drawing Sets\PD03.3 PRELIMINARY (UTILITY PLAN).dwg, Tuesday, April 20, 2021 4:25:15 PM, INGE.BRYANT

STORMWATER MANAGEMENT NOTES:

1. TOPOGRAPHIC AND UTILITY INFORMATION BASED ON AVAILABLE GIS MAPPING. PRELIMINARY BOUNDARY SURVEY PREPARED BY WITHERSRAVENEL.
2. WETLAND/STREAM INFORMATION BASED ON EVALUATION BY S&EC DATED 09/18/20.
3. REGULATORY FEMA MAPPED FLOODPLAINS EXIST ON SITE PER FIRM MAP #3720072200J (5/2/06).
4. THE SUBJECT PROPERTY IS LOCATED WITHIN THE TOWN OF APEX PRIMARY WATERSHED PROTECTION OVERLAY DISTRICT.
5. STORMWATER MANAGEMENT FACILITIES SHALL BE DESIGNED PER THE TOWN OF APEX STANDARDS AND REGULATIONS FOR STORMWATER QUANTITY AND QUALITY (UDO SECTION 6.1.7 B).
6. ALL APPLICABLE LOCAL AND STATE ENVIRONMENTAL PERMITS SHALL BE OBTAINED PRIOR TO START OF CONSTRUCTION.
7. STORMWATER TREATMENT WILL BE HANDLED BY INDIVIDUAL OR REGIONAL FACILITIES WITHIN THE SUBJECT PROPERTY OR ADJACENT OFF-SITE DRAINAGE EASEMENT.
8. THE POST DEVELOPMENT PEAK FLOW RATE OF ON-SITE STORMWATER WILL NOT EXCEED THE PRE-DEVELOPMENT PEAK FLOW RATE IN ACCORDANCE WITH THE UDO.

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

MICHAEL BASS
SHERRIE BASS
DB 14367, PG 1240
LOT 3
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503445

ELIZABETH PERKINS
DB 14268, PG 331
LOT 1
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503152

HASSE AVE
60' R/W

CRESCENT APEX, LLC
DB 17044, PG 924 RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 6
LINDEN SUBDIVISION
BM 2020, PG 1334
PIN No. 0722424038

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

EXISTING POND

50' BUFFER

40' UTILITY AND
PIPELINE EASEMENT
DB 14343, PG 2028

SCM #2

EXISTING 1% ANNUAL
FLOOD ZONE
(ZONE AE)

EXISTING
WETLANDS

50' BUFFER

C/L OF STREAM

SCM #3

EXISTING POND

APPROXIMATE
100' BUFFER

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

EXISTING
WETLANDS

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

FLOODWAY (OUT)

(N)

FLOODWAY (OUT)

(N)

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 924
PIN No. 0722219077

SCM #1

ROWBOAT ROAD
50' R/W

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 923
PIN No. 0722219077

WATER
TOWER LANE
50' R/W

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"FUTURE REC SITE"
SMITH FARM PUD, PH 1
BM 2018, PG 922 & 923
PIN No. 0722303175

SMITH FARMS OF APEX HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 1
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0721396648

SMITH FARMS OF APEX
HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 3
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0722309093

FARMHOUSE DRIVE
50' R/W

SMITH FARMS OF APEX
HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 2
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN NO. 0721397362

THASSOS DRIVE
50' R/W

OLIVE CHAPEL ROAD
(SR 1160)
VARIABLE WIDTH R/W

RILEYS
POND DRIVE
50' R/W

GRAPHIC SCALE
100 0 50 100 200
1 inch = 100 ft.

PRELIMINARY
NOT APPROVED FOR
CONSTRUCTION

No.	Revision	Date	By

Designer: WR	Scale: 1" = 100'
Drawn By: WR	Date: 02/26/2021
Checked By: WR	Job No.: 02180517.20

HACKNEY

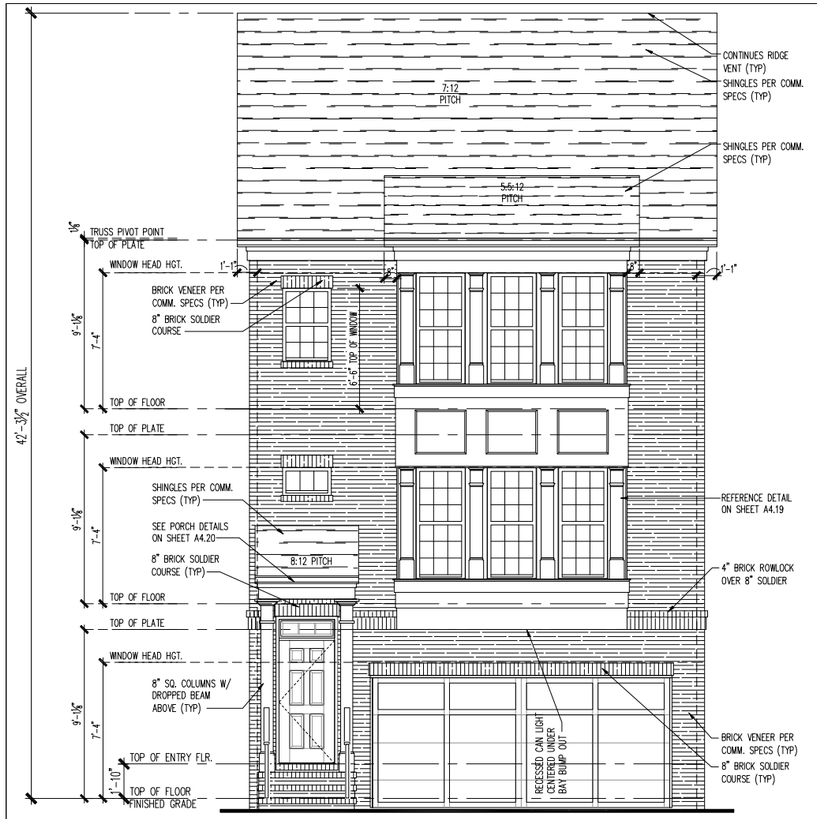
APEX WAKE COUNTY NORTH CAROLINA

CONCEPTUAL STORMWATER MANAGEMENT PLAN

WithersRavenel
Engineers | Planners | Surveyors
115 MacKenan Drive | Cary, NC 27511 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

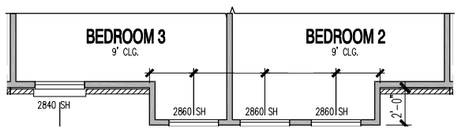
Sheet No. 4.0

K:\180\02180517.20\Hackney Tract\Apex\CAD\Drawing Sets\PUD\4.0 STORMWATER MANAGEMENT PLAN.dwg Friday, February 26, 2021 10:32:15 AM JNGE, BRYANT



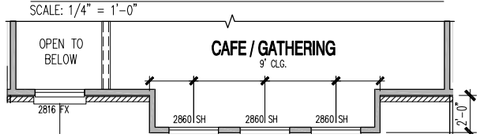
ELEVATION 64

SCALE: 1/4" = 1'-0"



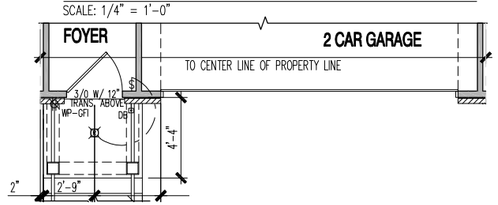
THIRD FLOOR PLAN

SCALE: 1/4" = 1'-0"



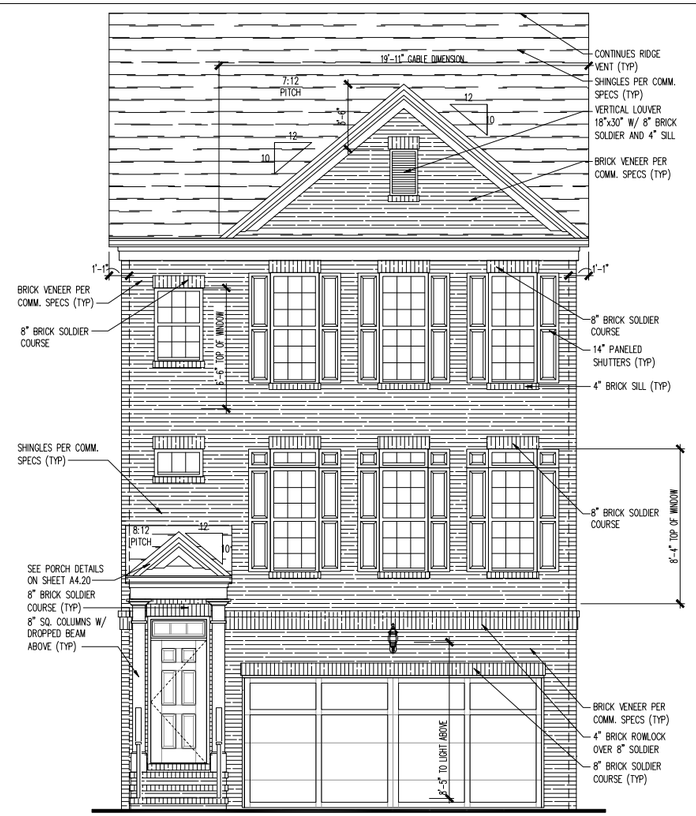
SECOND FLOOR PLAN

SCALE: 1/4" = 1'-0"



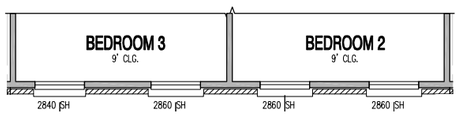
FIRST FLOOR PLAN

SCALE: 1/4" = 1'-0"



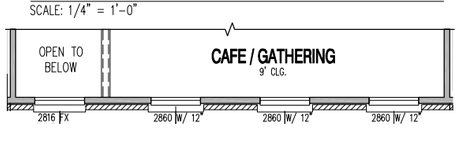
ELEVATION 65

SCALE: 1/4" = 1'-0"



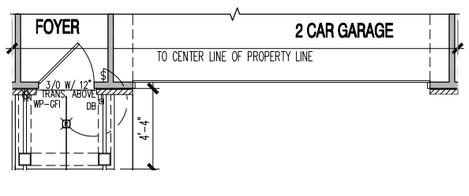
THIRD FLOOR PLAN

SCALE: 1/4" = 1'-0"



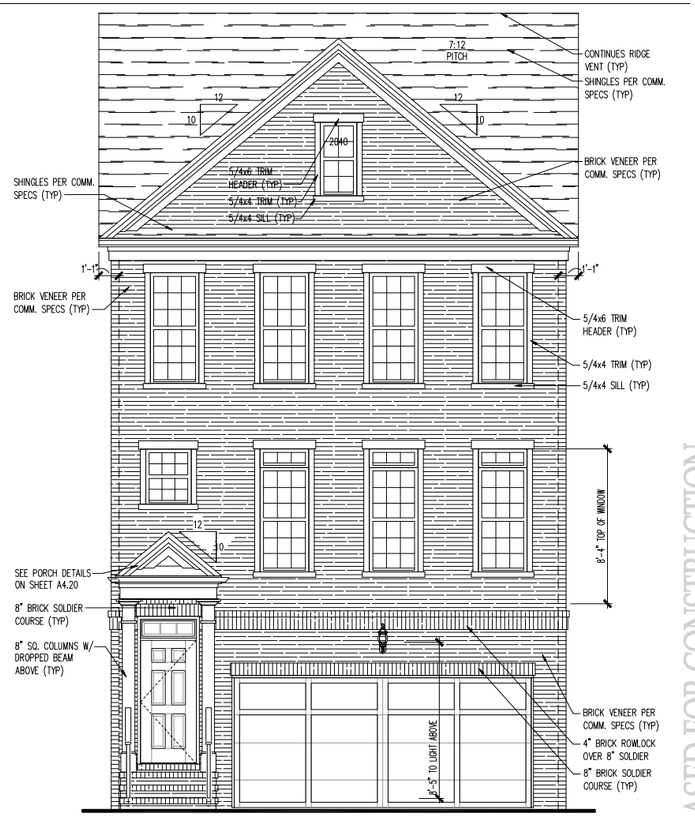
SECOND FLOOR PLAN

SCALE: 1/4" = 1'-0"



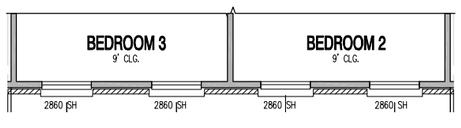
FIRST FLOOR PLAN

SCALE: 1/4" = 1'-0"



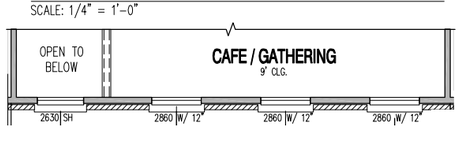
ELEVATION 66

SCALE: 1/4" = 1'-0"



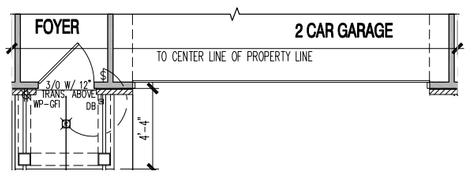
THIRD FLOOR PLAN

SCALE: 1/4" = 1'-0"



SECOND FLOOR PLAN

SCALE: 1/4" = 1'-0"



FIRST FLOOR PLAN

SCALE: 1/4" = 1'-0"

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Southeast Zone
2475 Northwinds Pkwy. Suite 600
Alpharetta, GA 30009 (770) 381-3450

Pulte Homes

RELEASED FOR CONSTRUCTION

Building Elevations
& Floor Plan Partials
Units 64, 65 & 66

PRODUCTION MANAGER
Dan Kostka
INITIAL RELEASE DATE:
12-08-2015
CURRENT RELEASE DATE:
12-08-2015

REV #	DATE / DESCRIPTION
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

GARAGE HANDING
FL-GE-ME-KC-KR

PLAN NAME
Summerford & Hutton

NPC PLAN NUMBER
2468.928 - 2468.929

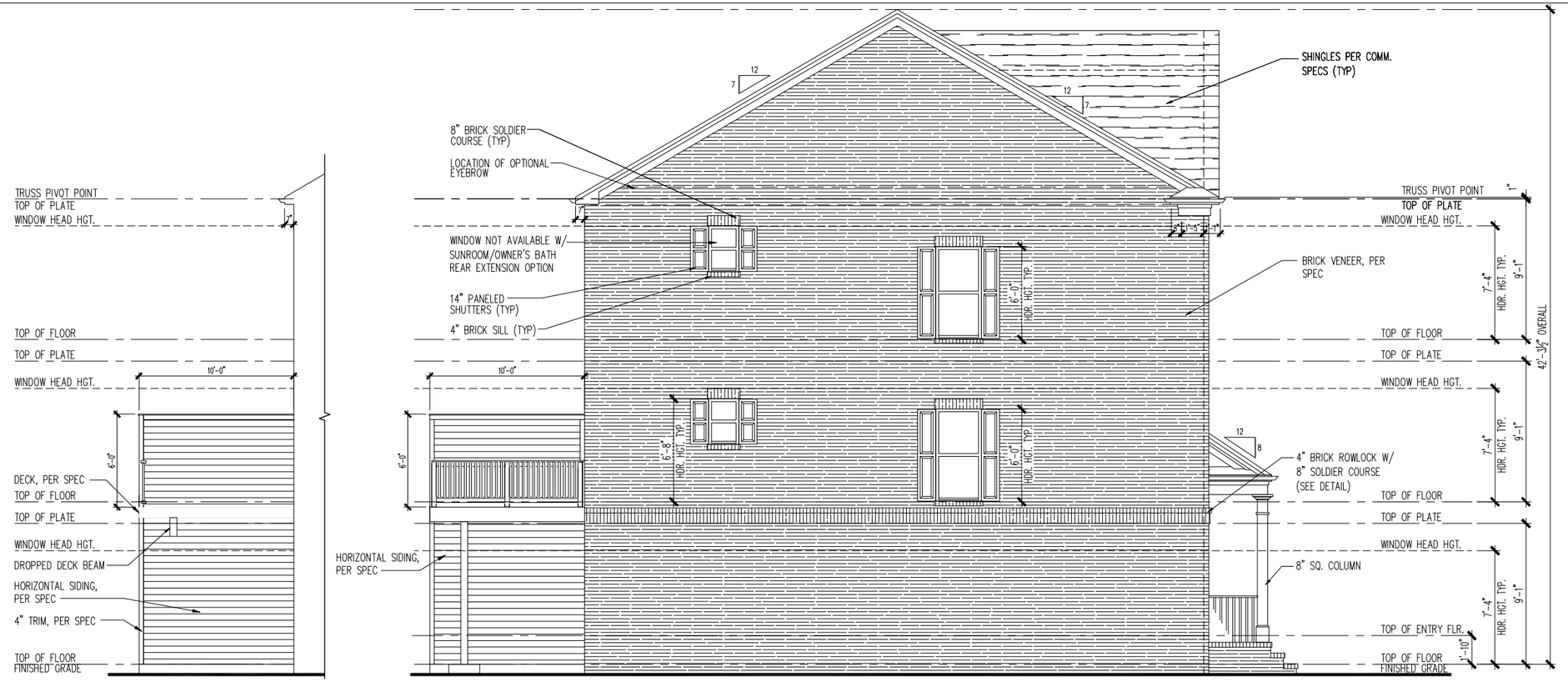
LAWSON PLAN ID
—

SHEET
A.3.27

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS – 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: April 17, 2017 / Samantha Powell / 24-FL-ELEVS.DWG

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.

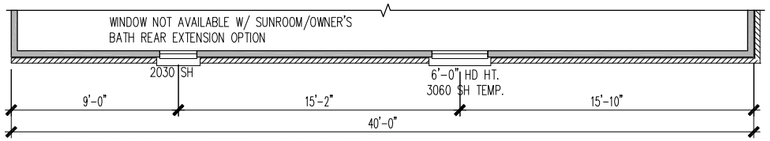


LEFT ELEVATION "61- 70"

SCALE: 3/16" = 1'-0"

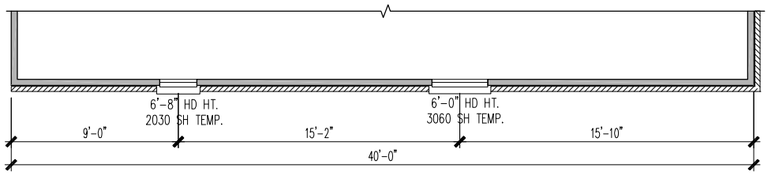
LEFT ELEVATION - DECK 3 OPTION - MIDDLE CONDITION

SCALE: 3/16" = 1'-0" SEE BUILDING CONTROL PLANS FOR MORE INFORMATION



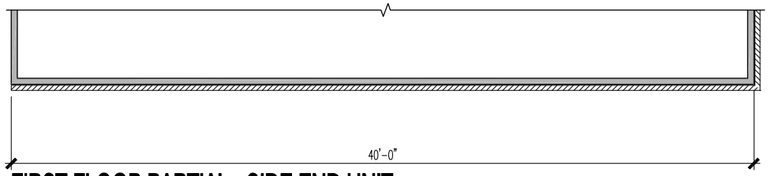
THIRD FLOOR PARTIAL - SIDE END UNIT

SCALE: 3/16" = 1'-0"



SECOND FLOOR PARTIAL - SIDE END UNIT

SCALE: 3/16" = 1'-0"



FIRST FLOOR PARTIAL - SIDE END UNIT

SCALE: 3/16" = 1'-0"

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.

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Southeast Zone
2475 Northwinds Pkwy. Suite 600
Alpharetta, GA 30009 (770) 381-3450

Pulte Homes

RELEASED FOR CONSTRUCTION

Left Elevations 61-70 & Floor Plan Partials

PRODUCTION MANAGER
Dan Kostka
INITIAL RELEASE DATE:
12-08-2015
CURRENT RELEASE DATE:
12-08-2015

REV # | DATE / DESCRIPTION

GARAGE HANDING
FL-GF-ME-KC-KR

PLAN NAME
Summerford & Hutton

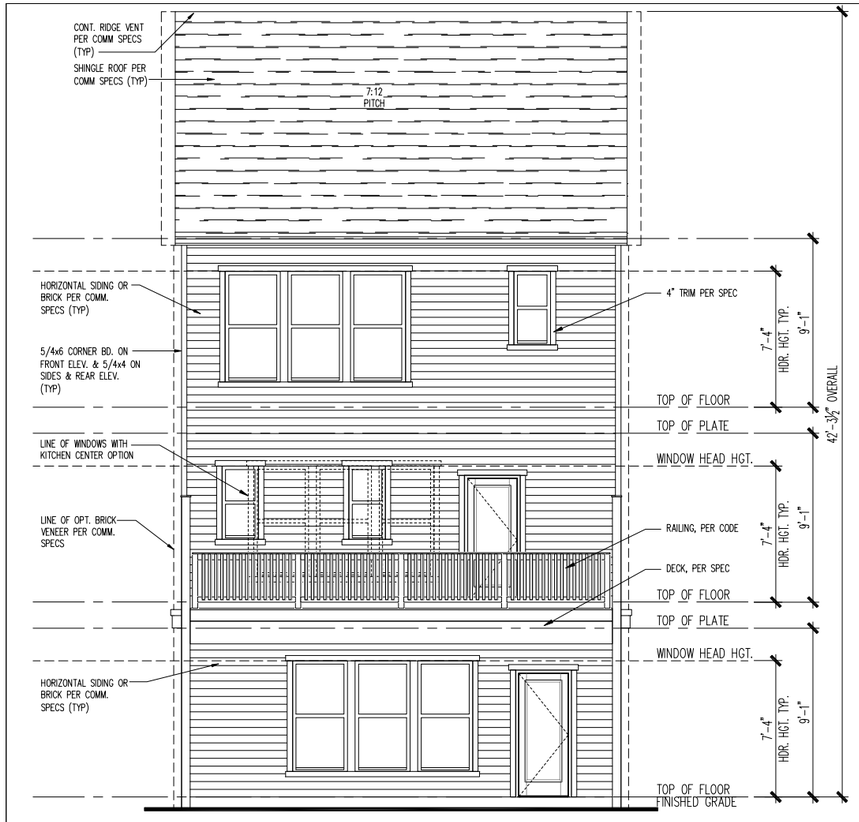
NPC PLAN NUMBER
2468.928 - 2468.929

LAWSON PLAN ID

SHEET
A.3.30S

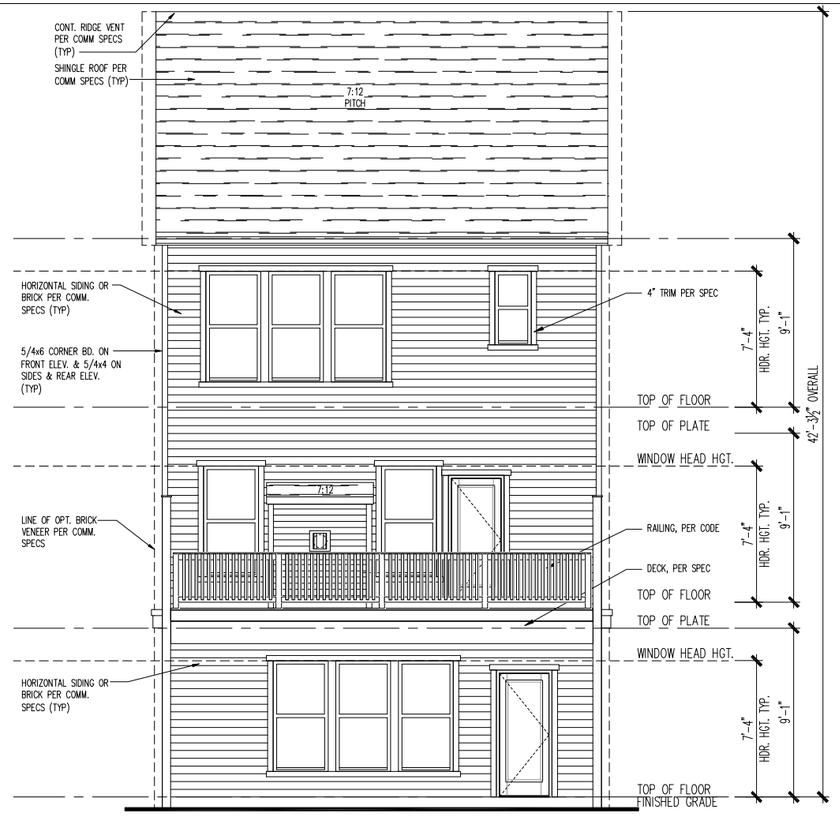
NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: April 17, 2017 / Samantha Powell / 24-FL-ELEVS.DWG



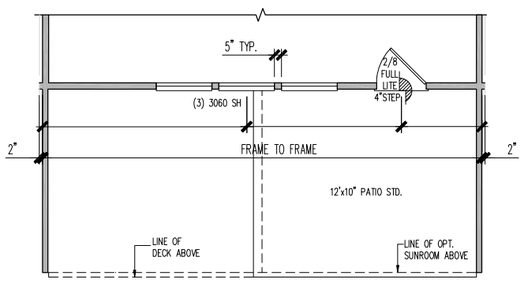
REAR ELEVATION

SCALE: 1/4" = 1'-0"



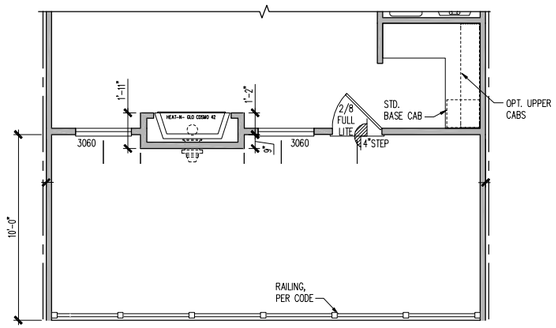
REAR ELEVATION - FIREPLACE OPTION w/ DECK 3

SCALE: 1/4" = 1'-0"



FIRST FLOOR PLAN

SCALE: 1/4" = 1'-0"



FIREPLACE OPTION AT GATHERING ROOM w/ DECK 3

SCALE: 1/4" = 1'-0"

SEE BASE PLANS FOR INFORMATION NOT SHOWN

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.

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Southeast Zone
2475 Northwinds Pkwy. Suite 600
Alpharetta, GA 30009 (770) 381-3450

Pulte Homes

RELEASED FOR CONSTRUCTION

Rear Elevations

PRODUCTION MANAGER
Dan Kostka
INITIAL RELEASE DATE:
12-08-2015
CURRENT RELEASE DATE:
12-08-2015

REV #	DATE / DESCRIPTION
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

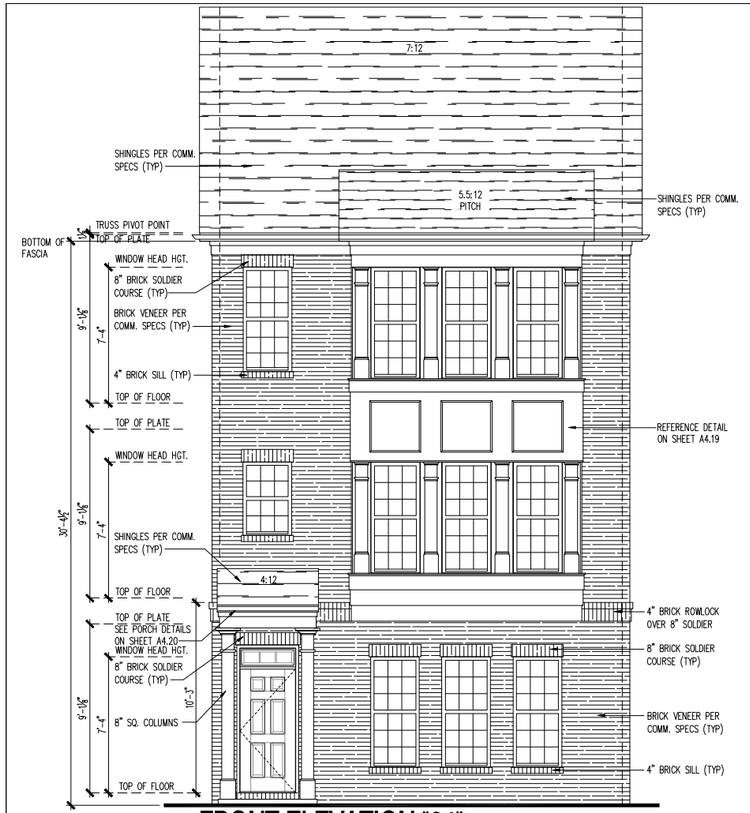
GARAGE HANDING
FL-GE-ME-KC-KR

PLAN NAME
Summerford & Hutton
NPC PLAN NUMBER
2468.928 - 2468.929
LAWSON PLAN ID

SHEET
A.3.60

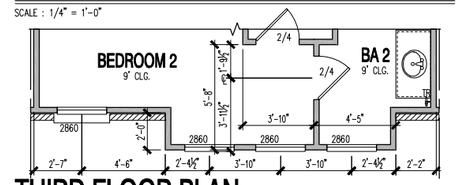
NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: April 17, 2017 / Samantha Powell / 24-FL-ELEVS.DWG



FRONT ELEVATION "64"

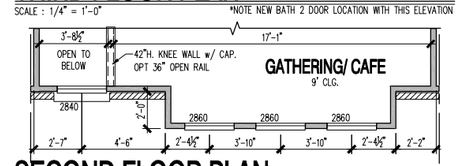
SCALE : 1/4" = 1'-0"



THIRD FLOOR PLAN

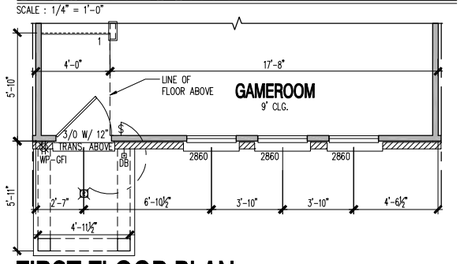
SCALE : 1/4" = 1'-0"

*NOTE NEW BATH 2 DOOR LOCATION WITH THIS ELEVATION



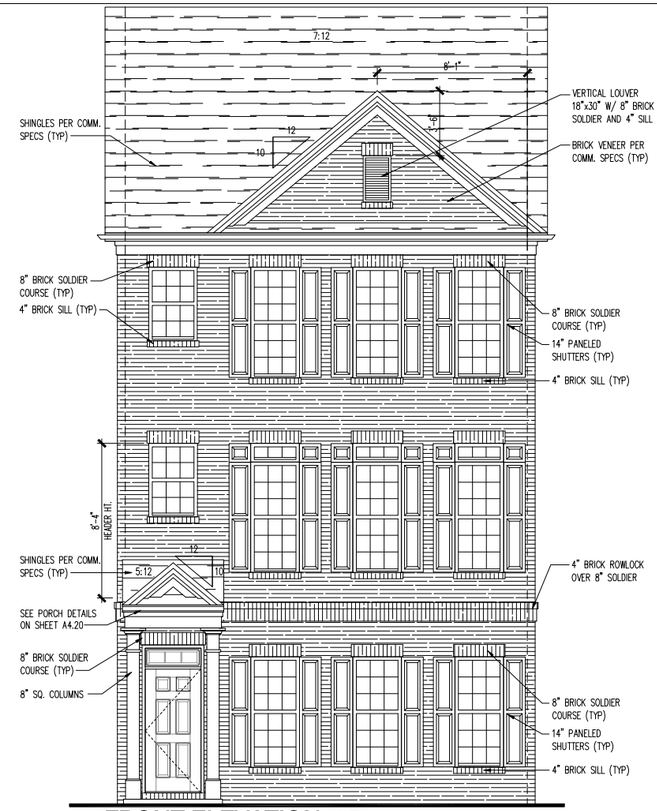
SECOND FLOOR PLAN

SCALE : 1/4" = 1'-0"



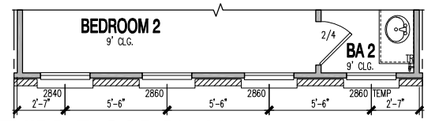
FIRST FLOOR PLAN

SCALE : 1/4" = 1'-0"



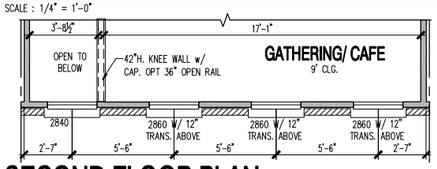
FRONT ELEVATION "65"

SCALE : 1/4" = 1'-0"



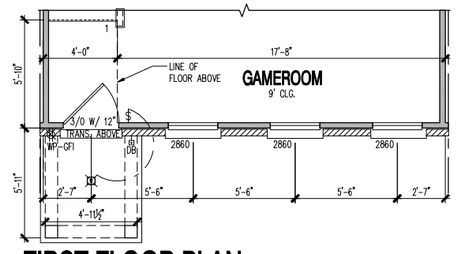
THIRD FLOOR PLAN

SCALE : 1/4" = 1'-0"



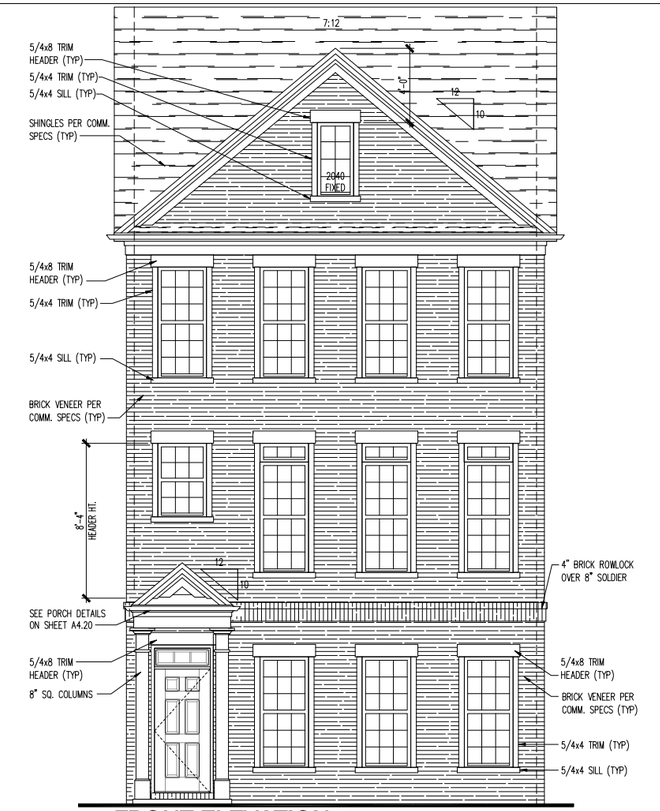
SECOND FLOOR PLAN

SCALE : 1/4" = 1'-0"



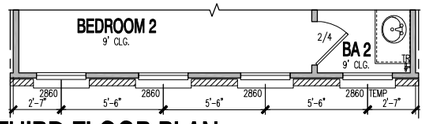
FIRST FLOOR PLAN

SCALE : 1/4" = 1'-0"



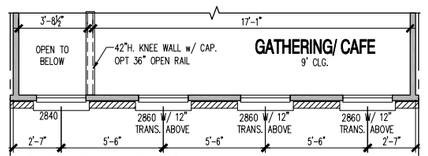
FRONT ELEVATION "66"

SCALE : 1/4" = 1'-0"



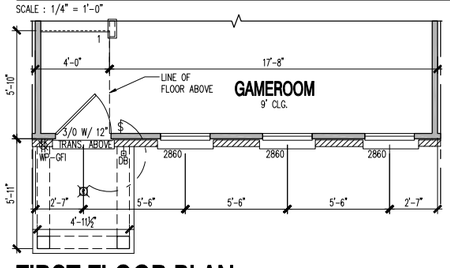
THIRD FLOOR PLAN

SCALE : 1/4" = 1'-0"



SECOND FLOOR PLAN

SCALE : 1/4" = 1'-0"



FIRST FLOOR PLAN

SCALE : 1/4" = 1'-0"

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.

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Southeast Zone
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Alpharetta, GA 30009 (770) 381-3450

Pulte Homes

Building Elevations 64 - 66
& Floor Plan Partials

PRODUCTION MANAGER
Dan Kostka
INITIAL RELEASE DATE:
12-08-2015
CURRENT RELEASE DATE:
1-29-2016

REV #	DATE / DESCRIPTION
1	-
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-
10	-

GARAGE HANDING
RL-ME-KC-KR

PLAN NAME
Hayward / Briarcliff

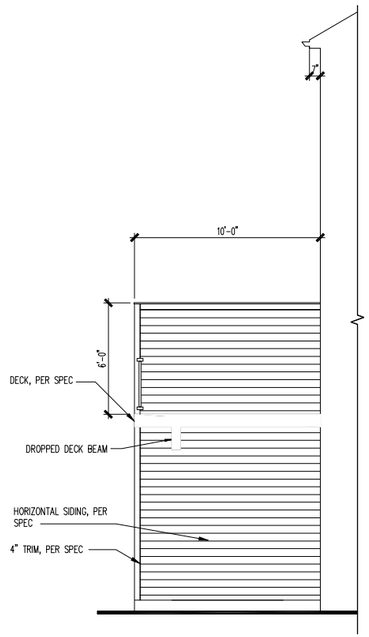
NPC PLAN NUMBER
2466.237 - 2466.238

LAWSON PLAN ID
—

SHEET
A.3.15

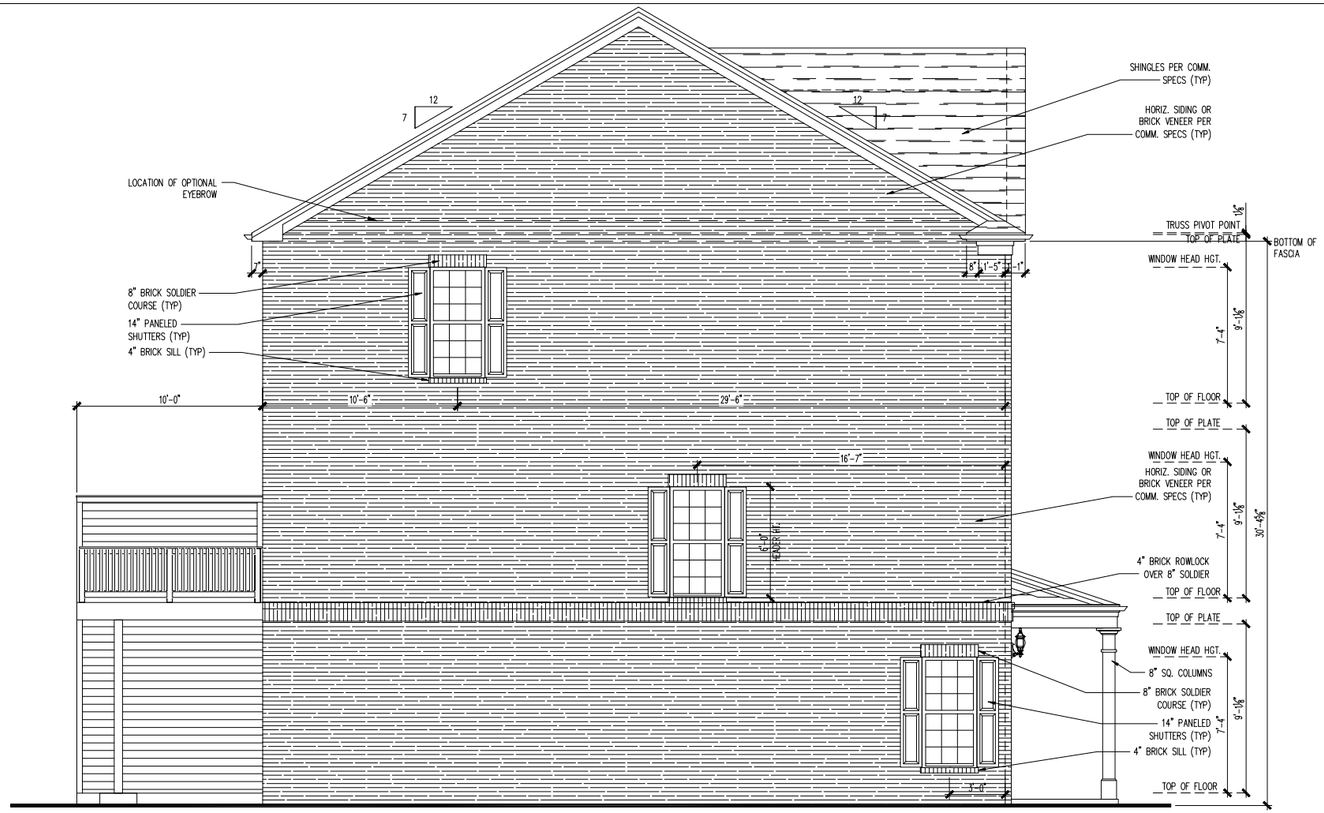
NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: February 24, 2017 / Samantha Powell / 22-RL-ELEVS_TRADITIONAL.DWG



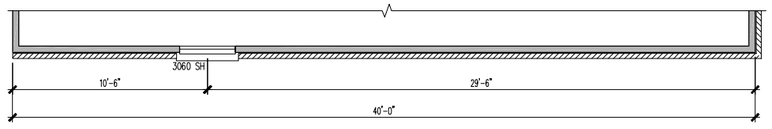
REAR DECK MIDDLE CONDITION

SCALE : 1/4" = 1'-0"



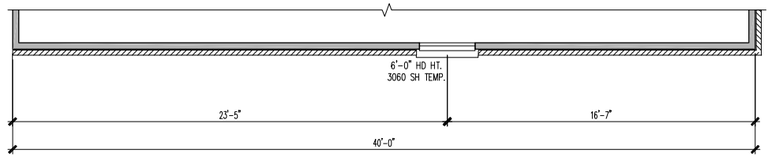
LEFT ELEVATION "61-70"

SCALE : 1/4" = 1'-0"



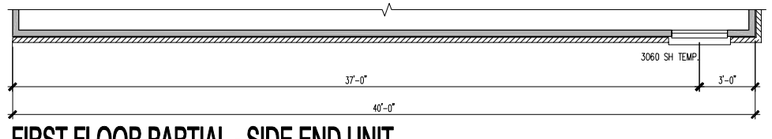
THIRD FLOOR PARTIAL - SIDE END UNIT

SCALE: 1/4" = 1'-0"



SECOND FLOOR PARTIAL - SIDE END UNIT

SCALE: 1/4" = 1'-0"



FIRST FLOOR PARTIAL - SIDE END UNIT

SCALE: 1/4" = 1'-0"

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.

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Pulte Homes

Left Elevations 61-70

PRODUCTION MANAGER
Dan Kostka
INITIAL RELEASE DATE:
12-08-2015
CURRENT RELEASE DATE:
1-29-2016

REV #	DATE / DESCRIPTION

GARAGE HANDING
RL-ME-KC-KR

PLAN NAME
Hayward / Briarcliff

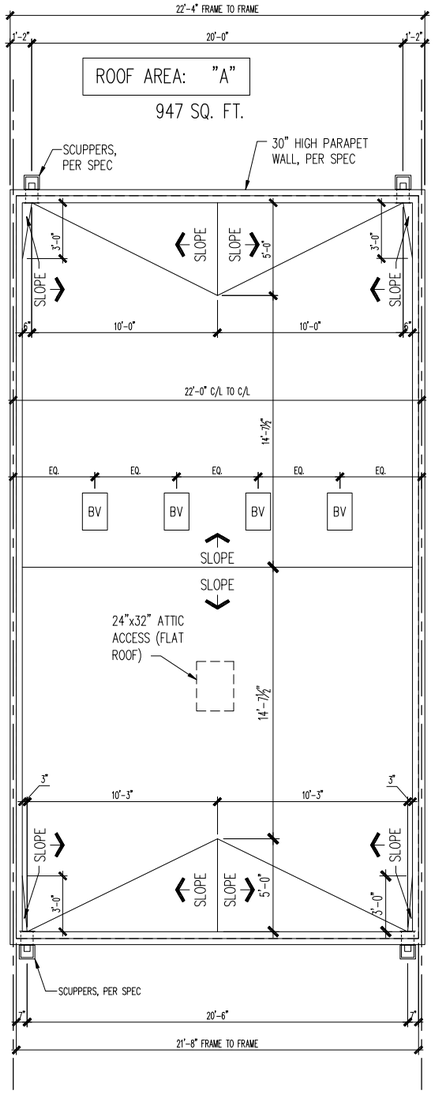
NPC PLAN NUMBER
2466.237 - 2466.238

LAWSON PLAN ID

SHEET
A.3.19

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: February 24, 2017 / Samantha Powell / 22-RL-ELEVS_TRADITIONAL.DWG



ROOF PLAN

SCALE: 1/4" = 1'-0"

ATTIC VENTILATION : (300 SQ FT ATTIC SPACE / 1 SQ FT VENTILATION)
W/ 40%-50% REQ. VENTS GREATER THAN OR EQUAL TO 3' ABOVE EAVE / CORNICE VENTS PER IRC R806.2

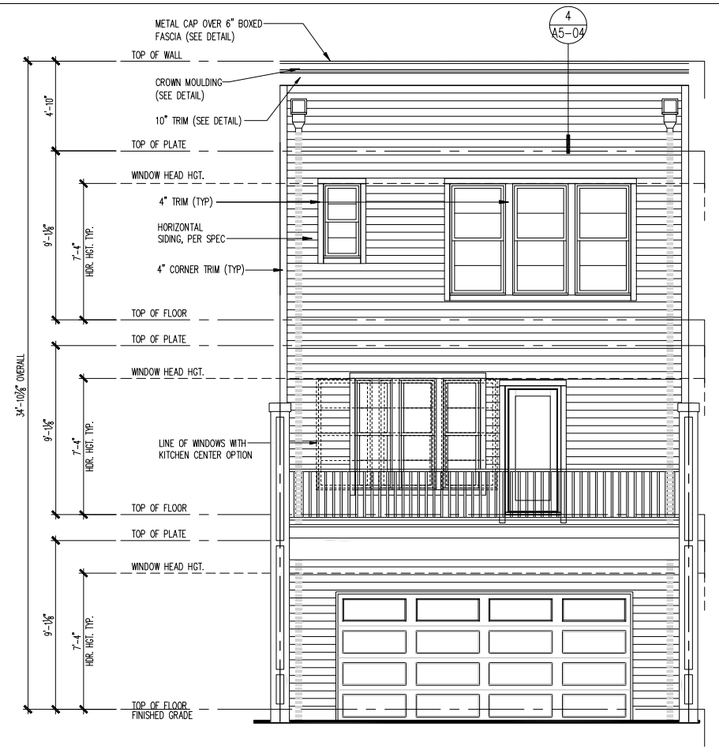
ELEVATION "2" 866 SQ FT UNDER ROOF ATTIC /
300 SQ FT / 1 SQ FT = 2.89 SQ FT VENTILATION

RIDGE VENT 18 SQ IN = (.125 SQ FT)
BOX VENT 50 SQ IN = (.3472 SQ FT)
SOFFIT VENT 9 SQ IN = (.0625 SQ FT)

2.89 SQ FT x 50 % = 1.443SQ FT RIDGE, 2.89 SQ FT x 50 % = 1.443 SQ FT SOFFIT

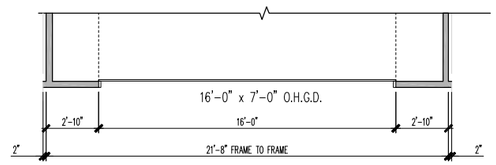
RIDGE VENT	OR W/ HIP, BOX VENT
1.443 SQ FT = 11.5 FEET OF RIDGE VENT	1.443 SQ FT = 4.2 BOX VENT(S)
0.125 SQ FT	0.3472SQ FT
SOFFIT VENT	
1.443 SQ FT = 23.1 FEET OF SOFFIT VENT	
0.0625SQ FT	

*CALCULATIONS REFLECT 50 % RIDGE AND 50 % SOFFIT VENTS ALLOWABLE PER SECTION IRC R806.2



REAR ELEVATION

SCALE: 1/4" = 1'-0"



FIRST FLOOR PLAN

SCALE: 1/4" = 1'-0"

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Pulte Homes

Rear Elevation 21-25 & Roof Plan

PRODUCTION MANAGER
Dan Kostka
INITIAL RELEASE DATE:
12-08-2015
CURRENT RELEASE DATE:
1-29-2016

REV #	DATE	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

GARAGE HANDING
RL-MIR-KC-KR

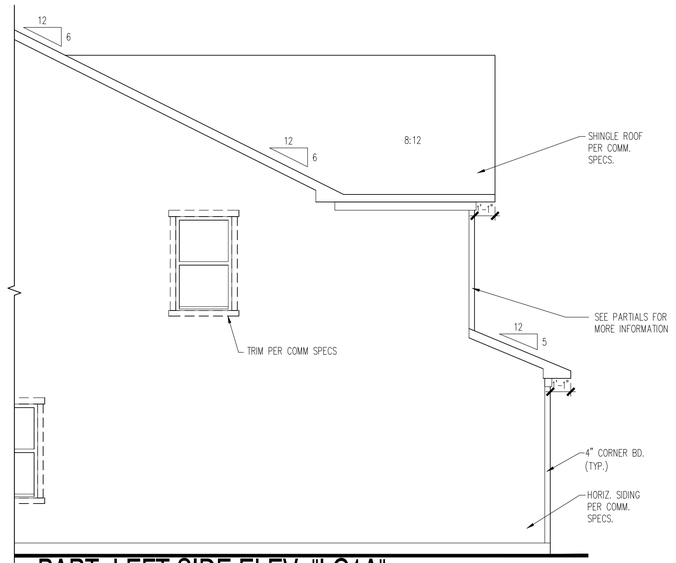
PLAN NAME
Hayward/ Briarcliff
NPC PLAN NUMBER
2466.237 - 2466.238
LAWSON PLAN ID
—

SHEET
A.3.20

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS — 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: February 24, 2017 / Samantha Powell / 22-RL-ELEVS_URBANJOWG

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.

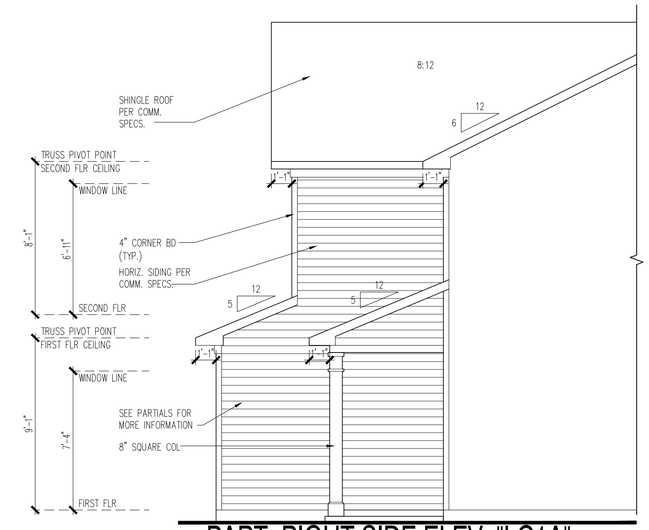


PART. LEFT SIDE ELEV. "LC1A"

SCALE : 1/4" = 1'-0"

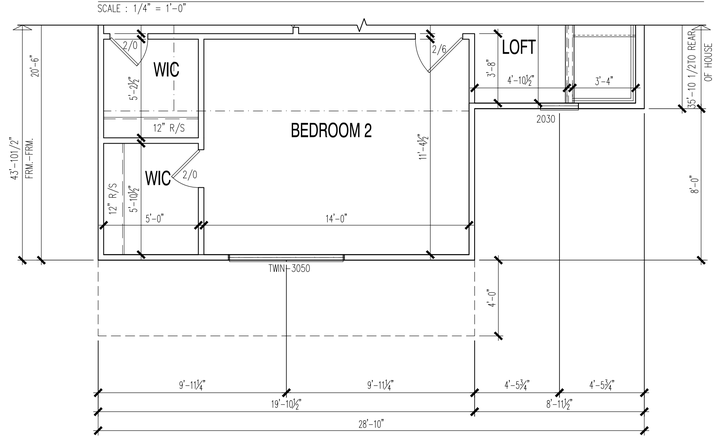
FRONT ELEVATION "LC1A" FRONT ENTRY GARAGE

SCALE : 1/4" = 1'-0"



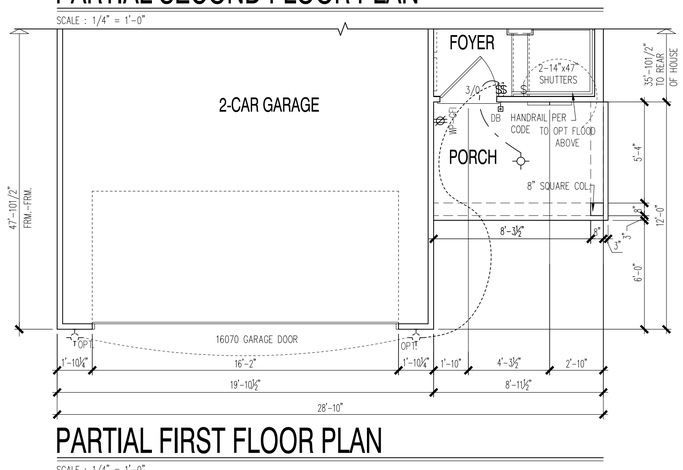
PART. RIGHT SIDE ELEV. "LC1A"

SCALE : 1/4" = 1'-0"



PARTIAL SECOND FLOOR PLAN

SCALE : 1/4" = 1'-0"



PARTIAL FIRST FLOOR PLAN

SCALE : 1/4" = 1'-0"

NOTE:
ADD 1X4 WINDBORNE DEBRIS TRIM AROUND ALL WINDOWS PER COMM SPEC

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.

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PulteGroup

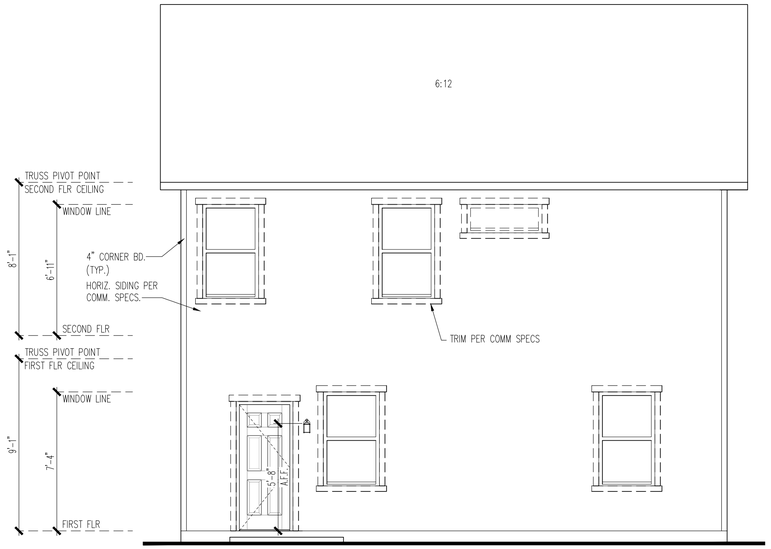
The HARRIS
FRONT ELEVATION "LC1A"
FRONT ENTRY GARAGE

PRODUCT MANAGER
INITIAL RELEASE DATE: 00/00/0000

REV#	DATE/DESCRIPTION
1	----
2	----
3	----
4	----
5	----
6	----
7	----
8	----
9	----
10	----

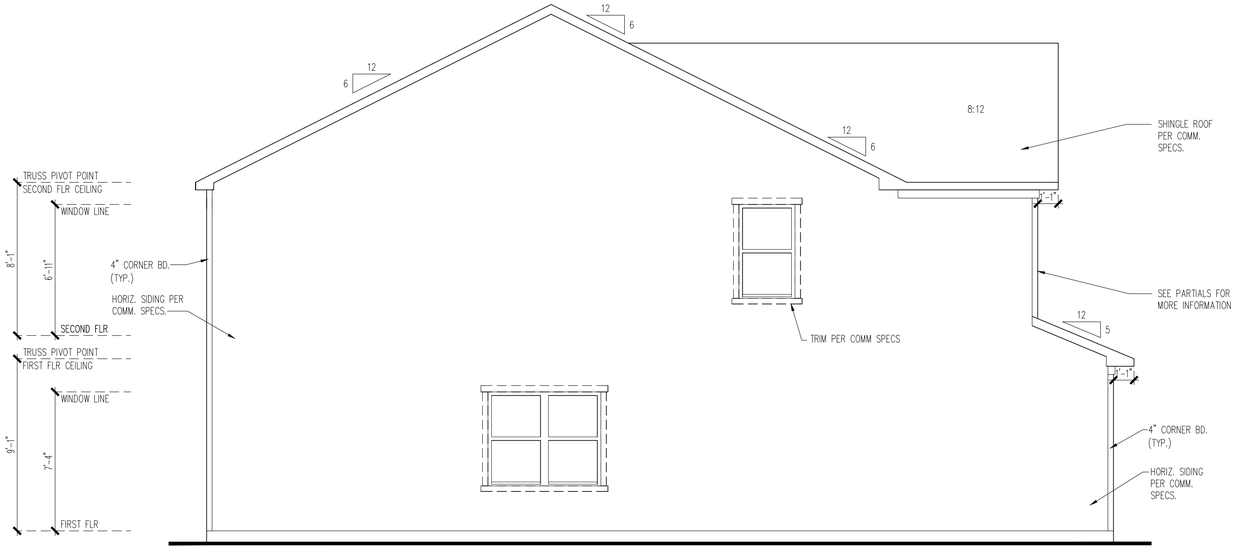
PROJECT TYPE: Single Family
SPECIFICATION LEVEL: Pulte
PLAN NAME: Harris
NPC NUMBER: 8126.200
SHEET: 3.10

PLOTTED: November 18, 2019 / tmcdowell / 3.10 FRONT ELEVATION LC1A.dwg



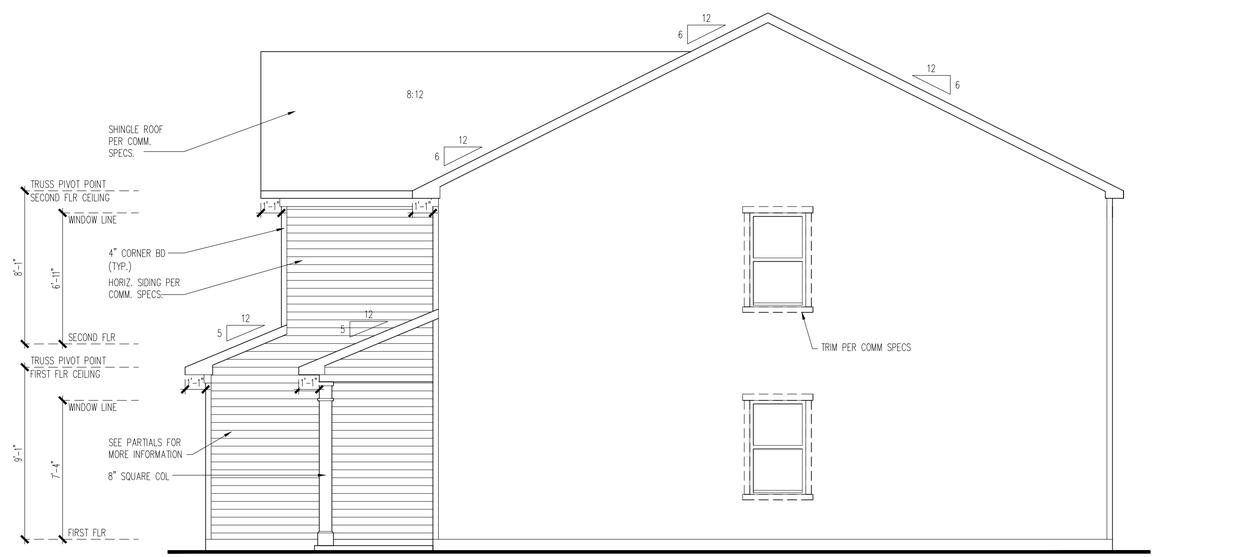
REAR ELEVATION "LC2A" FRONT ENTRY GARAGE

SCALE : 1/4" = 1'-0"



LEFT SIDE ELEVATION "LC2A" FRONT ENTRY GARAGE

SCALE : 1/4" = 1'-0"



RIGHT SIDE ELEVATION "LC2A" FRONT ENTRY GARAGE

SCALE : 1/4" = 1'-0"

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PulteGroup

The HARRIS
SIDE AND REAR ELEVATION "LC2A"
FRONT ENTRY GARAGE

PRODUCT MANAGER
INITIAL RELEASE
DATE: 00/00/0000

REV#	DATE/DESCRIPTION
1	---- ----
2	---- ----
3	---- ----
4	---- ----
5	---- ----
6	---- ----
7	---- ----
8	---- ----
9	---- ----
10	---- ----

PROJECT TYPE
Single Family

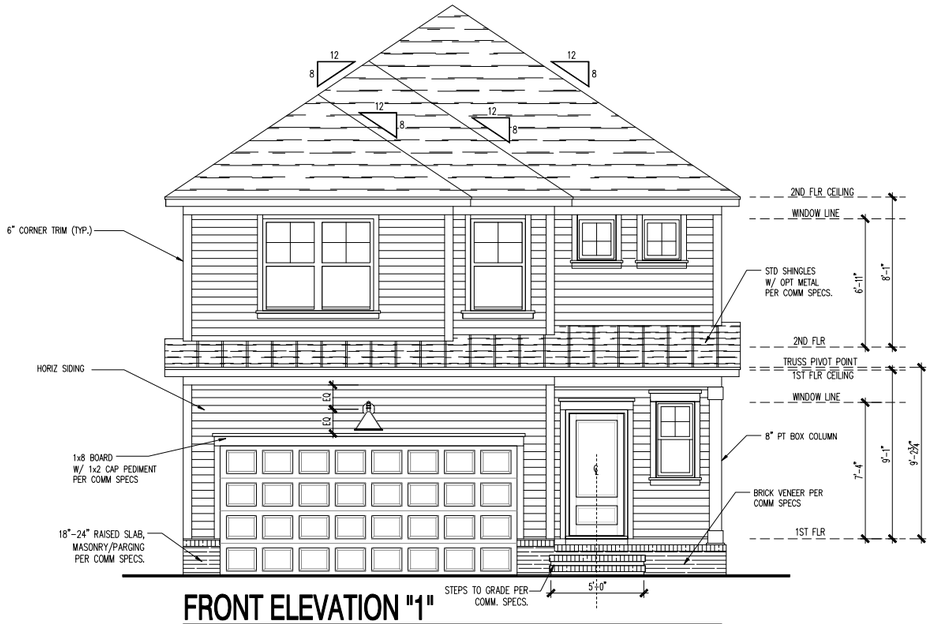
SPECIFICATION LEVEL
Pulte

PLAN NAME
Harris
NPC NUMBER
8126.200

SHEET
3.SR.3

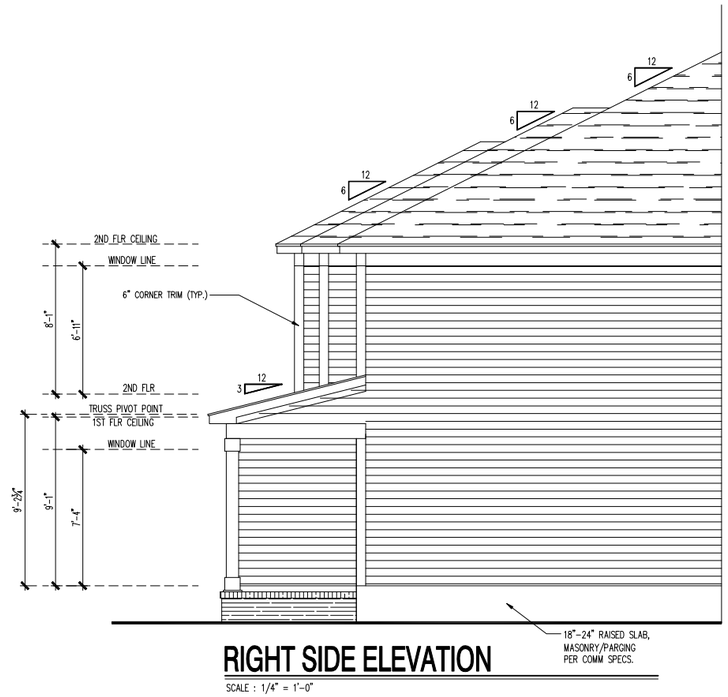
PLOTTED: November 18, 2019 / Kiki / 3.SR.3 SIDE AND REAR ELEVATIONS LC2A.dwg

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.



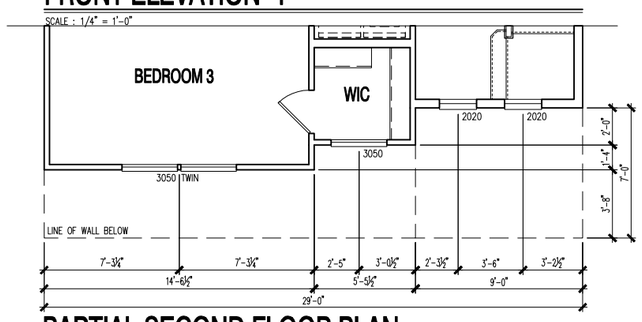
FRONT ELEVATION "1"

SCALE : 1/4" = 1'-0"



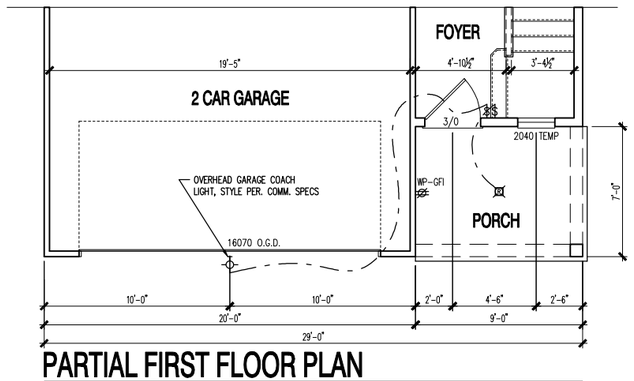
RIGHT SIDE ELEVATION

SCALE : 1/4" = 1'-0"



PARTIAL SECOND FLOOR PLAN

SCALE : 1/4" = 1'-0"



PARTIAL FIRST FLOOR PLAN

SCALE : 1/4" = 1'-0"

ATTIC VENTILATION : (300 SQ FT ATTIC SPACE / 1 SQ FT VENTILATION)
W/ 40%-50% REQ. VENTS GREATER THAN OR EQUAL TO 3' ABOVE
EAVE / CORNICE VENTS PER IRC R806.2

MORRISON ELEV 1 1095 SQ FT UNDER ROOF ATTIC /
300 SQ FT / 1 SQ FT = 3.65 SQ FT VENTILATION

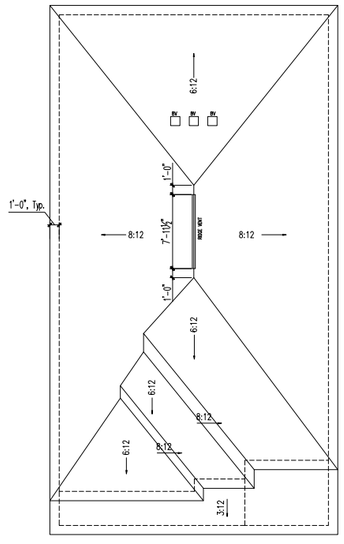
RIDGE VENT 18 SQ IN = (.125 SQ FT)
BOX VENT 50 SQ IN = (.3472 SQ FT)
SOFFIT VENT 9 SQ IN = (.0625 SQ FT)

3.65 SQ FT x 50 % = 1.825 SQ FT RIDGE, 3.65 SQ FT x 50 % = 1.825 SQ FT SOFFIT

RIDGE VENT	OR W/ HIP, BOX VENT
1.825 SQ FT = 14.6 FEET OF RIDGE VENT	1.825 SQ FT = 5.3 BOX VENT(S)
0.125 SQ FT	0.3472 SQ FT

SOFFIT VENT
1.825 SQ FT = 29.2 FEET OF SOFFIT VENT
0.06255 SQ FT

*CALCULATIONS REFLECT 50 % RIDGE AND 50 % SOFFIT VENTS ALLOWABLE PER SECTION IRC R806.2



ROOF PLAN

SCALE : 1/8" = 1'-0"

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Alpharetta, GA 30009 (770) 381-3450

Pulte Homes

The MORRISON
FRONT ELEVATION "1"

PRODUCTION MANAGER
ACKLEY
CURRENT RELEASE DATE: 7-30-17

REV #	DATE / DESCRIPTION
1	6-21-18
2	1-8-19

PROJECT TYPE
SINGLE FAMILY

COMMUNITY NAME
SOUTHEAST AREA SET
LAWSON COMMUNITY ID
-

GARAGE HANDING

SPECIFICATION LEVEL
P1, P2

PLAN NAME
MORRISON
NPC PLAN NUMBER
-
LAWSON PLAN ID

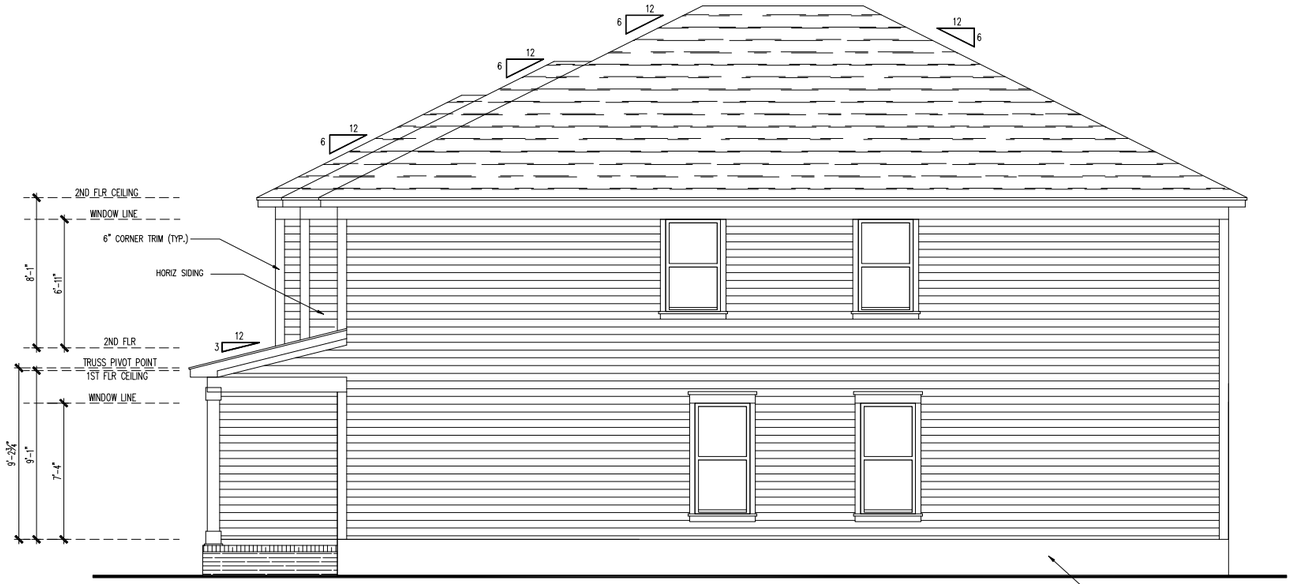
LEGACY PLAN NUMBER / NAME
same as current

SHEET
3.1

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: August 2, 2019 / Paul Howard / MORRISON ELEVATIONS - LEFT.DWG

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.

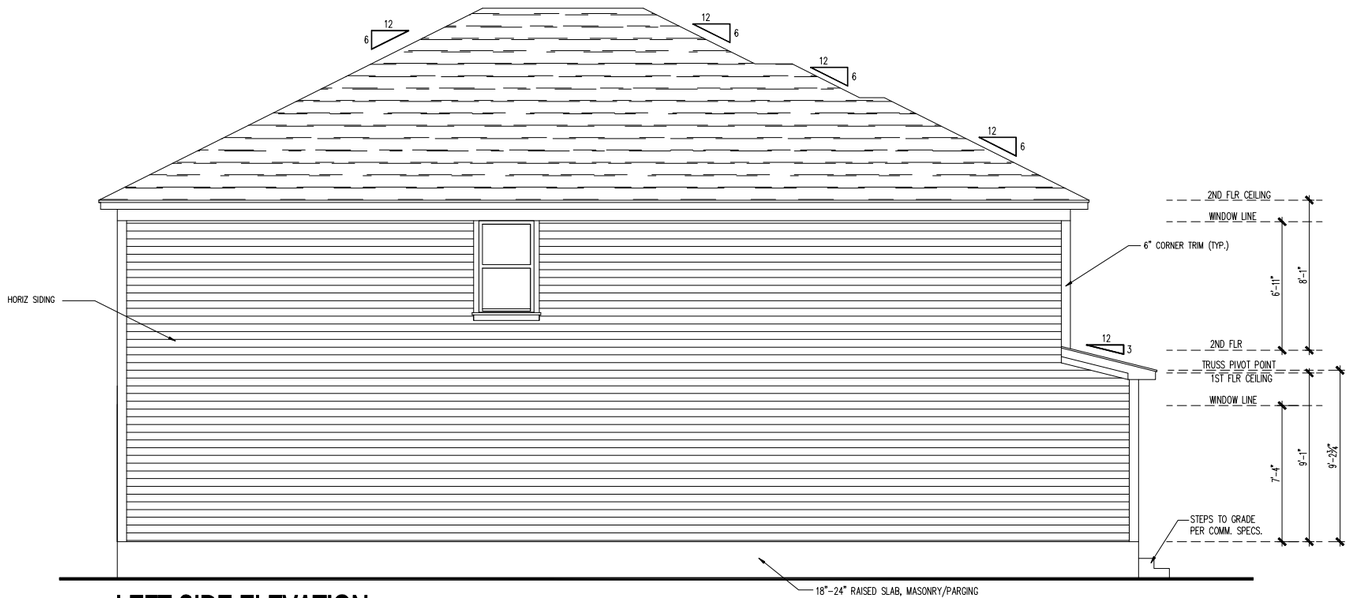


RIGHT SIDE ELEVATION

SCALE : 1/4" = 1'-0"

REAR ELEVATION

SCALE : 1/4" = 1'-0"



LEFT SIDE ELEVATION

SCALE : 1/4" = 1'-0"

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Pulte Homes

The MORRISON
SIDE / REAR ELEVATIONS

PRODUCTION MANAGER
ACKLEY
CURRENT RELEASE DATE: 7-30-17

REV #	DATE / DESCRIPTION
1	6-21-18
2	1-8-19

PROJECT TYPE
SINGLE FAMILY

COMMUNITY NAME
SOUTHEAST AREA SET
LAWSON COMMUNITY ID
--

GARAGE HANDING

SPECIFICATION LEVEL
P1, P2

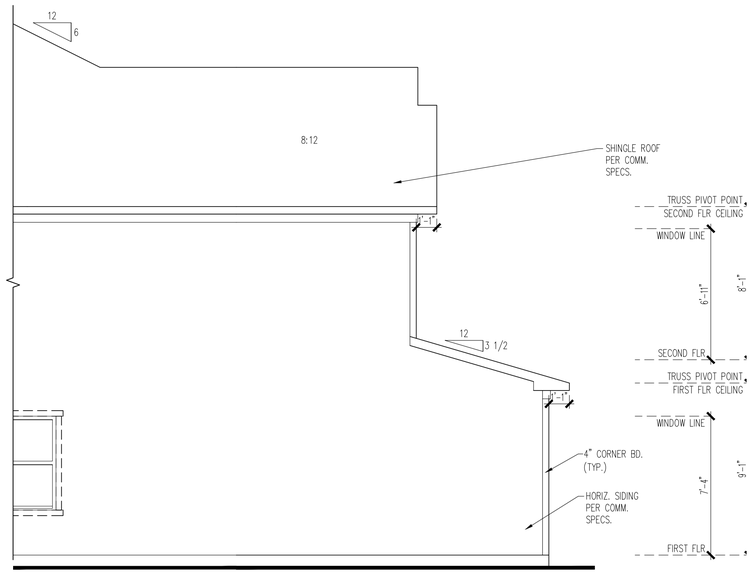
PLAN NAME
MORRISON
NPC PLAN NUMBER
--
LAWSON PLAN ID

LEGACY PLAN NUMBER / NAME
same as current

SHEET
3.SR

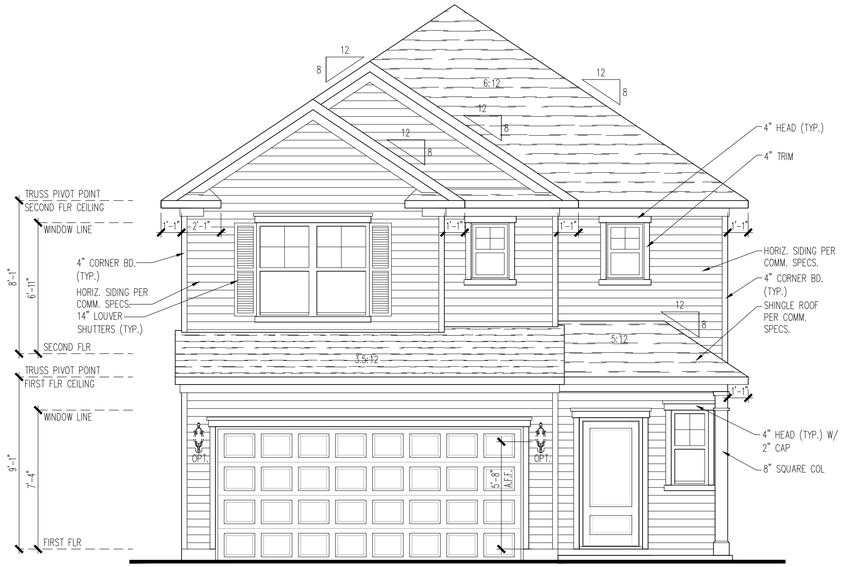
NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: February 5, 2019 / Paul Howard / MORRISON ELEVATIONS - LEFT.DWG



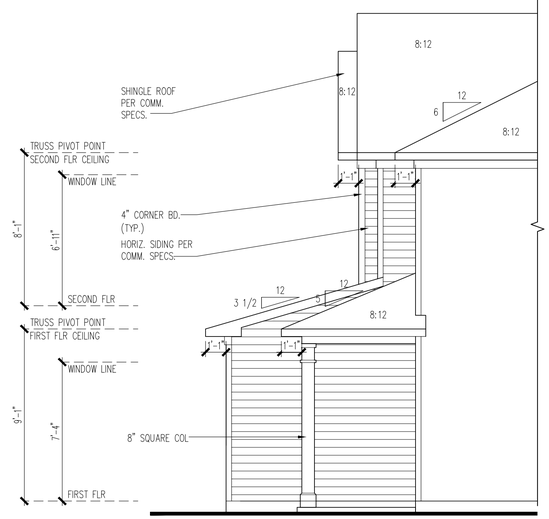
PARTIAL LEFT SIDE ELEVATION - "LC2A"

SCALE : 1/4" = 1'-0"



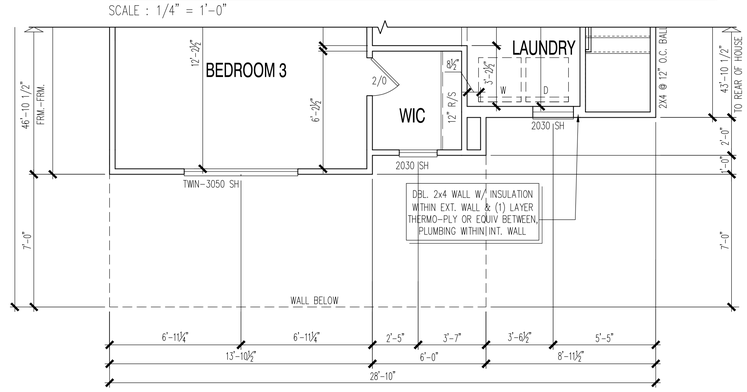
FRONT ELEVATION - "LC2A" - FRONT ENTRY GARAGE

SCALE : 1/4" = 1'-0"



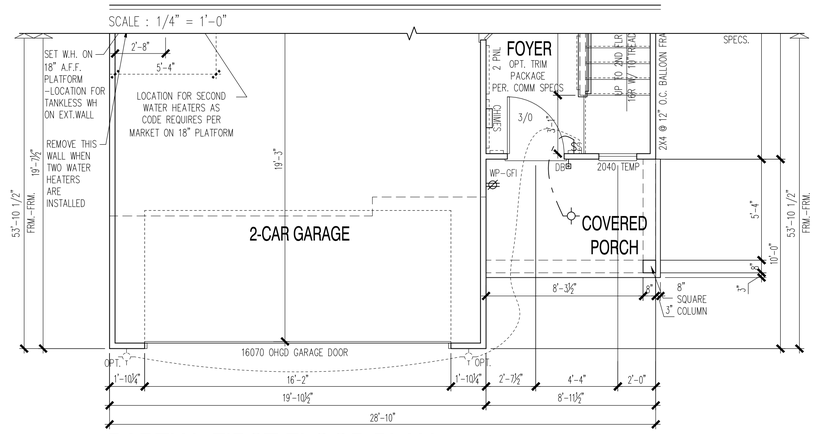
PARTIAL RIGHT SIDE ELEVATION - "LC2A"

SCALE : 1/4" = 1'-0"



PARTIAL SECOND FLOOR PLAN

SCALE : 1/4" = 1'-0"



PARTIAL FIRST FLOOR PLAN

SCALE : 1/4" = 1'-0"

NOTE:
ADD 1X4 WINDBORNE DEBRIS TRIM AROUND ALL WINDOWS PER COMM SPEC

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Alpharetta, GA 30009 (770) 381-3450

PulteGroup

The Murray
FRONT ELEVATION "LC2A"
FRONT ENTRY GARAGE

PRODUCT MANAGER

INITIAL RELEASE
DATE: 00/00/0000

REV#	DATE/DESCRIPTION
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

PROJECT TYPE
Single Family

SPECIFICATION LEVEL
Pulte

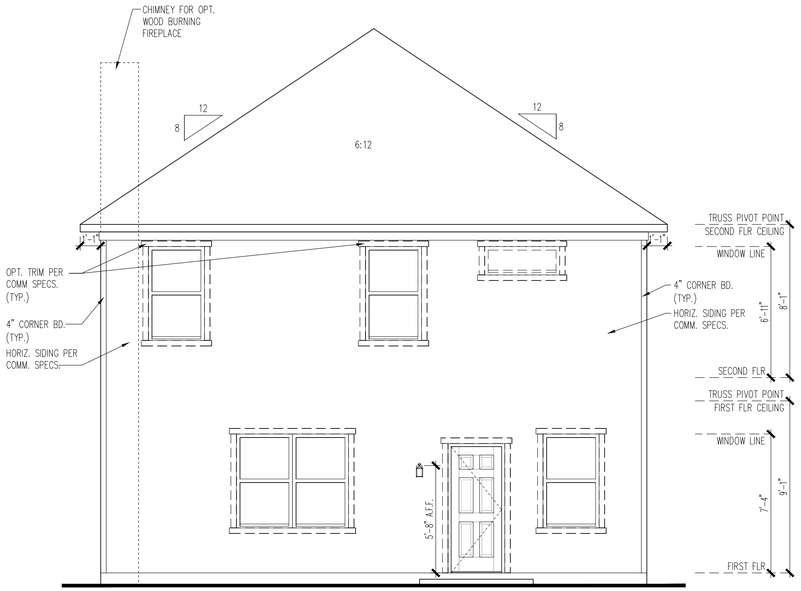
PLAN NAME
Murray

NPC NUMBER
8128.200

SHEET
3.11.0

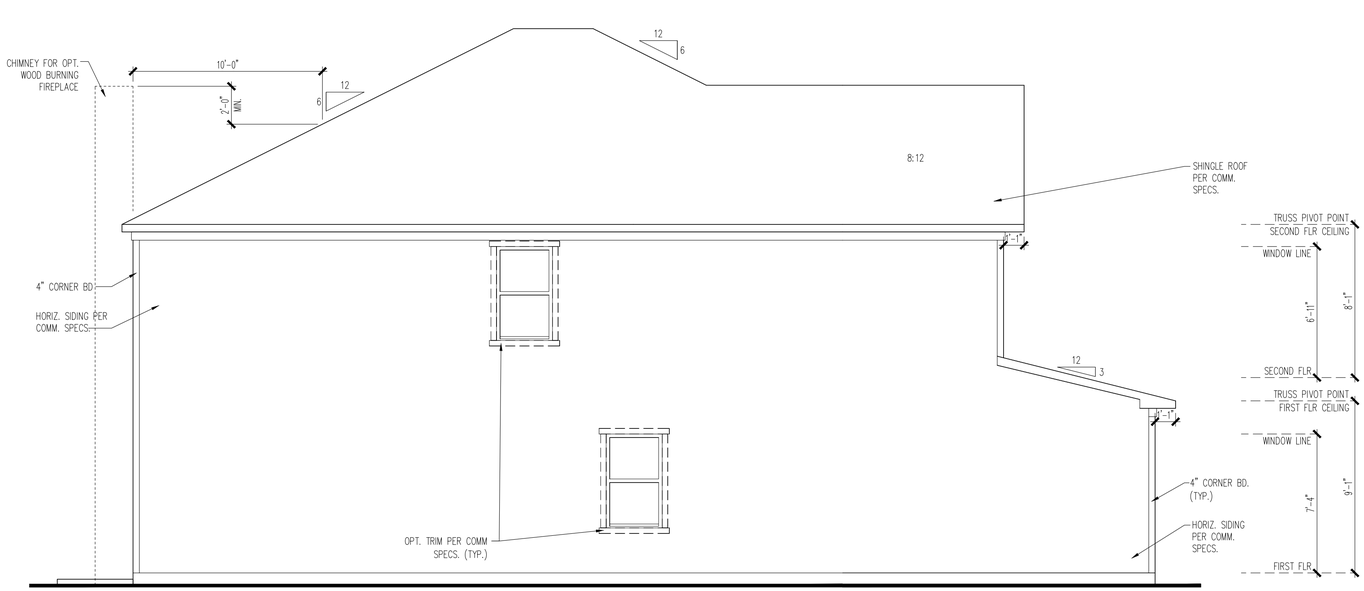
PLOTTED: November 20, 2019 / tmcdowell / 3.11.0 FRONT ELEVATION LC2A.dwg

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.



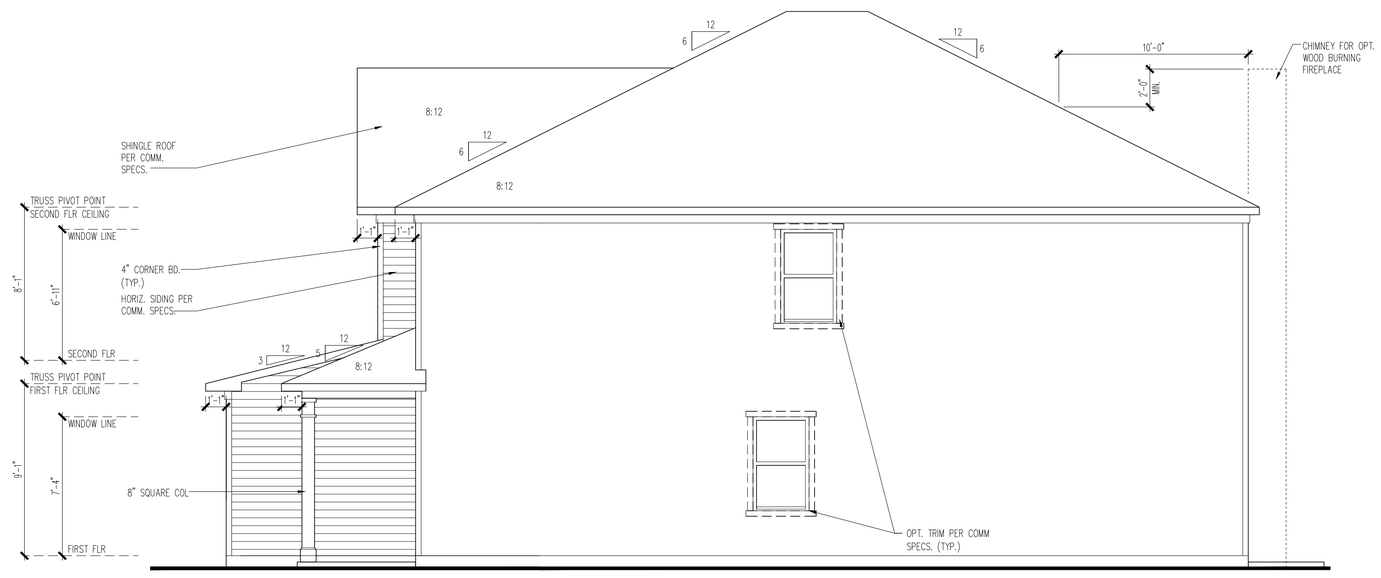
REAR ELEVATION - "LC1A" - FRONT ENTRY GARAGE

SCALE : 1/4" = 1'-0"



LEFT SIDE ELEVATION - "LC1A" - FRONT ENTRY GARAGE

SCALE : 1/4" = 1'-0"



RIGHT SIDE ELEVATION - "LC1A" - FRONT ENTRY GARAGE

SCALE : 1/4" = 1'-0"

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PulteGroup

The Murray
SIDE AND REAR ELEVATIONS "LC1A"
FRONT ENTRY GARAGE

PRODUCT MANAGER	
INITIAL RELEASE DATE:	00/00/0000

REV#	DATE/DESCRIPTION
1	
2	
3	
4	
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10	

PROJECT TYPE
Single Family

SPECIFICATION LEVEL
Pulte

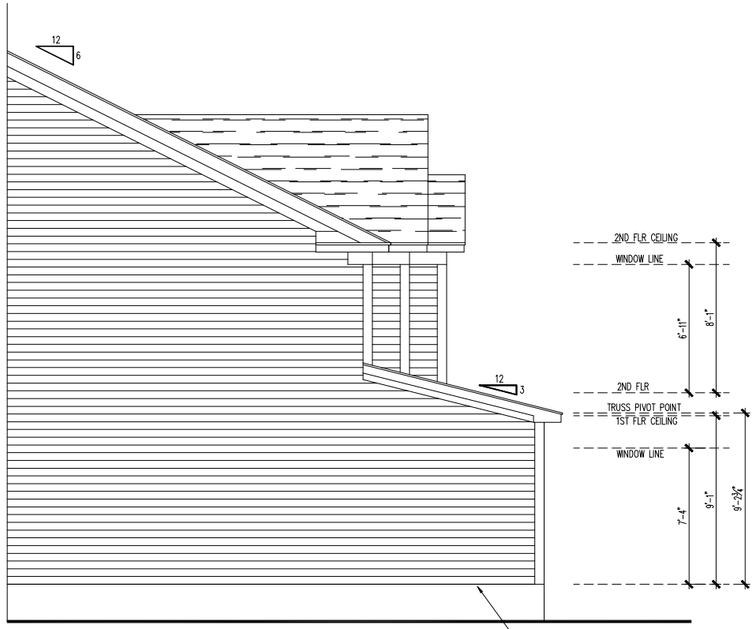
PLAN NAME
Murray

NPC NUMBER
8128.200

SHEET
3.SR.3

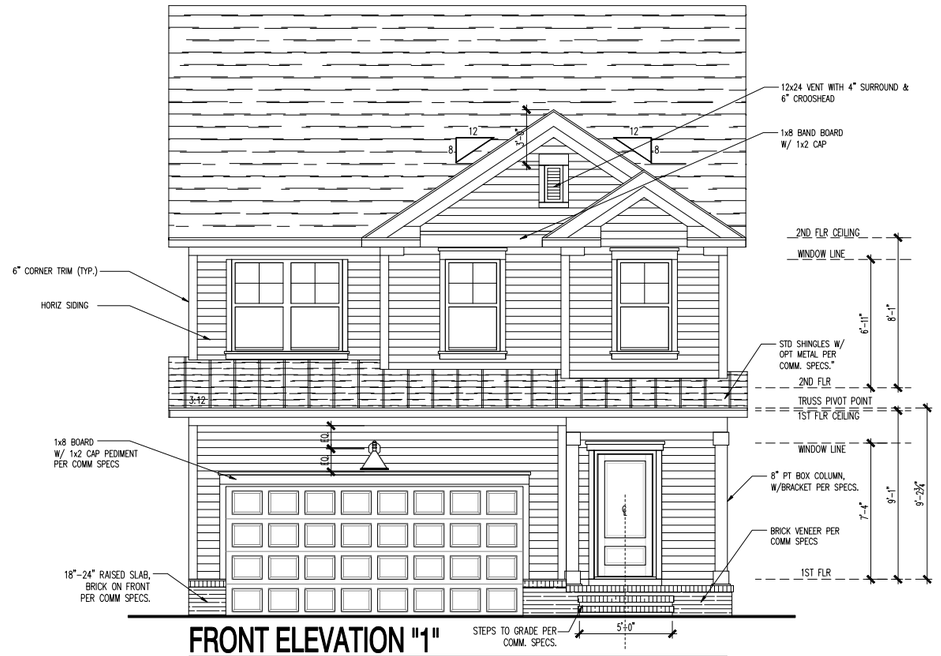
PLOTTED: November 20, 2019 / astbutler / J.SR.3 SIDE AND REAR ELEVATIONS LC1A.dwg

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.



LEFT SIDE ELEVATION

SCALE : 1/4" = 1'-0"



FRONT ELEVATION "1"

SCALE : 1/4" = 1'-0"

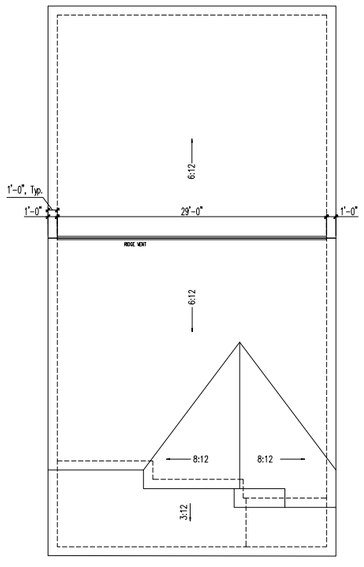
ATTIC VENTILATION : (300 SQ FT ATTIC SPACE / 1 SQ FT VENTILATION) W/ 50%-80% REQ. VENTS GREATER THAN OR EQUAL TO 3' ABOVE EAVE / CORNICE VENTS PER IRC R806.2

ELEVATIONS "ALL" 1180 SQ FT UNDER ROOF ATTIC / 300 SQ FT / 1 SQ FT = 3.93 SQ FT VENTILATION

RIDGE VENT 18 SQ IN = (.125 SQ FT)
SOFFIT VENT 9 SQ IN = (.0625 SQ FT)

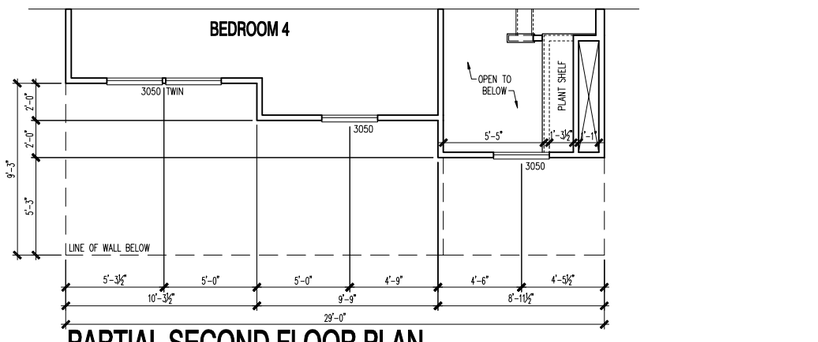
3.93 SQ FT x 50 % = 1.967SQ FT RIDGE, 3.93 SQ FT x 50 % = 1.967 SQ FT SOFFIT
RIDGE VENT
1.967 SQ FT = 15.7 FEET OF RIDGE VENT
0.125 SQ FT
SOFFIT VENT
1.967 SQ FT = 31.5 FEET OF SOFFIT VENT
0.0625SQ FT

*CALCULATIONS REFLECT 50 % RIDGE AND 50 % SOFFIT VENTS ALLOWABLE PER SECTION IRC R806.2



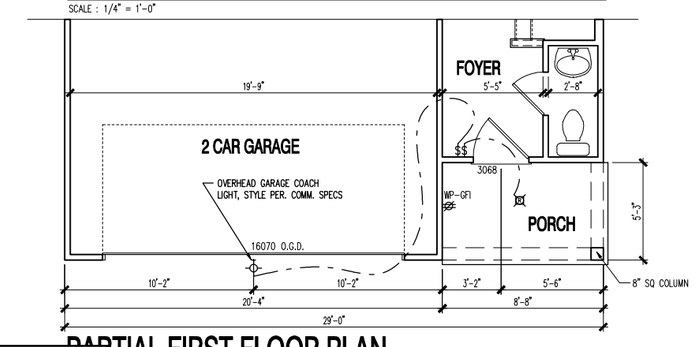
ROOF PLAN

SCALE : 1/8" = 1'-0"



PARTIAL SECOND FLOOR PLAN

SCALE : 1/4" = 1'-0"



PARTIAL FIRST FLOOR PLAN

SCALE : 1/4" = 1'-0"

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.

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Alpharetta, GA 30009 (770) 381-3450

Pulte Homes

The PRESTON
FRONT ELEVATION "1"

PRODUCTION MANAGER
ACKLEY
CURRENT RELEASE DATE: 7-30-17

REV #	DATE / DESCRIPTION
△	6-21-18
△	1-8-19
△	
△	
△	
△	
△	
△	
△	

PROJECT TYPE
SINGLE FAMILY

COMMUNITY NAME
SOUTHEAST AREA SET
LAWSON COMMUNITY ID
--

GARAGE HANDING

SPECIFICATION LEVEL
P1, P2

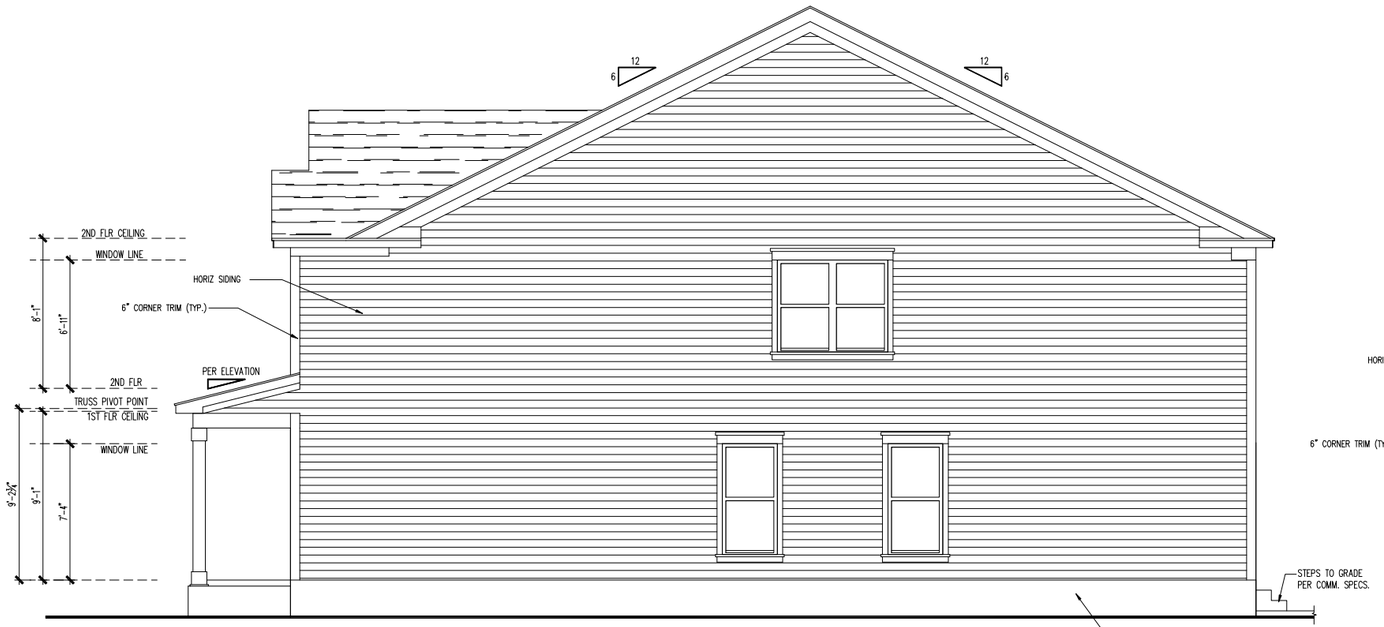
PLAN NAME
PRESTON
NPC PLAN NUMBER
--
LAWSON PLAN ID

LEGACY PLAN NUMBER / NAME
same as current

SHEET
3.1

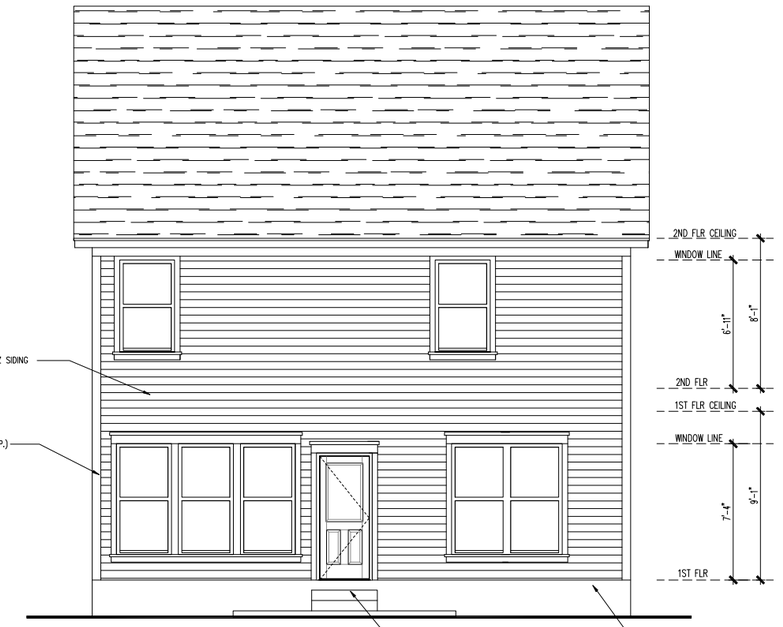
NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: August 2, 2019 / Paul Howard / PRESTON ELEVATIONS - LEFT.DWG



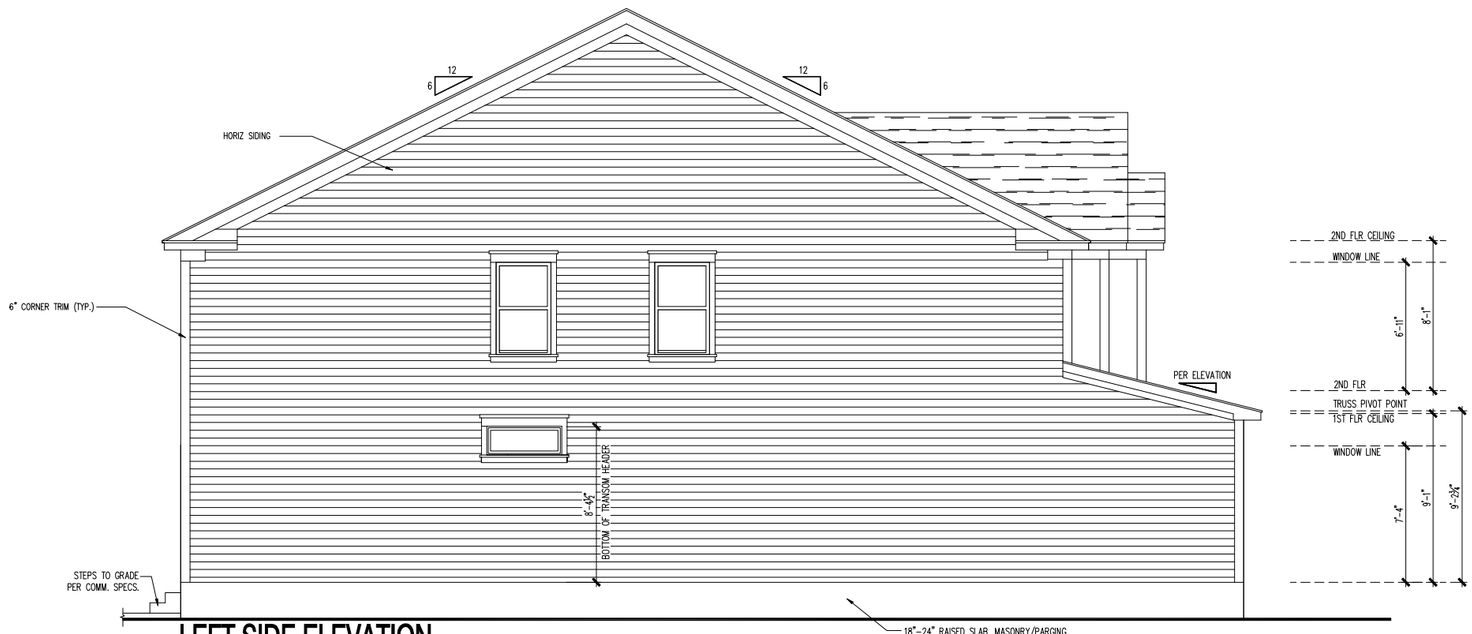
RIGHT SIDE ELEVATION

SCALE : 1/4" = 1'-0"



REAR ELEVATION

SCALE : 1/4" = 1'-0"



LEFT SIDE ELEVATION

SCALE : 1/4" = 1'-0"

Elevations are for illustrative purposes only; elevations submitted at MSP will be consistent with the architectural standards included in the PUD.

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Alpharetta, GA 30009 (770) 381-3450

Pulte Homes

The PRESTON
SIDE / REAR ELEVATIONS

PRODUCTION MANAGER
ACKLEY
CURRENT RELEASE DATE: 7-30-17

REV #	DATE / DESCRIPTION
1	6-21-18
2	1-8-19

PROJECT TYPE
SINGLE FAMILY

COMMUNITY NAME
SOUTHEAST AREA SET
LAWSON COMMUNITY ID
-

GARAGE HANDING

SPECIFICATION LEVEL
P1, P2

PLAN NAME
PRESTON
NPC PLAN NUMBER
-
LAWSON PLAN ID

LEGACY PLAN NUMBER / NAME
same as current

SHEET
3.SR

NOTE: SCALES NOTED ON DRAWINGS RELATE TO FULL SIZE PLOTS ON 22x34 SHEETS - 11x17 SHEETS REPRESENT 1/2 SCALE PLOTS

PLOTTED: August 2, 2019 / Paul Howard / PRESTON ELEVATIONS - LEFT.DWG

Hackney Tract Subdivision

Apex, NC

PREPARED FOR

WithersRavenel
c/o Nick Antrilli, PE
115 MacKenan Drive
Cary, NC 27511

PREPARED BY

VHB Engineering NC, P.C. (C-3705)
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December 22, 2020

Executive Summary

Project Background

There are plans to construct the proposed Hackney Tract Subdivision on the north side of Olive Chapel Road, east of the newly completed Richardson Road, in Apex, NC (Figure 1). The proposed Hackney Tract Subdivision is planned to consist of up to 100 single-family and 133 multi-family townhomes with full build-out expected in 2024. A traffic impact analysis is required by the Town of Apex and North Carolina Department of Transportation (NCDOT) to analyze the potential traffic impacts of the proposed the Hackney Tract Subdivision and to identify any necessary roadway improvements.

As shown on the conceptual site plan (Figure 2), the development will be accessed through one full movement access along Olive Chapel Road:

- Access #1: full movement access on Olive Chapel Road, approximately 2,500 feet east of Richardson Road

In addition, access will be provided via Hasse Avenue extension to the north to Richardson Road, and cross-connections will be provided via local street extensions to the west to Smith Farm.

Based on the agreement with the Town of Apex and NCDOT (Appendix A), the following existing and future intersections were included in the study and analyzed under the AM and PM peak hour conditions:

- SR 1160 (Olive Chapel Road) and SR 1145 (Richardson Road) (unsignalized/future signalized)
- SR 1160 (Olive Chapel Road) and SR 1162 (Apex Barbecue Road) (unsignalized)
- Richardson Road and Hasse Avenue (unsignalized)
- US Highway 64 East at Richardson Road (unsignalized/future signalized)
- US Highway 64 West at U-turn east of Richardson Road (unsignalized/future signalized)
- SR 1160 (Olive Chapel Road) and Future Access #1/Hasse Avenue Extension (full movement access)

The analysis for the Hackney Tract Subdivision was performed under three (3) scenarios: Existing (2020), No-Build (2024) and Build (2024) conditions. The Existing

(2020) scenario includes AM and PM peak hour analysis based on turning movement count data collected in November 2020. The No-Build (2024) scenario includes existing traffic, a three percent (3%) annual growth rate, and site trips generated by seven planned developments within or adjacent to the study area. The Build (2024) scenario includes No-Build (2024) volumes with the addition of site trips generated by the proposed Hackney Tract Subdivision.

Existing (2020) Conditions

Existing analyses were conducted based on current roadway geometrics and intersection turning movement counts.

As reported in the Summary Level of Service (LOS) table on page v, all of the stop- and yield-controlled approaches in the study area are operating at acceptable levels of service (i.e., LOS D or better) during both the AM and PM peak hours under the Existing (2020) conditions, with an exception that the southbound approach of Richardson Road (westbound left-turn of US 64) at US 64 Eastbound operates at LOS F during both peak hours.

No-Build (2024) Conditions

Based on the requirements by the Town of Apex and NCDOT, an annual growth rate of three percent (3%) was applied to the existing traffic to account for ambient growth between the base year (2020) and the future analysis year (2024). In addition, site trips generated by seven (7) planned developments in the study area were aggregated and included in the No-Build (2024) volumes. It should be noted that although significant traffic increases were expected with the inclusion of background developments, an undiscounted annual growth rate was applied to offset the impacts on traffic data collected in 2020 with COVID-19 pandemic restrictions in place.

As for transportation improvements, mitigation requirements associated with Sweetwater are expected to include two new signals and additional turn lanes along US 64 at the Richardson Road and U-turn east of Richardson Road intersections; in addition, a new signal is expected to be installed by Smith Farm at the Olive Chapel Road and Richardson Road intersection once it is warranted.

Based on the No-Build (2024) analysis, the study area is projected to experience traffic and delay increases, but the impacts will be substantially mitigated by the background transportation improvements. As a result, all of the signalized intersections and stop-controlled approaches in the study area are projected to operate at acceptable levels of service except that the stop-controlled northbound approach of Apex Barbecue Road at Olive Chapel Road is projected to decline to operate at LOS F in the PM peak hour.

Trip Generation and Assignment

Trip generation was conducted based on the most appropriate corresponding trip generation codes included in the *ITE Trip Generation Manual, 10th Edition* and the suggested method of calculation in the NCDOT's *"Rate vs. Equation" Spreadsheet*. To provide a conservative analysis, no transit, walking, or bicycling reductions will be applied.

Land Use Code	Land Use	Unit	ADT	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
210	Single-Family Detached Housing	100 du	1,040	19	57	76	64	38	102
220	Multi-Family Housing (Low-Rise)	133 du	965	14	49	63	48	28	76
Development Total			*2,005*	*33*	*106*	*139*	*112*	*66*	*178*

In total, the proposed Hackney Tract Subdivision is projected to generate 2,005 daily trips with 139 trips (33 entering, 106 exiting) occurring in the AM peak hour and 178 trips (112 entering, 66 exiting) occurring the PM peak hour. The resulting site trips were distributed in accordance with the existing traffic patterns and anticipated land uses.

Build (2024) Conditions

The Build (2024) conditions account for both the No-Build (2024) traffic and site traffic generated by the proposed Hackney Tract Subdivision.

As shown in the Summary LOS table on page v, the stop-controlled northbound approach of Apex Barbeque Road at Olive Chapel Road is projected to continue to operate at failing levels of services in the PM peak hour with delay increases. The rest of the intersections included in the study area are projected to continue operating at acceptable levels of service during both peak hours. The planned stop-controlled Future Access #1 is projected to operate at LOS C in the AM peak hour and LOS D in the PM peak hour.

Roadway Improvement Recommendations

As indicated in the traffic operations analyses, the proposed Hackney Tract Subdivision is projected to have minimum impacts on traffic operations of the surrounding roadway network and intersections. Nevertheless, the following roadway improvements are recommended to improve traffic operations and safety:

SR 1160 (Olive Chapel Road) and Future Access #1/Hasse Avenue Extension (unsignalized, full movement)

Future Access #1 is projected to operate at acceptable levels of service during the AM and PM peak hour with a two-lane cross-section. Although traffic volumes are not projected to automatically warrant turn lanes on Olive Chapel Road, dedicated turn lanes should be provided with the required frontage widening to meet the Town of Apex Comprehensive Transportation Plan standards. Therefore, the following site access configuration and transportation improvements are recommended at this intersection:

- Construct Future Access #1 to consist of one inbound lane and one outbound lane.
- Provide a dedicated left-turn lane on eastbound Olive Chapel Road with 100 feet of storage length and appropriate taper.
- Provide a dedicated right-turn lane on westbound Olive Chapel Road with 100 feet of storage length and appropriate taper.

SR 1160 (Olive Chapel Road) and SR 1162 (Apex Barbecue Road) (unsignalized)

Traffic analysis indicated that the northbound approach of Apex Barbecue Road is projected to operate at LOS F in the PM peak hour under the No-Build and Build conditions. The intersection is not anticipated to meet warrants for installing a new traffic signal, while options for adding new turn lanes are limited due to the skewed angle of intersection on a curve of Olive Chapel Road and potential right-of-way/drainage restrictions. As shown on the Apex Comprehensive Transportation Plan, this intersection is identified for future intersection realignment. Since site trips are anticipated to contribute less than 4% traffic increases in the AM and 3% in the PM at this intersection (increases of only 1 VPH in the AM peak hour and 2 VPH in the PM peak on the stop-controlled approach), improvement should not be required by this development based on the Town of Apex UDO. Nevertheless, alternative traffic control method (such as AWSC), if warranted by crash analysis, may be considered before this intersection is realigned in the future based on the Town of Apex CTP.

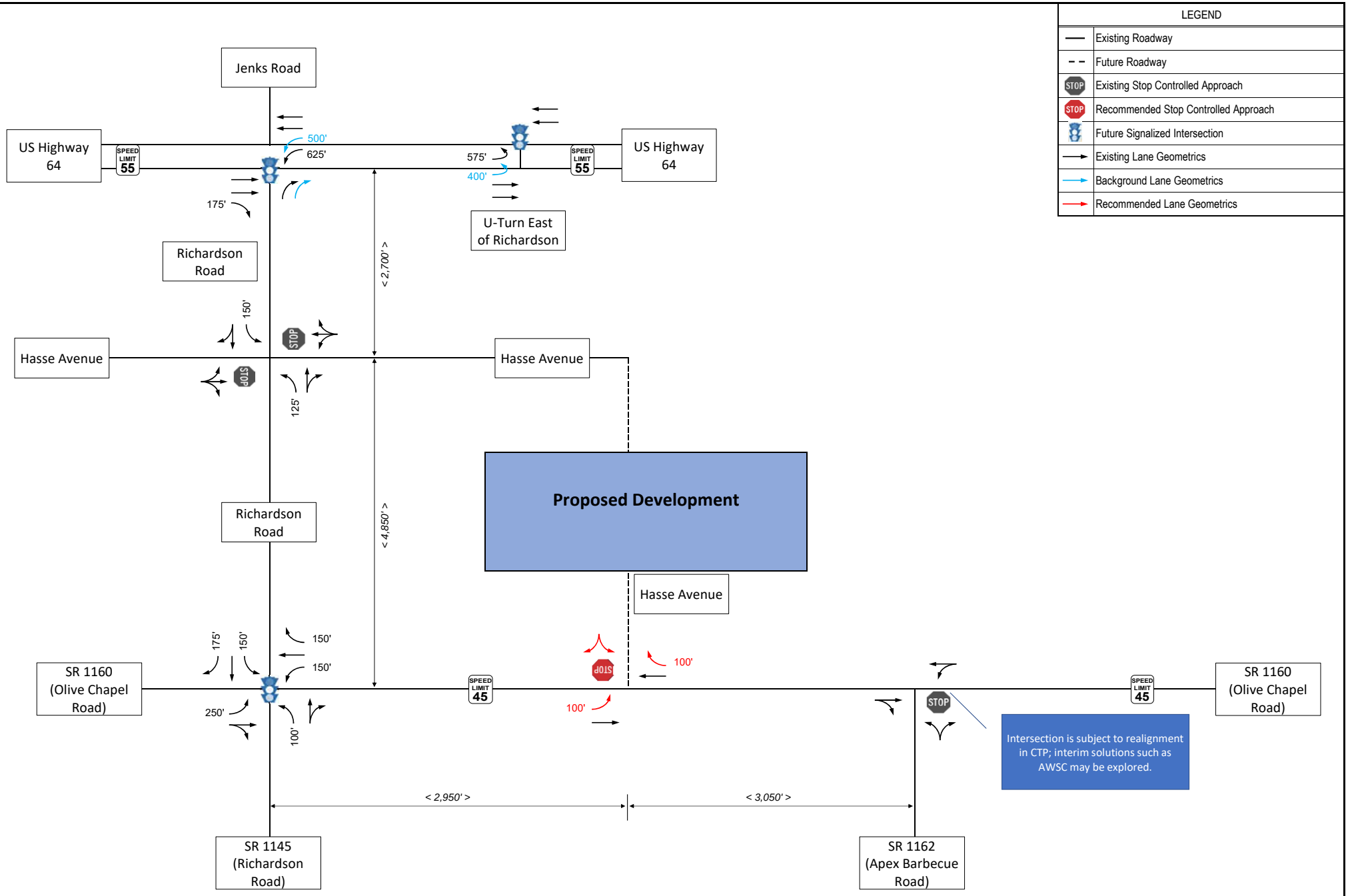
The rest of study area intersections are expected to operate acceptably. Therefore, no mitigation is required.

Summary Level of Service Table

Intersection and Approach	Control	Existing (2020)		No-Build (2024)		Build (2024)	
		AM	PM	AM	PM	AM	PM
Richardson Rd and Olive Chapel Rd	TWSC/ Signal	-	-	**A (9.7)**	**B (11.8)**	**A (9.8)**	**B (12.0)**
Eastbound		---	---	A-9.7	B-10.7	A-9.8	B-10.9
Westbound		---	---	B-10.3	B-12.0	B-10.5	B-12.2
Northbound		B-11.9	B-14.1	B-10.2	B-12.7	B-10.3	B-13.0
Southbound		B-11.7	C-15.5	A-8.4	B-11.5	A-8.5	B-11.6
Apex Barbecue Rd and Olive Chapel Rd	TWSC	-	-	-	-	-	-
Northbound		B-11.8	C-19.5	C-16.8	F-92.5	C-17.9	F-134.5
Richardson Rd and Little Gem Ln/Hasse Ave	TWSC	-	-	-	-	-	-
Eastbound		A-9.8	B-10.2	C-16.5	C-21.8	C-19.1	D-32.0
Westbound		A-9.7	A-9.9	C-15.1	C-19.1	C-17.0	C-21.9
Richardson Rd/WB Left-Over and US 64	TWSC/ Signal	-	-	**C (20.7)**	**D (42.0)**	**C (22.0)**	**D (44.5)**
Eastbound		---	---	C-20.7	D-51.3	C-23.7	E-56.0
Northbound		C-23.5	C-23.3	C-28.2	D-47.4	C-28.5	D-50.1
Southbound		F-66.0	F-216.7	B-10.9	B-19.6	A-9.8	B-19.5
U-Turn East of Richardson Rd and US 64	TWSC/ Signal	-	-	**B (11.8)**	**C (27.6)**	**B (12.5)**	**C (30.9)**
Westbound		---	---	A-9.6	C-20.5	B-10.5	C-24.1
Northbound		B-14.2	C-18.2	C-27.8	E-59.9	C-26.5	E-62.1
Olive Chapel Rd & Hasse Ave/Future Access #1	TWSC	-	-	-	-	-	-
Southbound		---	---	---	---	C-16.1	D-25.0

LEGEND: **X (XX)** = Overall intersection LOS (intersection delay in sec/veh);

X - XX = approach LOS – approach delay in sec/veh



Future (2024) Lane and Traffic Control

Hackney Tract Subdivision
Apex, NC

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1

Introduction

There are plans to construct the proposed Hackney Tract Subdivision on the north side of Olive Chapel Road, east of the newly completed Richardson Road, in Apex, NC (Figure 1). The proposed Hackney Tract Subdivision is planned to consist of up to 100 single-family and 133 multi-family townhomes with full build-out expected in 2024.

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In addition, access will be provided via Hasse Avenue extension to the north to Richardson Road, and cross-connections will be provided via local street extensions to the west to Smith Farm.

Based on the agreement with the Town of Apex and NCDOT (Appendix A), the following existing and future intersections were included in the study and analyzed under the AM and PM peak hour conditions:

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- US Highway 64 West at U-turn east of Richardson Road (unsignalized/future signalized)
- SR 1160 (Olive Chapel Road) and Future Access #1/Hasse Avenue Extension (full movement access)

VHB Engineering NC, P.C. (VHB) is contracted with the development team to analyze the potential traffic impacts of the proposed development and to identify any necessary roadway improvements. This Traffic Impact Analysis (TIA) summarizes trip generation, distribution, traffic assignment, and traffic analyses for the proposed development. The Memorandum of Understanding, which summarizes the assumptions for the study is included in Appendix A.

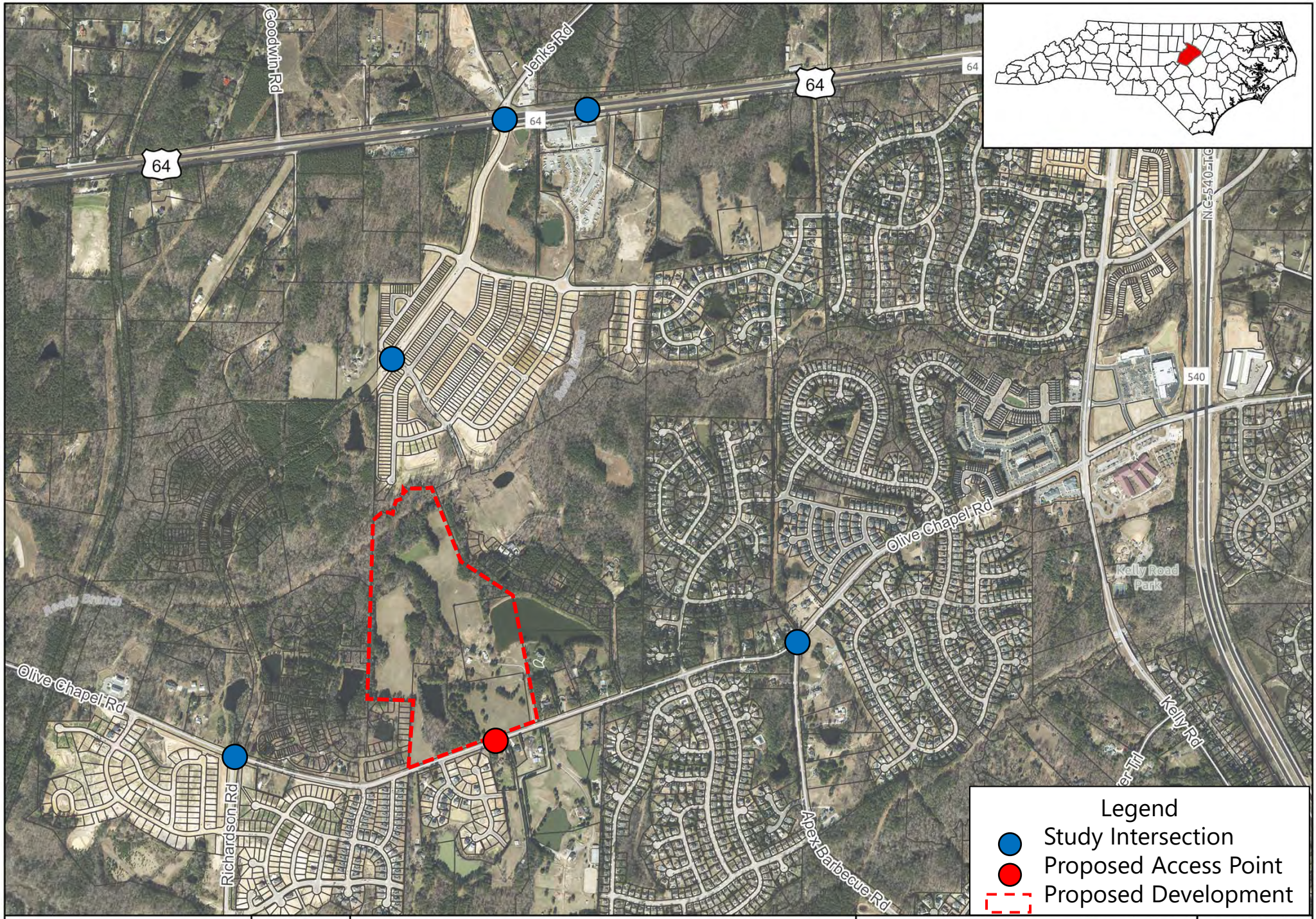

Figure 1:
Vicinity Map

Hackney Tract Subdivision
Traffic Impact Analysis
Apex, NC

GRAPHIC SCALE

100 0 50 100 200

1 inch = 100 ft.

WithersRavenel
Engineers | Planners | Surveyors
115 MacKenan Drive | Cary, NC 27511 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

HACKNEY TRACT SUBDIVISION

APEX, NORTH CAROLINA

OVERALL SUBDIVISION PLAN

Job No.	02180517.20	Drawn By	WR
Date	10/19/20	Designer	WR

PRELIMINARY
NOT APPROVED FOR CONSTRUCTION

Revisions

Sheet No.
1.0

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Existing (2020) Conditions

Existing Roadway Conditions

This section describes the existing roadways in the vicinity of the proposed development. Annual Average Daily Traffic (AADT) data for the surrounding network of roadway were obtained from the North Carolina Department of Transportation (NCDOT). The most recent AADT counts from the NCDOT are for 2019 on the study area roadways.

Olive Chapel Road (SR 1160)

- Olive Chapel Road is a two-lane undivided road within the study area. The posted speed limit along this roadway is 45 miles per hour (mph).
- As shown on the Town of Apex Thoroughfare and Collector Street Plan (last amended October 2020), Olive Chapel Road is planned to be widened to a 4-lane thoroughfare with median across the study area.
- The 2019 NCDOT AADT along Olive Chapel Road was 2,500 vehicles per day (vpd) between New Hill Olive Chapel Road and Kelly Road.

Richardson Road (SR 1145)

- Richardson Road is a new two-lane median divided roadway connecting US Highway 64 and Olive Chapel Road within the study area. The posted speed limit along this roadway is 45 mph.
- As shown on the Town of Apex Thoroughfare and Collector Street Plan, Richardson Road is planned to be widened to a 4-lane thoroughfare with median across the study area.
- The 2019 AADT along Richard Road was 810 vpd south of Olive Chapel Road. No AADT information is available for Richardson Road between Olive Chapel Road and US 64.

Apex Barbecue Road (SR 1162)

- Apex Barbecue Road is a two-lane undivided roadway south of the project site within the study area. The posted speed limit along this roadway is 45 mph.
- As shown on the Town of Apex Thoroughfare and Collector Street Plan, Apex Barbeque Road is planned to be widened to a 3-lane thoroughfare with intersection realignment planned at Olive Chapel Road.
- The 2019 NCDOT AADT along Apex Barbeque Road was 4,500 vpd between Kelly Road and Olive Chapel Road.

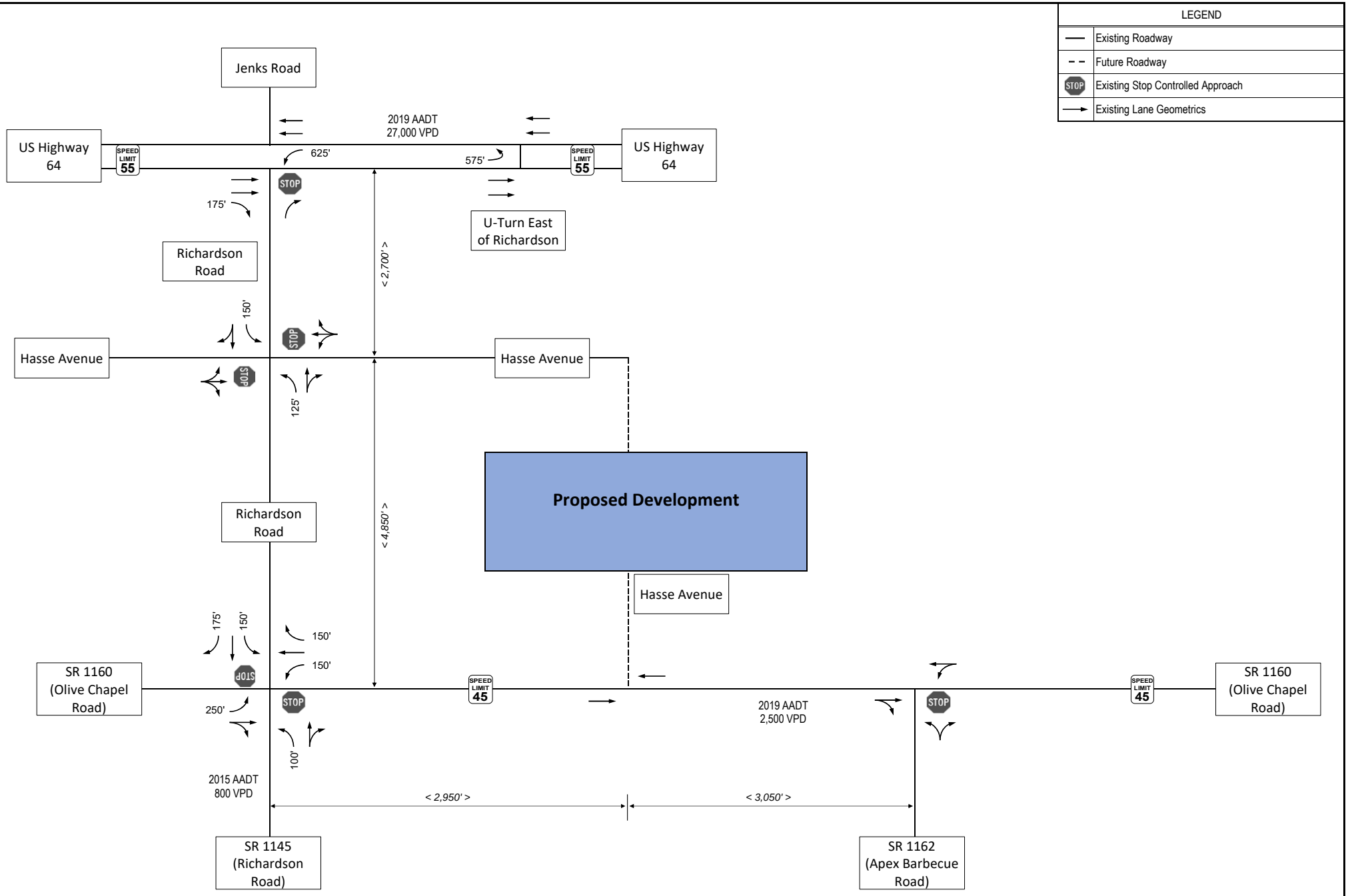
US Highway 64 (US 64)

- US Highway 64 is a four-lane median divided highway with partial control of access within the study area. The posted speed limit along US 64 is 55 mph.
- As shown on the Town of Apex Thoroughfare and Collector Street Plan, US Highway 64 is planned to be a freeway facility with full control of access, and a future interchange is planned along US 64 with Richardson Road/Jenks Road.
- The 2019 NCDOT AADT along US 64 was 27,000 vpd between New Hill Road and Kelly Road.

Hasse Avenue

- Hasse Avenue is a two-lane undivided local road within the study area. No posted speed limit was observed along Hasse Avenue.
- As shown on the Town of Apex Thoroughfare and Collector Street Plan, Hasse Avenue is planned to be extended to a two-lane major collector street between Richardson Road and Olive Chapel Road.
- No AADT information is available for Hasse Avenue within the study area.

Figure 3 provides a schematic diagram of the roadways near the proposed development including the existing intersection geometrics.



Existing (2020) Lane [illegible] and Traffic Control

Hackney Tract Subdivision
Apex, NC

Existing Turning Movement Data

VHB Engineering NC, P.C. collected the intersection turning movement counts analyzed in this TIA in November 2020. Traffic data were collected during typical AM (7:00 – 9:00 AM) and PM (4:00 – 6:00 PM) peak periods while schools were partially open due to the COVID-19 pandemic restrictions. Table 1 summarizes the schedule used to obtain the turning movement data. A detailed summary of the traffic counts can be found in Appendix B.

Table 1: Weekday Peak Hour Turning Movement Count Schedule

Intersection	Time Period	Data Collection Date
Olive Chapel Road and Richardson Road	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Thursday November 5, 2020
Richardson Road and Hasse Avenue/Little Gem Lane	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Thursday November 5, 2020
US Highway 64 and Richardson Road	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Thursday November 5, 2020
US Highway 64 and U-Turn East of Richardson Road	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Thursday November 5, 2020
Olive Chapel Road and Apex Barbecue Road	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Thursday November 5, 2020

The existing peak hour turning movement volumes are shown in Figure 4.

Level of Service Criteria

Peak hour level of service (LOS) measures the adequacy of the intersection geometrics and traffic controls of a particular intersection or approach for the given turning volumes. Levels of service range from A through F, based on the average control delay experienced by vehicles traveling through the intersection during the peak hour. Control delay represents the portion of total delay attributed to traffic control devices (e.g., signals or stop signs). Table 2 provides a general description of various levels of service categories and delay ranges.

Table 2: Level of Service Standard for Intersections

Level of Service	Signalized Intersection	Unsignalized Intersection
A	<= 10 sec.	<= 10 sec.
B	10-20 sec.	10-15 sec.
C	20-35 sec.	15-25 sec.
D	35-55 sec.	25-35 sec.
E	55-80 sec.	35-50 sec.
F	> 80 sec.	> 50 sec.

The engineering profession generally accepts LOS D as an acceptable operating condition for signalized intersections. Based on the Policy on Street and Driveway Access to North Carolina Highways (NCDOT Driveway Manual) and the Town of Apex Unified Development Ordinance (UDO), geometric and/or traffic control improvements should be identified at signalized intersections to prevent the traffic generated by the proposed development from causing any intersection or roadway approach to fall below LOS D. For intersections projected to operate worse than LOS D under the background conditions, improvements should be identified to minimize the increase in average overall intersection delay when site traffic accounts for at least 10% of the projected total peak hour traffic at the intersections.

At unsignalized intersections, stop-controlled minor street approaches may exceed LOS D provided the addition of development traffic is not anticipated to warrant a traffic signal upon build-out and the resulting congestion does not block traffic movements at adjacent intersections. Guidelines provided by NCDOT shall be used in the evaluation of the need for and length of exclusive right and/or left turn lanes to support development traffic; for any and all turning movements where the development is anticipated to add at least 10% to the existing peak hour traffic volume, improvements may be required to mitigate the impact of development traffic on turn lane storage requirements.

Level of Service Analysis

Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Professional Version 10.* A summary of the findings for the Existing (2020) scenario LOS analysis can be found in Table 3 and the full *Synchro/HCS* output can be found in Appendix D.

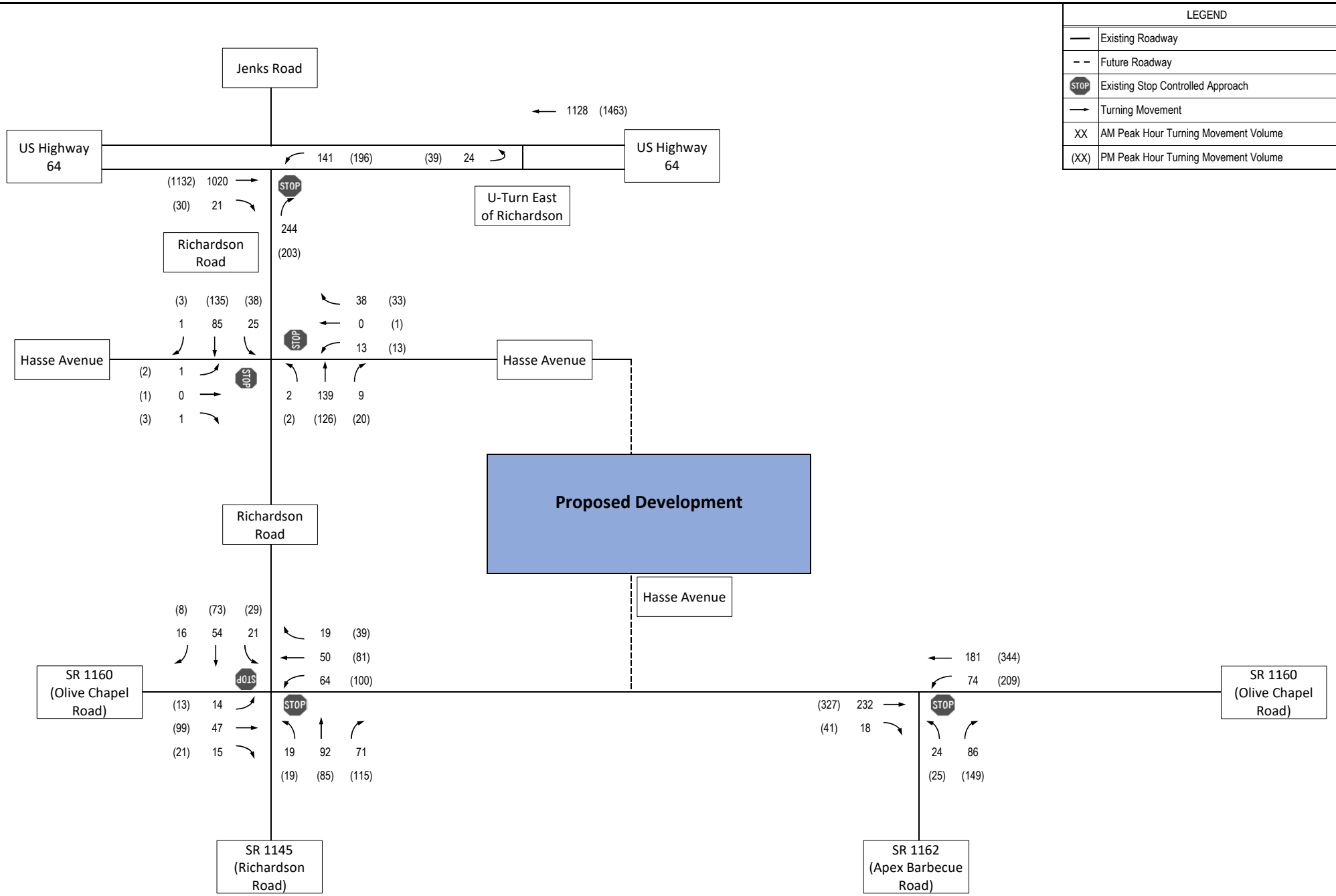
As reported in Table 3, all of the stop- and yield-controlled approaches in the study area are operating at acceptable levels of service (i.e., LOS D or better) during both the AM and PM peak hours under the Existing (2020) conditions, with an exception that the southbound approach of Richardson Road (westbound left-turn of US 64) at US 64 Eastbound operates at LOS F during both peak hours.

Table 3: Existing (2020) LOS Results

Intersection and Approach	Control	Existing (2020)	
		AM	PM
Richardson Rd and Olive Chapel Rd	TWSC	-	-
Northbound		B-11.9	B-14.1
Southbound		B-11.7	C-15.5
Apex Barbecue Rd and Olive Chapel Rd	TWSC	-	-
Northbound		B-11.8	C-19.5
Richardson Rd and Little Gem Ln/Hasse Ave	TWSC	-	-
Eastbound		A-9.8	B-10.2
Westbound		A-9.7	A-9.9
Richardson Rd/WB Left-Over and US 64	TWSC	-	-
Northbound		C-23.5	C-23.3
Southbound		F-66.0	F-216.7
U-Turn East of Richardson Rd and US 64	TWSC	-	-
Northbound		B-14.2	C-18.2

LEGEND: **X (XX)** = Overall intersection LOS (intersection delay in sec/veh);

X - XX = approach LOS – approach delay in sec/veh



Existing (2020) AM and PM Turning Movement Volumes

Hackney Tract Subdivision
Apex, NC

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No-Build (2024) Conditions

Background Growth and Development

Based on discussions with the Town of Apex and NCDOT, an annual growth rate of three percent (3%) was applied to the existing traffic to account for the growth between the base year (2020) and the future analysis year (2024). In addition, site trips from seven (7) adjacent developments that are expected to occur before the analysis year were incorporated into the analysis.

Saddlebrook (Lawrence Assemblage/Richardson West) – Located in the southwest corner of the Olive Chapel Road and Richardson Road intersection, this residential development is proposed to consist of 104 single-family homes and be constructed by 2017. A traffic analysis report was prepared by Ramey Kemp & Associates and submitted to the Town on November 3, 2014. As detailed in the report, the development is projected to generate 1,090 daily site trips, with 83 trips (21 entering, 62 exiting) occurring in the AM peak hour and 109 trips (69 entering, 40 exiting) occurring in the PM peak hour. These trips were distributed to the study area based on the assumed distribution patterns in the report. Field visits indicate that construction has begun but has not been completed; therefore, a percentage of traffic associated with the development was included in the No-Build (2024) analysis.

Sweetwater – Located on US 64 in Wake County, this mixed-use development is projected to consist of 375 single-family homes, 60 condominiums, 50,000 sf of office, 200,000 sf of retail, 7,000 sf of high-turnover restaurant, 3,000 sf of fast food with drive through window, and a drive-in bank with 4 lanes and be constructed by 2019. A TIA was prepared by Ramey Kemp & Associates and submitted on December 18, 2014. As detailed in the report the development is projected to generate 18,360 daily site trips, with 914 trips (457 entering, 457 exiting) occurring in the AM peak hour and 1,736 trips (865 entering, 871 exiting) occurring in the PM peak hour. These trips were distributed to the study area based on the assumed distribution patterns in the report. Field visits indicate that approximately 80% of the residential and 0% of the mixed-use phases have been constructed; therefore, a percentage of traffic associated with the development was included in the No-Build (2024) analysis.

Buckhorn Preserve (Goodwin-MacNair) – Located on the east side of Richardson Road, just north of M. Zion Church Road, this residential development is projected to consist of 347 single-family homes and be constructed by 2020. A TIA was prepared by VHB

and submitted to the Town on June 26, 2015, with an addendum submitted on August 3, 2015. As detailed in the report, the development is projected to generate 3,299 daily site trips, with 253 trips (63 entering, 190 exiting) occurring in the AM peak hour and 322 trips (203 entering, 119 exiting) occurring in the PM peak hour. These trips were distributed to the study area based on the assumed distribution patterns in the report. Field visits indicate that the development has not been fully constructed; therefore, a percentage of the traffic associated with the development was included in the No-Build (2024) analysis.

Stillwater (Womble) – Located between Ragan Road and Richardson Road north of Humie Olive Road, this residential development is projected to consist of 303 single-family homes and be constructed by 2018. A TIA was prepared by Stantec and submitted to the Town on February 27, 2014. As detailed in the report, the development is projected to generate 2,912 daily site trips, with 221 trips (55 entering, 166 exiting) occurring in the AM peak hour and 285 trips (180 entering, 105 exiting) occurring in the PM peak hour. These trips were distributed to the study area based on the assumed distribution patterns in the report. Field visits indicated that the development has not been fully constructed; therefore, a percentage of the traffic associated with the development was included in the No-Build (2024) analysis.

Westford – Located on the north side of US 64 and east of Jenks Road, this residential development is projected to consist of 300 apartment units, 225 townhomes, and 90 single-family homes and be constructed by 2019. A TIA was prepared by Kimley-Horn and submitted to the Town on December 7, 2016. As detailed in the report, the development is projected to generate 4,188 daily site trips, with 323 trips (65 entering, 258 exiting) occurring in the AM peak hour and 396 trips (257 entering, 139 exiting) occurring in the PM peak hour. These trips were distributed to the study area based on the assumed distribution patterns in the report. Field visits indicated that the development has not been fully constructed; therefore, a percentage of the traffic associated with the development was included in the No-Build (2024) analysis.

Smith Farm – Located north of Olive Chapel Road, west of Kelly Road, and south of US 64, this mixed-use development is projected to consist of 430 single-family homes, 170 townhomes, 150 apartments, 100,000 sf of office, 150,000 sf of retail, 10,000 sf of pharmacy, 16,000 sf of high-turnover sit-down restaurant, 9,000 sf of fast-food restaurant, 12,000 sf of drive-in bank, and a gas station with 8 fueling positions and be constructed by 2021. A TIA was prepared by Ramey Kemp & Associates and submitted to the Town on November 24, 2015. As detailed in the report, the development is projected to generate 27,930 daily site trips, with 1,709 trips (847 entering, 862 exiting) occurring in the AM peak hour and 2,545 trips (1,301 entering, 1,244 exiting) occurring in the PM peak hour. These trips were distributed to the study area based on the assumed distribution patterns in the report. Field visits indicated that the development has not been fully constructed; therefore, a percentage of the traffic associated with the development was included in the No-Build (2024) analysis.

Linden (Pricewood Assemblage) – Located in the northwest quadrant of the intersection of Olive Chapel Road and Pricewood Lane, this residential development is projected to consist of 211 single-family homes and be constructed by 2022. A TIA was prepared by Ramey Kemp & Associates and submitted to the Town on August 31, 2016. As detailed in the report, the development is projected to generate 2,010 daily site trips, with 158 trips (40 entering, 118 exiting) occurring in the AM peak hour and 211 trips (133 entering, 78 exiting) occurring in the PM peak hour. These trips were distributed to the study area based on the assumed distribution patterns in the report. Field visits indicated that the development has not been fully constructed; therefore, a percentage of the traffic associated with the development was included in the No-Build (2024) analysis.

As for transportation improvements, mitigation requirements associated with Sweetwater are expected to include two new signals and additional turn lanes along US 64 at the Richardson Road and U-Turn East of Richardson Road intersections, and Smith Farm is committed to installing a new signal at the Olive Chapel Road and Richardson Road intersection once it is warranted.

Note that although significant traffic increases are expected due to the inclusion of background developments, an undiscounted annual traffic growth rate of three percent (3%) was applied to offset the impacts on traffic data collected under the Existing (2020) conditions with COVID-19 pandemic restrictions in place. The No-Build (2024) AM and PM peak hour volumes are shown in Figure 5.

Level of Service Analysis

Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Professional Version 10*. A summary of the findings for the No-Build (2024) scenario LOS analysis can be found in Table 4. The full *Synchro/HCS* output for the No-Build scenario can be found in Appendix D.

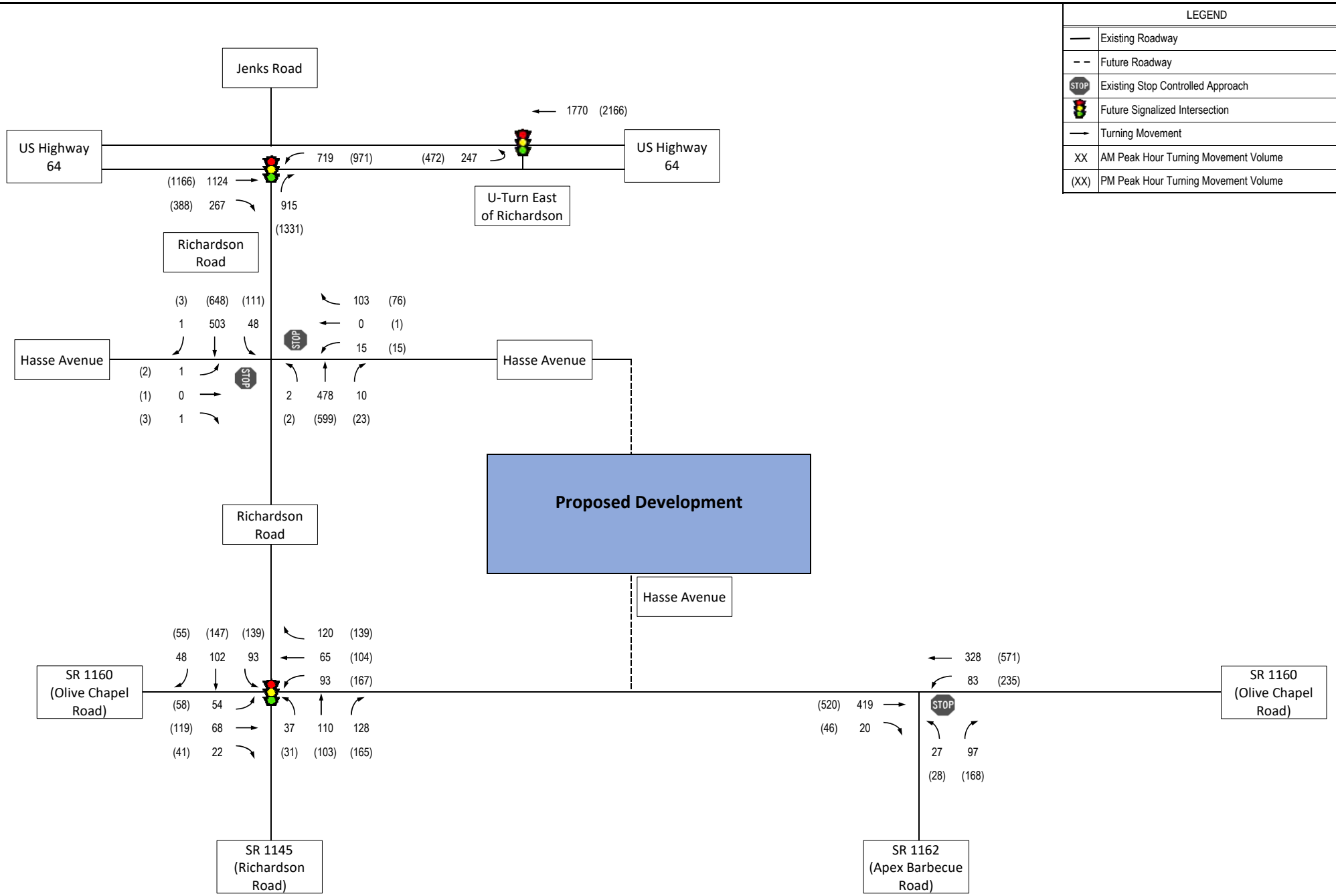
As reported in Table 4, the study area is projected to experience traffic and delay increases, but the impacts will be substantially mitigated by the background transportation improvements. As a result, all of the signalized intersections and stop-controlled approaches in the study area are projected to operate at acceptable levels of service except that the stop-controlled northbound approach of Apex Barbecue Road at Olive Chapel Road is projected to decline to operate at LOS F in the PM peak hour.

Table 4: No-Build (2024) LOS Results

Intersection and Approach	Control	No-Build (2024)	
		AM	PM
Richardson Rd and Olive Chapel Rd	Signal	**A (9.7)**	**B (11.8)**
Eastbound		A-9.7	B-10.7
Westbound		B-10.3	B-12.0
Northbound		B-10.2	B-12.7
Southbound		A-8.4	B-11.5
Apex Barbecue Rd and Olive Chapel Rd	TWSC	**-**	**-**
Northbound		C-16.8	F-92.5
Richardson Rd and Little Gem Ln/Hasse Ave	TWSC	**-**	**-**
Eastbound		C-16.5	C-21.8
Westbound		C-15.1	C-19.1
Richardson Rd/WB Left-Over and US 64	Signal	**C (20.7)**	**D (42.0)**
Eastbound		C-20.7	D-51.3
Northbound		C-28.2	D-47.4
Southbound		B-10.9	B-19.6
U-Turn East of Richardson Rd and US 64	Signal	**B (11.8)**	**C (27.6)**
Westbound		A-9.6	C-20.5
Northbound		C-27.8	E-59.9

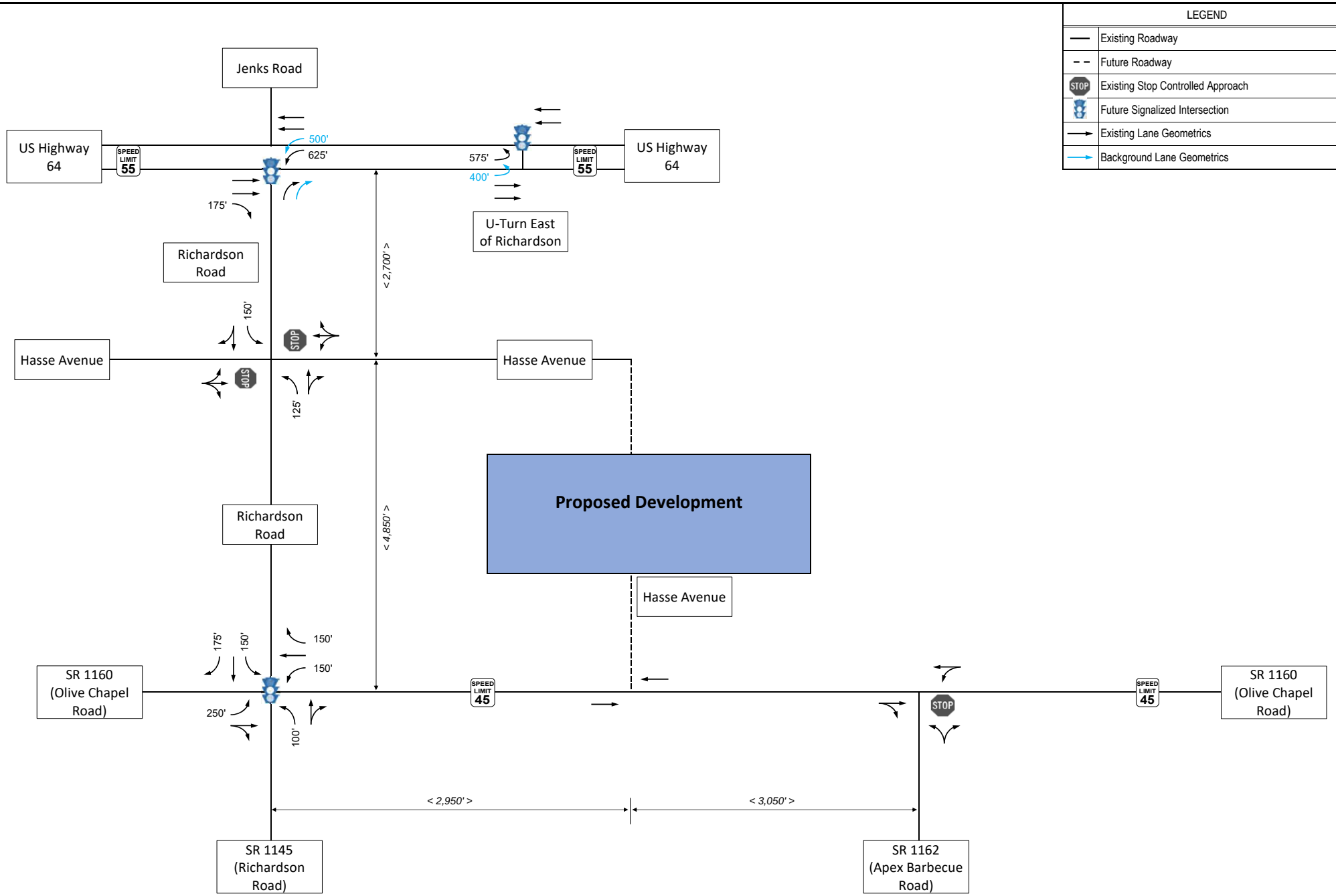
LEGEND: **X (XX)** = Overall intersection LOS (intersection delay in sec/veh);

X - XX = approach LOS – approach delay in sec/veh



No-Build (2024) AM and PM Turning Movement Volumes

Hackney Tract Subdivision
Apex, NC



Background (2024) La[illegible]cs and Traffic Control

Hackney Tract Subdivision
Apex, NC

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Build (2024) Conditions

There are plans to construct the proposed Hackney Tract Subdivision on the north side of Olive Chapel Road, east of the newly completed Richardson Road, in Apex, NC (Figure 1). The proposed Hackney Tract Subdivision is planned to consist of up to 100 single-family and 133 multi-family townhomes with full build-out expected in 2024.

Trip Generation

Trip generation was conducted based on the most appropriate corresponding trip generation codes included in the *ITE Trip Generation Manual, 10th Edition* and the suggested method of calculation in the NCDOT's *"Rate vs. Equation" Spreadsheet*. To provide a conservative analysis, no transit, walking, or bicycling reductions will be applied.

Table 5 summarizes the estimated trip generation for the proposed Hackney Tract Subdivision for weekday AM and PM peak hours.

Table 5: Trip Generation Rates

Land Use Code	Land Use	Unit	ADT	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
210	Single-Family Detached Housing	100 du	1,040	19	57	76	64	38	102
220	Multi-Family Housing (Low-Rise)	133 du	965	14	49	63	48	28	76
Development Total			*2,005*	*33*	*106*	*139*	*112*	*66*	*178*

In total, the proposed Hackney Tract Subdivision is projected to generate 2,005 daily trips with 139 trips (33 entering, 106 exiting) occurring in the AM peak hour and 178 trips (112 entering, 66 exiting) occurring the PM peak hour.

Traffic Distribution and Assignment

As shown on the conceptual site plan (Figure 2), the development will be accessed through one full movement access along Olive Chapel Road:

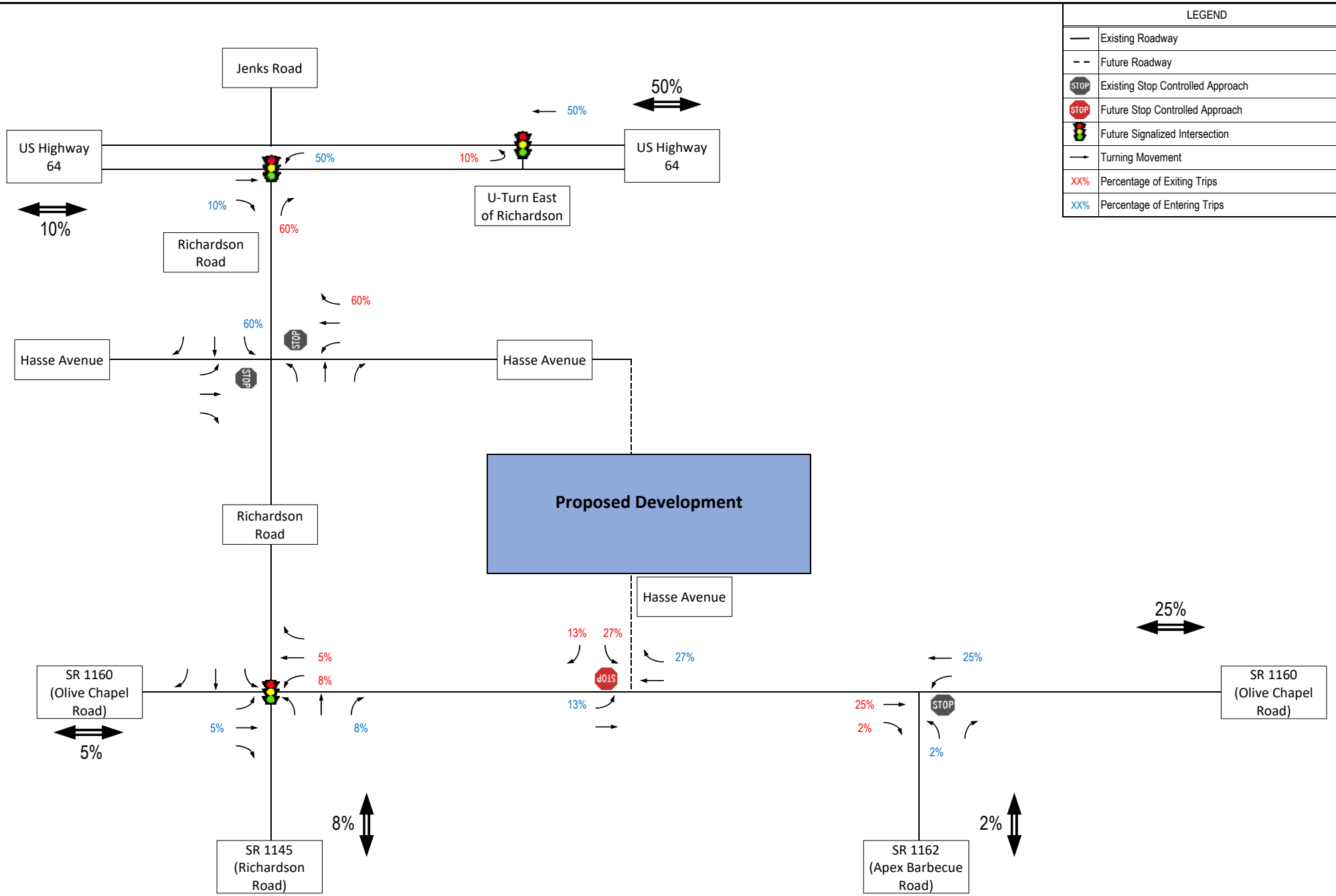
- Access #1: full movement access on Olive Chapel Road, approximately 2,500 feet east of Richardson Road

In addition, access will be provided via Hasse Avenue extension to the north to Richardson Road, and cross-connections will be provided via local street extensions to the west to Smith Farm. Potential traffic reductions due to cross-connections are not accounted for in this TIA to be conservative.

Based on agreements with the Town of Apex and NCDOT through the Memorandum of Understanding (Appendix A), the directional distribution percentages are as follows:

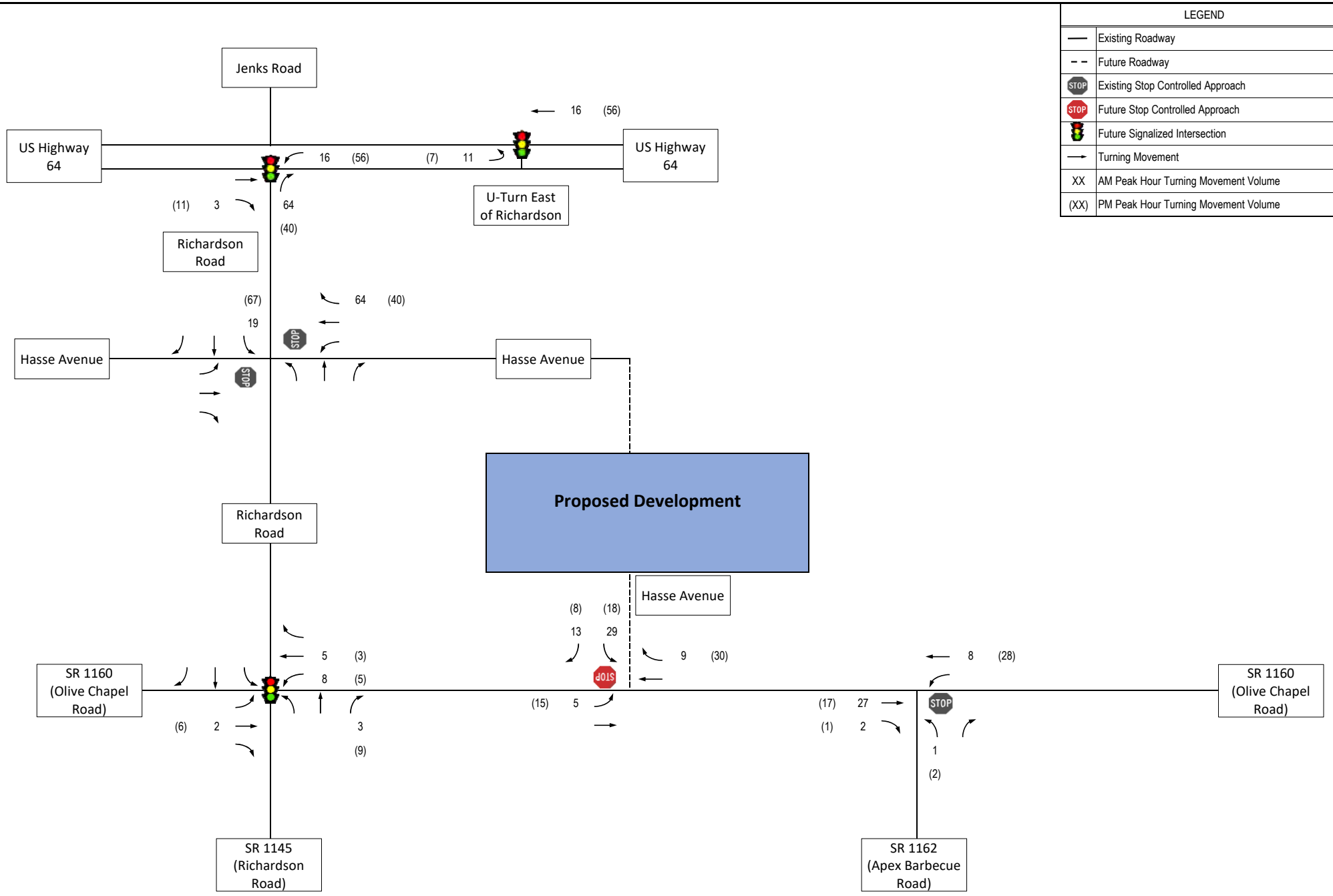
- from/to the east via US Highway 64 – 50%
- from/to the west via US Highway 64 – 10%
- from/to the east via Olive Chapel Road – 25%
- from/to the west via Olive Chapel Road – 5%
- from/to the south via Richardson Road – 8%
- from/to the south via Apex Barbecue Road – 2%

A graphic illustration of the proposed peak hour directional distribution percentages is shown in Figure 7, with the resulting site trips shown in Figure 8.



Peak Hour Site Trip Di[illegible]signment Percentages

Hackney Tract Subdivision
Apex, NC



AM and PM Site Trips

Hackney Tract Subdivision
Apex, NC

Level of Service Analysis

The Build (2024) analysis scenario includes the No-Build (2024) traffic as well as site-generated trips from the proposed development. Figure 9 depicts the turning movement volumes used in the Build (2024) scenario analysis.

Intersection levels of service analyses were performed for the typical weekday AM and PM peak hours using *Synchro/SimTraffic Professional Version 10*. Table 6 summarizes the LOS results for the Build (2024) scenario and Appendix D contains the full *Synchro/HCS* reports of the analysis.

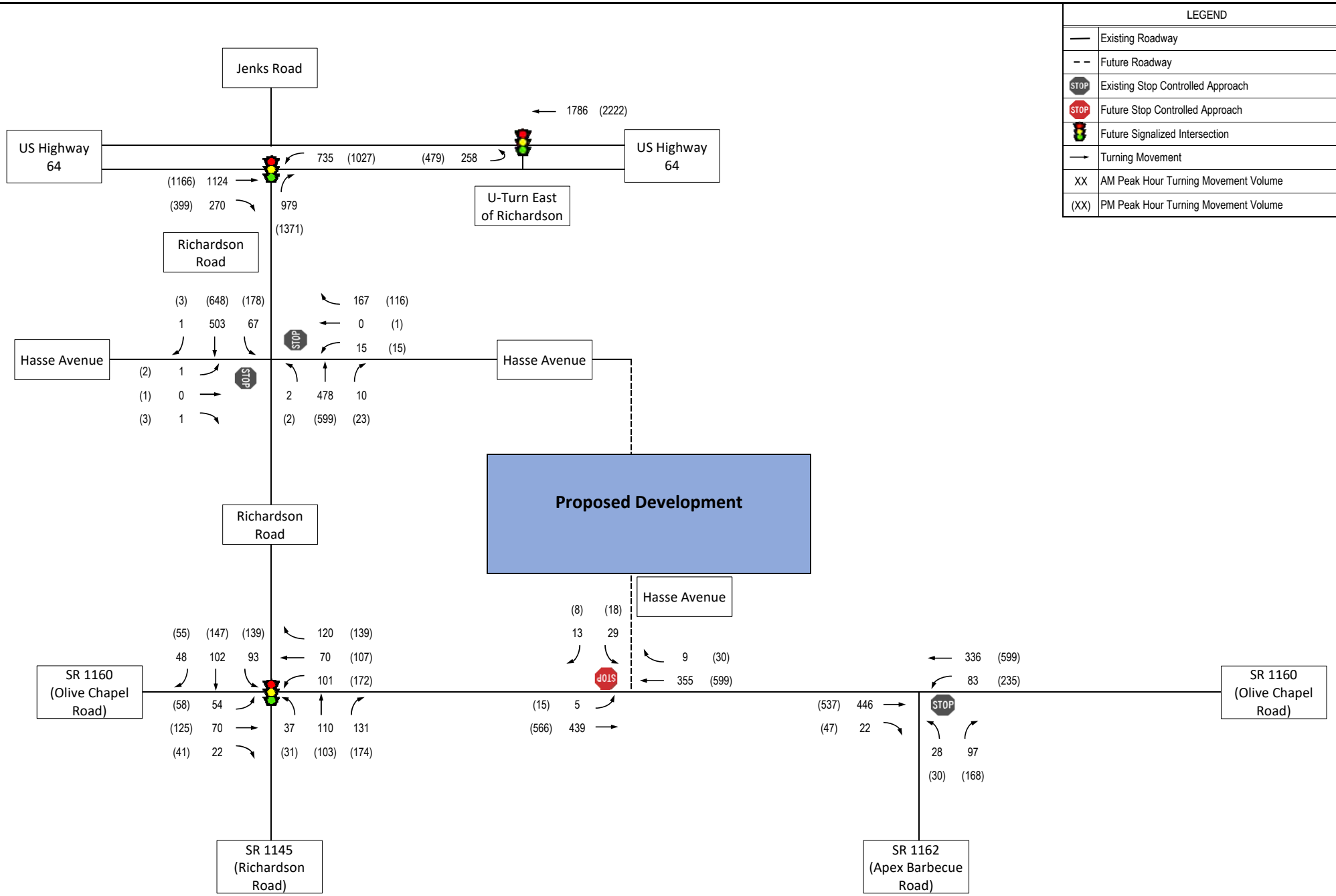
As reported in Table 6, the stop-controlled northbound approach of Apex Barbeque Road at Olive Chapel Road is projected to continue to operate at failing levels of services in the PM peak hour with delay increases. The rest of the intersections included in the study area are projected to continue operating at acceptable levels of service during both peak hours. The planned stop-controlled Future Access #1 is projected to operate at LOS C in the AM peak hour and LOS D in the PM peak hour.

Table 6: Build (2024) LOS Results

Intersection and Approach	Control	Build (2024)	
		AM	PM
Richardson Rd and Olive Chapel Rd	Signal	**A (9.8)**	**B (12.0)**
Eastbound		A-9.8	B-10.9
Westbound		B-10.5	B-12.2
Northbound		B-10.3	B-13.0
Southbound		A-8.5	B-11.6
Apex Barbecue Rd and Olive Chapel Rd	TWSC	-	-
Northbound		C-17.9	F-134.5
Richardson Rd and Little Gem Ln/Hasse Ave	TWSC	-	-
Eastbound		C-19.1	D-32.0
Westbound		C-17.0	C-21.9
Richardson Rd/WB Left-Over and US 64	Signal	**C (22.0)**	**D (44.5)**
Eastbound		C-23.7	E-56.0
Northbound		C-28.5	D-50.1
Southbound		A-9.8	B-19.5
U-Turn East of Richardson Rd and US 64	Signal	**B (12.5)**	**C (30.9)**
Westbound		B-10.5	C-24.1
Northbound		C-26.5	E-62.1
Olive Chapel Rd & Hasse Ave/Future Access #1	TWSC	-	-
Southbound		C-16.1	D-25.0

LEGEND: **X (XX)** = Overall intersection LOS (intersection delay in sec/veh);

X - XX = approach LOS – approach delay in sec/veh



Build (2024) AM and PM P[illegible]rning Movement Volumes

Hackney Tract Subdivision
Apex, NC

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Findings and Conclusions

As indicated in the traffic operations analyses, the proposed Hackney Tract Subdivision is projected to have minimum impacts on traffic operations of the surrounding roadway network and intersections. Nevertheless, the following roadway improvements are recommended to improve traffic operations and safety:

SR 1160 (Olive Chapel Road) and Future Access #1/Hasse Avenue Extension (unsignalized, full movement)

Future Access #1 is projected to operate at acceptable levels of service during the AM and PM peak hour with a two-lane cross-section. Although traffic volumes are not projected to automatically warrant turn lanes on Olive Chapel Road, dedicated turn lanes should be provided with the required frontage widening to meet the Town of Apex Comprehensive Transportation Plan standards. Therefore, the following site access configuration and transportation improvements are recommended at this intersection:

- Construct Future Access #1 to consist of one inbound lane and one outbound lane.
- Provide a dedicated left-turn lane on eastbound Olive Chapel Road with 100 feet of storage length and appropriate taper.
- Provide a dedicated right-turn lane on westbound Olive Chapel Road with 100 feet of storage length and appropriate taper.

SR 1160 (Olive Chapel Road) and SR 1162 (Apex Barbecue Road) (unsignalized)

Traffic analysis indicated that the northbound approach of Apex Barbecue Road is projected to operate at LOS F in the PM peak hour under the No-Build and Build conditions. The intersection is not anticipated to meet warrants for installing a new traffic signal, while options for adding new turn lanes are limited due to the skewed angle of intersection on a curve of Olive Chapel Road and potential right-of-way/drainage restrictions. As shown on the Apex Comprehensive Transportation Plan, this intersection is identified for future intersection realignment. Since site trips are anticipated to contribute less than 4% traffic increases in the AM and 3% in the PM at this intersection (increases of only 1 VPH in the AM peak hour and 2 VPH in the PM peak on the stop-controlled approach), improvement should not be required by this development based on the Town of Apex UDO. Nevertheless, alternative traffic control method (such as AWSC), if warranted by crash analysis, may be considered

before this intersection is realigned in the future based on the Town of Apex CTP.

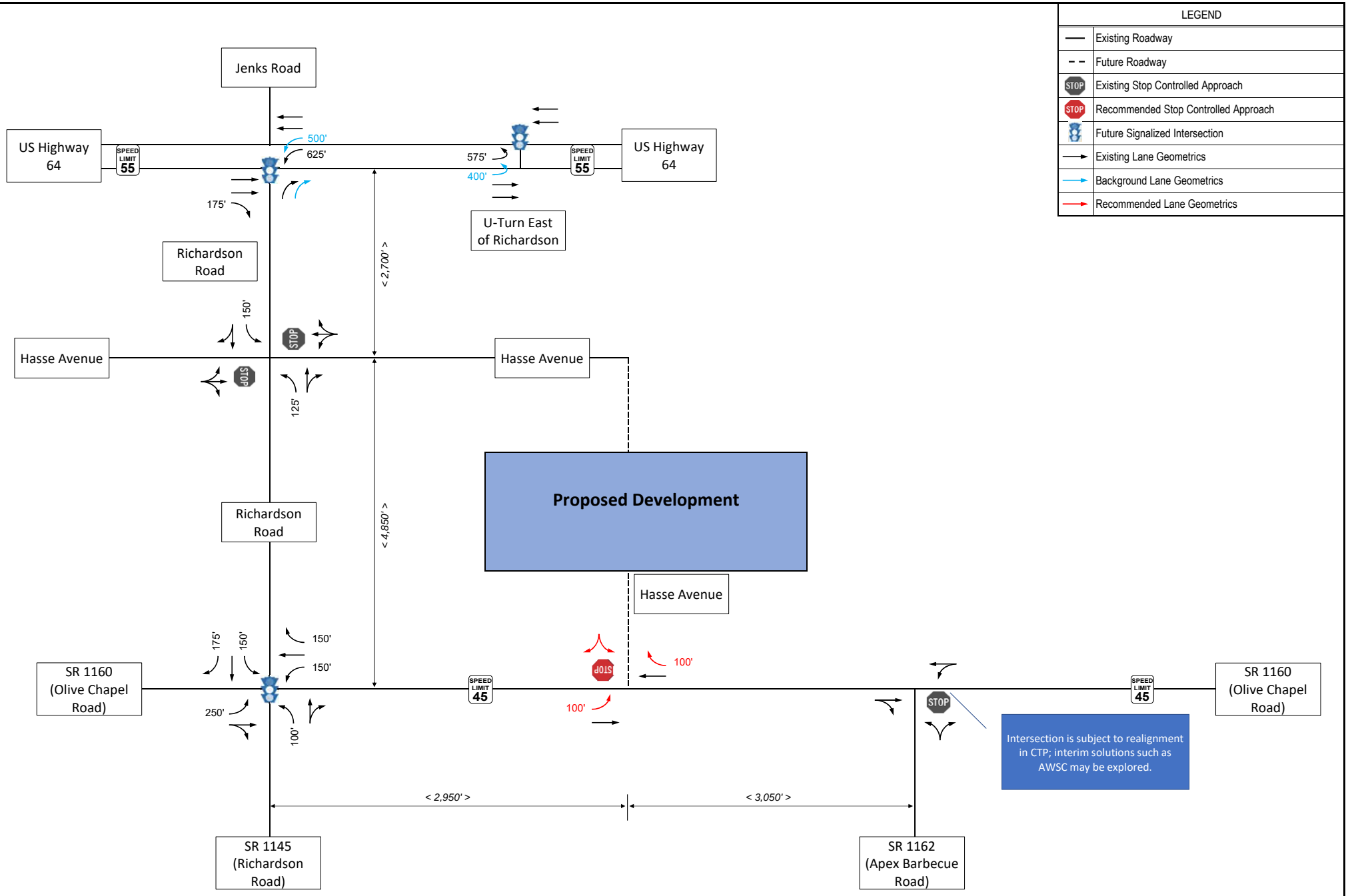
The rest of study area intersections are expected to operate acceptably. Therefore, no mitigation is required. A summary of the findings for the analysis scenarios is shown in Table 7, and the resulting future lane configurations and traffic controls in 2024 are shown in Figure 10.

Table 7: Summary LOS Table

Intersection and Approach	Control	Existing (2020)		No-Build (2024)		Build (2024)	
		AM	PM	AM	PM	AM	PM
Richardson Rd and Olive Chapel Rd	TWSC/ Signal	-	-	**A (9.7)**	**B (11.8)**	**A (9.8)**	**B (12.0)**
Eastbound		---	---	A-9.7	B-10.7	A-9.8	B-10.9
Westbound		---	---	B-10.3	B-12.0	B-10.5	B-12.2
Northbound		B-11.9	B-14.1	B-10.2	B-12.7	B-10.3	B-13.0
Southbound		B-11.7	C-15.5	A-8.4	B-11.5	A-8.5	B-11.6
Apex Barbecue Rd and Olive Chapel Rd	TWSC	-	-	-	-	-	-
Northbound		B-11.8	C-19.5	C-16.8	F-92.5	C-17.9	F-134.5
Richardson Rd and Little Gem Ln/Hasse Ave	TWSC	-	-	-	-	-	-
Eastbound		A-9.8	B-10.2	C-16.5	C-21.8	C-19.1	D-32.0
Westbound		A-9.7	A-9.9	C-15.1	C-19.1	C-17.0	C-21.9
Richardson Rd/WB Left-Over and US 64	TWSC/ Signal	-	-	**C (20.7)**	**D (42.0)**	**C (22.0)**	**D (44.5)**
Eastbound		---	---	C-20.7	D-51.3	C-23.7	E-56.0
Northbound		C-23.5	C-23.3	C-28.2	D-47.4	C-28.5	D-50.1
Southbound		F-66.0	F-216.7	B-10.9	B-19.6	A-9.8	B-19.5
U-Turn East of Richardson Rd and US 64	TWSC/ Signal	-	-	**B (11.8)**	**C (27.6)**	**B (12.5)**	**C (30.9)**
Westbound		---	---	A-9.6	C-20.5	B-10.5	C-24.1
Northbound		B-14.2	C-18.2	C-27.8	E-59.9	C-26.5	E-62.1
Olive Chapel Rd & Hasse Ave/Future Access #1	TWSC	-	-	-	-	-	-
Southbound		---	---	---	---	C-16.1	D-25.0

LEGEND: **X (XX)** = Overall intersection LOS (intersection delay in sec/veh);

X - XX = approach LOS – approach delay in sec/veh



Future (2024) Lane [illegible] and Traffic Control

Hackney Tract Subdivision
Apex, NC

APPENDICES

APPENDIX A:

Memorandum of Understanding

Memorandum

To: Russell H. Dalton, PE
Public Works & Transportation
Town of Apex
73 Hunter Street
Apex, NC 27502

Date: November 12, 2020

Project #: 38504.25

From: Baohong Wan, PhD, PE
Senior Project Manager

Re: Hackney Tract Subdivision TIA
Memorandum of Understanding

This memorandum summarizes the assumptions for a Traffic Impact Analysis (TIA) prepared for the proposed Hackney Tract Subdivision on Olive Chapel Road, west of the newly completed Richardson Road, in Apex, NC. Based on the preliminary plan (attached), the development is to consist of a mix of single-family and multi-family townhome uses:

- 100 single family homes
- 133 townhomes

Access to the development is to be provided primarily through a collector street (Hasse Avenue Extension) planned across the property. In addition, cross-connections will be provided via several street extensions to Smith Farm.

Study Area

Based on our previous correspondence, the following existing and future study area intersections will be included for analysis under the AM and PM peak hour conditions:

- SR 1160 (Olive Chapel Road) and SR 1145 (Richardson Road) (unsignalized/future signalized)
- SR 1160 (Olive Chapel Road) and SR 1162 (Apex Barbecue Road) (unsignalized)
- Richardson Road and Hasse Avenue (unsignalized)
- US Highway 64 East at Richardson Road (unsignalized/future signalized)
- US Highway 64 West at U-turn east of Richardson Road (unsignalized/future signalized)
- SR 1160 (Olive Chapel Road) and Future Access #1/Hasse Avenue Extension (full movement access)

The signalized intersection of SR 1160 (Olive Chapel Road) and SR 1163 (Kelly Road) was initially considered, but it was excluded from the study area due to its distance from the project site and the fact that this intersection has recently been upgraded with new turn lanes and crosswalks, and traffic is expected to decrease at this intersection due to the newly completed Richardson Road connection.

Data Collection

As discussed with the Town of Apex and NCDOT, collecting new traffic data was preferred to reflect new traffic patterns with the recently completed Richard Road between Olive Chapel Road and US 64. Turning movement data at the study intersections were collected by VHB during the AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods in November 2020. Traffic counts were collected while area schools were partially open with the

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Memorandum

COVID-19 restrictions. The Existing (2020) AM and PM peak hour turning movement volumes are shown in the Figure MOU-1.

Analysis Scenarios

In accordance with the Town of Apex's Unified Development Ordinance (UDO), a build-out year of 2024 will be analyzed. Therefore, weekday AM and PM peak hour analysis for the proposed development will be performed for four (4) scenarios:

- Existing (2020) Conditions
- Background (2024) Conditions
- Build (2024) Scenario
- Build (2024) Scenario with Improvements

Background Projects and Growth

As concurred by the Town of Apex, an annual growth rate of three percent (3%) will be applied to the existing year (2020) traffic to project future conditions (2024). In addition, the following approved developments are identified as within the study area, and will be included the future year traffic analysis:

- Saddlebrook (Lawrence Assemblage/Richardson West), TIA by RKA, November 2014, 75% completed
- Sweetwater, TIA by RKA December 2014, 80% completed for residential portion, 0% for mixed use
- Buckhorn Preserve (Goodwin-MacNair), TIA by VHB, June 2015, 50% completed
- Stillwater (Womble), TIA by Stantec, February 2014, 85% completed
- Westford, TIA by KHA, December 2016, 80% completed
- Smith Farm, TIA by RKA, November 2015, 75% completed for residential portion, 0% for mixed-use
- Linden (Pricewood Assemblage) TIA by RKA, August 2016, 15% completed

Note that although a significant number of trips are expected due to the approved developments, a 3% annual traffic growth rate will still be used to offset lower-than-normal traffic counts collected under the Existing (2020) conditions. Transportation improvements due to approved developments (particularly Sweetwater and Smith Farm) will be included in the future year analysis based on the transportation zoning conditions.

Trip Generation

Trip Generation will be conducted based on the most appropriate corresponding trip generation codes included in the *ITE Trip Generation Manual, 10th Edition*. Trip generation calculations will be based on the suggested method in the NCDOT's *"Rate vs. Equation"* spreadsheet. To provide a conservative analysis, no transit, walking, or bicycling reductions will be applied.

As shown in the preliminary trip generation results (attached), the proposed development is projected to generate 2,005 trips on a typical weekday with 139 trips occurring during the AM peak hour and 178 trips in the PM peak hour.

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Memorandum

Land Use Code[1]	Land Use	Unit	ADT	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
210	Single-Family Detached Housing	100 du	1,040	19	57	76	64	38	102
220	Multi-Family Housing (Low-Rise)	133 du	965	14	49	63	48	28	76
Development Total			*2,005*	*33*	*106*	*139*	*112*	*66*	*178*

Notes:

1. Land Use Code and trip generation rates are based on *ITE Trip Generation, 10th Edition*
2. Trips are determined based on the suggested method in the NCDOT Rate Vs Equation Spreadsheet.

Trip Distribution and Assignment

The site trips will be distributed in accordance with the existing traffic patterns and planned land uses in the vicinity of the study area. Based on the traffic data, the site trips will be distributed as follows:

- from/to the east via US Highway 64 – 50%
- from/to the west via US Highway 64 – 10%
- from/to the east via Olive Chapel Road – 25%
- from/to the west via Olive Chapel Road – 5%
- from/to the south via Richardson Road – 8%
- from/to the south via Apex Barbecue Road – 2%

A graphic illustration of the proposed peak hour directional distribution percentages is shown in the attached Figure MOU-2, and the resulting AM and PM peak hour trips at each study intersection are shown in Figure MOU-3.

CC: Amy N. Neidringhaus, PE, NCDOT Highway Division 5 District 1

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GRAPHIC SCALE

100 0 50 100 200

1 inch = 100 ft.

WithersRavenel
Engineers | Planners | Surveyors
115 MacKenan Drive | Cary, NC 27511 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

HACKNEY TRACT SUBDIVISION

APEX, NORTH CAROLINA

OVERALL SUBDIVISION PLAN

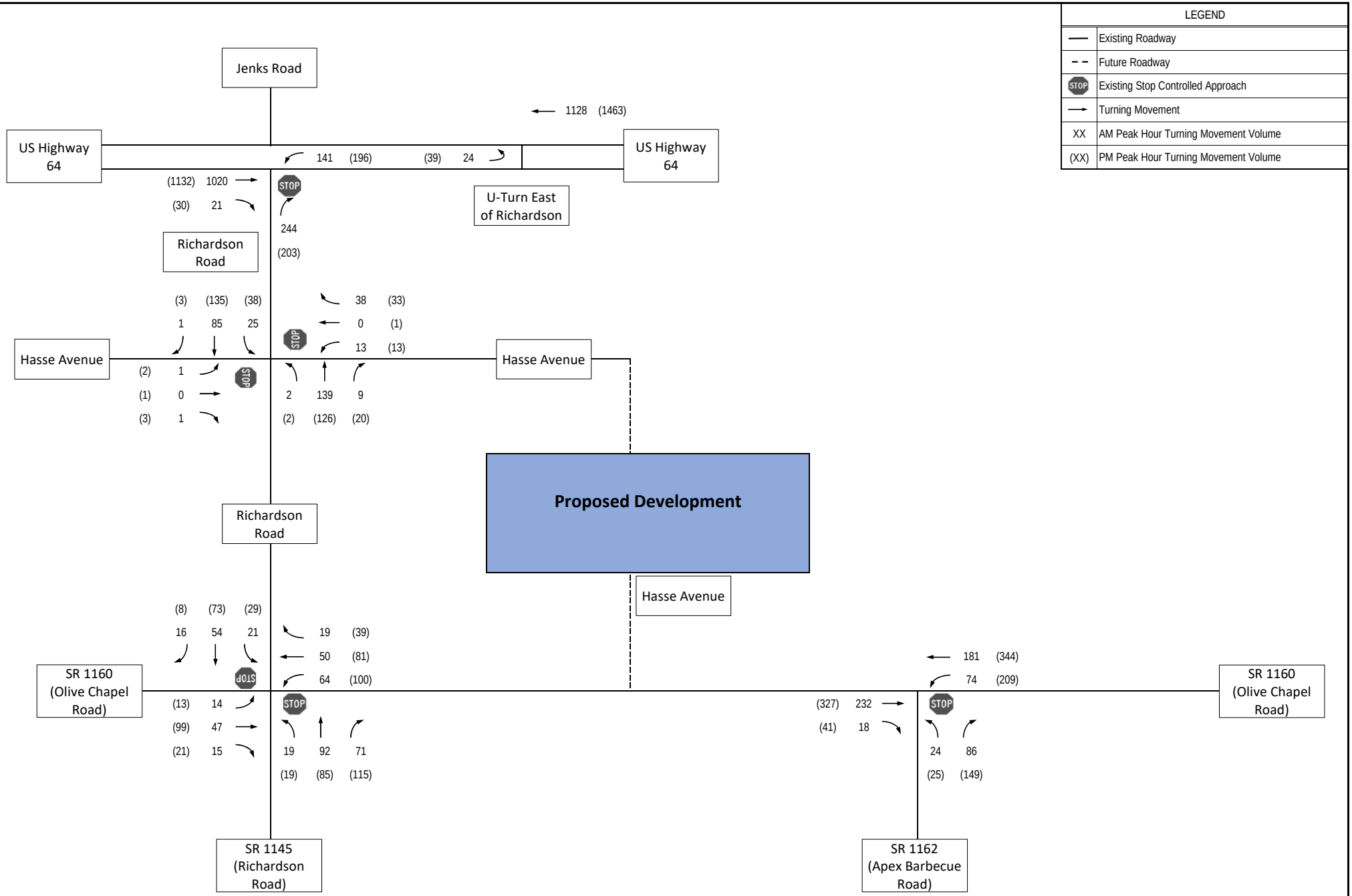
Job No.	02180517.20	Drawn By	WR
Date	10/19/20	Designer	WR

PRELIMINARY
NOT APPROVED FOR CONSTRUCTION

Revisions

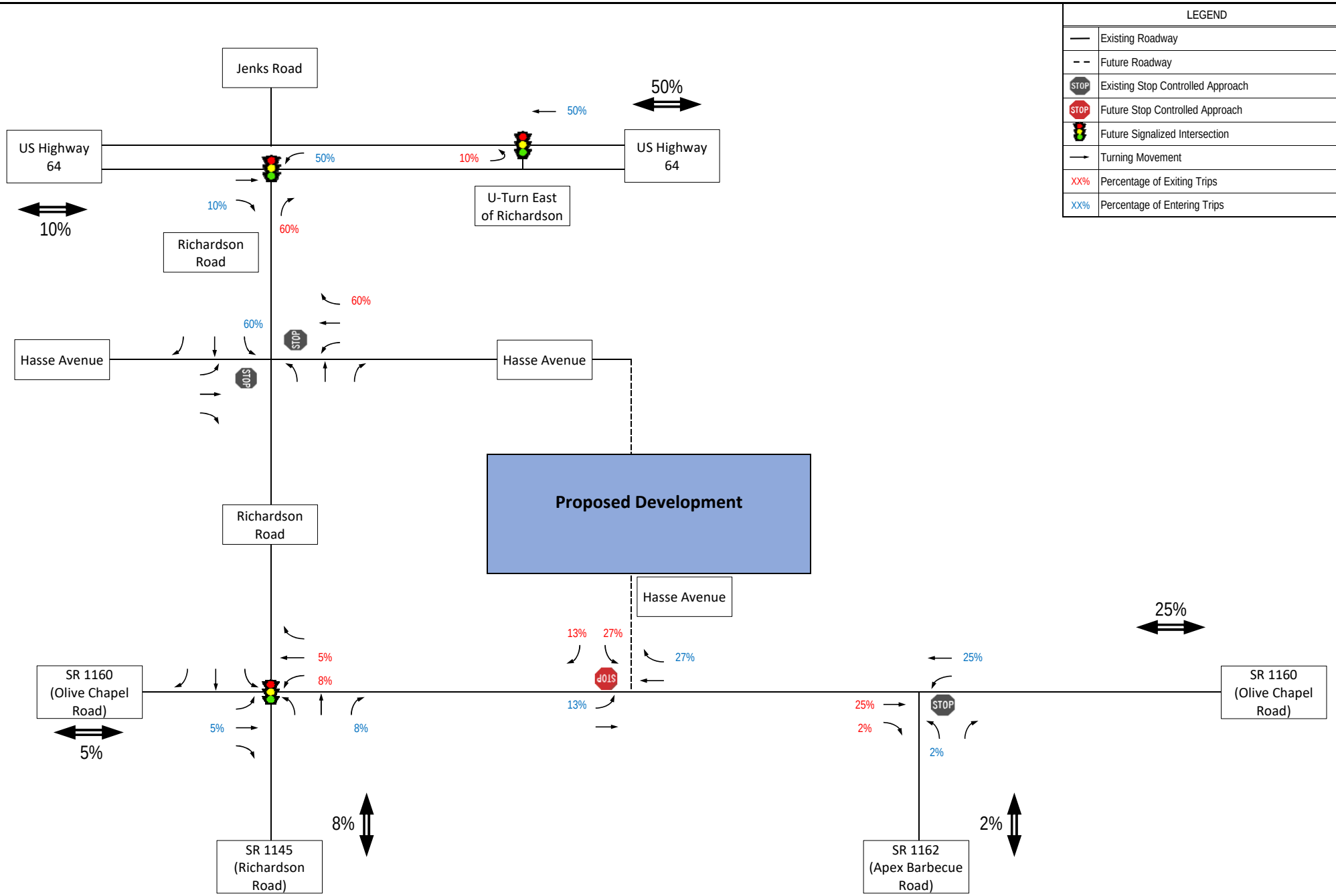
Sheet No. 1.0

K:\18\18-0010\180517.10-Fuller-Hackney Tract\CAD\Drawing Sets\Preliminary\1.0 SUBDIVISION PLAN.dwg Tuesday, October 20, 2020 1:12:52 PM INGE.BRYANT



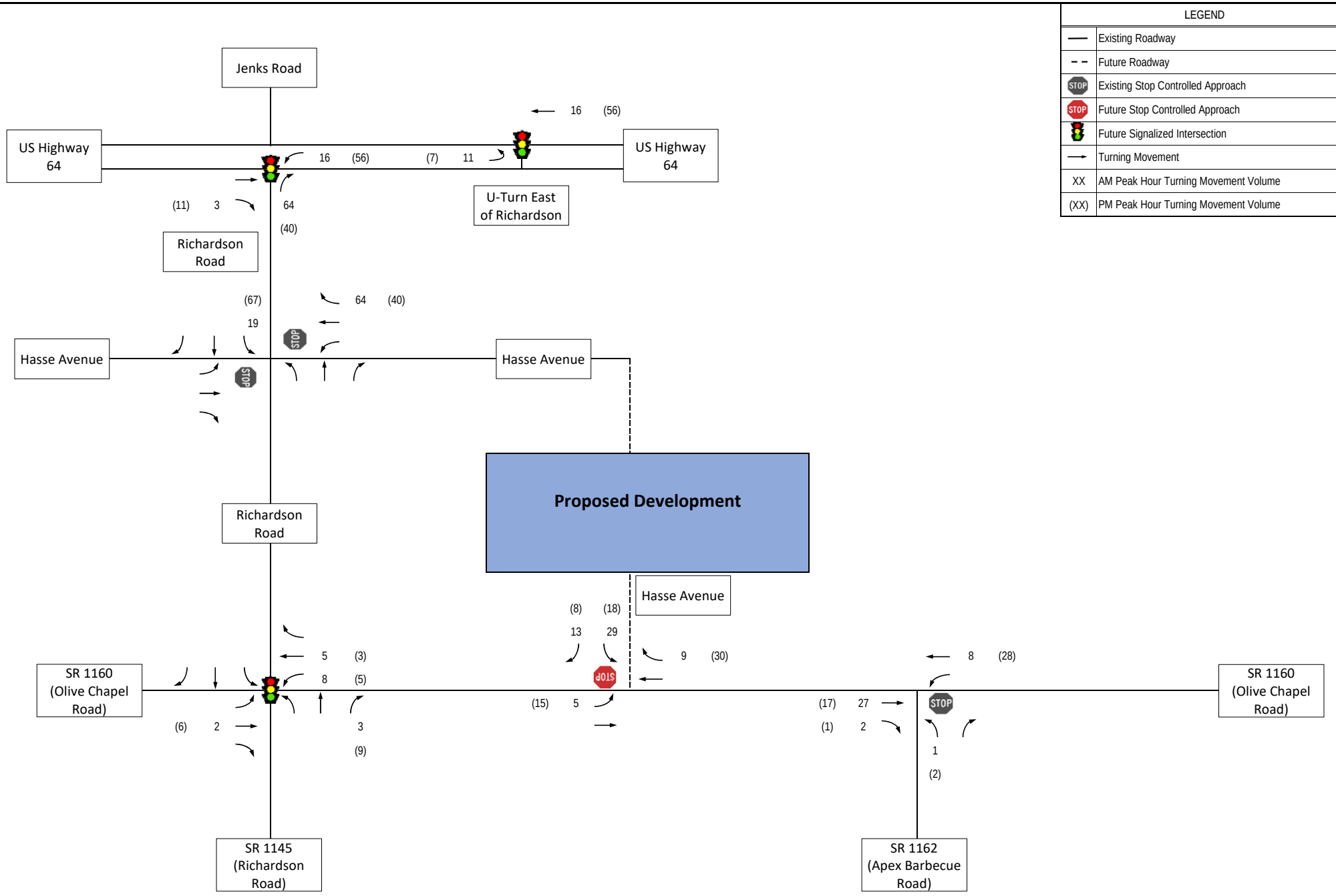
Existing (2020) AM and PM Peak Hour Turning Movement Volumes

Hackney Tract Subdivision
Apex, NC



Peak Hour Site Trip Di[illegible]signment Percentages

Hackney Tract Subdivision
Apex, NC



AM and P[illegible] Site Trips

Hackney Tract Subdivision
Apex, NC

APPENDIX B:

Turning Movement Counts

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Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : OliveChapel@ApexBarbecue
Site Code :
Start Date : 11/5/2020
Page No : 1

Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Driveway Southbound				Olive Chapel Road Westbound				Apex Barbecue Road Northbound				Olive Chapel Road Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	9	18	0	0	2	0	21	1	0	35	3	0	1	88	89
07:15 AM	0	0	0	0	9	20	0	0	4	0	19	1	0	44	5	0	1	101	102
07:30 AM	0	0	0	0	13	24	0	0	4	0	29	3	0	46	5	0	3	121	124
07:45 AM	0	0	0	0	21	45	0	0	6	0	30	4	0	57	10	0	4	169	173
Total	0	0	0	0	52	107	0	0	16	0	99	9	0	182	23	0	9	479	488
08:00 AM	0	0	0	0	13	43	0	0	7	0	19	5	0	52	2	0	5	136	141
08:15 AM	0	0	0	0	14	51	0	0	7	0	23	0	0	58	5	0	0	158	158
08:30 AM	0	0	0	0	16	36	0	0	6	0	27	2	0	54	4	0	2	143	145
08:45 AM	0	0	0	0	31	51	0	0	4	0	17	0	0	68	7	0	0	178	178
Total	0	0	0	0	74	181	0	0	24	0	86	7	0	232	18	0	7	615	622
*** BREAK ***																			
04:00 PM	0	1	0	0	47	72	0	0	6	0	27	1	0	64	8	0	1	225	226
04:15 PM	0	0	0	0	39	87	1	0	12	0	30	0	0	52	10	0	0	231	231
04:30 PM	0	0	0	0	43	72	0	0	4	0	32	6	0	74	6	0	6	231	237
04:45 PM	0	0	0	0	32	76	0	0	7	0	30	5	0	70	9	0	5	224	229
Total	0	1	0	0	161	307	1	0	29	0	119	12	0	260	33	0	12	911	923
05:00 PM	0	0	1	0	49	94	0	0	8	0	32	4	0	83	8	0	4	275	279
05:15 PM	0	0	0	0	59	81	0	0	9	0	42	8	0	91	8	0	8	290	298
05:30 PM	0	0	0	0	50	85	0	0	6	0	32	9	0	83	8	0	9	264	273
05:45 PM	0	0	0	0	51	84	0	0	2	0	43	4	0	70	17	0	4	267	271
Total	0	0	1	0	209	344	0	0	25	0	149	25	0	327	41	0	25	1096	1121
Grand Total	0	1	1	0	496	939	1	0	94	0	453	53	0	1001	115	0	53	3101	3154
Apprch %	0	50	50		34.5	65.4	0.1		17.2	0	82.8		0	89.7	10.3				
Total %	0	0	0		16	30.3	0		3	0	14.6		0	32.3	3.7		1.7	98.3	
Passenger Vehicles	0	1	1		476	916	1		93	0	446		0	981	115		0	0	3030
% Passenger Vehicles	0	100	100	0	96	97.6	100	0	98.9	0	98.5	0	0	98	100	0	0	0	96.1
Single Unit	0	0	0		20	20	0		1	0	7		0	19	0		0	0	67
% Single Unit	0	0	0	0	4	2.1	0	0	1.1	0	1.5	0	0	1.9	0	0	0	0	2.1
TTST	0	0	0		0	3	0		0	0	0		0	1	0		0	0	4
% TTST	0	0	0	0	0	0.3	0	0	0	0	0	0	0	0.1	0	0	0	0	0.1
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	4
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	7.5	0	0	0	0	0	0	0.1
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	49
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	92.5	0	0	0	0	0	0	1.6

VHB Engineering NC, P.C.

Venture I
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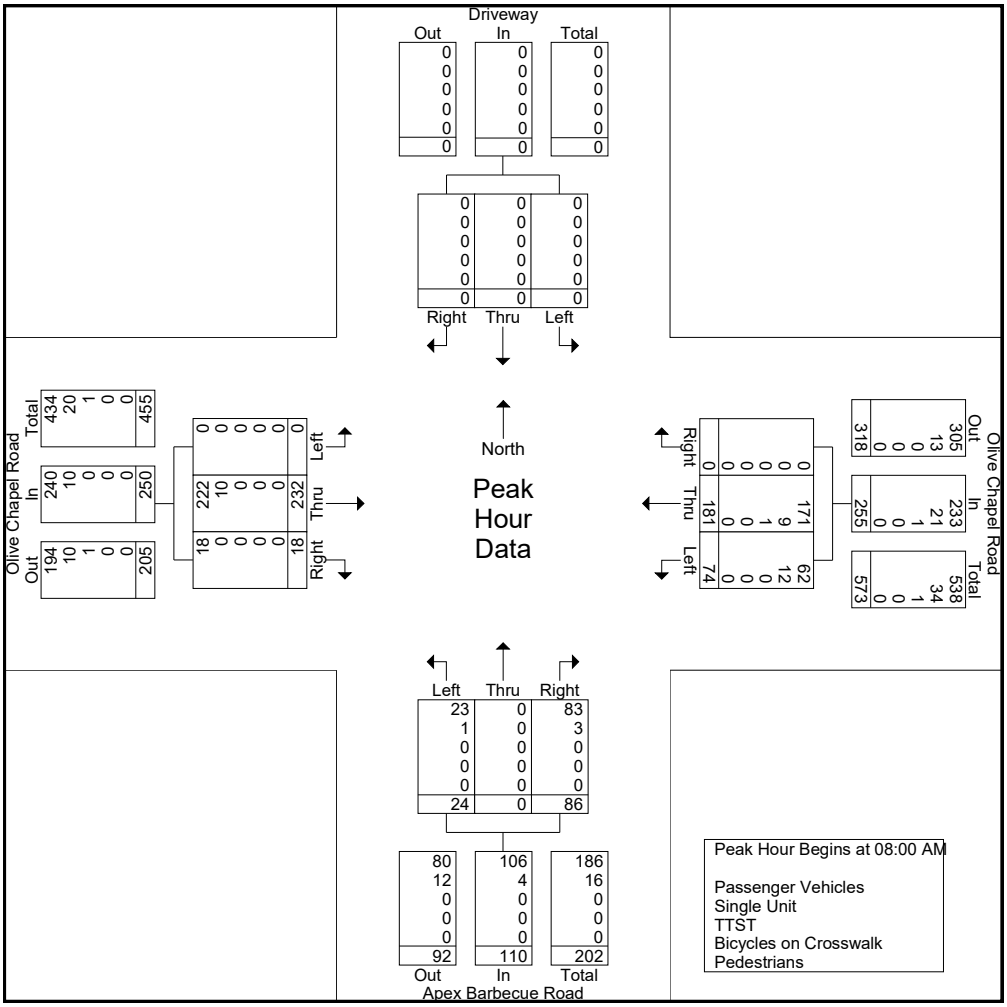
p: 919.829.0328 f: 919.833.0034

File Name : OliveChapel@ApexBarbecue
Site Code :
Start Date : 11/5/2020
Page No : 2

	Driveway Southbound				Olive Chapel Road Westbound				Apex Barbecue Road Northbound				Olive Chapel Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	0	0	0	0	13	43	0	56	7	0	19	26	0	52	2	54	136
08:15 AM	0	0	0	0	14	51	0	65	7	0	23	30	0	58	5	63	158
08:30 AM	0	0	0	0	16	36	0	52	6	0	27	33	0	54	4	58	143
08:45 AM	0	0	0	0	31	51	0	82	4	0	17	21	0	68	7	75	178
Total Volume	0	0	0	0	74	181	0	255	24	0	86	110	0	232	18	250	615
% App. Total	0	0	0		29	71	0		21.8	0	78.2		0	92.8	7.2		
PHF	.000	.000	.000	.000	.597	.887	.000	.777	.857	.000	.796	.833	.000	.853	.643	.833	.864
Passenger Vehicles	0	0	0	0	62	171	0	233	23	0	83	106	0	222	18	240	579
% Passenger Vehicles	0	0	0	0	83.8	94.5	0	91.4	95.8	0	96.5	96.4	0	95.7	100	96.0	94.1
Single Unit	0	0	0	0	12	9	0	21	1	0	3	4	0	10	0	10	35
% Single Unit	0	0	0	0	16.2	5.0	0	8.2	4.2	0	3.5	3.6	0	4.3	0	4.0	5.7
TTST	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% TTST	0	0	0	0	0	0.6	0	0.4	0	0	0	0	0	0	0	0	0.2
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Venture I
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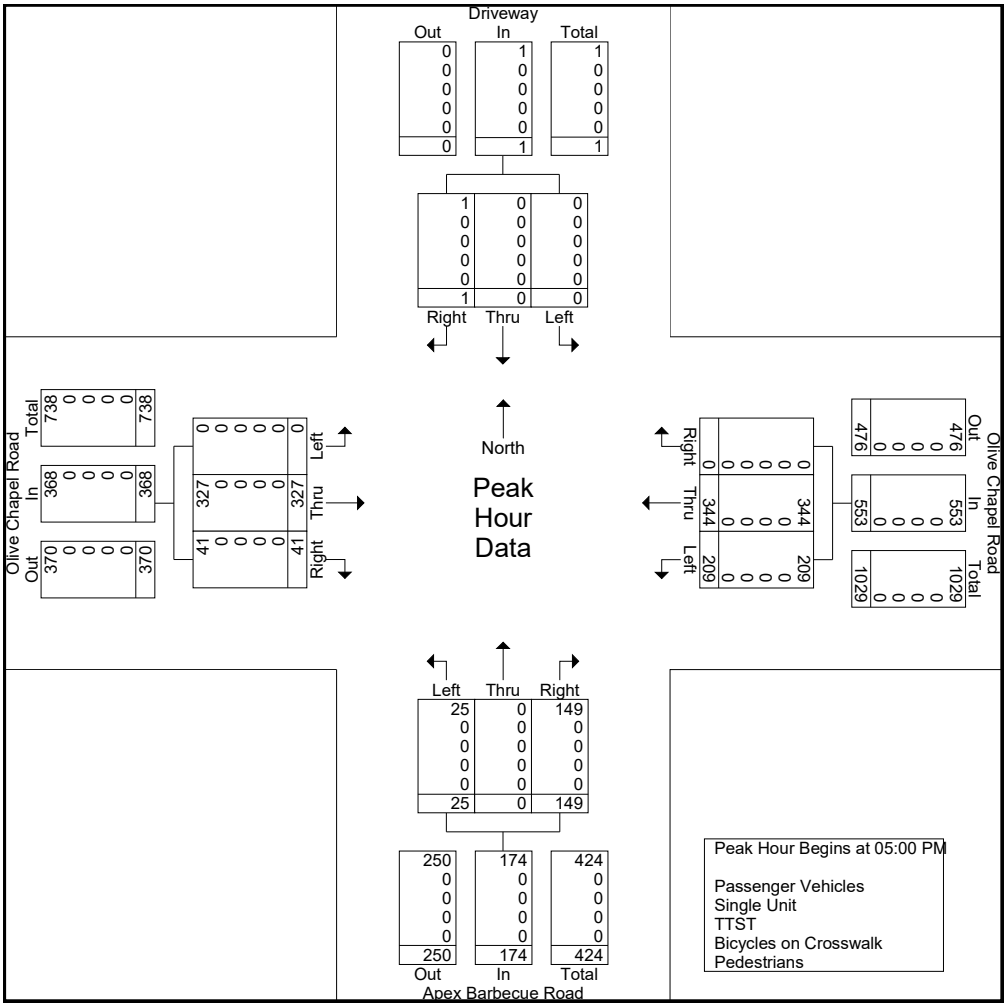
p: 919.829.0328 f: 919.833.0034

File Name : OliveChapel@ApexBarbecue
Site Code :
Start Date : 11/5/2020
Page No : 3

	Driveway Southbound				Olive Chapel Road Westbound				Apex Barbecue Road Northbound				Olive Chapel Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	1	1	49	94	0	143	8	0	32	40	0	83	8	91	275
05:15 PM	0	0	0	0	59	81	0	140	9	0	42	51	0	91	8	99	290
05:30 PM	0	0	0	0	50	85	0	135	6	0	32	38	0	83	8	91	264
05:45 PM	0	0	0	0	51	84	0	135	2	0	43	45	0	70	17	87	267
Total Volume	0	0	1	1	209	344	0	553	25	0	149	174	0	327	41	368	1096
% App. Total	0	0	100		37.8	62.2	0		14.4	0	85.6		0	88.9	11.1		
PHF	.000	.000	.250	.250	.886	.915	.000	.967	.694	.000	.866	.853	.000	.898	.603	.929	.945
Passenger Vehicles	0	0	1	1	209	344	0	553	25	0	149	174	0	327	41	368	1096
% Passenger Vehicles	0	0	100	100	100	100	0	100	100	0	100	100	0	100	100	100	100
Single Unit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Single Unit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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940 Main Campus Drive, Suite 500
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p: 919.829.0328 f: 919.833.0034

File Name : OliveChapel@Richardson
Site Code :
Start Date : 11/5/2020
Page No : 1

Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Richardson Road Southbound				Olive Chapel Road Westbound				Richardson Road Northbound				Olive Chapel Road Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	3	14	1	0	9	8	1	1	6	14	5	0	1	8	4	0	0	75	75
07:15 AM	2	8	7	0	4	14	3	0	6	23	11	0	4	9	4	0	0	95	95
07:30 AM	0	15	2	0	8	9	7	1	6	24	10	2	8	23	3	1	0	119	119
07:45 AM	5	14	4	0	13	16	4	0	5	15	11	0	0	11	2	0	0	100	100
Total	10	51	14	0	34	47	15	2	23	76	37	2	13	51	13	1	0	389	389
08:00 AM	3	11	3	0	14	17	5	1	4	23	14	4	3	8	2	0	0	112	112
08:15 AM	3	18	4	0	15	9	5	1	4	30	17	2	2	14	3	0	0	127	127
08:30 AM	4	13	3	2	15	14	6	0	6	16	18	0	5	12	4	0	2	116	118
08:45 AM	11	12	6	1	20	10	3	0	5	23	22	0	4	13	6	0	1	135	136
Total	21	54	16	3	64	50	19	2	19	92	71	6	14	47	15	0	3	490	493
*** BREAK ***																			
04:00 PM	6	19	2	0	27	18	7	0	6	14	13	1	4	26	1	0	0	144	144
04:15 PM	4	13	7	0	22	30	9	4	3	16	13	0	1	18	2	3	0	145	145
04:30 PM	12	23	0	2	16	20	8	2	7	12	23	0	5	21	3	0	2	152	154
04:45 PM	5	23	9	1	21	18	12	0	3	15	18	0	1	21	3	0	1	149	150
Total	27	78	18	3	86	86	36	6	19	57	67	1	11	86	9	3	3	590	593
05:00 PM	6	23	2	1	28	23	7	0	4	21	39	1	3	18	4	0	1	179	180
05:15 PM	8	17	2	0	29	30	9	1	4	26	29	0	3	21	3	0	0	182	182
05:30 PM	4	18	4	1	19	12	16	0	9	23	26	0	2	28	6	0	1	167	168
05:45 PM	11	15	0	1	24	16	7	0	2	15	21	0	5	32	8	0	1	156	157
Total	29	73	8	3	100	81	39	1	19	85	115	1	13	99	21	0	3	684	687
Grand Total	87	256	56	9	284	264	109	11	80	310	290	10	51	283	58	4	9	2153	2162
Apprch %	21.8	64.2	14		42.5	39.5	16.3	1.6	11.6	44.9	42	1.4	12.9	71.5	14.6	1			
Total %	4	11.9	2.6		13.2	12.3	5.1	0.5	3.7	14.4	13.5	0.5	2.4	13.1	2.7	0.2	0.4	99.6	
Passenger Vehicles	86	247	45		276	257	107	0	79	298	283	0	47	280	56	0	0	0	2061
% Passenger Vehicles	98.9	96.5	80.4	0	97.2	97.3	98.2	0	98.8	96.1	97.6	0	92.2	98.9	96.6	0	0	0	95.3
Single Unit	1	7	9		8	6	2	0	0	8	7	0	4	3	1	0	0	0	56
% Single Unit	1.1	2.7	16.1	0	2.8	2.3	1.8	0	0	2.6	2.4	0	7.8	1.1	1.7	0	0	0	2.6
TTST	0	2	2		0	1	0	0	1	4	0	0	0	0	1	0	0	0	11
% TTST	0	0.8	3.6	0	0	0.4	0	0	1.2	1.3	0	0	0	0	1.7	0	0	0	0.5
Bicycles on Crosswalk	0	0	0		0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0.1
Pedestrians	0	0	0		0	0	0	11	0	0	0	8	0	0	0	4	0	0	32
% Pedestrians	0	0	0	100	0	0	0	100	0	0	0	80	0	0	0	100	0	0	1.5

VHB Engineering NC, P.C.

Venture I
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
p: 919.829.0328 f: 919.833.0034

File Name : OliveChapel@Richardson
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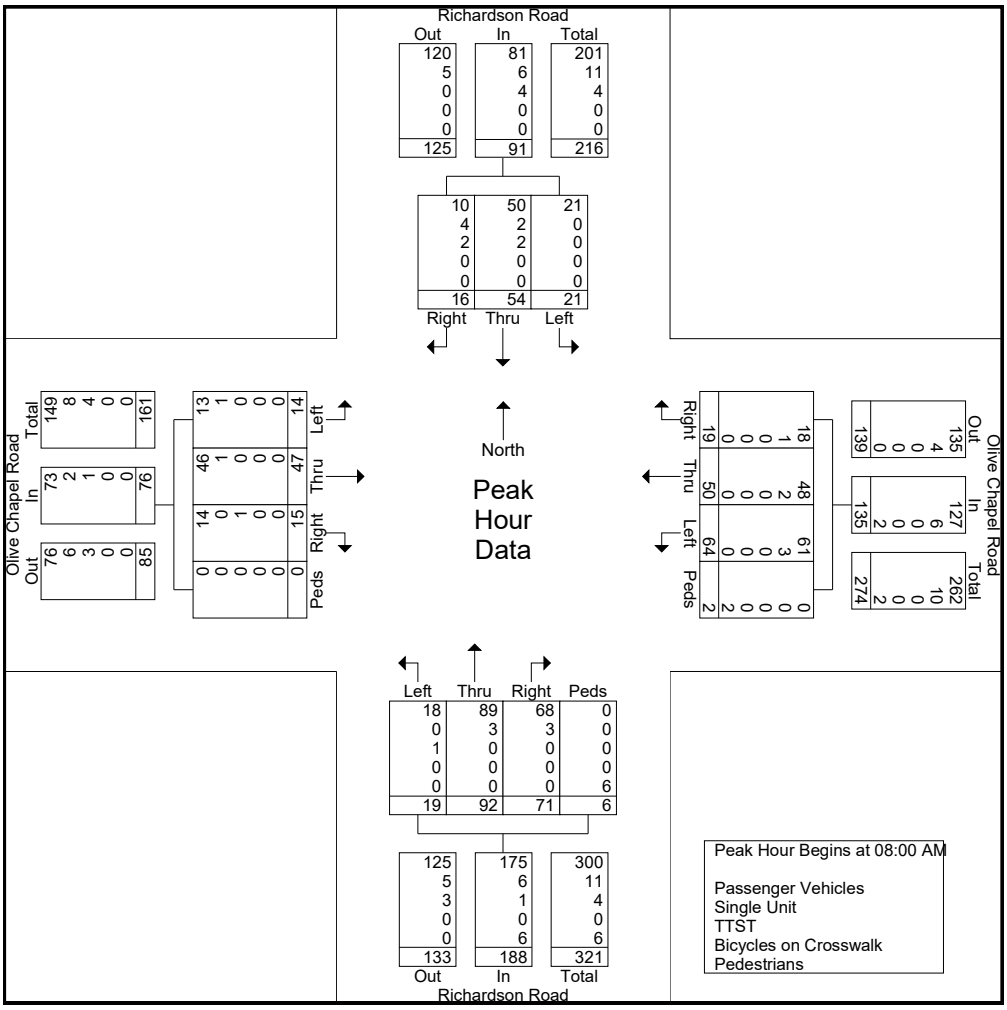
	Richardson Road Southbound				Olive Chapel Road Westbound					Richardson Road Northbound					Olive Chapel Road Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 08:00 AM																				
08:00 AM	3	11	3	17	14	17	5	1	37	4	23	14	4	45	3	8	2	0	13	112
08:15 AM	3	18	4	25	15	9	5	1	30	4	30	17	2	53	2	14	3	0	19	127
08:30 AM	4	13	3	20	15	14	6	0	35	6	16	18	0	40	5	12	4	0	21	116
08:45 AM	11	12	6	29	20	10	3	0	33	5	23	22	0	50	4	13	6	0	23	135
Total Volume	21	54	16	91	64	50	19	2	135	19	92	71	6	188	14	47	15	0	76	490
% App. Total	23.1	59.3	17.6		47.4	37	14.1	1.5		10.1	48.9	37.8	3.2		18.4	61.8	19.7	0		
PHF	.477	.750	.667	.784	.800	.735	.792	.500	.912	.792	.767	.807	.375	.887	.700	.839	.625	.000	.826	.907
Passenger Vehicles	21	50	10	81	61	48	18	0	127	18	89	68	0	175	13	46	14	0	73	456
% Passenger Vehicles																				
Single Unit	0	2	4	6	3	2	1	0	6	0	3	3	0	6	1	1	0	0	2	20
% Single Unit	0	3.7	25.0	6.6	4.7	4.0	5.3	0	4.4	0	3.3	4.2	0	3.2	7.1	2.1	0	0	2.6	4.1
TTST	0	2	2	4	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	6
% TTST	0	3.7	12.5	4.4	0	0	0	0	0	5.3	0	0	0	0.5	0	0	6.7	0	1.3	1.2
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	2	2	0	0	0	6	6	0	0	0	0	0	8
% Pedestrians	0	0	0	0	0	0	0	100	1.5	0	0	0	100	3.2	0	0	0	0	0	1.6



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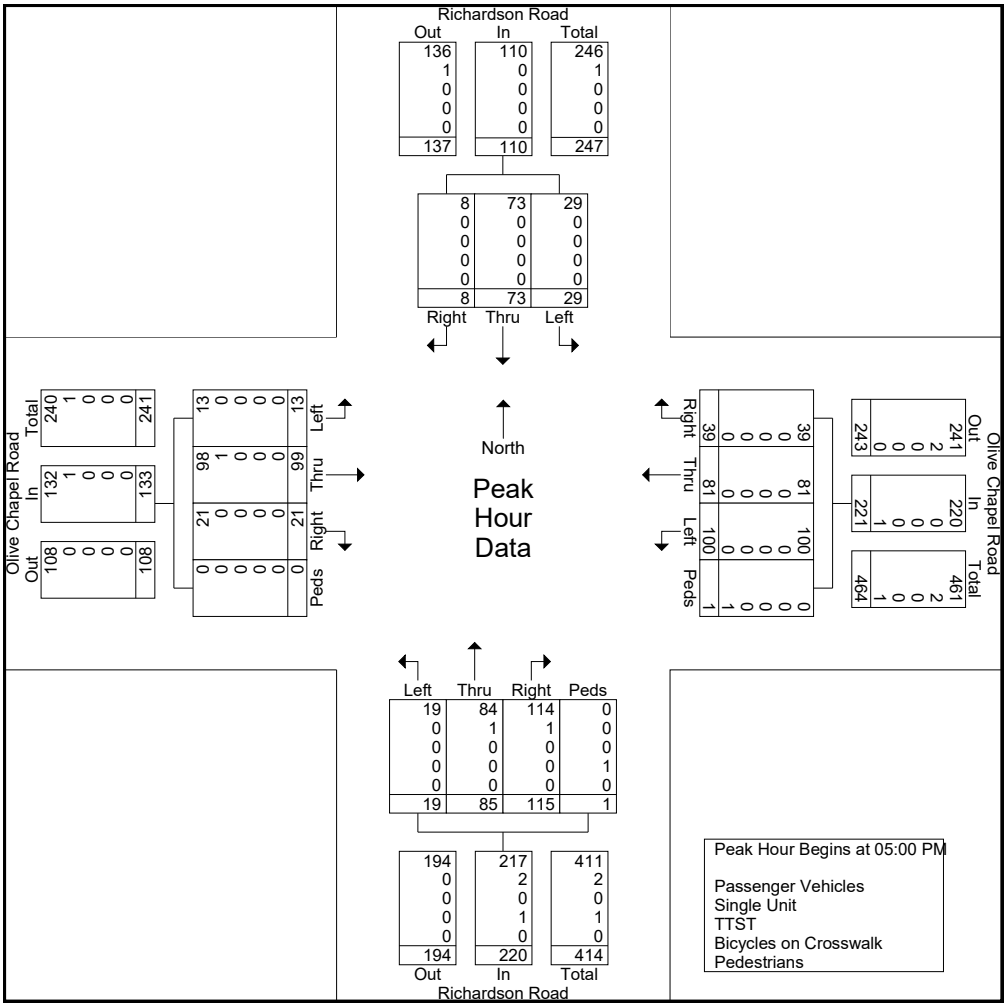
	Richardson Road Southbound				Olive Chapel Road Westbound					Richardson Road Northbound					Olive Chapel Road Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 05:00 PM																				
05:00 PM	6	23	2	31	28	23	7	0	58	4	21	39	1	65	3	18	4	0	25	179
05:15 PM	8	17	2	27	29	30	9	1	69	4	26	29	0	59	3	21	3	0	27	182
05:30 PM	4	18	4	26	19	12	16	0	47	9	23	26	0	58	2	28	6	0	36	167
05:45 PM	11	15	0	26	24	16	7	0	47	2	15	21	0	38	5	32	8	0	45	156
Total Volume	29	73	8	110	100	81	39	1	221	19	85	115	1	220	13	99	21	0	133	684
% App. Total	26.4	66.4	7.3		45.2	36.7	17.6	0.5		8.6	38.6	52.3	0.5		9.8	74.4	15.8	0		
PHF	.659	.793	.500	.887	.862	.675	.609	.250	.801	.528	.817	.737	.250	.846	.650	.773	.656	.000	.739	.940
Passenger Vehicles	29	73	8	110	100	81	39	0	220	19	84	114	0	217	13	98	21	0	132	679
% Passenger Vehicles																				
Single Unit	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	1	0	0	1	3
% Single Unit	0	0	0	0	0	0	0	0	0	0	1.2	0.9	0	0.9	0	1.0	0	0	0.8	0.4
TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% TTST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	100	0.5	0	0	0	0	0	0.1
Pedestrians	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
% Pedestrians	0	0	0	0	0	0	0	100	0.5	0	0	0	0	0	0	0	0	0	0	0.1



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Venture I
940 Main Campus Drive, Suite 500
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p: 919.829.0328 f: 919.833.0034

File Name : Richardson@Hasse
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Start Date : 11/5/2020
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Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Richardson Road Southbound				Hasse Avenue Westbound				Richardson Road Northbound				Little Gem Lane Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	3	16	0	0	2	0	6	2	0	22	0	0	0	0	0	0	2	49	51
07:15 AM	6	16	0	2	1	0	8	1	0	36	1	0	0	0	0	0	3	68	71
07:30 AM	2	17	0	0	1	0	14	0	2	36	3	1	3	1	0	1	2	79	81
07:45 AM	5	23	0	0	3	0	13	1	0	26	2	0	1	0	1	1	2	74	76
Total	16	72	0	2	7	0	41	4	2	120	6	1	4	1	1	2	9	270	279
08:00 AM	9	17	0	0	2	0	11	0	1	35	3	0	0	0	0	1	1	78	79
08:15 AM	4	27	1	0	4	0	9	1	0	29	4	0	0	0	0	1	2	78	80
08:30 AM	6	22	0	0	3	0	9	1	0	36	1	0	1	0	0	1	2	78	80
08:45 AM	6	19	0	0	4	0	9	0	1	39	1	1	0	0	1	1	2	80	82
Total	25	85	1	0	13	0	38	2	2	139	9	1	1	0	1	4	7	314	321
*** BREAK ***																			
04:00 PM	2	24	0	3	0	1	8	1	0	17	5	0	1	0	0	1	5	58	63
04:15 PM	7	19	3	1	7	0	6	4	0	28	2	1	1	0	0	0	6	73	79
04:30 PM	5	22	0	2	1	0	8	2	0	26	3	1	0	0	0	2	7	65	72
04:45 PM	11	36	0	2	3	0	10	0	0	21	6	0	1	1	0	0	2	89	91
Total	25	101	3	8	11	1	32	7	0	92	16	2	3	1	0	3	20	285	305
05:00 PM	10	33	0	2	2	0	7	0	0	33	6	0	1	0	1	0	2	93	95
05:15 PM	8	24	0	2	5	1	7	2	0	40	3	1	0	0	2	1	6	90	96
05:30 PM	9	42	3	0	3	0	9	0	2	32	5	0	0	0	0	1	1	105	106
05:45 PM	7	21	0	0	2	0	3	0	2	27	5	0	0	0	1	0	0	68	68
Total	34	120	3	4	12	1	26	2	4	132	19	1	1	0	4	2	9	356	365
Grand Total	100	378	7	14	43	2	137	15	8	483	50	5	9	2	6	11	45	1225	1270
Apprch %	20.6	77.9	1.4		23.6	1.1	75.3		1.5	89.3	9.2		52.9	11.8	35.3				
Total %	8.2	30.9	0.6		3.5	0.2	11.2		0.7	39.4	4.1		0.7	0.2	0.5		3.5	96.5	
Passenger Vehicles	98	365	6		41	2	136		8	467	49		8	0	6		0	0	1186
% Passenger Vehicles	98	96.6	85.7	0	95.3	100	99.3	0	100	96.7	98	0	88.9	0	100	0	0	0	93.4
Single Unit	2	6	1		2	0	1		0	10	1		1	1	0		0	0	25
% Single Unit	2	1.6	14.3	0	4.7	0	0.7	0	0	2.1	2	0	11.1	50	0	0	0	0	2
TTST	0	7	0		0	0	0		0	6	0		0	1	0		0	0	14
% TTST	0	1.9	0	0	0	0	0	0	0	1.2	0	0	0	50	0	0	0	0	1.1
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	2
% Bicycles on Crosswalk	0	0	0	7.1	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0.2
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	43
% Pedestrians	0	0	0	92.9	0	0	0	100	0	0	0	80	0	0	0	100	0	0	3.4

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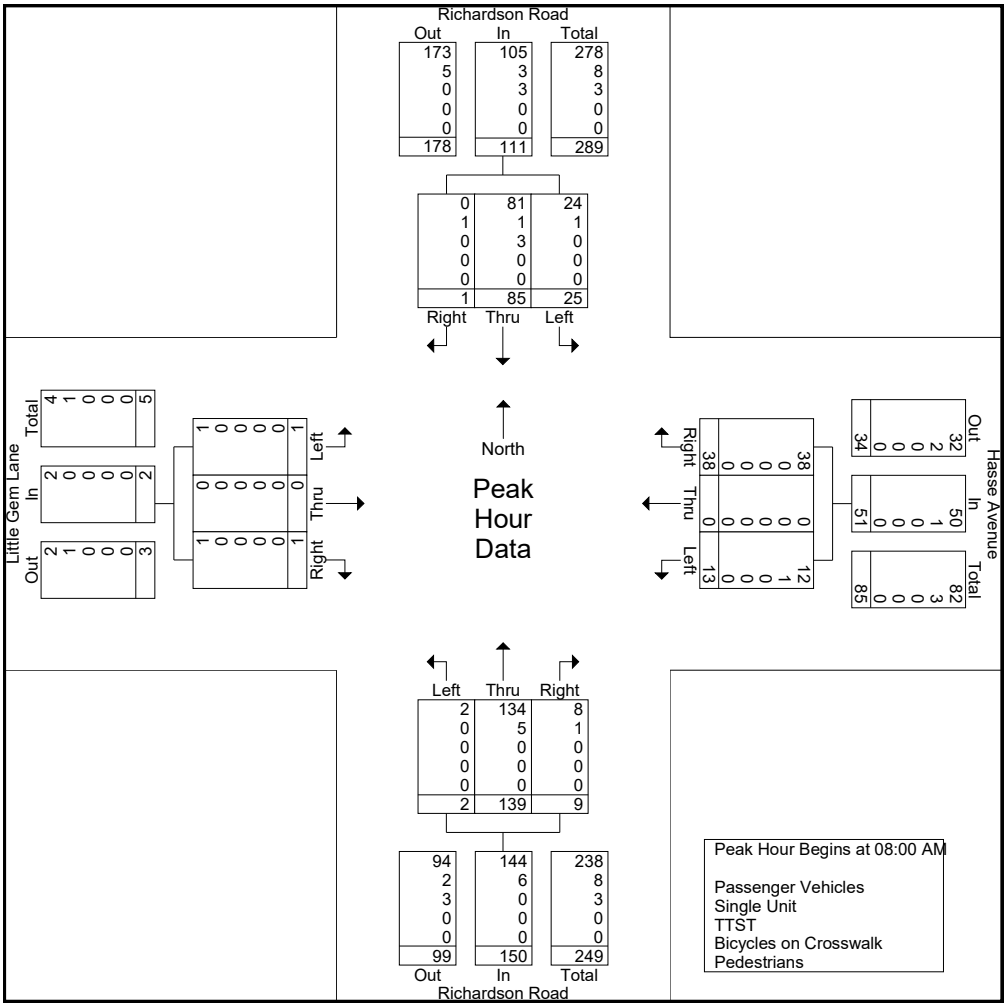
	Richardson Road Southbound				Hasse Avenue Westbound				Richardson Road Northbound				Little Gem Lane Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	9	17	0	26	2	0	11	13	1	35	3	39	0	0	0	0	78
08:15 AM	4	27	1	32	4	0	9	13	0	29	4	33	0	0	0	0	78
08:30 AM	6	22	0	28	3	0	9	12	0	36	1	37	1	0	0	1	78
08:45 AM	6	19	0	25	4	0	9	13	1	39	1	41	0	0	1	1	80
Total Volume	25	85	1	111	13	0	38	51	2	139	9	150	1	0	1	2	314
% App. Total	22.5	76.6	0.9		25.5	0	74.5		1.3	92.7	6		50	0	50		
PHF	.694	.787	.250	.867	.813	.000	.864	.981	.500	.891	.563	.915	.250	.000	.250	.500	.981
Passenger Vehicles	24	81	0	105	12	0	38	50	2	134	8	144	1	0	1	2	301
% Passenger Vehicles	96.0	95.3	0	94.6	92.3	0	100	98.0	100	96.4	88.9	96.0	100	0	100	100	95.9
Single Unit	1	1	1	3	1	0	0	1	0	5	1	6	0	0	0	0	10
% Single Unit	4.0	1.2	100	2.7	7.7	0	0	2.0	0	3.6	11.1	4.0	0	0	0	0	3.2
TTST	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
% TTST	0	3.5	0	2.7	0	0	0	0	0	0	0	0	0	0	0	0	1.0
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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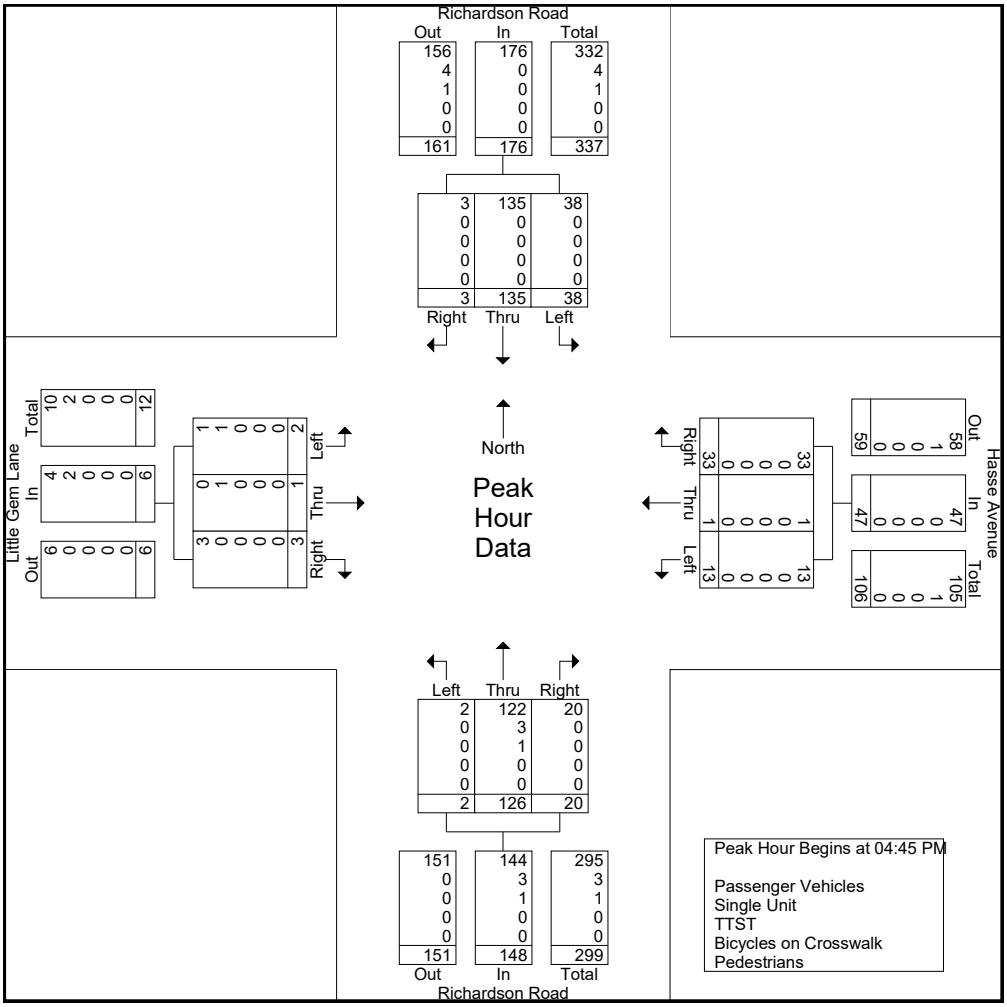
	Richardson Road Southbound				Hasse Avenue Westbound				Richardson Road Northbound				Little Gem Lane Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	11	36	0	47	3	0	10	13	0	21	6	27	1	1	0	2	89
05:00 PM	10	33	0	43	2	0	7	9	0	33	6	39	1	0	1	2	93
05:15 PM	8	24	0	32	5	1	7	13	0	40	3	43	0	0	2	2	90
05:30 PM	9	42	3	54	3	0	9	12	2	32	5	39	0	0	0	0	105
Total Volume	38	135	3	176	13	1	33	47	2	126	20	148	2	1	3	6	377
% App. Total	21.6	76.7	1.7		27.7	2.1	70.2		1.4	85.1	13.5		33.3	16.7	50		
PHF	.864	.804	.250	.815	.650	.250	.825	.904	.250	.788	.833	.860	.500	.250	.375	.750	.898
Passenger Vehicles	38	135	3	176	13	1	33	47	2	122	20	144	1	0	3	4	371
% Passenger Vehicles	100	100	100	100	100	100	100	100	100	96.8	100	97.3	50.0	0	100	66.7	98.4
Single Unit	0	0	0	0	0	0	0	0	0	3	0	3	1	1	0	2	5
% Single Unit	0	0	0	0	0	0	0	0	0	2.4	0	2.0	50.0	100	0	33.3	1.3
TTST	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% TTST	0	0	0	0	0	0	0	0	0	0.8	0	0.7	0	0	0	0	0.3
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Venture I
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File Name : US64@Richardson
Site Code :
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Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	Jenks Road Southbound				US 64 Westbound				Richardson Avenue Northbound				US 64 Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	19	0	22	174	18	0	0	0	31	0	17	228	1	0	0	510	510
07:15 AM	0	0	29	0	38	222	10	0	0	0	55	0	31	239	4	0	0	628	628
07:30 AM	0	0	13	0	22	244	16	0	0	0	67	0	19	275	5	0	0	661	661
07:45 AM	0	0	21	0	41	257	17	0	0	0	55	0	15	257	6	0	0	669	669
Total	0	0	82	0	123	897	61	0	0	0	208	0	82	999	16	0	0	2468	2468
08:00 AM	0	0	25	0	40	210	15	0	0	0	67	0	12	249	6	0	0	624	624
08:15 AM	0	0	25	0	39	230	25	0	0	0	43	0	17	226	6	0	0	611	611
08:30 AM	0	0	22	0	31	242	21	0	0	0	55	0	14	209	4	0	0	598	598
08:45 AM	0	0	18	0	24	185	17	0	0	0	59	0	17	192	5	0	0	517	517
Total	0	0	90	0	134	867	78	0	0	0	224	0	60	876	21	0	0	2350	2350
*** BREAK ***																			
04:00 PM	0	0	29	0	29	280	11	0	0	0	39	0	14	223	6	0	0	631	631
04:15 PM	0	0	30	0	41	295	11	0	0	0	43	0	21	226	6	0	0	673	673
04:30 PM	0	0	26	0	35	271	11	0	0	0	53	0	14	268	4	0	0	682	682
04:45 PM	0	0	25	0	59	255	21	0	0	0	45	0	16	238	6	0	0	665	665
Total	0	0	110	0	164	1101	54	0	0	0	180	0	65	955	22	0	0	2651	2651
05:00 PM	0	0	41	0	52	313	17	0	0	0	51	0	17	291	6	0	0	788	788
05:15 PM	0	0	42	0	42	330	24	0	0	0	50	0	16	297	7	0	0	808	808
05:30 PM	0	0	40	0	60	281	16	0	0	0	60	0	24	262	12	0	0	755	755
05:45 PM	0	0	37	0	42	265	13	0	0	0	42	0	17	282	5	0	0	703	703
Total	0	0	160	0	196	1189	70	0	0	0	203	0	74	1132	30	0	0	3054	3054
Grand Total	0	0	442	0	617	4054	263	0	0	0	815	0	281	3962	89	0	0	10523	10523
Apprch %	0	0	100		12.5	82.2	5.3		0	0	100		6.5	91.5	2.1				
Total %	0	0	4.2		5.9	38.5	2.5		0	0	7.7		2.7	37.7	0.8		0	100	
Passenger Vehicles	0	0	417		599	3775	234		0	0	788		265	3716	82		0	0	9876
% Passenger Vehicles	0	0	94.3	0	97.1	93.1	89	0	0	0	96.7	0	94.3	93.8	92.1	0	0	0	93.9
Single Unit	0	0	22		13	163	23		0	0	23		11	105	7		0	0	367
% Single Unit	0	0	5	0	2.1	4	8.7	0	0	0	2.8	0	3.9	2.7	7.9	0	0	0	3.5
TTST	0	0	3		5	116	6		0	0	4		5	141	0		0	0	280
% TTST	0	0	0.7	0	0.8	2.9	2.3	0	0	0	0.5	0	1.8	3.6	0	0	0	0	2.7
Bicycles on Crosswalk	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Venture I
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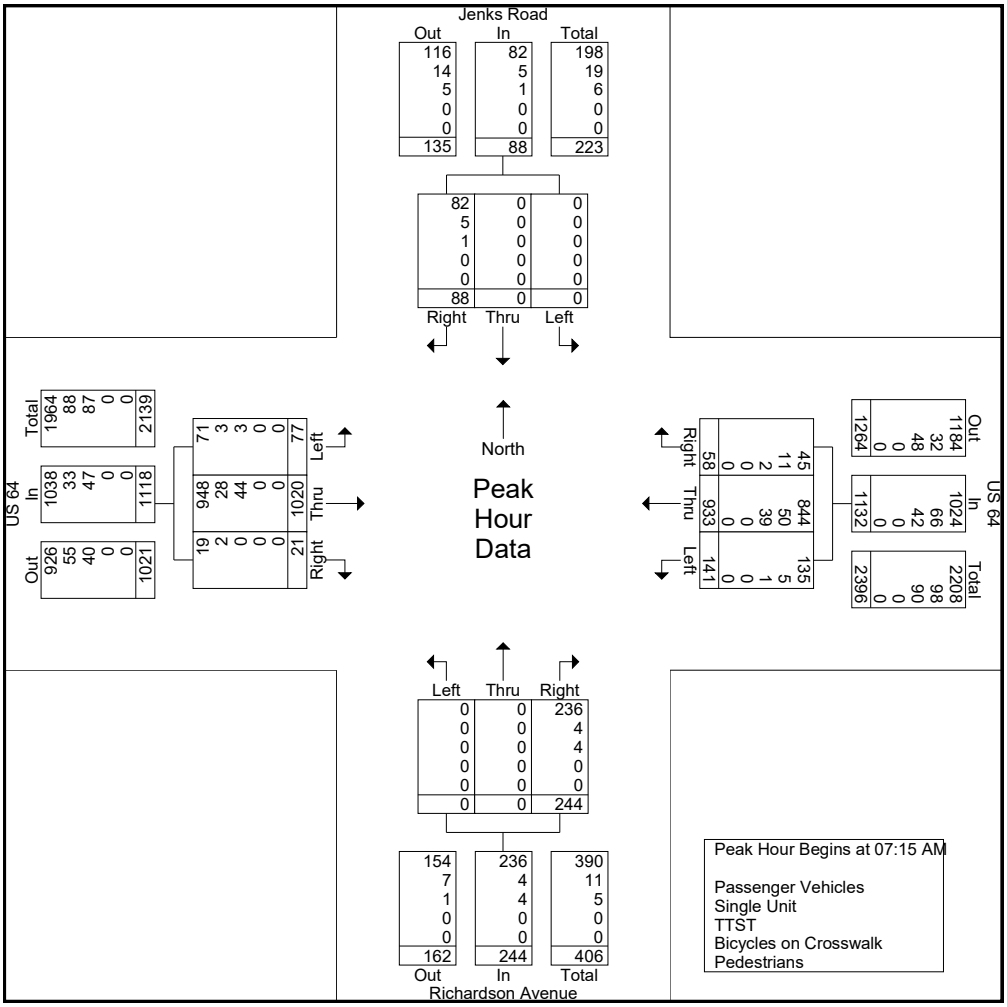
	Jenks Road Southbound				US 64 Westbound				Richardson Avenue Northbound				US 64 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	29	29	38	222	10	270	0	0	55	55	31	239	4	274	628
07:30 AM	0	0	13	13	22	244	16	282	0	0	67	67	19	275	5	299	661
07:45 AM	0	0	21	21	41	257	17	315	0	0	55	55	15	257	6	278	669
08:00 AM	0	0	25	25	40	210	15	265	0	0	67	67	12	249	6	267	624
Total Volume	0	0	88	88	141	933	58	1132	0	0	244	244	77	1020	21	1118	2582
% App. Total	0	0	100		12.5	82.4	5.1		0	0	100		6.9	91.2	1.9		
PHF	.000	.000	.759	.759	.860	.908	.853	.898	.000	.000	.910	.910	.621	.927	.875	.935	.965
Passenger Vehicles	0	0	82	82	135	844	45	1024	0	0	236	236	71	948	19	1038	2380
% Passenger Vehicles	0	0	93.2	93.2	95.7	90.5	77.6	90.5	0	0	96.7	96.7	92.2	92.9	90.5	92.8	92.2
Single Unit	0	0	5	5	5	50	11	66	0	0	4	4	3	28	2	33	108
% Single Unit	0	0	5.7	5.7	3.5	5.4	19.0	5.8	0	0	1.6	1.6	3.9	2.7	9.5	3.0	4.2
TTST	0	0	1	1	1	39	2	42	0	0	4	4	3	44	0	47	94
% TTST	0	0	1.1	1.1	0.7	4.2	3.4	3.7	0	0	1.6	1.6	3.9	4.3	0	4.2	3.6
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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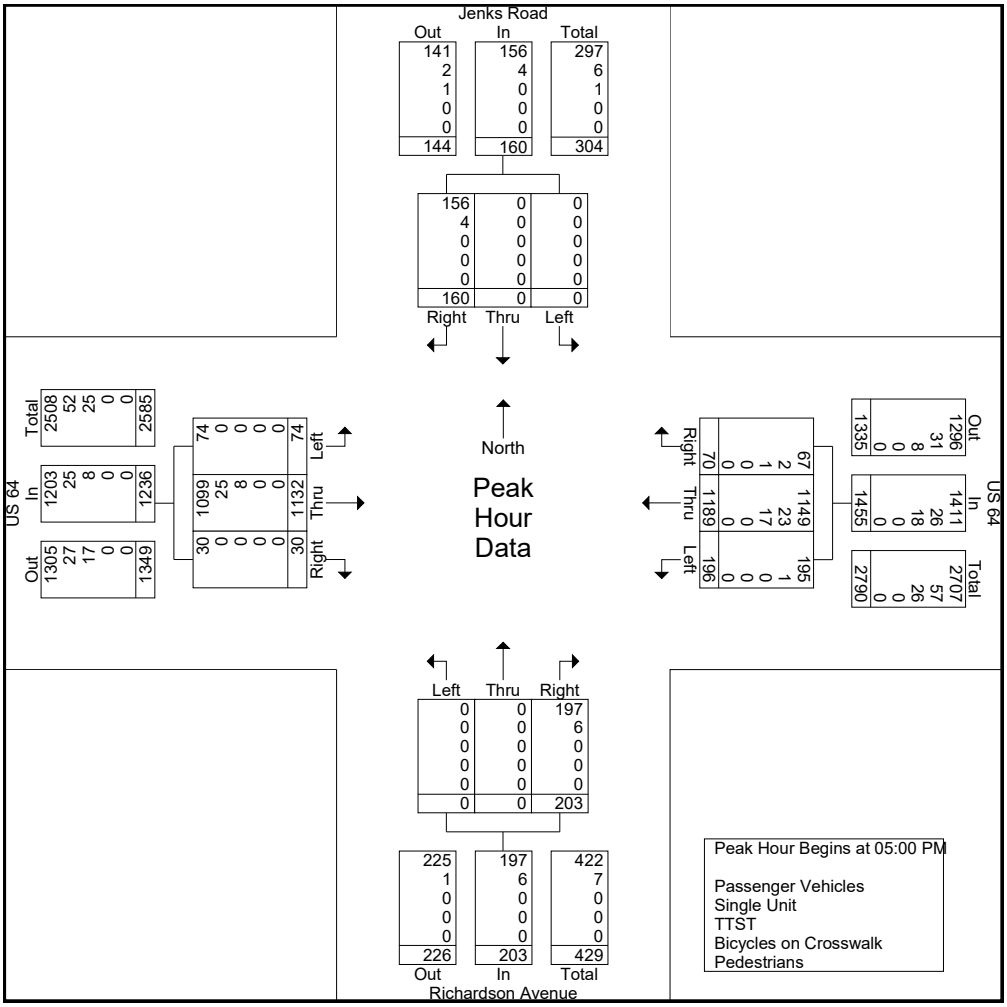
	Jenks Road Southbound				US 64 Westbound				Richardson Avenue Northbound				US 64 Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	41	41	52	313	17	382	0	0	51	51	17	291	6	314	788
05:15 PM	0	0	42	42	42	330	24	396	0	0	50	50	16	297	7	320	808
05:30 PM	0	0	40	40	60	281	16	357	0	0	60	60	24	262	12	298	755
05:45 PM	0	0	37	37	42	265	13	320	0	0	42	42	17	282	5	304	703
Total Volume	0	0	160	160	196	1189	70	1455	0	0	203	203	74	1132	30	1236	3054
% App. Total	0	0	100		13.5	81.7	4.8		0	0	100		6	91.6	2.4		
PHF	.000	.000	.952	.952	.817	.901	.729	.919	.000	.000	.846	.846	.771	.953	.625	.966	.945
Passenger Vehicles	0	0	156	156	195	1149	67	1411	0	0	197	197	74	1099	30	1203	2967
% Passenger Vehicles	0	0	97.5	97.5	99.5	96.6	95.7	97.0	0	0	97.0	97.0	100	97.1	100	97.3	97.2
Single Unit	0	0	4	4	1	23	2	26	0	0	6	6	0	25	0	25	61
% Single Unit	0	0	2.5	2.5	0.5	1.9	2.9	1.8	0	0	3.0	3.0	0	2.2	0	2.0	2.0
TTST	0	0	0	0	0	17	1	18	0	0	0	0	0	8	0	8	26
% TTST	0	0	0	0	0	1.4	1.4	1.2	0	0	0	0	0	0.7	0	0.6	0.9
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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Groups Printed- Passenger Vehicles - Single Unit - TTST - Bicycles on Crosswalk - Pedestrians

	No Approach Southbound				US 64 Westbound				No Approach Northbound				US 64 Eastbound						
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	U-Turn	Thru	Right	Peds	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	1	0	0	218	0	0	0	0	0	0	2	247	0	0	0	468	468
07:15 AM	0	0	0	0	0	268	0	0	0	0	0	0	5	302	0	0	0	575	575
07:30 AM	0	0	3	0	0	278	0	0	0	0	0	0	8	315	0	0	0	604	604
07:45 AM	0	0	0	0	0	309	0	0	0	0	0	0	4	272	0	0	0	585	585
Total	0	0	4	0	0	1073	0	0	0	0	0	0	19	1136	0	0	0	2232	2232
08:00 AM	0	0	0	0	0	273	0	0	0	0	0	0	7	331	0	0	0	611	611
08:15 AM	0	0	0	0	0	283	0	0	0	0	0	0	8	264	0	0	0	555	555
08:30 AM	0	0	0	0	0	305	0	0	0	0	0	0	6	261	0	0	0	572	572
08:45 AM	0	0	0	0	0	203	0	0	0	0	0	0	7	239	0	0	0	449	449
Total	0	0	0	0	0	1064	0	0	0	0	0	0	28	1095	0	0	0	2187	2187
*** BREAK ***																			
04:00 PM	0	0	0	0	0	324	0	0	0	0	0	0	6	263	0	0	0	593	593
04:15 PM	0	0	0	0	0	349	0	0	0	0	0	0	5	266	0	0	0	620	620
04:30 PM	0	0	0	0	0	303	0	0	0	0	0	0	9	311	0	0	0	623	623
04:45 PM	0	0	0	0	0	330	0	0	0	0	0	0	7	277	0	0	0	614	614
Total	0	0	0	0	0	1306	0	0	0	0	0	0	27	1117	0	0	0	2450	2450
05:00 PM	0	0	3	0	0	376	0	0	0	0	0	0	10	341	0	0	0	730	730
05:15 PM	0	0	1	0	0	394	0	0	0	0	0	0	10	334	0	0	0	739	739
05:30 PM	0	0	2	0	0	363	0	0	0	0	0	0	12	294	0	0	0	671	671
05:45 PM	0	0	2	0	0	301	0	0	0	0	0	0	9	294	0	0	0	606	606
Total	0	0	8	0	0	1434	0	0	0	0	0	0	41	1263	0	0	0	2746	2746
Grand Total	0	0	12	0	0	4877	0	0	0	0	0	0	115	4611	0	0	0	9615	9615
Apprch %	0	0	100		0	100	0	0	0	0	0	0	2.4	97.6	0	0			
Total %	0	0	0.1		0	50.7	0	0	0	0	0	0	1.2	48	0	0	0	100	
Passenger Vehicles	0	0	8		0	4597	0	0	0	0	0	0	103	4370	0	0	0	0	9078
% Passenger Vehicles	0	0	66.7	0	0	94.3	0	0	0	0	0	0	89.6	94.8	0	0	0	0	94.4
Single Unit	0	0	3		0	157	0	0	0	0	0	0	11	125	0	0	0	0	296
% Single Unit	0	0	25	0	0	3.2	0	0	0	0	0	0	9.6	2.7	0	0	0	0	3.1
TTST	0	0	1		0	123	0	0	0	0	0	0	1	116	0	0	0	0	241
% TTST	0	0	8.3	0	0	2.5	0	0	0	0	0	0	0.9	2.5	0	0	0	0	2.5
Bicycles on Crosswalk	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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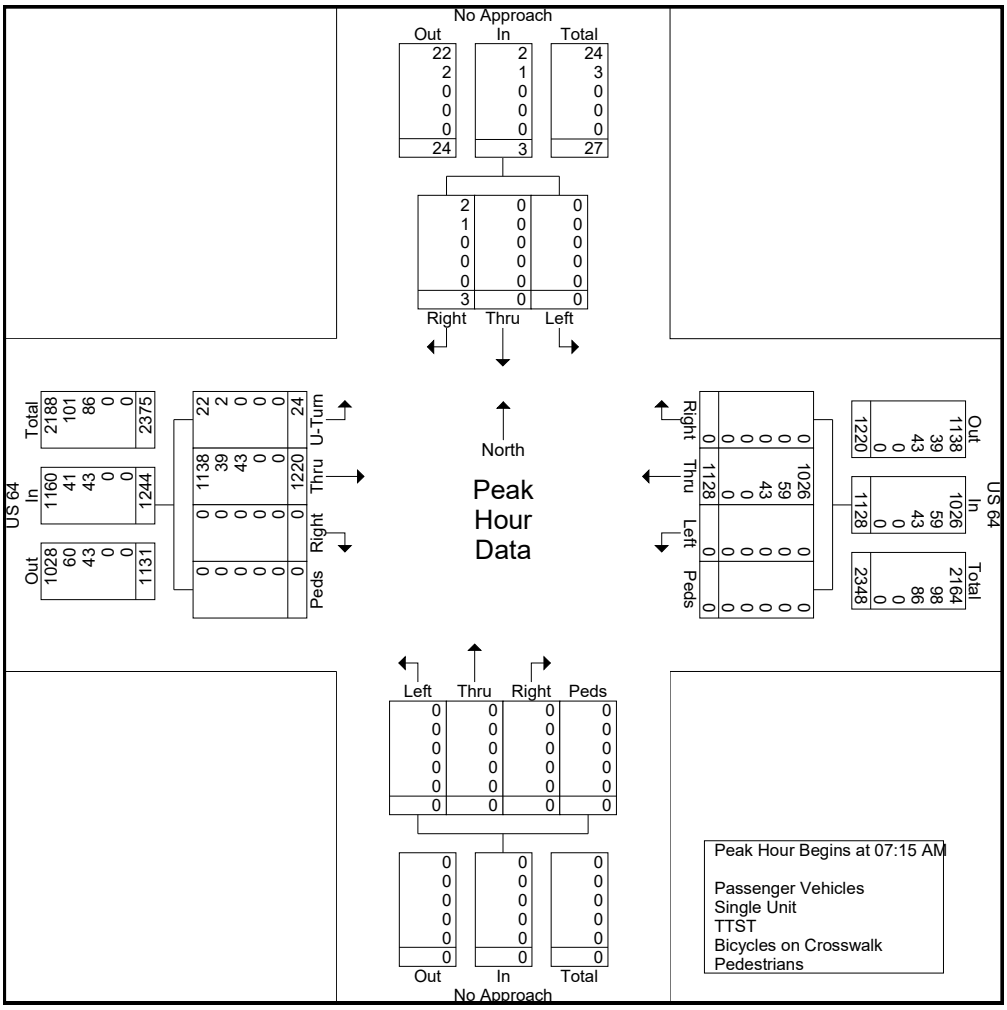
	No Approach Southbound				US 64 Westbound					No Approach Northbound					US 64 Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	U-Turn	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 07:15 AM																				
07:15 AM	0	0	0	0	0	268	0	0	268	0	0	0	0	0	5	302	0	0	307	575
07:30 AM	0	0	3	3	0	278	0	0	278	0	0	0	0	0	8	315	0	0	323	604
07:45 AM	0	0	0	0	0	309	0	0	309	0	0	0	0	0	4	272	0	0	276	585
08:00 AM	0	0	0	0	0	273	0	0	273	0	0	0	0	0	7	331	0	0	338	611
Total Volume	0	0	3	3	0	1128	0	0	1128	0	0	0	0	0	24	1220	0	0	1244	2375
% App. Total	0	0	100		0	100	0	0		0	0	0	0		1.9	98.1	0	0		
PHF	.000	.000	.250	.250	.000	.913	.000	.000	.913	.000	.000	.000	.000	.000	.750	.921	.000	.000	.920	.972
Passenger Vehicles	0	0	2	2	0	1026	0	0	1026	0	0	0	0	0	22	1138	0	0	1160	2188
% Passenger Vehicles																				
Single Unit	0	0	1	1	0	59	0	0	59	0	0	0	0	0	2	39	0	0	41	101
% Single Unit	0	0	33.3	33.3	0	5.2	0	0	5.2	0	0	0	0	0	8.3	3.2	0	0	3.3	4.3
TTST	0	0	0	0	0	43	0	0	43	0	0	0	0	0	0	43	0	0	43	86
% TTST	0	0	0	0	0	3.8	0	0	3.8	0	0	0	0	0	0	3.5	0	0	3.5	3.6
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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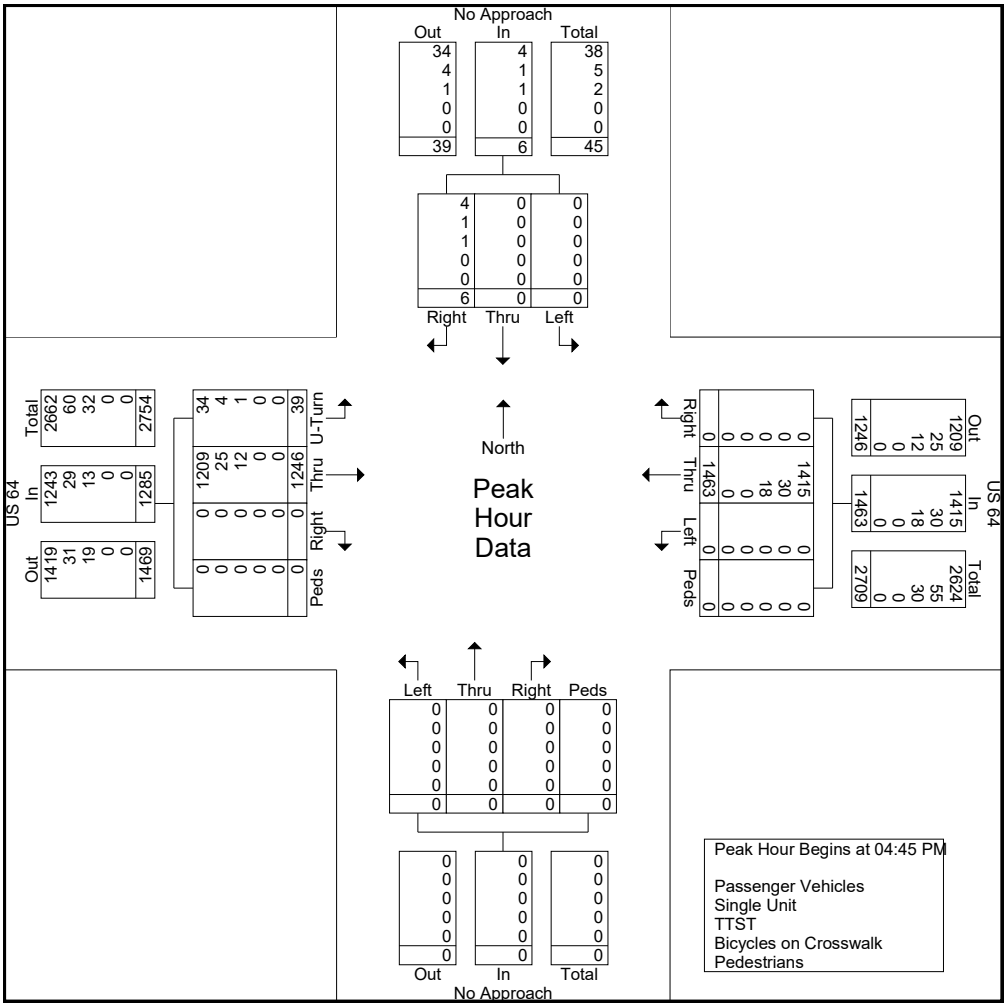
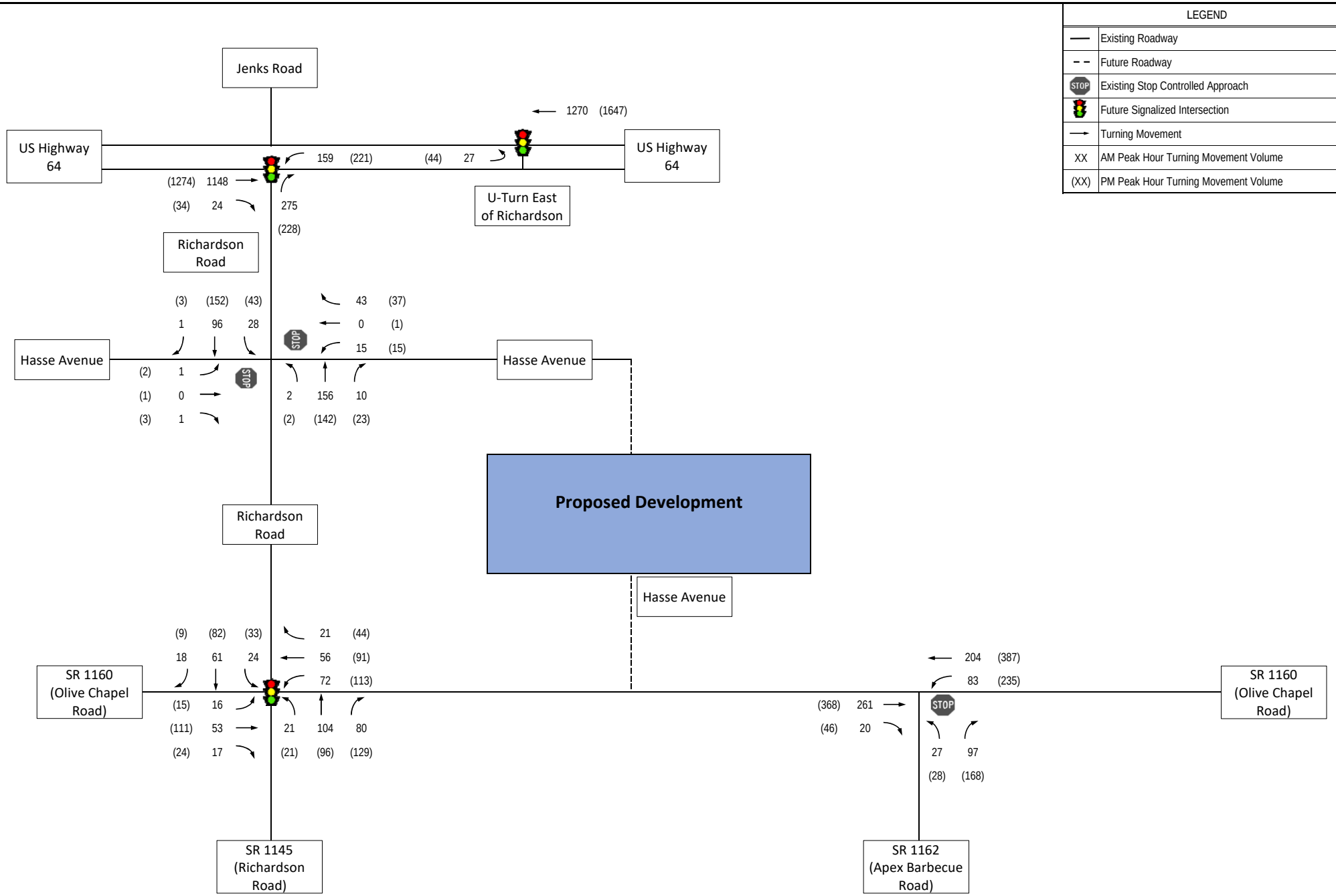
	No Approach Southbound				US 64 Westbound					No Approach Northbound					US 64 Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	U-Turn	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																				
Peak Hour for Entire Intersection Begins at 04:45 PM																				
04:45 PM	0	0	0	0	0	330	0	0	330	0	0	0	0	0	7	277	0	0	284	614
05:00 PM	0	0	3	3	0	376	0	0	376	0	0	0	0	0	10	341	0	0	351	730
05:15 PM	0	0	1	1	0	394	0	0	394	0	0	0	0	0	10	334	0	0	344	739
05:30 PM	0	0	2	2	0	363	0	0	363	0	0	0	0	0	12	294	0	0	306	671
Total Volume	0	0	6	6	0	1463	0	0	1463	0	0	0	0	0	39	1246	0	0	1285	2754
% App. Total	0	0	100		0	100	0	0		0	0	0	0		3	97	0	0		
PHF	.000	.000	.500	.500	.000	.928	.000	.000	.928	.000	.000	.000	.000	.000	.813	.913	.000	.000	.915	.932
Passenger Vehicles	0	0	4	4	0	1415	0	0	1415	0	0	0	0	0	34	1209	0	0	1243	2662
% Passenger Vehicles																				
Single Unit	0	0	1	1	0	30	0	0	30	0	0	0	0	0	4	25	0	0	29	60
% Single Unit	0	0	16.7	16.7	0	2.1	0	0	2.1	0	0	0	0	0	10.3	2.0	0	0	2.3	2.2
TTST	0	0	1	1	0	18	0	0	18	0	0	0	0	0	1	12	0	0	13	32
% TTST	0	0	16.7	16.7	0	1.2	0	0	1.2	0	0	0	0	0	2.6	1.0	0	0	1.0	1.2
Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bicycles on Crosswalk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



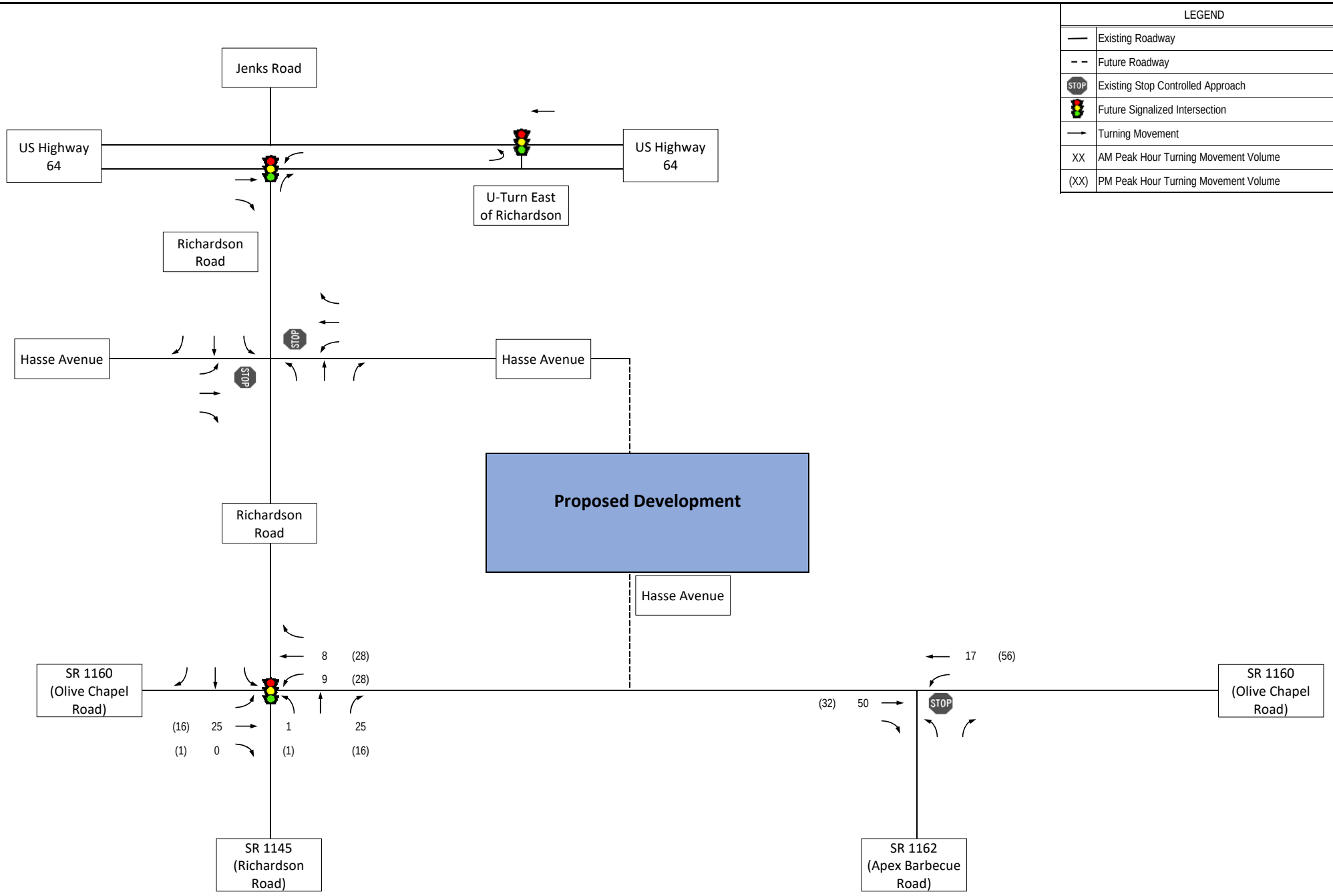
APPENDIX C:

Background Projects



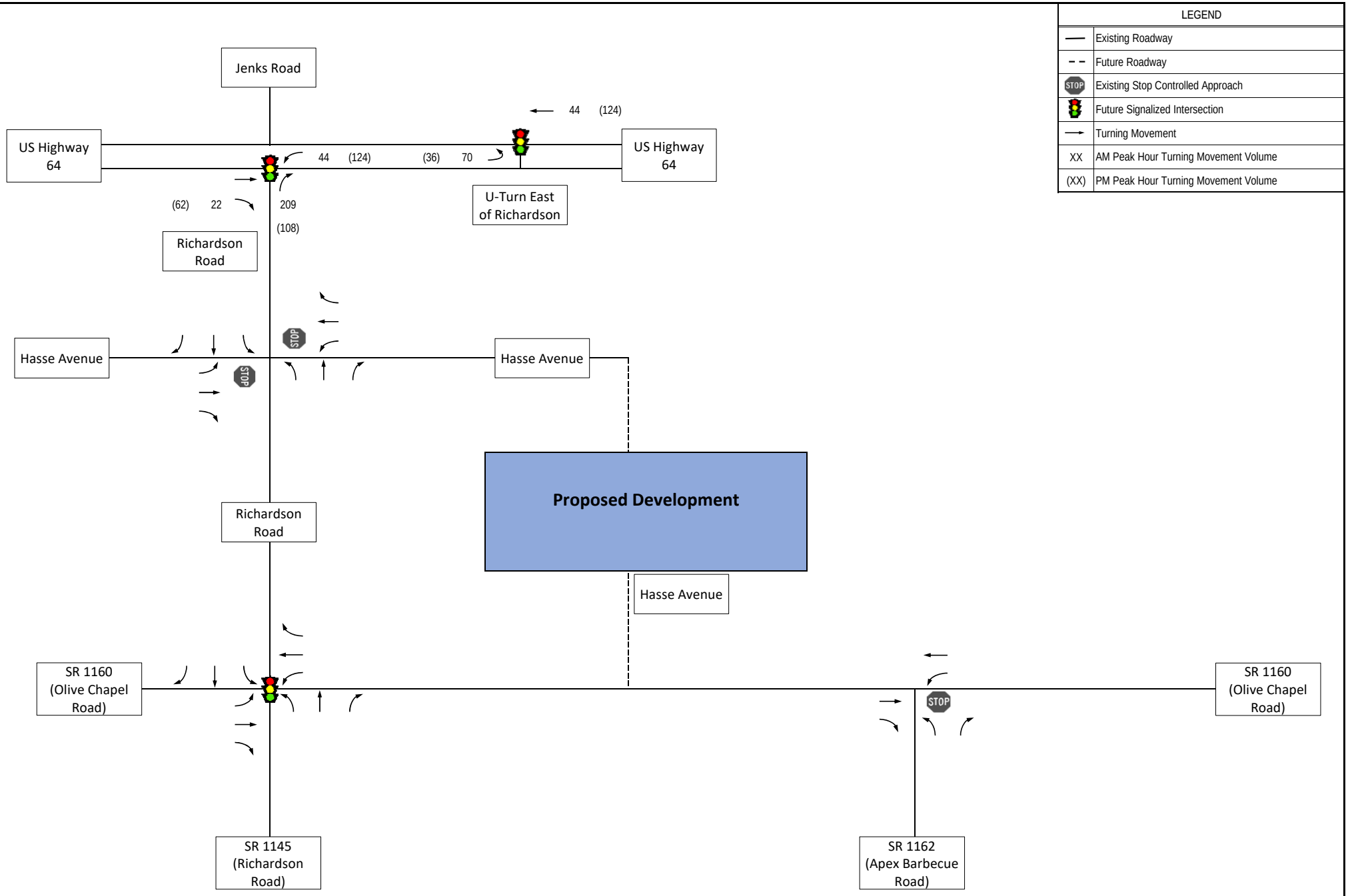
Background (2020) AM and P Turning Movement Volumes

Hackney Tract Subdivision
Apex, NC



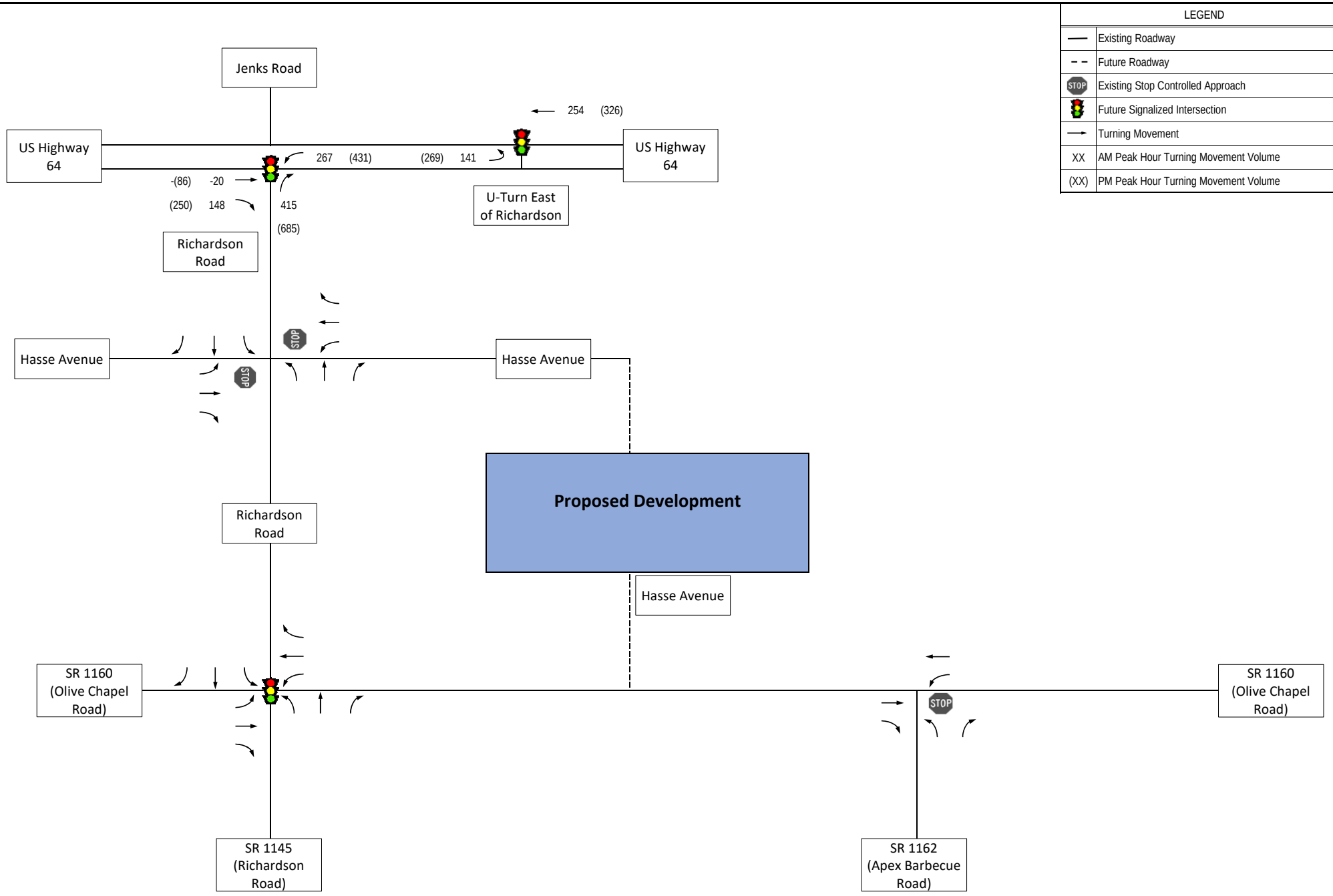
Total Site Trips Due to S (Lawrence Assemblage)

Hackney Tract Subdivision
Apex, NC



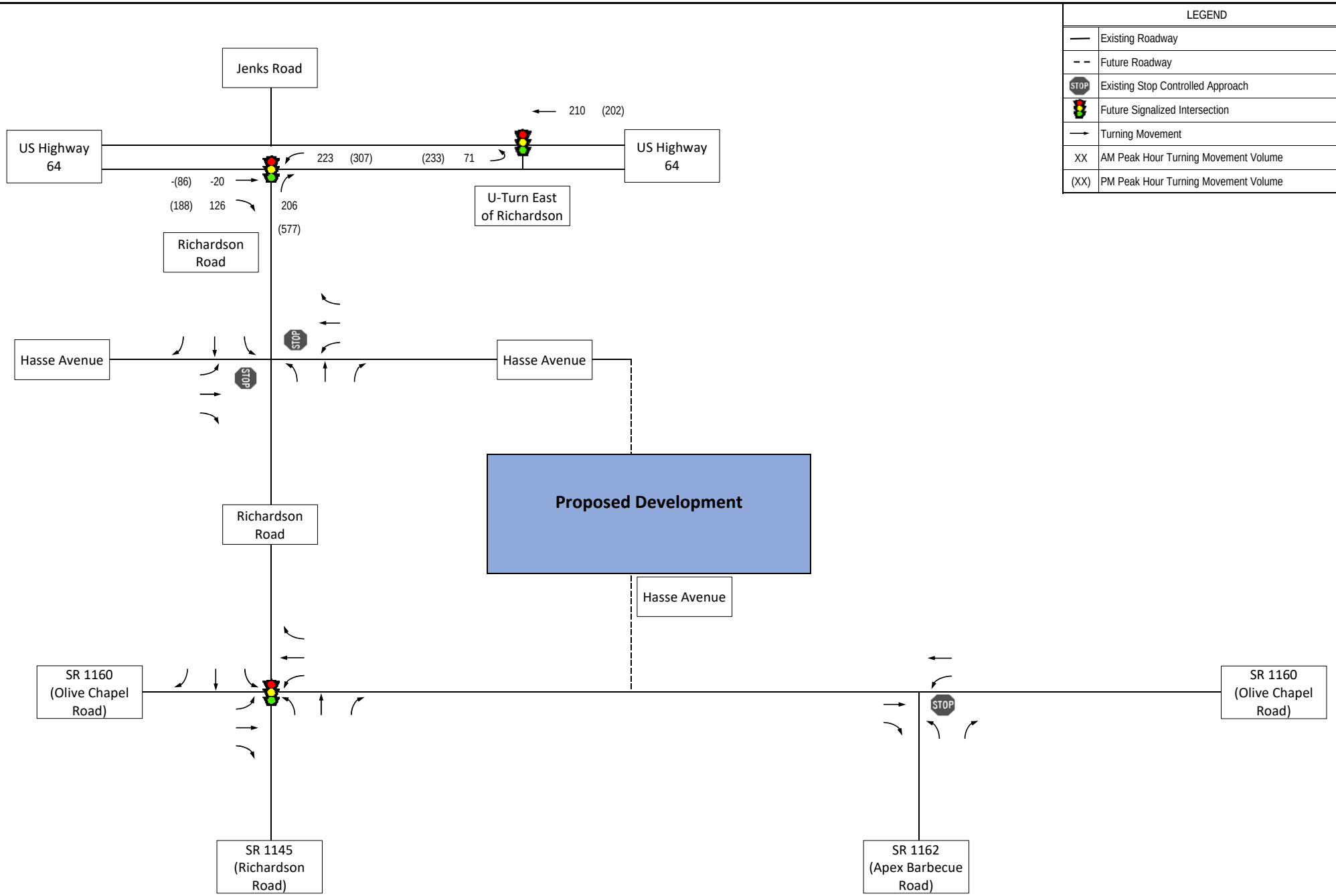
Residential Si to Sweetwater

Hackney Tract Subdivision
Apex, NC



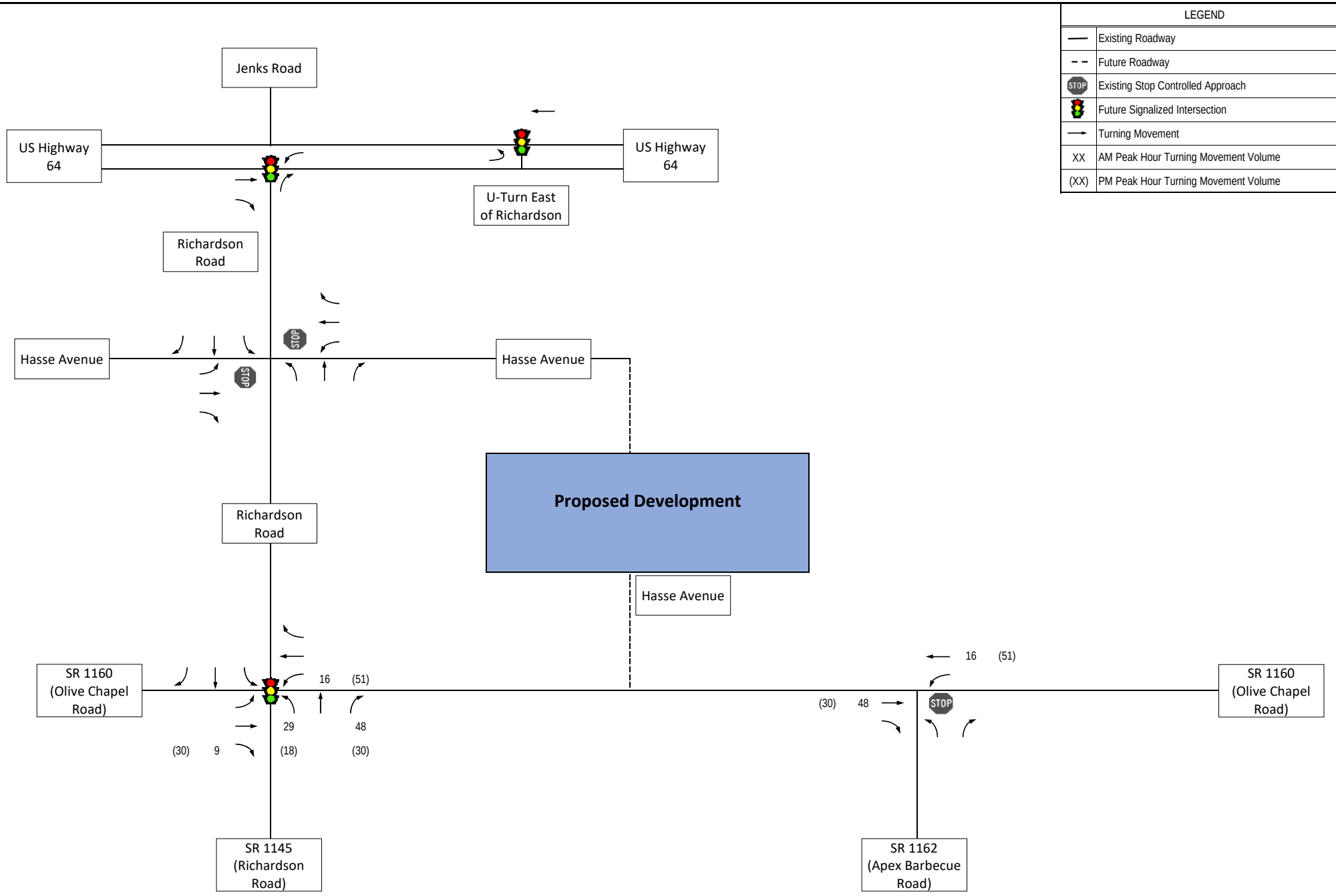
Total Site T... Sweetwater

Hackney Tract Subdivision
Apex, NC



Mixed-Use Sit o Sweetwater

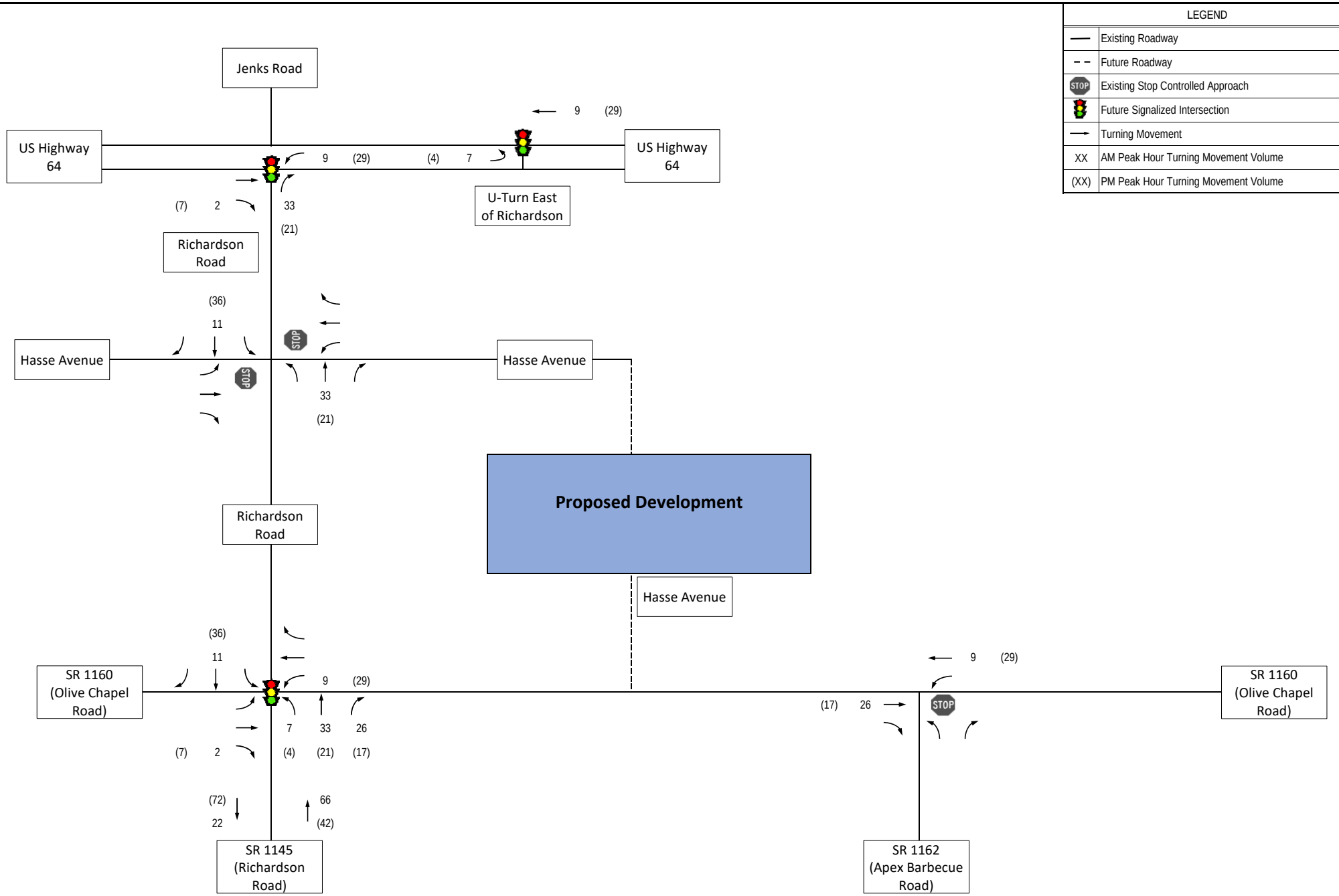
Hackney Tract Subdivision
Apex, NC



vhb

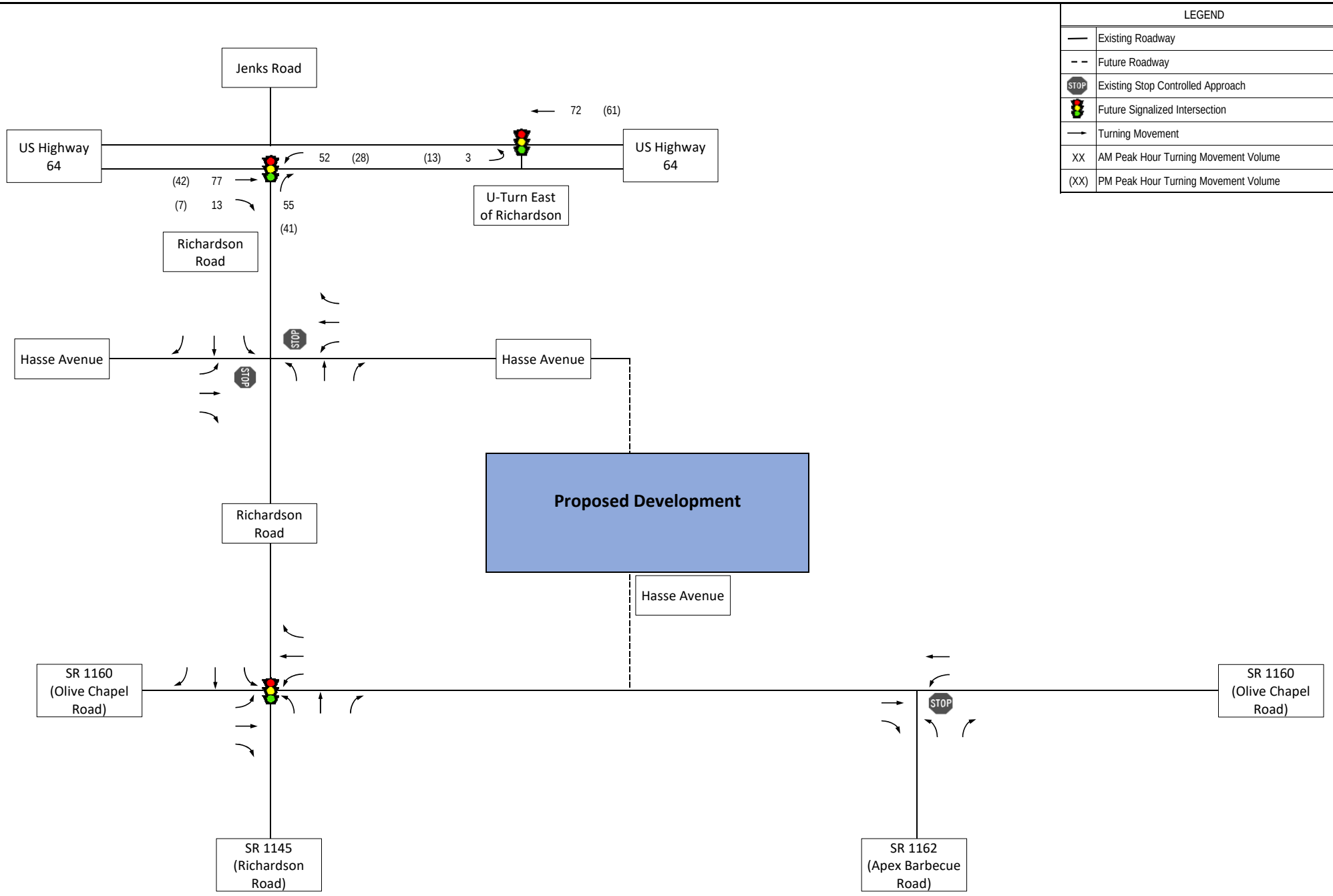
Site Trips Due to Buck ve (Goodwin-MacNair)

Hackney Tract Subdivision
Apex, NC



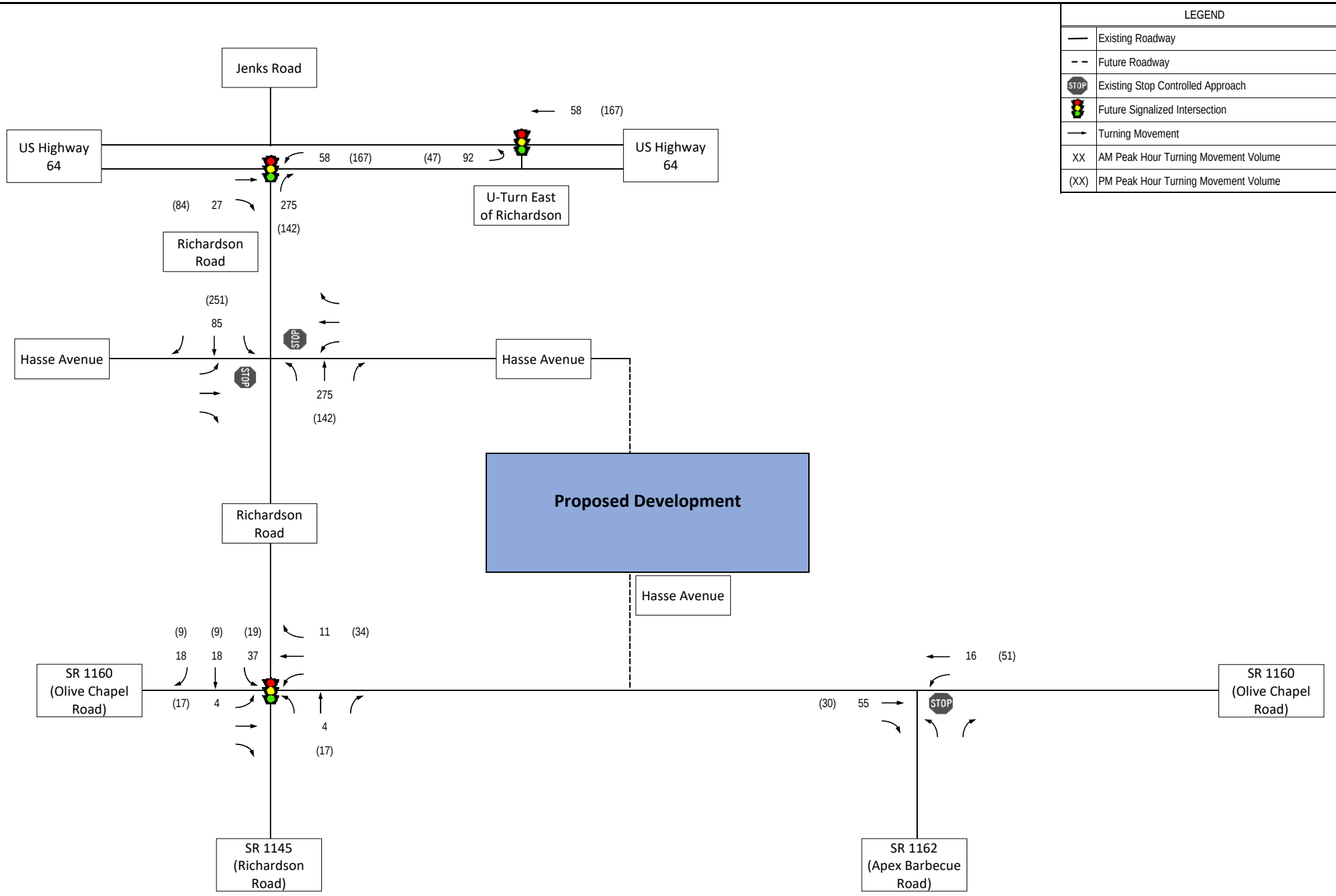
Site Trips D[illegible]er (Womble)

Hackney Tract Subdivision
Apex, NC



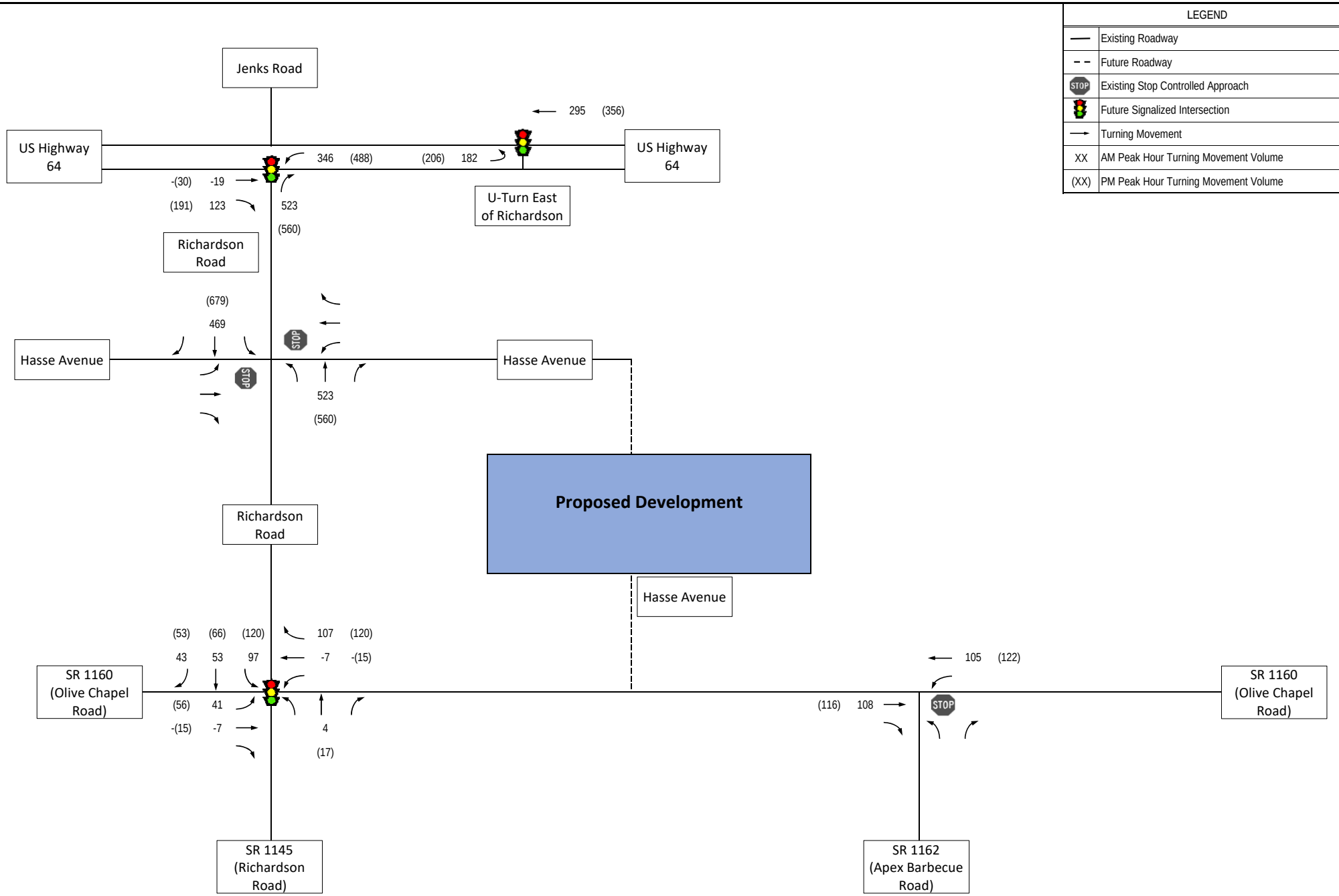
Site Tr estford

Hackney Tract Subdivision
Apex, NC



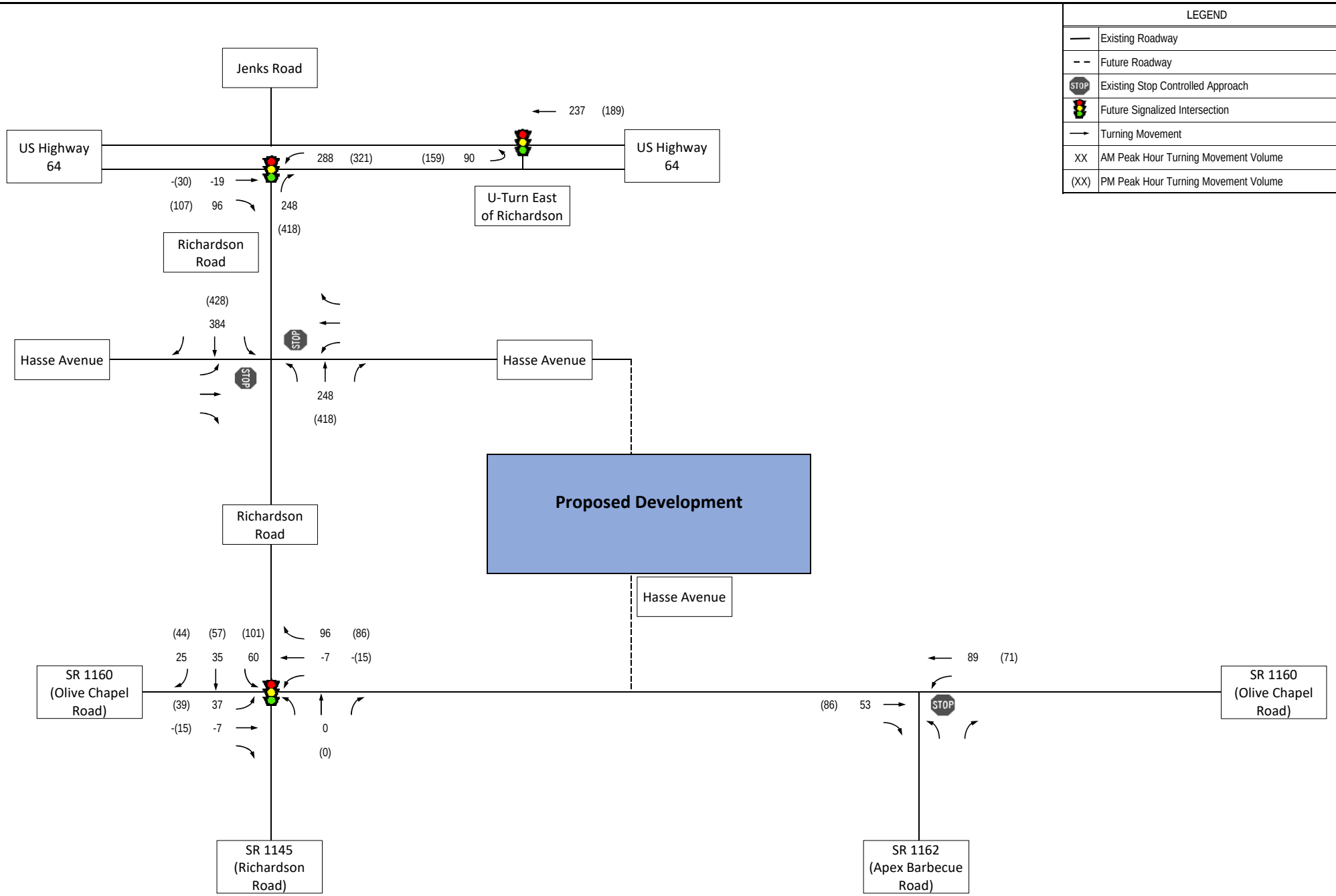
Residential S... o Smith Farm

Hackney Tract Subdivision
Apex, NC



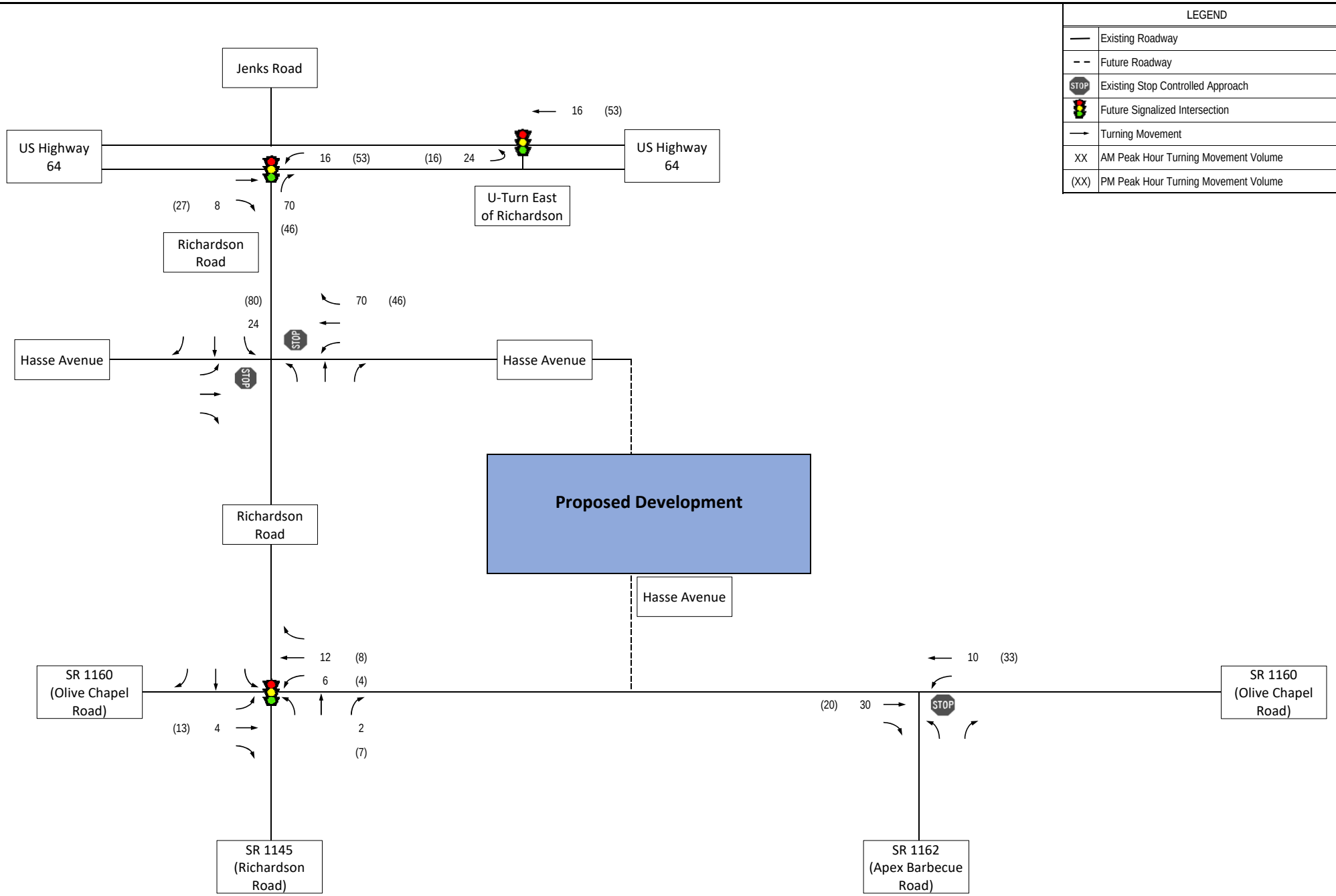
Total Site **mith Farm**

Hackney Tract Subdivision
Apex, NC



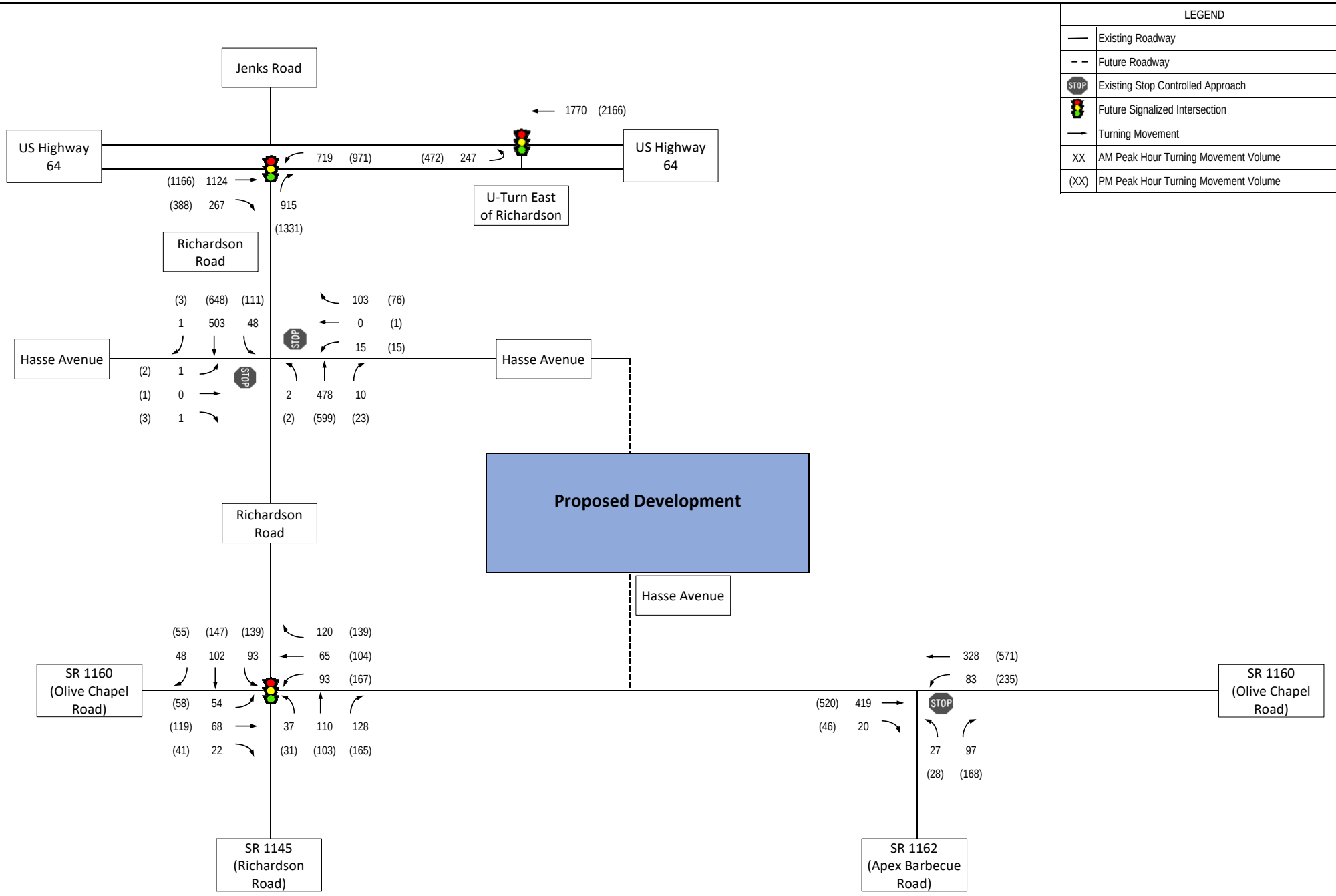
Mixed-Use Si... Smith Farm

Hackney Tract Subdivision
Apex, NC



Site Trips Due to L[illegible]ood Assemblage)

Hackney Tract Subdivision
Apex, NC



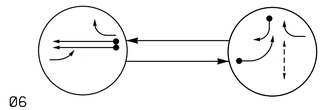
Total Site Trips Due to Backg[illegible] and Approved Developments

Hackney Tract Subdivision
Apex, NC

DocuSign Envelope ID: CA81BC5D-527A-44E9-991D-E92A2C8933FE

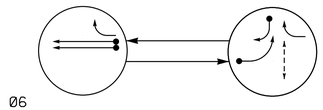
PROJECT REFERENCE NO.	SHEET NO.
36249.4164	Sig-2.0

DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø3	PHASE Ø6	FLASH
31	←	~~F~~	~~Y~~
32,33	→	R	R
61,62	R	G	Y
P31,P32	W	DW	DRK

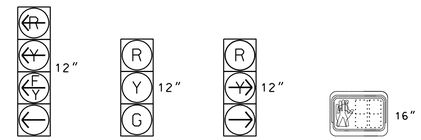
ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø3	PHASE Ø6	FLASH
31	←	~~R~~	~~Y~~
32,33	→	R	R
61,62	R	G	Y
P31,P32	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



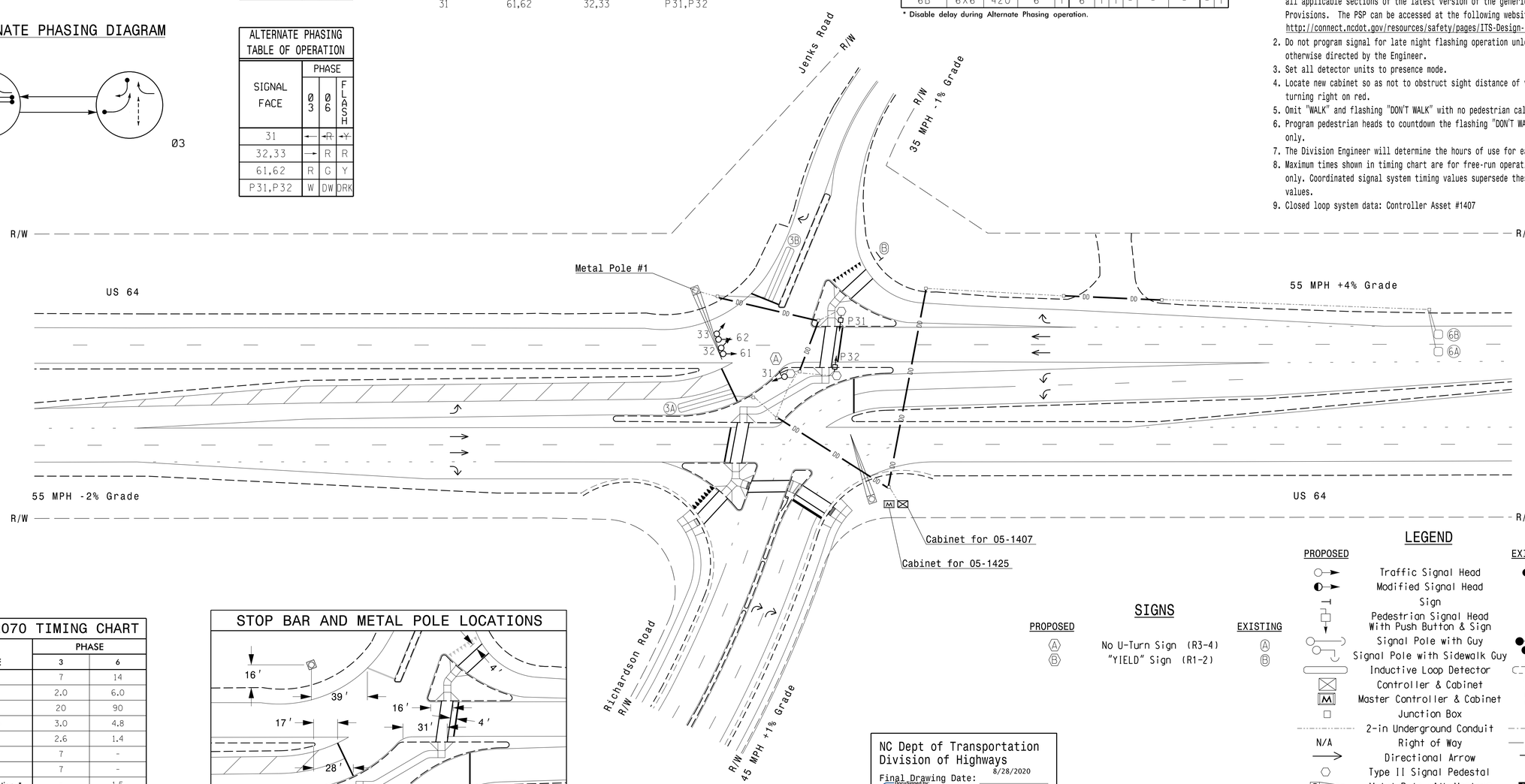
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
	INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	15*	-	Y
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	15	-	Y
6A	6X6	420	6	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	420	6	Y	6	Y	Y	-	-	-	-	Y

* Disable delay during Alternate Phasing operation.

2 Phase
Fully Actuated
(US 64 & Jenks/Richardson Road
Closed Loop System)
Signal System: 10534

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018, "Standard Specifications for Roads and Structures" dated January 2018, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: http://connect.ncdot.gov/resources/safety/pages/ITS-Design-Resources.aspx
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
7. The Division Engineer will determine the hours of use for each phasing plan.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Closed loop system data: Controller Asset #1407



SIGNS

PROPOSED		EXISTING
Ⓐ	No U-Turn Sign (R3-4)	Ⓐ
Ⓑ	"YIELD" Sign (R1-2)	Ⓑ

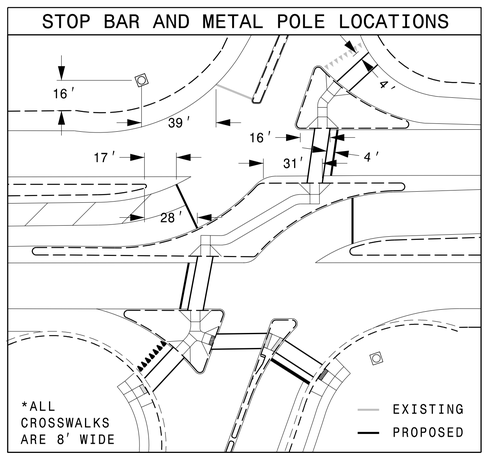
LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
M	Master Controller & Cabinet	M
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type II Signal Pedestal	
	Metal Pole with Mastarm	
DD	Directional Drill	N/A

OASIS 2070 TIMING CHART		
	PHASE	
FEATURE	3	6
Min Green 1 *	7	14
Extension 1 *	2.0	6.0
Max Green 1 *	20	90
Yellow Clearance	3.0	4.8
Red Clearance	2.6	1.4
Walk 1 *	7	-
Don't Walk 1	7	-
Seconds Per Actuation *	-	1.5
Max Variable Initial *	-	46
Time Before Reduction *	-	15
Time To Reduce *	-	45
Minimum Gap	-	3.4
Recall Mode	-	MIN RECALL
Vehicle Call Memory	-	YELLOW
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

STOP BAR AND METAL POLE LOCATIONS



NC Dept of Transportation
Division of Highways
Final Drawing Date: 8/28/2020
DocuSigned by: Changsuk Baek
ITS & Signals Unit

New Installation

RKA
RAMEY KEMP ASSOCIATES
8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28262
Phone: 704-545-6200 | www.rameykemp.com | NC License No. C-0910

Prepared For: NC Department of Transportation Mobility and Safety Division, Traffic Engineering Branch, Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 64 WB
at
Jenks Road

Division 5 Wake County Apex

PLAN DATE:	August 2020	REVIEWED BY:	WJ Hamilton
PREPARED BY:	ZM Esposito	RKA PROJ. NO:	19331 (040)

SCALE 1"=40' (0 40)

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON
DocuSigned by: William J. Hamilton
SIGNATURE 8/24/2020 DATE

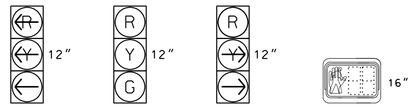
SIG. INVENTORY NO. 05-1407

DocuSign Envelope ID: CA81BC5D-527A-44E9-991D-E92A2C8933FE

PROJECT REFERENCE NO.	SHEET NO.
36249.4164	Sig-1.0

SIGNAL FACE I.D.

All Heads L.E.D.



71,72 | 21,22 | 73,74 | P21,P22 P71,P72

PHASING DIAGRAM

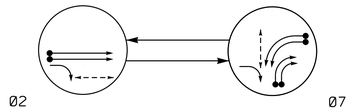


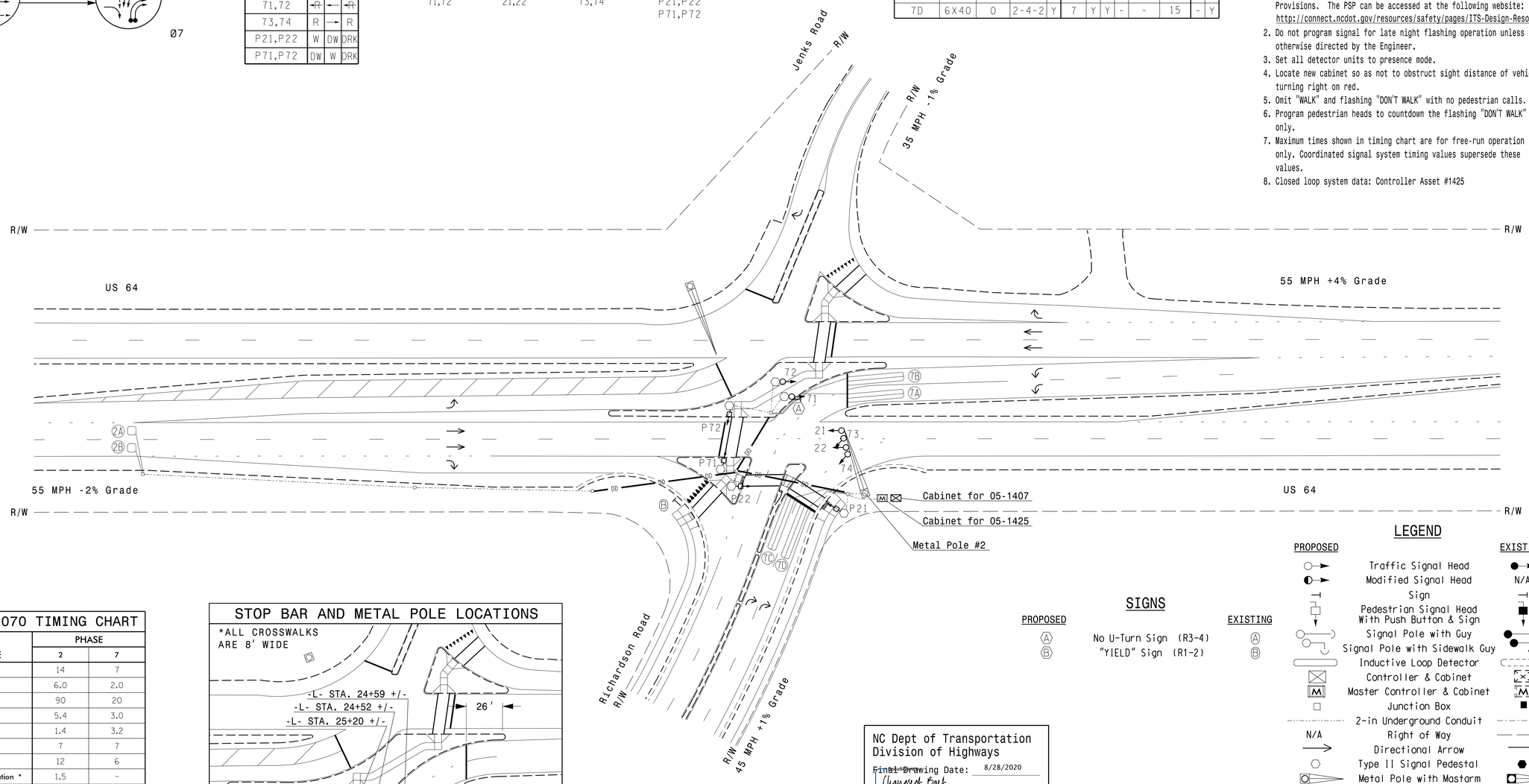
TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2	PHASE Ø7	FLASH
21,22	G	R	Y
71,72	~~R~~	←	~~R~~
73,74	R	→	R
P21,P22	W	DW	DRK
P71,P72	DW	W	DRK

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	420	6	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	420	6	Y	2	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	-	-	Y
7B	6X40	0	2-4-2	Y	7	Y	Y	-	-	-	-	Y
7C	6X40	0	2-4-2	Y	7	Y	Y	-	-	15	-	Y
7D	6X40	0	2-4-2	Y	7	Y	Y	-	-	15	-	Y

2 Phase
Fully Actuated
(US 64 & Jenks/Richardson Road
Closed Loop System)
Signal System: 10534

NOTES

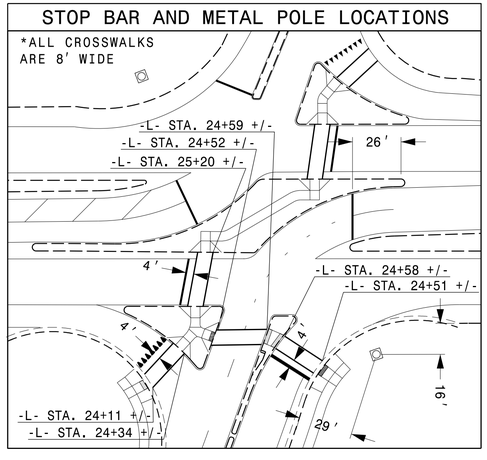
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018, "Standard Specifications for Roads and Structures" dated January 2018, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: http://connect.ncdot.gov/resources/safety/pages/ITS-Design-Resources.aspx
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Closed loop system data: Controller Asset #1425



OASIS 2070 TIMING CHART		
FEATURE	PHASE 2	PHASE 7
Min Green 1 *	14	7
Extension 1 *	6.0	2.0
Max Green 1 *	90	20
Yellow Clearance	5.4	3.0
Red Clearance	1.4	3.2
Walk 1 *	7	7
Don't Walk 1	12	6
Seconds Per Actuation *	1.5	-
Max Variable Initial *	46	-
Time Before Reduction *	15	-
Time To Reduce *	45	-
Minimum Gap	3.4	-
Recall Mode	MIN RECALL	-
Vehicle Call Memory	YELLOW	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

STOP BAR AND METAL POLE LOCATIONS



SIGNS

PROPOSED		EXISTING
A	No U-Turn Sign (R3-4)	A
B	"YIELD" Sign (R1-2)	B

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
M	Master Controller & Cabinet	M
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type II Signal Pedestal	
	Metal Pole with Mastarm	
DD	Directional Drill	N/A

NC Dept of Transportation
Division of Highways

Final Drawing Date: 8/28/2020

Changsek Baek
9D65AF807F2A46D...

ITS & Signals Unit

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 64 EB
at
Richardson Road

Division 5 Wake County Apex

PLAN DATE: August 2020 REVIEWED BY: WJ Hamilton
PREPARED BY: ZM Esposito RKA PROJ. NO: 19331 (040)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J HAMILTON

William J. Hamilton
405D0D35AA4A4A6...
SIGNATURE 8/24/2020 DATE

SIG. INVENTORY NO. 05-1425

RKA
RAMEY KEMP ASSOCIATES
8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28262
Phone: 704-549-4260 | www.rameykemp.com | NC License No. C-0910

DocuSign Envelope ID: CA81BC5D-527A-44E9-991D-E92A2C8933FE

PROJECT REFERENCE NO.	SHEET NO.
36249.4164	Sig-3.0

PHASING DIAGRAM

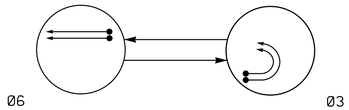
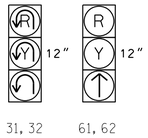


TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø3	PHASE Ø6	FLASH
31, 32	↶	R	R
61, 62	R	↑	Y

SIGNAL FACE I.D.

All Heads L.E.D.

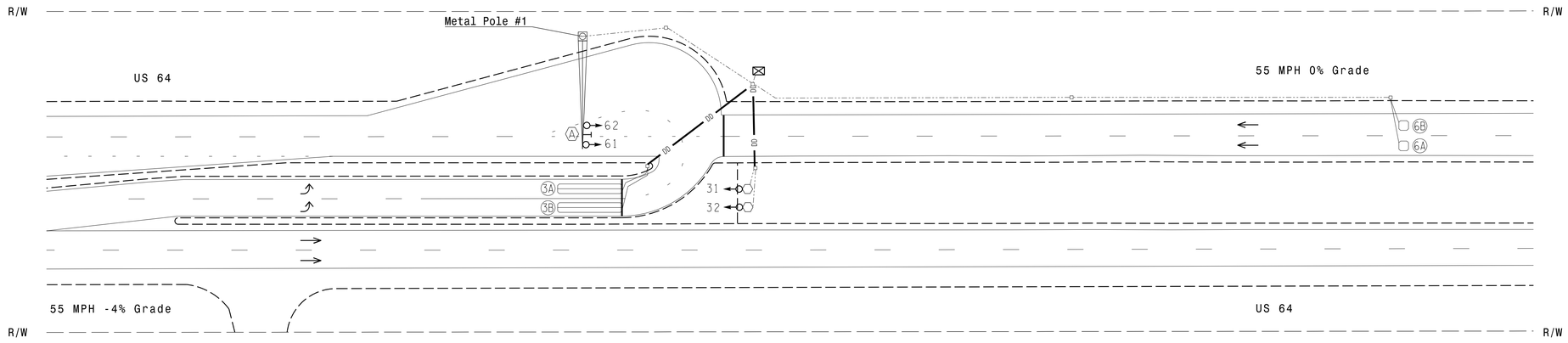


OASIS 2070 LOOP & DETECTOR INSTALLATION CHART											
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	-	-	Y
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	-	-	Y
6A	6X6	420	6	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	420	6	Y	6	Y	Y	-	-	-	-	Y

2 Phase
Fully Actuated
(US 64 & Jenks/Richardson Road
Closed Loop System)
Signal System: 10534

NOTES

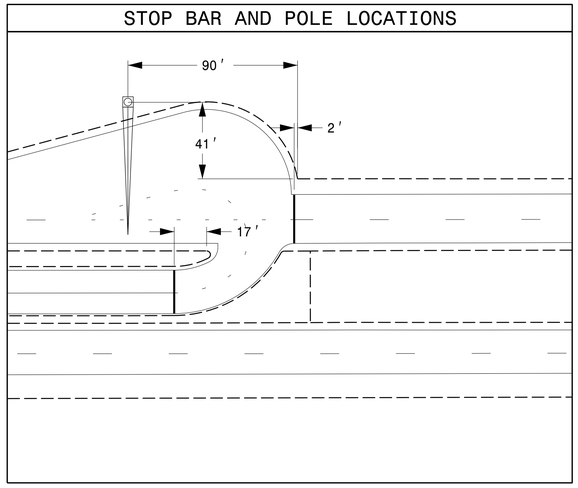
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018, "Standard Specifications for Roads and Structures" dated January 2018, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: http://connect.ncdot.gov/resources/safety/pages/ITS-Design-Resources.aspx
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede thes values.
6. Closed loop system data: Controller Asset #1426



OASIS 2070 TIMING CHART		
FEATURE	PHASE 3	PHASE 6
Min Green 1 *	7	14
Extension 1 *	2.0	6.0
Max Green 1 *	20	90
Yellow Clearance	3.0	5.2
Red Clearance	3.3	1.0
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	-	1.5
Max Variable Initial *	-	46
Time Before Reduction *	-	15
Time To Reduce *	-	45
Minimum Gap	-	3.4
Recall Mode	-	MIN RECALL
Vehicle Call Memory	-	YELLOW
Dual Entry	-	-
Simultaneous Gap	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

STOP BAR AND POLE LOCATIONS



NC Dept of Transportation
Division of Highways

Final Drawing Date: 8/28/2020

DocuSigned by: Changsek Baik

ITS & Signals Unit

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▯↓	Pedestrian Signal Head With Push Button & Sign	■↓
○~	Signal Pole with Guy	●~
○~	Signal Pole with Sidewalk Guy	●~
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
·····	2-in Underground Conduit	·····
N/A	Right of Way	— — —
→	Directional Arrow	→
—DD—	Directional Drill	N/A
Ⓐ	No Left Turn Sign (R3-2)	Ⓐ
⊙	Metal Pole with Mastarm	⊙
⬡	Type II Signal Pedestal	⬢

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Signal Design Section

750 N.Greenfield Pkwy,Garner,NC 27529

RAMEY KEMP ASSOCIATES
5808 Farringdon Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

US 64 WB
at
U-Turn East of Richardson Road

Division 5 Wake County Apex

PLAN DATE:	August 2020	REVIEWED BY:	WJ Hamilton
PREPARED BY:	ZM Esposito	RKA PROJ. NO:	19331 (040)

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON

DocuSigned by: William J. Hamilton 8/24/2020

SIGNATURE DATE

SIG. INVENTORY NO. 05-1426

APPENDIX D:

Intersection Capacity Analysis

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	47	15	64	50	19	19	92	71	21	54	16
Future Vol, veh/h	14	47	15	64	50	19	19	92	71	21	54	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	150	-	150	100	-	-	150	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	52	17	71	56	21	21	102	79	23	60	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	77	0	0	69	0	0	341	312	61	381	299	56
Stage 1	-	-	-	-	-	-	93	93	-	198	198	-
Stage 2	-	-	-	-	-	-	248	219	-	183	101	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1522	-	-	1532	-	-	613	603	1004	577	613	1011
Stage 1	-	-	-	-	-	-	914	818	-	804	737	-
Stage 2	-	-	-	-	-	-	756	722	-	819	811	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1522	-	-	1532	-	-	531	569	1004	439	579	1011
Mov Cap-2 Maneuver	-	-	-	-	-	-	531	569	-	439	579	-
Stage 1	-	-	-	-	-	-	904	809	-	795	703	-
Stage 2	-	-	-	-	-	-	648	689	-	652	802	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.4	3.6	11.9	11.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	531	701	1522	-	-	1532	-	-	439	579	1011
HCM Lane V/C Ratio	0.04	0.258	0.01	-	-	0.046	-	-	0.053	0.104	0.018
HCM Control Delay (s)	12.1	11.9	7.4	-	-	7.5	-	-	13.7	11.9	8.6
HCM Lane LOS	B	B	A	-	-	A	-	-	B	B	A
HCM 95th %tile Q(veh)	0.1	1	0	-	-	0.1	-	-	0.2	0.3	0.1

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	18	74	181	24	86
Future Vol, veh/h	232	18	74	181	24	86
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	258	20	82	201	27	96

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	278	0	633	268
Stage 1	-	-	-	-	268	-
Stage 2	-	-	-	-	365	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1285	-	444	771
Stage 1	-	-	-	-	777	-
Stage 2	-	-	-	-	702	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1285	-	412	771
Mov Cap-2 Maneuver	-	-	-	-	412	-
Stage 1	-	-	-	-	777	-
Stage 2	-	-	-	-	651	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	648	-	-	1285	-
HCM Lane V/C Ratio	0.189	-	-	0.064	-
HCM Control Delay (s)	11.8	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0.2	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	1	0	1	13	0	38	2	139	9	25	85	1
Future Vol, veh/h	1	0	1	13	0	38	2	139	9	25	85	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	14	0	42	2	154	10	28	94	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	335	319	95	314	314	159	95	0	0	164	0	0
Stage 1	151	151	-	163	163	-	-	-	-	-	-	-
Stage 2	184	168	-	151	151	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	619	598	962	639	601	886	1499	-	-	1414	-	-
Stage 1	851	772	-	839	763	-	-	-	-	-	-	-
Stage 2	818	759	-	851	772	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	580	585	962	628	588	886	1499	-	-	1414	-	-
Mov Cap-2 Maneuver	625	606	-	667	615	-	-	-	-	-	-	-
Stage 1	850	757	-	838	762	-	-	-	-	-	-	-
Stage 2	778	758	-	833	757	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	9.7	0.1	1.7
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1499	-	-	758	818	1414	-	-
HCM Lane V/C Ratio	0.001	-	-	0.003	0.069	0.02	-	-
HCM Control Delay (s)	7.4	-	-	9.8	9.7	7.6	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	10.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1020	21	0	0	0	0	0	244	0	141	0
Future Vol, veh/h	0	1020	21	0	0	0	0	0	244	0	141	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	175	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16983	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	0	-	-	1	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1133	23	0	0	0	0	0	271	0	157	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	567	567	1133	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	567	1133	-
Critical Hdwy	-	-	-	-	-	7.04	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	-	-	-	-	-	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	0	-	-	0	0	459	406	202	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	476	276	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	459	166	202	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	166	202	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	195	276	-

Approach	EB	NB	SB
HCM Control Delay, s	0	23.5	66
HCM LOS		C	F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	459	-	-	202
HCM Lane V/C Ratio	0.591	-	-	0.776
HCM Control Delay (s)	23.5	-	-	66
HCM Lane LOS	C	-	-	F
HCM 95th %tile Q(veh)	3.7	-	-	5.3

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↰	
Traffic Vol, veh/h	0	0	0	1128	24	0
Future Vol, veh/h	0	0	0	1128	24	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	1253	27	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	-	-	627	-
Stage 1	-	-	0	-
Stage 2	-	-	627	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	416	0
Stage 1	0	-	-	0
Stage 2	0	-	495	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	416	-
Mov Cap-2 Maneuver	-	-	416	-
Stage 1	-	-	-	-
Stage 2	-	-	495	-

Approach	WB	NB
HCM Control Delay, s	0	14.2
HCM LOS		B

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	416	-
HCM Lane V/C Ratio	0.064	-
HCM Control Delay (s)	14.2	-
HCM Lane LOS	B	-
HCM 95th %tile Q(veh)	0.2	-

Intersection	
Int Delay, s/veh	8.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	99	21	100	81	39	19	85	115	29	73	8
Future Vol, veh/h	13	99	21	100	81	39	19	85	115	29	73	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	150	-	150	100	-	-	150	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	110	23	111	90	43	21	94	128	32	81	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	133	0	0	133	0	0	529	505	122	573	473	90
Stage 1	-	-	-	-	-	-	150	150	-	312	312	-
Stage 2	-	-	-	-	-	-	379	355	-	261	161	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1452	-	-	1452	-	-	460	470	929	430	490	968
Stage 1	-	-	-	-	-	-	853	773	-	699	658	-
Stage 2	-	-	-	-	-	-	643	630	-	744	765	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1452	-	-	1452	-	-	368	430	929	289	448	968
Mov Cap-2 Maneuver	-	-	-	-	-	-	368	430	-	289	448	-
Stage 1	-	-	-	-	-	-	844	765	-	692	608	-
Stage 2	-	-	-	-	-	-	510	582	-	557	757	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	3.5	14.1	15.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	368	622	1452	-	-	1452	-	-	289	448	968
HCM Lane V/C Ratio	0.057	0.357	0.01	-	-	0.077	-	-	0.111	0.181	0.009
HCM Control Delay (s)	15.4	14	7.5	-	-	7.7	-	-	19	14.8	8.8
HCM Lane LOS	C	B	A	-	-	A	-	-	C	B	A
HCM 95th %tile Q(veh)	0.2	1.6	0	-	-	0.2	-	-	0.4	0.7	0

Intersection	
Int Delay, s/veh	4.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	327	41	209	344	25	149
Future Vol, veh/h	327	41	209	344	25	149
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	363	46	232	382	28	166

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	409	0	1232	386
Stage 1	-	-	-	-	386	-
Stage 2	-	-	-	-	846	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1150	-	196	662
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	421	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1150	-	146	662
Mov Cap-2 Maneuver	-	-	-	-	146	-
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	313	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.4	19.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	439	-	-	1150	-
HCM Lane V/C Ratio	0.44	-	-	0.202	-
HCM Control Delay (s)	19.5	-	-	8.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.2	-	-	0.8	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	2	1	3	13	1	33	2	126	20	38	135	3
Future Vol, veh/h	2	1	3	13	1	33	2	126	20	38	135	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1	3	14	1	37	2	140	22	42	150	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	410	402	152	393	392	151	153	0	0	162	0	0
Stage 1	236	236	-	155	155	-	-	-	-	-	-	-
Stage 2	174	166	-	238	237	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	552	537	894	566	544	895	1428	-	-	1417	-	-
Stage 1	767	710	-	847	769	-	-	-	-	-	-	-
Stage 2	828	761	-	765	709	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	516	520	894	550	527	895	1428	-	-	1417	-	-
Mov Cap-2 Maneuver	581	558	-	606	568	-	-	-	-	-	-	-
Stage 1	766	689	-	846	768	-	-	-	-	-	-	-
Stage 2	792	760	-	738	688	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	9.9	0.1	1.6
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1428	-	-	698	782	1417	-	-
HCM Lane V/C Ratio	0.002	-	-	0.01	0.067	0.03	-	-
HCM Control Delay (s)	7.5	-	-	10.2	9.9	7.6	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	30.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱						↱		↰↑	
Traffic Vol, veh/h	0	1132	30	0	0	0	0	0	203	0	196	0
Future Vol, veh/h	0	1132	30	0	0	0	0	0	203	0	196	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	None
Storage Length	-	-	175	-	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16983	-	-	0	-	-	0	-
Grade, %	-	-2	-	-	0	-	-	1	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1258	33	0	0	0	0	0	226	0	218	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	629	629	1258	-
Stage 1	-	-	-	-	-	-	0	0	-
Stage 2	-	-	-	-	-	-	629	1258	-
Critical Hdwy	-	-	-	-	-	7.04	7.54	6.54	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	-	-	-	-	-	3.32	3.52	4.02	-
Pot Cap-1 Maneuver	0	-	-	0	0	418	367	~ 170	0
Stage 1	0	-	-	0	0	-	-	-	0
Stage 2	0	-	-	0	0	-	437	241	0
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	418	169	~ 170	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	169	~ 170	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	201	241	-

Approach	EB	NB	SB
HCM Control Delay, s	0	23.3	216.7
HCM LOS		C	F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	418	-	-	170
HCM Lane V/C Ratio	0.54	-	-	1.281
HCM Control Delay (s)	23.3	-	-	216.7
HCM Lane LOS	C	-	-	F
HCM 95th %tile Q(veh)	3.1	-	-	12.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

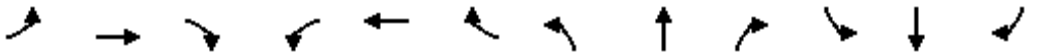
Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				↑↑	↰	
Traffic Vol, veh/h	0	0	0	1463	39	0
Future Vol, veh/h	0	0	0	1463	39	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	1626	43	0

Major/Minor	Major2		Minor1	
Conflicting Flow All	-	-	813	-
Stage 1	-	-	0	-
Stage 2	-	-	813	-
Critical Hdwy	-	-	6.84	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	5.84	-
Follow-up Hdwy	-	-	3.52	-
Pot Cap-1 Maneuver	0	-	316	0
Stage 1	0	-	-	0
Stage 2	0	-	396	0
Platoon blocked, %		-		
Mov Cap-1 Maneuver	-	-	316	-
Mov Cap-2 Maneuver	-	-	316	-
Stage 1	-	-	-	-
Stage 2	-	-	396	-

Approach	WB	NB
HCM Control Delay, s	0	18.2
HCM LOS		C

Minor Lane/Major Mvmt	NBLn1	WBT
Capacity (veh/h)	316	-
HCM Lane V/C Ratio	0.137	-
HCM Control Delay (s)	18.2	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	0.5	-

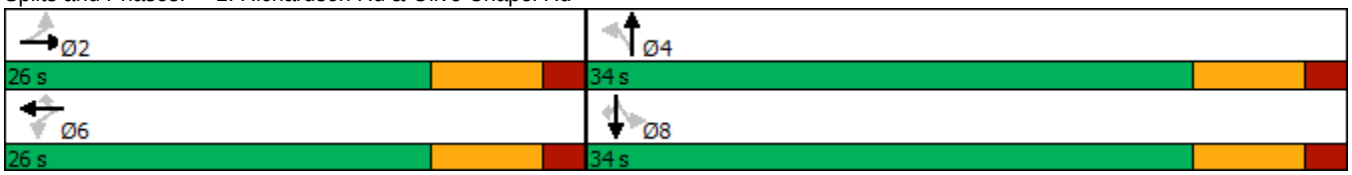


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	68	22	93	65	120	37	110	128	93	102	48
Future Volume (vph)	54	68	22	93	65	120	37	110	128	93	102	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	150		150	100		0	150		175
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.964				0.850		0.919				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1796	0	1770	1863	1583	1770	1712	0	1770	1863	1583
Flt Permitted	0.710			0.692			0.684			0.596		
Satd. Flow (perm)	1323	1796	0	1289	1863	1583	1274	1712	0	1110	1863	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		1889			1311			1771			2925	
Travel Time (s)		28.6			19.9			26.8			44.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	60	76	24	103	72	133	41	122	142	103	113	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	100	0	103	72	133	41	264	0	103	113	53
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	14.0		14.0	14.0	14.0
Total Split (s)	26.0	26.0		26.0	26.0	26.0	34.0	34.0		34.0	34.0	34.0
Total Split (%)	43.3%	43.3%		43.3%	43.3%	43.3%	56.7%	56.7%		56.7%	56.7%	56.7%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	27.0	27.0		27.0	27.0	27.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min		Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	12.1	12.1		12.1	12.1	12.1	12.7	12.7		12.7	12.7	12.7
Actuated g/C Ratio	0.35	0.35		0.35	0.35	0.35	0.36	0.36		0.36	0.36	0.36
v/c Ratio	0.13	0.16		0.23	0.11	0.24	0.09	0.43		0.26	0.17	0.09
Control Delay	9.8	9.7		10.8	9.3	10.6	7.7	10.6		9.4	7.9	7.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	9.8	9.7		10.8	9.3	10.6	7.7	10.6		9.4	7.9	7.5
LOS	A	A		B	A	B	A	B		A	A	A
Approach Delay		9.7			10.3			10.2			8.4	
Approach LOS		A			B			B			A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	7	12		13	8	16	4	31		11	12	5
Queue Length 95th (ft)	27	39		42	30	51	18	82		38	37	21
Internal Link Dist (ft)		1809			1231			1691			2845	
Turn Bay Length (ft)	250			150		150	100			150		175
Base Capacity (vph)	805	1093		785	1134	964	1071	1440		933	1567	1331
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.07	0.09		0.13	0.06	0.14	0.04	0.18		0.11	0.07	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 35			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay: 9.7		Intersection LOS: A	
Intersection Capacity Utilization 43.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Richardson Rd & Olive Chapel Rd



Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	419	20	83	328	27	97
Future Vol, veh/h	419	20	83	328	27	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	466	22	92	364	30	108

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	488	0	1025	477
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	548	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1075	-	260	588
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	579	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1075	-	232	588
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	517	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	16.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	441	-	-	1075	-
HCM Lane V/C Ratio	0.312	-	-	0.086	-
HCM Control Delay (s)	16.8	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0.3	-

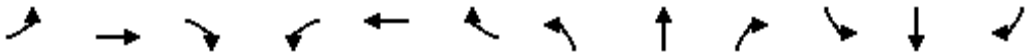
Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	1	15	0	103	2	478	10	48	503	1
Future Vol, veh/h	1	0	1	15	0	103	2	478	10	48	503	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	17	0	114	2	531	11	53	559	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1264	1212	560	1207	1207	537	560	0	0	542	0	0
Stage 1	666	666	-	541	541	-	-	-	-	-	-	-
Stage 2	598	546	-	666	666	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	146	182	528	160	183	544	1011	-	-	1027	-	-
Stage 1	449	457	-	525	521	-	-	-	-	-	-	-
Stage 2	489	518	-	449	457	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	111	172	528	153	173	544	1011	-	-	1027	-	-
Mov Cap-2 Maneuver	223	283	-	282	293	-	-	-	-	-	-	-
Stage 1	448	433	-	524	520	-	-	-	-	-	-	-
Stage 2	385	517	-	425	433	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.5	15.1	0	0.8
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1011	-	-	314	487	1027	-	-
HCM Lane V/C Ratio	0.002	-	-	0.007	0.269	0.052	-	-
HCM Control Delay (s)	8.6	-	-	16.5	15.1	8.7	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	1.1	0.2	-	-

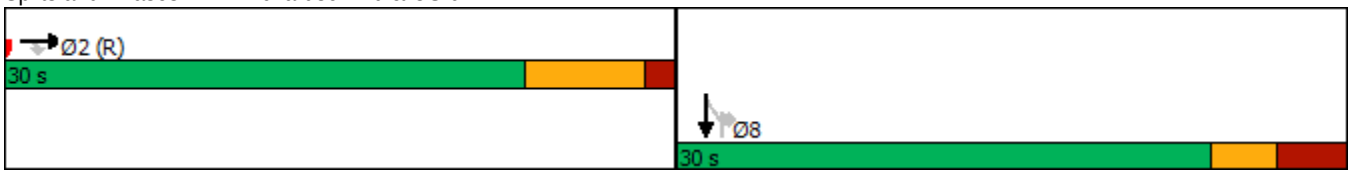


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1124	267	0	0	0	0	0	915	0	719	0
Future Volume (vph)	0	1124	267	0	0	0	0	0	915	0	719	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			1%			0%	
Storage Length (ft)	0		175	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88	0.95	0.95	1.00
Frt			0.850						0.850			
Flt Protected												
Satd. Flow (prot)	0	3575	1599	0	0	0	0	0	2773	0	3539	0
Flt Permitted												
Satd. Flow (perm)	0	3575	1599	0	0	0	0	0	2773	0	3539	0
Right Turn on Red			No			No			No	No		No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			45			35	
Link Distance (ft)		3066			489			978			454	
Travel Time (s)		38.0			6.1			14.8			8.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1249	297	0	0	0	0	0	1017	0	799	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1249	297	0	0	0	0	0	1017	0	799	0
Turn Type		NA	Perm						Perm		NA	
Protected Phases		2									8	
Permitted Phases			2						8	8		
Detector Phase		2	2						8	8	8	
Switch Phase												
Minimum Initial (s)		14.0	14.0						7.0	7.0	7.0	
Minimum Split (s)		20.8	20.8						13.2	13.2	13.2	
Total Split (s)		30.0	30.0						30.0	30.0	30.0	
Total Split (%)		50.0%	50.0%						50.0%	50.0%	50.0%	
Maximum Green (s)		23.2	23.2						23.8	23.8	23.8	
Yellow Time (s)		5.4	5.4						3.0	3.0	3.0	
All-Red Time (s)		1.4	1.4						3.2	3.2	3.2	
Lost Time Adjust (s)		-1.8	-1.8						-1.2		-1.2	
Total Lost Time (s)		5.0	5.0						5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0	6.0						2.0	2.0	2.0	
Minimum Gap (s)		3.4	3.4						0.2	0.2	0.2	
Time Before Reduce (s)		15.0	15.0						0.0	0.0	0.0	
Time To Reduce (s)		45.0	45.0						0.0	0.0	0.0	
Recall Mode		C-Min	C-Min						None	None	None	
Act Effct Green (s)		25.2	25.2						24.8		24.8	
Actuated g/C Ratio		0.42	0.42						0.41		0.41	
v/c Ratio		0.83	0.44						0.89		0.55	
Control Delay		22.1	15.1						28.2		10.9	
Queue Delay		0.0	0.0						0.0		0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		22.1	15.1						28.2		10.9	
LOS		C	B						C		B	
Approach Delay		20.7						28.2			10.9	
Approach LOS		C						C			B	
Queue Length 50th (ft)		203	74						183		106	
Queue Length 95th (ft)		#296	132						#311		m120	
Internal Link Dist (ft)		2986			409			898			374	
Turn Bay Length (ft)			175									
Base Capacity (vph)		1502	672						1155		1474	
Starvation Cap Reductn		0	0						0		0	
Spillback Cap Reductn		0	0						0		0	
Storage Cap Reductn		0	0						0		0	
Reduced v/c Ratio		0.83	0.44						0.88		0.54	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 20.7		Intersection LOS: C	
Intersection Capacity Utilization 99.9%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: Richardson Rd & US 64 EB

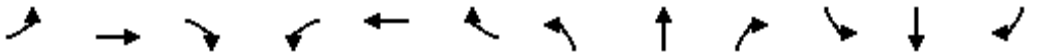


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1770	247	0
Future Volume (vph)	0	0	0	1770	247	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Right Turn on Red		No			No	No
Satd. Flow (RTOR)						
Link Speed (mph)	55			55	25	
Link Distance (ft)	459			2512	426	
Travel Time (s)	5.7			31.1	11.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1967	274	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1967	274	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				14.0	7.0	
Minimum Split (s)				20.2	13.3	
Total Split (s)				46.7	13.3	
Total Split (%)				77.8%	22.2%	
Maximum Green (s)				40.5	7.0	
Yellow Time (s)				5.2	3.0	
All-Red Time (s)				1.0	3.3	
Lost Time Adjust (s)				-1.2	-1.3	
Total Lost Time (s)				5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				6.0	2.0	
Minimum Gap (s)				3.4	0.2	
Time Before Reduce (s)				15.0	0.0	
Time To Reduce (s)				45.0	0.0	
Recall Mode				C-Min	None	
Act Effct Green (s)				41.7	8.3	
Actuated g/C Ratio				0.70	0.14	
v/c Ratio				0.80	0.58	
Control Delay				9.6	27.8	
Queue Delay				0.0	0.0	
Total Delay				9.6	27.8	
LOS				A	C	
Approach Delay				9.6	27.8	
Approach LOS				A	C	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Queue Length 50th (ft)				199	50	
Queue Length 95th (ft)				288	m60	
Internal Link Dist (ft)	379			2432	346	
Turn Bay Length (ft)						
Base Capacity (vph)				2459	474	
Starvation Cap Reductn				0	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.80	0.58	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 11.8		Intersection LOS: B	
Intersection Capacity Utilization 64.3%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 5: U-Turn East & US 64 WB

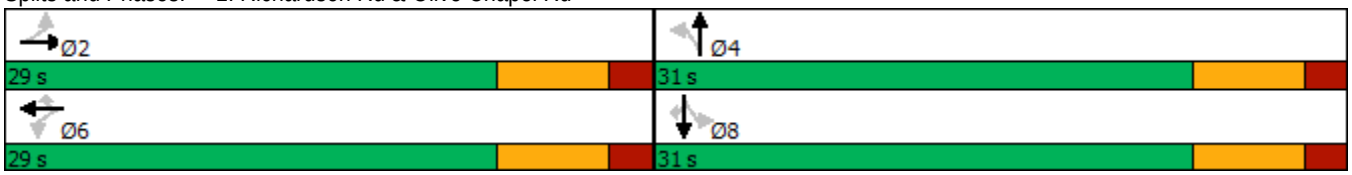


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	119	41	167	104	139	31	103	165	139	147	55
Future Volume (vph)	58	119	41	167	104	139	31	103	165	139	147	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	150		150	100		0	150		175
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.961				0.850		0.908				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1790	0	1770	1863	1583	1770	1691	0	1770	1863	1583
Flt Permitted	0.682			0.645			0.654			0.579		
Satd. Flow (perm)	1270	1790	0	1201	1863	1583	1218	1691	0	1079	1863	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		1889			1311			1771			2925	
Travel Time (s)		28.6			19.9			26.8			44.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	64	132	46	186	116	154	34	114	183	154	163	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	178	0	186	116	154	34	297	0	154	163	61
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	14.0		14.0	14.0	14.0
Total Split (s)	29.0	29.0		29.0	29.0	29.0	31.0	31.0		31.0	31.0	31.0
Total Split (%)	48.3%	48.3%		48.3%	48.3%	48.3%	51.7%	51.7%		51.7%	51.7%	51.7%
Maximum Green (s)	22.0	22.0		22.0	22.0	22.0	24.0	24.0		24.0	24.0	24.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min		Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	14.2	14.2		14.2	14.2	14.2	14.6	14.6		14.6	14.6	14.6
Actuated g/C Ratio	0.36	0.36		0.36	0.36	0.36	0.37	0.37		0.37	0.37	0.37
v/c Ratio	0.14	0.28		0.43	0.17	0.27	0.08	0.47		0.39	0.24	0.10
Control Delay	10.2	10.9		13.9	10.0	11.1	9.6	13.1		13.4	10.4	9.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	10.2	10.9		13.9	10.0	11.1	9.6	13.1		13.4	10.4	9.6
LOS	B	B		B	B	B	A	B		B	B	A
Approach Delay		10.7			12.0			12.7			11.5	
Approach LOS		B			B			B			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	8	24		27	15	21	4	43		21	21	8
Queue Length 95th (ft)	33	73		86	50	66	21	124		73	67	31
Internal Link Dist (ft)		1809			1231			1691			2845	
Turn Bay Length (ft)	250			150		150	100			150		175
Base Capacity (vph)	817	1152		773	1199	1018	849	1179		752	1299	1103
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.08	0.15		0.24	0.10	0.15	0.04	0.25		0.20	0.13	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 39.4			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 11.8		Intersection LOS: B	
Intersection Capacity Utilization 57.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Richardson Rd & Olive Chapel Rd



Intersection	
Int Delay, s/veh	13.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	520	46	235	571	28	168
Future Vol, veh/h	520	46	235	571	28	168
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	578	51	261	634	31	187

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	629	0	1760	604
Stage 1	-	-	-	-	604	-
Stage 2	-	-	-	-	1156	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	953	-	93	498
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	300	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	953	-	54	498
Mov Cap-2 Maneuver	-	-	-	-	54	-
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	173	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3	92.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	229	-	-	953	-
HCM Lane V/C Ratio	0.951	-	-	0.274	-
HCM Control Delay (s)	92.5	-	-	10.2	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	8.4	-	-	1.1	-

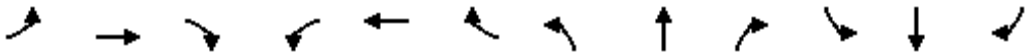
Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1	3	15	1	76	2	599	23	111	648	3
Future Vol, veh/h	2	1	3	15	1	76	2	599	23	111	648	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1	3	17	1	84	2	666	26	123	720	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1694	1664	722	1653	1652	679	723	0	0	692	0	0
Stage 1	968	968	-	683	683	-	-	-	-	-	-	-
Stage 2	726	696	-	970	969	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	73	97	427	78	98	452	879	-	-	903	-	-
Stage 1	305	332	-	439	449	-	-	-	-	-	-	-
Stage 2	416	443	-	304	332	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	53	84	427	69	84	452	879	-	-	903	-	-
Mov Cap-2 Maneuver	138	176	-	177	195	-	-	-	-	-	-	-
Stage 1	304	287	-	438	448	-	-	-	-	-	-	-
Stage 2	337	442	-	260	287	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.8	19.1	0	1.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	879	-	-	221	357	903	-	-
HCM Lane V/C Ratio	0.003	-	-	0.03	0.286	0.137	-	-
HCM Control Delay (s)	9.1	-	-	21.8	19.1	9.6	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.2	0.5	-	-

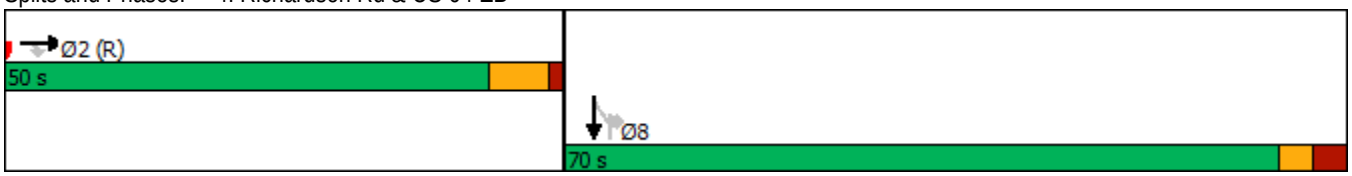


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1166	388	0	0	0	0	0	1331	0	971	0
Future Volume (vph)	0	1166	388	0	0	0	0	0	1331	0	971	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			1%			0%	
Storage Length (ft)	0		175	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88	0.95	0.95	1.00
Frt			0.850						0.850			
Flt Protected												
Satd. Flow (prot)	0	3575	1599	0	0	0	0	0	2773	0	3539	0
Flt Permitted												
Satd. Flow (perm)	0	3575	1599	0	0	0	0	0	2773	0	3539	0
Right Turn on Red			No			No			No	No		No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			45			35	
Link Distance (ft)		3066			489			978			454	
Travel Time (s)		38.0			6.1			14.8			8.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1296	431	0	0	0	0	0	1479	0	1079	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1296	431	0	0	0	0	0	1479	0	1079	0
Turn Type		NA	Perm						Perm		NA	
Protected Phases		2									8	
Permitted Phases			2						8	8		
Detector Phase		2	2						8	8	8	
Switch Phase												
Minimum Initial (s)		14.0	14.0						7.0	7.0	7.0	
Minimum Split (s)		20.8	20.8						13.2	13.2	13.2	
Total Split (s)		50.0	50.0						70.0	70.0	70.0	
Total Split (%)		41.7%	41.7%						58.3%	58.3%	58.3%	
Maximum Green (s)		43.2	43.2						63.8	63.8	63.8	
Yellow Time (s)		5.4	5.4						3.0	3.0	3.0	
All-Red Time (s)		1.4	1.4						3.2	3.2	3.2	
Lost Time Adjust (s)		-1.8	-1.8						-1.2		-1.2	
Total Lost Time (s)		5.0	5.0						5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0	6.0						2.0	2.0	2.0	
Minimum Gap (s)		3.4	3.4						0.2	0.2	0.2	
Time Before Reduce (s)		15.0	15.0						0.0	0.0	0.0	
Time To Reduce (s)		45.0	45.0						0.0	0.0	0.0	
Recall Mode		C-Min	C-Min						None	None	None	
Act Effct Green (s)		45.0	45.0						65.0		65.0	
Actuated g/C Ratio		0.38	0.38						0.54		0.54	
v/c Ratio		0.97	0.72						0.98		0.56	
Control Delay		55.0	40.2						47.4		19.6	
Queue Delay		0.0	0.0						0.0		0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		55.0	40.2						47.4		19.6	
LOS		E	D						D		B	
Approach Delay		51.3						47.4			19.6	
Approach LOS		D						D			B	
Queue Length 50th (ft)		512	283						613		278	
Queue Length 95th (ft)		#668	408						#817		341	
Internal Link Dist (ft)		2986			409			898			374	
Turn Bay Length (ft)			175									
Base Capacity (vph)		1340	599						1502		1916	
Starvation Cap Reductn		0	0						0		0	
Spillback Cap Reductn		0	0						0		0	
Storage Cap Reductn		0	0						0		0	
Reduced v/c Ratio		0.97	0.72						0.98		0.56	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 42.0		Intersection LOS: D	
Intersection Capacity Utilization 129.6%		ICU Level of Service H	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Richardson Rd & US 64 EB



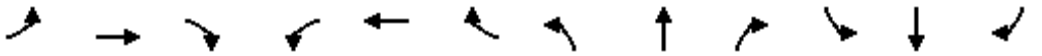
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	2166	472	0
Future Volume (vph)	0	0	0	2166	472	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Right Turn on Red		No			No	No
Satd. Flow (RTOR)						
Link Speed (mph)	55			55	25	
Link Distance (ft)	459			2512	426	
Travel Time (s)	5.7			31.1	11.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	2407	524	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	2407	524	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				14.0	7.0	
Minimum Split (s)				20.2	13.3	
Total Split (s)				70.0	20.0	
Total Split (%)				77.8%	22.2%	
Maximum Green (s)				63.8	13.7	
Yellow Time (s)				5.2	3.0	
All-Red Time (s)				1.0	3.3	
Lost Time Adjust (s)				-1.2	-1.3	
Total Lost Time (s)				5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				6.0	2.0	
Minimum Gap (s)				3.4	0.2	
Time Before Reduce (s)				15.0	0.0	
Time To Reduce (s)				45.0	0.0	
Recall Mode				C-Min	None	
Act Effct Green (s)				65.0	15.0	
Actuated g/C Ratio				0.72	0.17	
v/c Ratio				0.94	0.92	
Control Delay				20.5	59.9	
Queue Delay				0.0	0.0	
Total Delay				20.5	59.9	
LOS				C	E	
Approach Delay				20.5	59.9	
Approach LOS				C	E	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Queue Length 50th (ft)				523	152	
Queue Length 95th (ft)				#847	#246	
Internal Link Dist (ft)	379			2432	346	
Turn Bay Length (ft)						
Base Capacity (vph)				2555	572	
Starvation Cap Reductn				0	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.94	0.92	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 27.6		Intersection LOS: C	
Intersection Capacity Utilization 81.7%		ICU Level of Service D	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: U-Turn East & US 64 WB

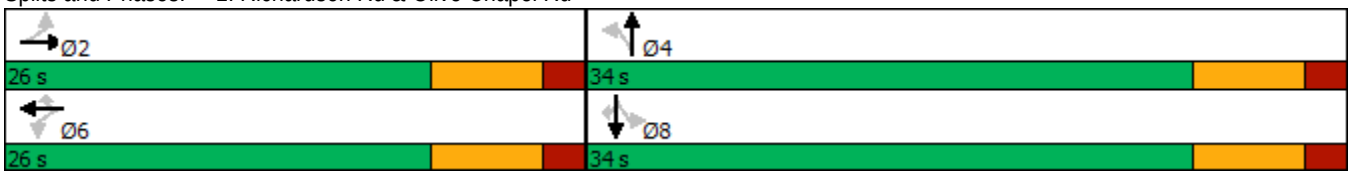


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	70	22	101	70	120	37	110	131	93	102	48
Future Volume (vph)	54	70	22	101	70	120	37	110	131	93	102	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	150		150	100		0	150		175
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.965				0.850		0.918				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1798	0	1770	1863	1583	1770	1710	0	1770	1863	1583
Flt Permitted	0.706			0.691			0.684			0.594		
Satd. Flow (perm)	1315	1798	0	1287	1863	1583	1274	1710	0	1106	1863	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		1889			1311			1771			2925	
Travel Time (s)		28.6			19.9			26.8			44.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	60	78	24	112	78	133	41	122	146	103	113	53
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	102	0	112	78	133	41	268	0	103	113	53
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	14.0		14.0	14.0	14.0
Total Split (s)	26.0	26.0		26.0	26.0	26.0	34.0	34.0		34.0	34.0	34.0
Total Split (%)	43.3%	43.3%		43.3%	43.3%	43.3%	56.7%	56.7%		56.7%	56.7%	56.7%
Maximum Green (s)	19.0	19.0		19.0	19.0	19.0	27.0	27.0		27.0	27.0	27.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min		Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	12.2	12.2		12.2	12.2	12.2	12.8	12.8		12.8	12.8	12.8
Actuated g/C Ratio	0.35	0.35		0.35	0.35	0.35	0.36	0.36		0.36	0.36	0.36
v/c Ratio	0.13	0.16		0.25	0.12	0.24	0.09	0.43		0.26	0.17	0.09
Control Delay	9.9	9.8		11.1	9.5	10.6	7.8	10.7		9.5	8.0	7.6
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	9.9	9.8		11.1	9.5	10.6	7.8	10.7		9.5	8.0	7.6
LOS	A	A		B	A	B	A	B		A	A	A
Approach Delay		9.8			10.5			10.3			8.5	
Approach LOS		A			B			B			A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	7	12		14	9	17	4	31		11	12	5
Queue Length 95th (ft)	28	40		46	32	52	18	85		39	38	22
Internal Link Dist (ft)		1809			1231			1691			2845	
Turn Bay Length (ft)	250			150		150	100			150		175
Base Capacity (vph)	796	1088		779	1128	958	1065	1430		924	1558	1323
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.08	0.09		0.14	0.07	0.14	0.04	0.19		0.11	0.07	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 35.2			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay: 9.8		Intersection LOS: A	
Intersection Capacity Utilization 44.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Richardson Rd & Olive Chapel Rd



Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	446	22	83	336	28	97
Future Vol, veh/h	446	22	83	336	28	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	496	24	92	373	31	108

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	520	0	1065	508
Stage 1	-	-	-	-	508	-
Stage 2	-	-	-	-	557	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1046	-	246	565
Stage 1	-	-	-	-	604	-
Stage 2	-	-	-	-	574	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1046	-	219	565
Mov Cap-2 Maneuver	-	-	-	-	219	-
Stage 1	-	-	-	-	604	-
Stage 2	-	-	-	-	510	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	17.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	417	-	-	1046	-
HCM Lane V/C Ratio	0.333	-	-	0.088	-
HCM Control Delay (s)	17.9	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.4	-	-	0.3	-

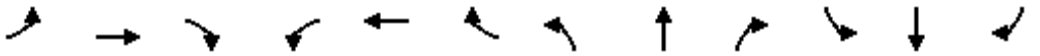
Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	1	15	0	167	2	478	10	67	503	1
Future Vol, veh/h	1	0	1	15	0	167	2	478	10	67	503	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	1	17	0	186	2	531	11	74	559	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1342	1254	560	1249	1249	537	560	0	0	542	0	0
Stage 1	708	708	-	541	541	-	-	-	-	-	-	-
Stage 2	634	546	-	708	708	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	129	172	528	150	173	544	1011	-	-	1027	-	-
Stage 1	426	438	-	525	521	-	-	-	-	-	-	-
Stage 2	467	518	-	426	438	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	80	159	528	141	160	544	1011	-	-	1027	-	-
Mov Cap-2 Maneuver	170	266	-	267	279	-	-	-	-	-	-	-
Stage 1	425	406	-	524	520	-	-	-	-	-	-	-
Stage 2	307	517	-	394	406	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.1	17	0	1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1011	-	-	257	501	1027	-	-
HCM Lane V/C Ratio	0.002	-	-	0.009	0.404	0.072	-	-
HCM Control Delay (s)	8.6	-	-	19.1	17	8.8	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	1.9	0.2	-	-

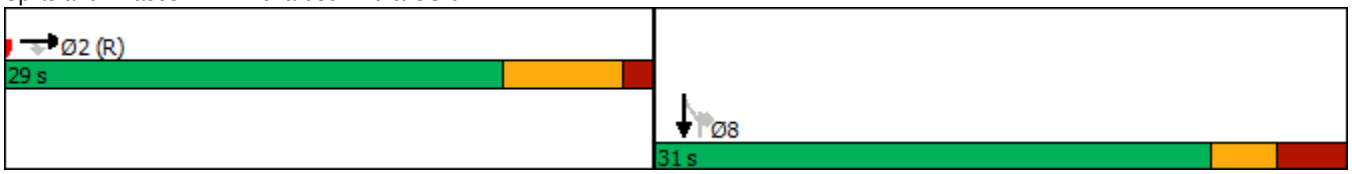


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1124	270	0	0	0	0	0	979	0	735	0
Future Volume (vph)	0	1124	270	0	0	0	0	0	979	0	735	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			1%			0%	
Storage Length (ft)	0		175	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88	0.95	0.95	1.00
Frt			0.850						0.850			
Flt Protected												
Satd. Flow (prot)	0	3575	1599	0	0	0	0	0	2773	0	3539	0
Flt Permitted												
Satd. Flow (perm)	0	3575	1599	0	0	0	0	0	2773	0	3539	0
Right Turn on Red			No			No			No	No		No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			45			35	
Link Distance (ft)		3066			489			978			454	
Travel Time (s)		38.0			6.1			14.8			8.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1249	300	0	0	0	0	0	1088	0	817	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1249	300	0	0	0	0	0	1088	0	817	0
Turn Type		NA	Perm						Perm		NA	
Protected Phases		2									8	
Permitted Phases			2						8	8		
Detector Phase		2	2						8	8	8	
Switch Phase												
Minimum Initial (s)		14.0	14.0						7.0	7.0	7.0	
Minimum Split (s)		20.8	20.8						13.2	13.2	13.2	
Total Split (s)		29.0	29.0						31.0	31.0	31.0	
Total Split (%)		48.3%	48.3%						51.7%	51.7%	51.7%	
Maximum Green (s)		22.2	22.2						24.8	24.8	24.8	
Yellow Time (s)		5.4	5.4						3.0	3.0	3.0	
All-Red Time (s)		1.4	1.4						3.2	3.2	3.2	
Lost Time Adjust (s)		-1.8	-1.8						-1.3		-1.2	
Total Lost Time (s)		5.0	5.0						4.9		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0	6.0						2.0	2.0	2.0	
Minimum Gap (s)		3.4	3.4						0.2	0.2	0.2	
Time Before Reduce (s)		15.0	15.0						0.0	0.0	0.0	
Time To Reduce (s)		45.0	45.0						0.0	0.0	0.0	
Recall Mode		C-Min	C-Min						None	None	None	
Act Effct Green (s)		24.0	24.0						26.1		26.0	
Actuated g/C Ratio		0.40	0.40						0.44		0.43	
v/c Ratio		0.87	0.47						0.90		0.53	
Control Delay		25.5	16.3						28.5		9.8	
Queue Delay		0.0	0.0						0.0		0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		25.5	16.3						28.5		9.8	
LOS		C	B						C		A	
Approach Delay		23.7						28.5			9.8	
Approach LOS		C						C			A	
Queue Length 50th (ft)		210	77						197		99	
Queue Length 95th (ft)		#333	138						#333		m110	
Internal Link Dist (ft)		2986			409			898			374	
Turn Bay Length (ft)			175									
Base Capacity (vph)		1430	639						1206		1533	
Starvation Cap Reductn		0	0						0		0	
Spillback Cap Reductn		0	0						0		0	
Storage Cap Reductn		0	0						0		0	
Reduced v/c Ratio		0.87	0.47						0.90		0.53	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 22.0		Intersection LOS: C	
Intersection Capacity Utilization 103.0%		ICU Level of Service G	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: Richardson Rd & US 64 EB



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1786	258	0
Future Volume (vph)	0	0	0	1786	258	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Right Turn on Red		No			No	No
Satd. Flow (RTOR)						
Link Speed (mph)	55			55	25	
Link Distance (ft)	459			2512	426	
Travel Time (s)	5.7			31.1	11.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	1984	287	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	1984	287	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				14.0	7.0	
Minimum Split (s)				21.2	14.0	
Total Split (s)				46.0	14.0	
Total Split (%)				76.7%	23.3%	
Maximum Green (s)				39.8	7.7	
Yellow Time (s)				5.2	3.0	
All-Red Time (s)				1.0	3.3	
Lost Time Adjust (s)				-1.2	-1.3	
Total Lost Time (s)				5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				6.0	2.0	
Minimum Gap (s)				3.4	0.2	
Time Before Reduce (s)				15.0	0.0	
Time To Reduce (s)				45.0	0.0	
Recall Mode				C-Min	None	
Act Effct Green (s)				41.1	8.9	
Actuated g/C Ratio				0.68	0.15	
v/c Ratio				0.82	0.57	
Control Delay				10.5	26.5	
Queue Delay				0.0	0.0	
Total Delay				10.5	26.5	
LOS				B	C	
Approach Delay				10.5	26.5	
Approach LOS				B	C	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Queue Length 50th (ft)				215	51	
Queue Length 95th (ft)				312	m59	
Internal Link Dist (ft)	379			2432	346	
Turn Bay Length (ft)						
Base Capacity (vph)				2426	514	
Starvation Cap Reductn				0	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.82	0.56	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 12.5		Intersection LOS: B	
Intersection Capacity Utilization 65.1%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 5: U-Turn East & US 64 WB

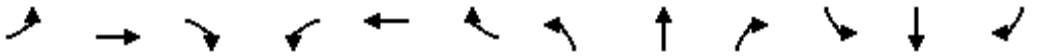
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	439	355	9	29	13
Future Vol, veh/h	5	439	355	9	29	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	488	394	10	32	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	404	0	-	0	894	394
Stage 1	-	-	-	-	394	-
Stage 2	-	-	-	-	500	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1155	-	-	-	312	655
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	609	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1155	-	-	-	310	655
Mov Cap-2 Maneuver	-	-	-	-	310	-
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	609	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1155	-	-	-	370
HCM Lane V/C Ratio	0.005	-	-	-	0.126
HCM Control Delay (s)	8.1	-	-	-	16.1
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.4

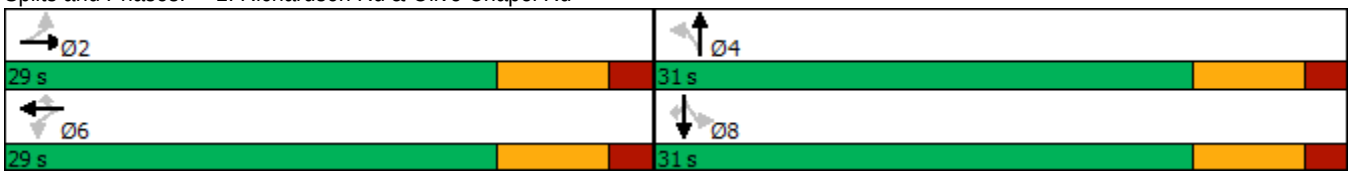


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	125	41	172	107	139	31	103	174	139	147	55
Future Volume (vph)	58	125	41	172	107	139	31	103	174	139	147	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	250		0	150		150	100		0	150		175
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.963				0.850		0.906				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1794	0	1770	1863	1583	1770	1688	0	1770	1863	1583
Flt Permitted	0.681			0.641			0.654			0.573		
Satd. Flow (perm)	1269	1794	0	1194	1863	1583	1218	1688	0	1067	1863	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		1889			1311			1771			2925	
Travel Time (s)		28.6			19.9			26.8			44.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	64	139	46	191	119	154	34	114	193	154	163	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	185	0	191	119	154	34	307	0	154	163	61
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		2			6			4			8	
Permitted Phases	2			6		6	4			8		8
Detector Phase	2	2		6	6	6	4	4		8	8	8
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0
Minimum Split (s)	14.0	14.0		14.0	14.0	14.0	14.0	14.0		14.0	14.0	14.0
Total Split (s)	29.0	29.0		29.0	29.0	29.0	31.0	31.0		31.0	31.0	31.0
Total Split (%)	48.3%	48.3%		48.3%	48.3%	48.3%	51.7%	51.7%		51.7%	51.7%	51.7%
Maximum Green (s)	22.0	22.0		22.0	22.0	22.0	24.0	24.0		24.0	24.0	24.0
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Min	Min		Min	Min	Min	None	None		None	None	None
Act Effct Green (s)	14.5	14.5		14.5	14.5	14.5	15.0	15.0		15.0	15.0	15.0
Actuated g/C Ratio	0.36	0.36		0.36	0.36	0.36	0.37	0.37		0.37	0.37	0.37
v/c Ratio	0.14	0.29		0.44	0.18	0.27	0.07	0.49		0.39	0.23	0.10
Control Delay	10.3	11.1		14.2	10.2	11.2	9.8	13.4		13.6	10.5	9.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	10.3	11.1		14.2	10.2	11.2	9.8	13.4		13.6	10.5	9.7
LOS	B	B		B	B	B	A	B		B	B	A
Approach Delay		10.9			12.2			13.0			11.6	
Approach LOS		B			B			B			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	9	26		29	16	22	4	45		22	21	8
Queue Length 95th (ft)	33	77		89	52	67	21	131		75	69	31
Internal Link Dist (ft)		1809			1231			1691			2845	
Turn Bay Length (ft)	250			150		150	100			150		175
Base Capacity (vph)	804	1137		757	1181	1004	836	1159		733	1280	1088
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.08	0.16		0.25	0.10	0.15	0.04	0.26		0.21	0.13	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 40.2			
Natural Cycle: 40			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 12.0		Intersection LOS: B	
Intersection Capacity Utilization 59.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Richardson Rd & Olive Chapel Rd



Intersection	
Int Delay, s/veh	18

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	537	47	235	599	30	168
Future Vol, veh/h	537	47	235	599	30	168
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	597	52	261	666	33	187

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	649	0	1811	623
Stage 1	-	-	-	-	623	-
Stage 2	-	-	-	-	1188	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	937	-	86	486
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	289	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	937	-	48	486
Mov Cap-2 Maneuver	-	-	-	-	48	-
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	161	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	134.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	204	-	-	937	-
HCM Lane V/C Ratio	1.078	-	-	0.279	-
HCM Control Delay (s)	134.5	-	-	10.3	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	10.1	-	-	1.1	-

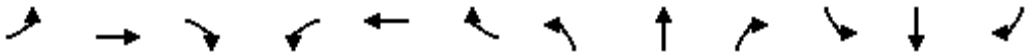
Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1	3	15	1	116	2	599	23	178	648	3
Future Vol, veh/h	2	1	3	15	1	116	2	599	23	178	648	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	125	-	-	150	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	1	3	17	1	129	2	666	26	198	720	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1866	1814	722	1803	1802	679	723	0	0	692	0	0
Stage 1	1118	1118	-	683	683	-	-	-	-	-	-	-
Stage 2	748	696	-	1120	1119	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	56	78	427	62	80	452	879	-	-	903	-	-
Stage 1	251	282	-	439	449	-	-	-	-	-	-	-
Stage 2	404	443	-	251	282	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	33	61	427	51	62	452	879	-	-	903	-	-
Mov Cap-2 Maneuver	71	133	-	140	158	-	-	-	-	-	-	-
Stage 1	250	220	-	438	448	-	-	-	-	-	-	-
Stage 2	287	442	-	193	220	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32	21.9	0	2.2
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	879	-	-	140	357	903	-	-
HCM Lane V/C Ratio	0.003	-	-	0.048	0.411	0.219	-	-
HCM Control Delay (s)	9.1	-	-	32	21.9	10.1	-	-
HCM Lane LOS	A	-	-	D	C	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.9	0.8	-	-

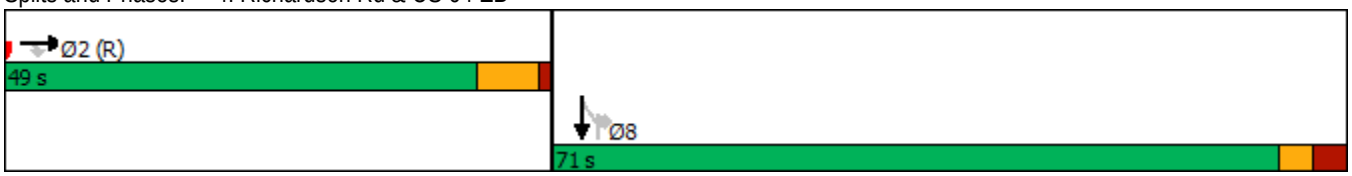


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1166	399	0	0	0	0	0	1371	0	1027	0
Future Volume (vph)	0	1166	399	0	0	0	0	0	1371	0	1027	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-2%			0%			1%			0%	
Storage Length (ft)	0		175	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		2	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88	0.95	0.95	1.00
Frt			0.850						0.850			
Flt Protected												
Satd. Flow (prot)	0	3575	1599	0	0	0	0	0	2773	0	3539	0
Flt Permitted												
Satd. Flow (perm)	0	3575	1599	0	0	0	0	0	2773	0	3539	0
Right Turn on Red			No			No			No	No		No
Satd. Flow (RTOR)												
Link Speed (mph)		55			55			45			35	
Link Distance (ft)		3066			489			978			454	
Travel Time (s)		38.0			6.1			14.8			8.8	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1296	443	0	0	0	0	0	1523	0	1141	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1296	443	0	0	0	0	0	1523	0	1141	0
Turn Type		NA	Perm						Perm		NA	
Protected Phases		2									8	
Permitted Phases			2						8	8		
Detector Phase		2	2						8	8	8	
Switch Phase												
Minimum Initial (s)		14.0	14.0						7.0	7.0	7.0	
Minimum Split (s)		20.8	20.8						13.2	13.2	13.2	
Total Split (s)		49.0	49.0						71.0	71.0	71.0	
Total Split (%)		40.8%	40.8%						59.2%	59.2%	59.2%	
Maximum Green (s)		42.2	42.2						64.8	64.8	64.8	
Yellow Time (s)		5.4	5.4						3.0	3.0	3.0	
All-Red Time (s)		1.4	1.4						3.2	3.2	3.2	
Lost Time Adjust (s)		-1.8	-1.8						-1.2		-1.2	
Total Lost Time (s)		5.0	5.0						5.0		5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		6.0	6.0						2.0	2.0	2.0	
Minimum Gap (s)		3.4	3.4						0.2	0.2	0.2	
Time Before Reduce (s)		15.0	15.0						0.0	0.0	0.0	
Time To Reduce (s)		45.0	45.0						0.0	0.0	0.0	
Recall Mode		C-Min	C-Min						None	None	None	
Act Effct Green (s)		44.0	44.0						66.0		66.0	
Actuated g/C Ratio		0.37	0.37						0.55		0.55	
v/c Ratio		0.99	0.76						1.00		0.59	
Control Delay		60.5	43.0						50.1		19.5	
Queue Delay		0.0	0.0						0.0		0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		60.5	43.0						50.1		19.5	
LOS		E	D						D		B	
Approach Delay		56.0						50.1			19.5	
Approach LOS		E						D			B	
Queue Length 50th (ft)		520	298						640		295	
Queue Length 95th (ft)		#681	430						#847		361	
Internal Link Dist (ft)		2986			409			898			374	
Turn Bay Length (ft)			175									
Base Capacity (vph)		1310	586						1525		1946	
Starvation Cap Reductn		0	0						0		0	
Spillback Cap Reductn		0	0						0		0	
Storage Cap Reductn		0	0						0		0	
Reduced v/c Ratio		0.99	0.76						1.00		0.59	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 44.5		Intersection LOS: D	
Intersection Capacity Utilization 134.1%		ICU Level of Service H	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Richardson Rd & US 64 EB



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	2222	479	0
Future Volume (vph)	0	0	0	2222	479	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.97	1.00
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	0	3539	3433	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	0	3539	3433	0
Right Turn on Red		No			No	No
Satd. Flow (RTOR)						
Link Speed (mph)	55			55	25	
Link Distance (ft)	459			2512	426	
Travel Time (s)	5.7			31.1	11.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	2469	532	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	2469	532	0
Turn Type				NA	Prot	
Protected Phases				6	8	
Permitted Phases						
Detector Phase				6	8	
Switch Phase						
Minimum Initial (s)				14.0	7.0	
Minimum Split (s)				20.2	13.3	
Total Split (s)				70.0	20.0	
Total Split (%)				77.8%	22.2%	
Maximum Green (s)				63.8	13.7	
Yellow Time (s)				5.2	3.0	
All-Red Time (s)				1.0	3.3	
Lost Time Adjust (s)				-1.2	-1.3	
Total Lost Time (s)				5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)				6.0	2.0	
Minimum Gap (s)				3.4	0.2	
Time Before Reduce (s)				15.0	0.0	
Time To Reduce (s)				45.0	0.0	
Recall Mode				C-Min	None	
Act Effct Green (s)				65.0	15.0	
Actuated g/C Ratio				0.72	0.17	
v/c Ratio				0.97	0.93	
Control Delay				24.1	62.1	
Queue Delay				0.0	0.0	
Total Delay				24.1	62.1	
LOS				C	E	
Approach Delay				24.1	62.1	
Approach LOS				C	E	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Queue Length 50th (ft)				567	155	
Queue Length 95th (ft)				#886	#252	
Internal Link Dist (ft)	379			2432	346	
Turn Bay Length (ft)						
Base Capacity (vph)				2555	572	
Starvation Cap Reductn				0	0	
Spillback Cap Reductn				0	0	
Storage Cap Reductn				0	0	
Reduced v/c Ratio				0.97	0.93	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 30.9		Intersection LOS: C	
Intersection Capacity Utilization 83.4%		ICU Level of Service E	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: U-Turn East & US 64 WB

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	566	599	30	18	8
Future Vol, veh/h	15	566	599	30	18	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	100	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	629	666	33	20	9

Major/Minor	Major1			Major2		
Conflicting Flow All	699	0	-	0	1329	666
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	663	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	898	-	-	-	171	459
Stage 1	-	-	-	-	511	-
Stage 2	-	-	-	-	512	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	898	-	-	-	168	459
Mov Cap-2 Maneuver	-	-	-	-	168	-
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	512	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	25
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	898	-	-	-	209
HCM Lane V/C Ratio	0.019	-	-	-	0.138
HCM Control Delay (s)	9.1	-	-	-	25
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

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PLANNING BOARD REPORT TO TOWN COUNCIL

Rezoning Case: 20CZ14 Hackney PUD

Planning Board Meeting Date: March 8, 2021

Report Requirements:

Per NCGS §160D-604(b), all proposed amendments to the zoning ordinance or zoning map shall be submitted to the Planning Board for review and comment. If no written report is received from the Planning Board within 30 days of referral of the amendment to the Planning Board, the Town Council may act on the amendment without the Planning Board report. The Town Council is not bound by the recommendations, if any, of the Planning Board.

Per NCGS §160D-604(d), the Planning Board shall advise and comment on whether the proposed action is consistent with all applicable officially adopted plans, and provide a written recommendation to the Town Council that addresses plan consistency and other matters as deemed appropriate by the Planning Board, but a comment by the Planning Board that a proposed amendment is inconsistent with the officially adopted plans shall not preclude consideration or approval of the proposed amendment by the Town Council.

PROJECT DESCRIPTION:

Acreage: ±79.79 acres

PIN(s): 0721492629, 0722406699, & 0722411102

Current Zoning: Rural Residential (RR) & R-80W

Proposed Zoning: Planned Unit Development-Conditional Zoning (PUD-CZ)

2045 Land Use Map: Medium Density Residential

Town Limits: ETJ and Outside (annexation of portion in Wake County is required with rezoning)

Applicable Officially Adopted Plans:

The Board must state whether the project is consistent or inconsistent with the following officially adopted plans, if applicable. Applicable plans have a check mark next to them.

☑ 2045 Land Use Map
☑ Consistent ☐ Inconsistent Reason: _____

☑ Apex Transportation Plan
☑ Consistent ☐ Inconsistent Reason: _____

☑ Parks, Recreation, Open Space, and Greenways Plan
☑ Consistent ☐ Inconsistent Reason: _____

Legislative Considerations:

The applicant shall propose site-specific standards and conditions that take into account the following considerations, which are considerations that are relevant to the legislative determination of whether or not the proposed conditional zoning district rezoning request is in the public interest. These considerations do not exclude the legislative consideration of any other factor that is relevant to the public interest.

1. *Consistency with 2045 Land Use Plan*. The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and consistency with the purposes, goals, objectives, and policies of the 2045 Land Use Plan.
   ☑ Consistent ☐ Inconsistent Reason: _____

2. *Compatibility.* The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and compatibility with the character of surrounding land uses.
   ☑ Consistent ☐ Inconsistent Reason: _____

3. *Zoning district supplemental standards*. The proposed Conditional Zoning (CZ) District use's compliance with Sec. 4.4 *Supplemental Standards*, if applicable.
   ☑ Consistent ☐ Inconsistent Reason: _____

4. *Design minimizes adverse impact.* The design of the proposed Conditional Zoning (CZ) District use's minimization of adverse effects, including visual impact of the proposed use on adjacent lands; and avoidance of significant adverse impacts on surrounding lands regarding trash, traffic, service delivery, parking and loading, odors, noise, glare, and vibration and not create a nuisance.
   ☑ Consistent ☐ Inconsistent Reason: _____

5. *Design minimizes environmental impact.* The proposed Conditional Zoning District use's minimization of environmental impacts and protection from significant deterioration of water and air resources, wildlife habitat, scenic resources, and other natural resources.
   ☑ Consistent ☐ Inconsistent Reason: _____

6. *Impact on public facilities.* The proposed Conditional Zoning (CZ) District use's avoidance of having adverse impacts on public facilities and services, including roads, potable water and wastewater facilities, parks, schools, police, fire and EMS facilities.
☑ Consistent ☐ Inconsistent Reason: _____

7. *Health, safety, and welfare.* The proposed Conditional Zoning (CZ) District use's effect on the health, safety, or welfare of the residents of the Town or its ETJ.
☑ Consistent ☐ Inconsistent Reason: _____

8. *Detrimental to adjacent properties.* Whether the proposed Conditional Zoning (CZ) District use is substantially detrimental to adjacent properties.
☑ Consistent ☐ Inconsistent Reason: _____

9. *Not constitute nuisance or hazard.* Whether the proposed Conditional Zoning (CZ) District use constitutes a nuisance or hazard due to traffic impact or noise, or because of the number of persons who will be using the Conditional Zoning (CZ) District use.
☑ Consistent ☐ Inconsistent Reason: _____

10. *Other relevant standards of this Ordinance.* Whether the proposed Conditional Zoning (CZ) District use complies with all standards imposed on it by all other applicable provisions of this Ordinance for use, layout, and general development characteristics.
☑ Consistent ☐ Inconsistent Reason: _____

Planning Board Recommendation:

Motion: To recommend approval as presented.

Introduced by Planning Board member: Keith Braswell

Seconded by Planning Board member: Mark Steele

☐ *Approval*: the project is consistent with all applicable officially adopted plans and the applicable legislative considerations listed above.

☑ *Approval with conditions*: the project is not consistent with all applicable officially adopted plans and/or the applicable legislative considerations as noted above, so the following conditions are recommended to be included in the project in order to make it fully consistent:

Conditions proposed by the applicant.

☐ *Denial*: the project is not consistent with all applicable officially adopted plans and/or the applicable legislative considerations as noted above.

With 6 Planning Board Member(s) voting "aye"

With 0 Planning Board Member(s) voting "no"

Reasons for dissenting votes:

This report reflects the recommendation of the Planning Board, this the 8th day of March 2021.

Attest:

Michael Marks Digitally signed by Michael Marks Date: 2021.03.09 14:50:15 -05'00'

Michael Marks, Planning Board Chair

Dianne Khin Digitally signed by Dianne Khin Date: 2021.03.08 17:59:54 -05'00'

Dianne Khin, Director of Planning and Community Development

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TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

PUBLIC NOTIFICATION
OF PUBLIC HEARINGS
CONDITIONAL ZONING #20CZ14
Hackney PUD

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Dianne F. Khin, AICP
Director of Planning and Community Development

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Dianne F. Khin, AICP
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Published Dates: February 26-March 23, 2021

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Dianne F. Khin, AICP
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Published Dates: ~~February 26~~ March 16~~March~~ 23, 2021

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CONDITIONAL ZONING #20CZ14
Hackney PUD
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Dianne F. Khin, AICP
Director of Planning and Community Development

Published Dates: February 26-March 23, 2021

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Published Dates: February 23-March 8, 2021

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Published Dates: ~~February 26~~ March 16-March 23, 202

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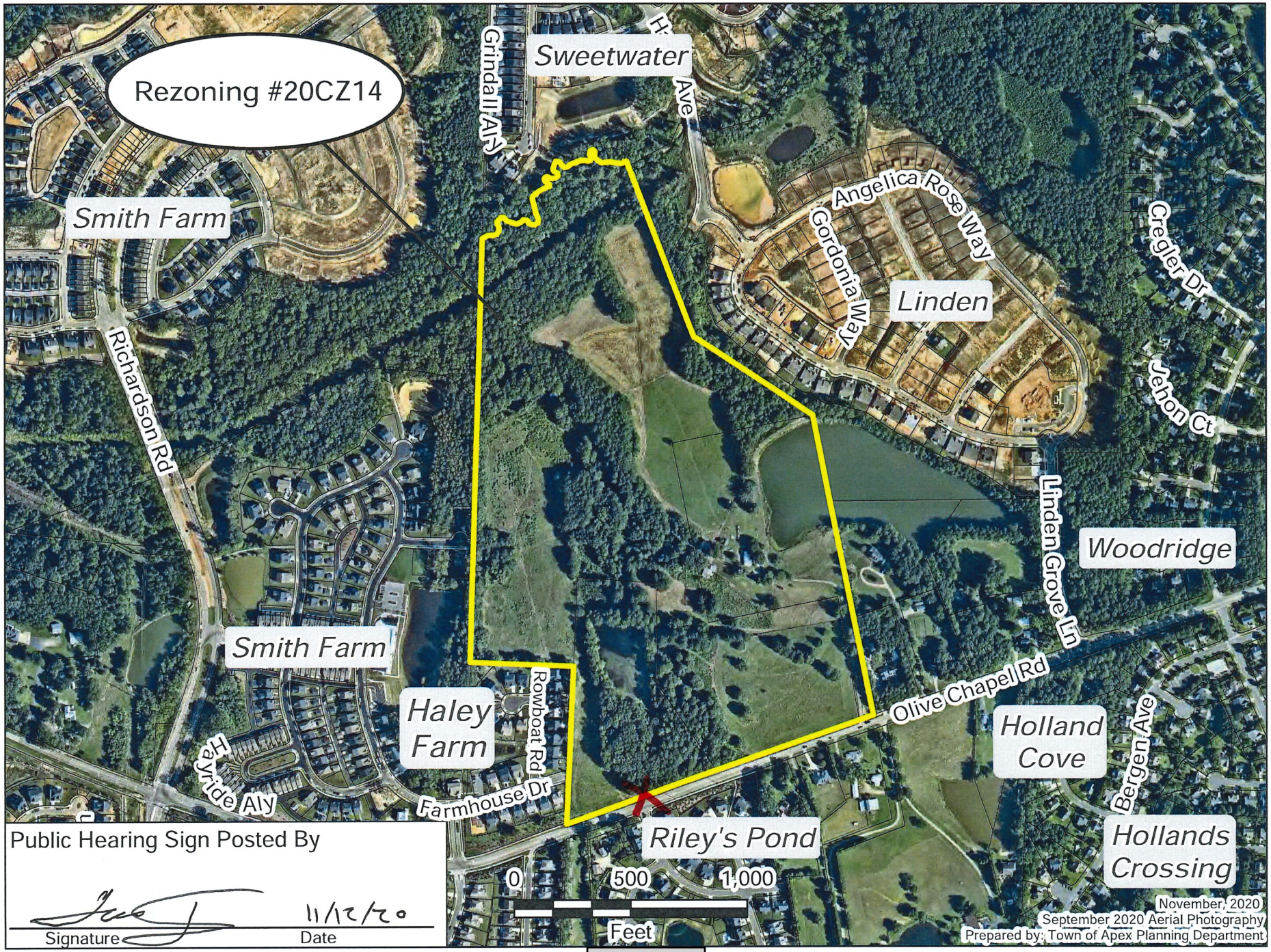
Director of Planning and Community Development

Published Dates: ~~February 26~~ ~~March 16~~ March 26 - ~~Ma~~ 021



Public Hearing Sign Posted By

11/12/20

Signature Date

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

AFFIDAVIT CERTIFYING
Public Notification – Written (Mailed) Notice

Section 2.2.11
Town of Apex Unified Development Ordinance

Project Name:	Conditional Zoning #20CZ14 Hackney PUD
Project Location:	0, 2500, & 2600 Olive Chapel Road
Applicant or Authorized Agent:	Brendie Vega, WithersRavenel
Firm:	WithersRavenel

This is to certify that I, as Director of Planning and Community Development, mailed or caused to have mailed by first class postage for the above mentioned project on February 26, 2021, a notice containing the time and place, location, nature and scope of the application, where additional information may be obtained, and the opportunity for interested parties to be heard, to the property owners within 300' of the land subject to notification. I further certify that I relied on information provided to me by the above-mentioned person as to accuracy and mailing addresses of property owners within 300' of the land subject to notification.

2-26-2021
Date

Liz Loftin for Dianne Khin
Director of Planning & Community Development

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Jeri Chastain Pederson, a Notary Public for the above State and County, this the 26 day of February, 2021.

JERI CHASTAIN PEDERSON
Notary Public
Wake County, North Carolina
My Commission Expires
SEAL March 10, 2024

Jeri Chastain Pederson
Notary Public

My Commission Expires: 3/10/2024

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
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Project Location:	0, 2500, & 2600 Olive Chapel Road
Applicant or Authorized Agent:	Brendie Vega, WithersRavenel
Firm:	WithersRavenel

This is to certify that I, as Director of Planning and Community Development, mailed or caused to have mailed by first class postage for the above mentioned project on February 23, 2021, a notice containing the time and place, location, nature and scope of the application, where additional information may be obtained, and the opportunity for interested parties to be heard, to the property owners within 300' of the land subject to notification. I further certify that I relied on information provided to me by the above-mentioned person as to accuracy and mailing addresses of property owners within 300' of the land subject to notification.

2-23-2021
Date

Liz Loftin for Dianne Khin
Director of Planning & Community Development

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Jeri Chastain Pederson, a Notary Public for the above State and County, this the 23 day of February, 2021.

JERI CHASTAIN PEDERSON
Notary Public
Wake County, North Carolina
My Commission Expires
March 10, 2024

Jeri Chastain Pederson
Notary Public

My Commission Expires: 3/10/2024

WAKE COUNTY
PUBLIC SCHOOL SYSTEM

Student Assignment
Glenn Carrozza
5625 Dillard Drive
Cary, NC 27518

tel: (919) 431-7333
fax: (919) 694-7753

February 17, 2021

Dianne Khin, AICP
Director, Department of Planning and Community Development
Town of Apex
Dianne.Khin@apexnc.org

Dear Dianne,
The Wake County Public School System (WCPSS) Office of School Assignment received information about a proposed rezoning/development within the Town of Apex planning area. We are providing this letter to share information about WCPSS's capacity related to the proposal. The following information about the proposed rezoning/development was provided through the Wake County Residential Development Notification database:

- Date of application: November 2, 2020
- Name of development: 20CZ14 Hackney Tracts PUD
- Address of rezoning/development: 0, 2500, & 2600 Olive Chapel Rd
- Total number of proposed residential units: 319
- Type(s) of residential units proposed: Single-family; townhouse; townhouse, detached; accessory apartment

Based on the information received at the time of application, the Office of School Assignment is providing the following assessment of possible impacts to the Wake County Public School System:

☐ Schools at all grade levels within the current assignment area for the proposed rezoning/development are anticipated to have sufficient capacity for future students.

☒ Schools at the following grade levels within the current assignment area for the proposed rezoning/development are anticipated to have insufficient capacity for future students; transportation to schools outside of the current assignment area should be anticipated:

☒ Elementary ☐ Middle ☒ High

The following mitigation of capacity concerns due to school construction or expansion is anticipated:

☐ Not applicable – existing school capacity is anticipated to be sufficient.

☐ School expansion or construction within the next five years is not anticipated to address concerns.

☒ School expansion or construction within the next five years may address concerns at these grade levels:

☐ Elementary ☐ Middle ☒ High

Thank you for sharing this information with the Town of Apex Planning Board and Town Council as they consider the proposed rezoning/development.

Sincerely,

Glenn Carrozza

Glenn Carrozza

ORDINANCE AMENDING THE OFFICIAL ZONING DISTRICT MAP OF THE TOWN OF APEX TO CHANGE THE ZONING OF APPROXIMATELY 73.64 ACRES LOCATED ON 0, 2500, 2600 OLIVE CHAPEL ROAD FROM RURAL RESIDENTIAL (RR) AND R-80W TO PLANNED UNIT DEVELOPMENT CONDITIONAL ZONING

#20CZ14

WHEREAS, the application of Brendie Vega, WithersRavenel petitioner, for the rezoning of lands hereinafter described was duly filed with the office of the Planning Director and thereafter a public hearing was held hereon on the 8th day of March 2020 before the Planning Board. Thereafter, the Planning Board submitted its final report to the Town Council recommending approval of said application for the rezoning of the lands hereinafter described, all in accordance with the requirements of the Town of Apex Unified Development Ordinance and the provisions of Chapter 160A, Article 19, of the North Carolina General Statutes. A public hearing was held on the 23rd day of March 2021, before the Town Council. All public hearings were held pursuant to due notice mailed and published pursuant to G.S. § 160A-384; **NOW, THEREFORE,**

BE IT ORDAINED BY THE TOWN COUNCIL OF THE TOWN OF APEX

Section 1: The lands that are the subject of the Ordinance are those certain lands described in Attachment "A" – Legal Description which is incorporated herein by reference, and said lands are hereafter referred to as the "Rezoned Lands."

Section 2: The Town of Apex Unified Development Ordinance, including the Town of Apex North Carolina Official Zoning District Map which is a part of said Ordinance, is hereby amended by changing the zoning classification of the "Rezoned Lands" from Rural Residential (RR) and R-80W to Planned Unit Development-Conditional Zoning (PUD-CZ) District, subject to the conditions stated herein.

Section 3: The Planning Director is hereby authorized and directed to cause the said Official Zoning District Map for the Town of Apex, North Carolina, to be physically revised and amended to reflect the zoning changes ordained by this Ordinance.

Section 4: The "Rezoned Lands" are subject to the conditions in Attachment "B" Hackney Tract PUD which are imposed as part of this rezoning.

Section 5: The "Rezoned Lands" shall be perpetually bound to the conditions imposed including the uses authorized, unless subsequently changed or amended as provided for in the Unified Development Ordinance. Site plans for any development to be made pursuant to this amendment to the Official Zoning District Map shall be submitted for site plan approval as provided for in the Unified Development Ordinance.

Section 6: This ordinance shall be in full force and effect from and after its adoption.

Motion by Council Member_____

Seconded by Council Member_____

With ____ Council Member(s) voting "aye."
With ____ Council Member(s) voting "no."

This the _____ day of _____ 2021.

TOWN OF APEX

_____
Mayor

ATTEST:

_____
Town Clerk

APPROVED AS TO FORM:

_____
Town Attorney

Legal description for Tract 1 Hackney Property

Beginning at an Existing Iron Pipe located at the Southwest corner of Lot 1, "William E. Gerringer Subdivision", Recorded at Map Book 1982, Page 24, Wake County Registry. Said Existing Iron Pipe having North Carolina Geodetic Coordinates (NAD 83, 2011) N: 719,823.90', E: 2,025,316.49' Said point is also located on the Northern Margin of Olive Chapel Road, Thence, following the Northern Margin of Olive Chapel Road; South 70°32'42" West, 65.39 feet to a point, said point being the **True Point of Beginning.** Thence, following the Northern Margin of Olive Chapel Road, South 70°31'17" West, 649.92 feet to a point, Thence, Leaving Said Road, North 34°12'20" West, 445.67 feet to a point; Thence, North 00°58'41" West, 436.43 feet to a point; Thence, North 85°35'51" West, 339.02 feet to an Existing Iron Pipe; Thence, South 02°31'45" West, 382.15 feet to an Existing Iron Pipe; Thence, North 87°46'36" West, 443.92 feet to an Existing Iron Pipe; Thence, North 01°42'56" East, 1,191.60 feet to an Existing Iron Pipe; Thence, North 01°42'19" East, 635.94 feet to a point located in the centerline of a creek, Said point being located South 01°42'19" West, 8.02 feet from an Existing Iron Pipe found on the North bank of the creek; Thence, along the centerline of the creek the following seventy-eight (78) calls:
North 62°12'20" East, 26.95 feet to a point; Thence, North 85°25'51" East, 12.16 feet to a point; Thence, South 89°25'18" East, 9.95 feet to a point; Thence, North 72°42'15" East, 16.28 feet to a point; Thence, North 35°12'38" East, 17.29 feet to a point; Thence, North 04°12'00" East, 12.96 feet to a point; Thence, North 21°34'14" West, 18.72 feet to a point; Thence, North 09°03'47" West, 8.16 feet to a point, Thence, North 41°28'27" East, 26.53 feet to a point, Thence, South 84°15'14" East, 11.15 feet to a point, Thence, South 44°43'11" East, 19.83 feet to a point, Thence, South 71°15'05" East, 13.95 feet to a point, Thence, South 74°11'34" East, 15.85 feet to a point, Thence, South 74°44'51" East, 12.72 feet to a point, Thence, South 83°49'13" East, 3.99 feet to a point, Thence, North 64°08'10" East, 16.34 feet to a point, Thence, North 47°07'30" East, 15.60 feet to a point, Thence, South 78°20'55" East, 15.26 feet to a point, Thence, South 56°02'16" East, 5.33 feet to a point, Thence, South 19°19'09" East, 6.90 feet to a point, Thence, South 56°44'29" East, 12.49 feet to a point, Thence, South 83°31'01" East, 16.05 feet to a point, Thence, North 59°49'27" East, 15.58 feet to a point, Thence, North 16°43'28" East, 6.92 feet to a point, Thence, North 01°57'42" West, 8.52 feet to a point, Thence, North 19°34'33" West, 8.53 feet to a point, Thence, North 22°27'53" West, 25.52 feet to a point, Thence, North 08°13'00" West, 17.60 feet to a point, Thence, North 13°08'01" West, 25.39 feet to a point, Thence, North 19°34'33" West, 12.83 feet to a point, Thence, North 00°51'00" East, 8.68 feet to a point, Thence, North 37°09'53" East, 11.70 feet to a point, Thence, North 49°22'35" East, 26.46 feet to a point, Thence, North 62°21'20" East, 30.37 feet to a point, Thence, North 67°46'29" East, 19.95 feet to a point, Thence, North 02°19'02" West, 8.02 feet to a point, Thence, North 48°37'20" West, 9.79 feet to a point, Thence, North 51°28'51" West, 14.82 feet to a point, Thence, North 10°18'42" West, 10.15 feet to a point, Thence, North 29°53'30" East, 7.06 feet to a point, Thence, North 67°41'49" East, 9.59 feet to a point, Thence, South 56°14'07" East, 5.77 feet to a point, Thence, South 63°24'14" East, 9.29 feet to a point, Thence, South 76°41'34" East, 9.25 feet to a point, Thence, North 77°10'45" East, 14.30 feet to a point, Thence, North 49°00'07" East, 13.34 feet to a point, Thence, North 10°50'19" West, 12.26 feet to a point, Thence, North 64°58'17" West, 15.90 feet to a point, Thence, North 31°59'29" West, 7.02 feet to a point, Thence, North 01°03'18" West, 7.87 feet to a point, Thence, North 17°34'16" East, 24.60 feet to a point, Thence, North 26°59'18" East, 8.17 feet to a point, Thence, South 81°51'44" East, 16.60 feet to a point, Thence, South 33°48'00" East, 15.96 feet to a point, Thence, South 49°25'00" East, 16.68 feet to a point, Thence, North 78°59'30" East, 12.42 feet to a point, Thence, North 50°28'53" East, 20.42 feet to a point, Thence, North 70°44'43" East, 46.11 feet to a point, Thence, South 89°01'57" East, 16.84 feet to a point, Thence, South 73°56'31" East, 11.76 feet to a point, Thence, North 66°33'30" East, 13.41 feet to a point, Thence, North 10°20'58" East, 8.36 feet to a point, Thence, North 17°44'49" West, 19.09 feet to a point, Thence, North 07°53'24" East, 12.39 feet to a point, Thence, North 59°58'19" East, 13.53 feet to a point, Thence, South 42°16'28" East, 13.69 feet to

a point, Thence, South 04°17'52" West, 12.70 feet to a point, Thence, South 10°35'03" West, 9.31 feet to a point, Thence, South 32°25'41" East, 5.70 feet to a point, Thence, South 46°46'35" East, 17.73 feet to a point, Thence, South 60°06'25" East, 16.74 feet to a point, Thence, North 86°29'56" East, 19.64 feet to a point, Thence, North 81°25'49" East, 16.54 feet to a point, Thence, South 80°06'27" East, 29.38 feet to a point, Thence, South 84°39'29" East, 22.26 feet to a point, Thence, North 58°33'23" East, 13.24 feet to a point, Thence, North 74°43'49" East, 8.91 feet to a point, Thence, leaving the centerline of said creek, South 20°58'05" East, 22.05 feet to a point, Thence, South 20°45'12" East, 790.03 feet to an Existing Iron Pipe, Thence, South 56°33'25" East, 611.03 feet to an Existing Iron Pipe, Thence, South 78°41'14" West, 615.50 feet to a point, Thence, South 11°18'46" East, 791.04 feet to a point, Thence, North 78°41'14" East, 566.96 feet to a point, Thence, South 09°38'52" East, 536.92 feet to a point, being the **True Point of Beginning**, and having an area of 51.280 Acres, more or less.

Together with the following area located within the public right of way of Olive Chapel Road

Beginning at an Existing Iron Pipe located at the Southwest corner of Lot 1, "William E. Gerringer Subdivision", Recorded at Map Book 1982, Page 24, Wake County Registry. Said Existing Iron Pipe having North Carolina Geodetic Coordinates (NAD 83, 2011) N: 719,823.90', E: 2,025,316.49' Said point is also located on the Northern Margin of Olive Chapel Road, Thence, following the Northern Margin of Olive Chapel Road; South 70°32'42" West, 65.39 feet to a point, said point being the **True Point of Beginning.** Thence, South 70°29'55" West, 636.77 feet to a point; Thence, North 34°12'20" West, 31.27 feet to a point; Thence, North 70°31'17" East, 649.92 feet to a point; Thence, South 09°38'52" East, 30.43 feet to a point; being the **True Point of Beginning**, and having an area of 0.445 Acres (19,375 sf), more or less.

Legal description for Tract 2 Hackney Property

Beginning at an Existing Iron Pipe located at the Southwest corner of Lot 1, "William E. Gerringer Subdivision", Recorded at Map Book 1982, Page 24, Wake County Registry. Said Existing Iron Pipe having North Carolina Geodetic Coordinates (NAD 83, 2011) N: 719,823.90', E: 2,025,316.49' Said point is also located on the Northern Margin of Olive Chapel Road, Thence, following the Northern Margin of Olive Chapel Road; South 70°32'42" West, 65.39 feet to a point; Thence, South 70°31'17" West, 649.92 feet to a point, said point being the **True Point of Beginning.**
Thence, following the Northern Margin of Olive Chapel Road, South 70°19'56" West, 682.58 feet to a New Iron Pipe, Thence, Leaving Said Right of Way, Thence, North 02°31'13" East, 5.41 feet to an Existing Iron Pipe; Thence, North 02°31'13" East, 674.17 feet to an Existing Iron Pipe; Thence, North 02°31'45" East, 382.15 feet to an Existing Iron Pipe; Thence, South 85°35'51" East, 339.02 feet to a point, Thence, South 00°58'41" East, 436.43 feet to a point; Thence, South 34°12'20" East, 445.67 feet to a point, being the **True Point of Beginning**, and having an area of 9.526 Acres, more or less.

Together with the following area located within the public right of way of Olive Chapel Road

Beginning at an Existing Iron Pipe located at the Southwest corner of Lot 1, "William E. Gerringer Subdivision", Recorded at Map Book 1982, Page 24, Wake County Registry. Said Existing Iron Pipe having North Carolina Geodetic Coordinates (NAD 83, 2011) N: 719,823.90', E: 2,025,316.49' Said point is also located on the Northern Margin of Olive Chapel Road, Thence, following the Northern Margin of Olive Chapel Road; South 70°32'42" West, 65.39 feet to a point; Thence, South 70°31'17" West, 649.92 feet to a point, said point being the **True Point of Beginning.**
Thence, South 34°12'20" East, 31.27 feet to a point; Thence, South 70°19'56" West, 702.77 feet to a point; Thence, North 02°31'13" East, 32.69 feet to a New Iron Pipe; Thence, North 70°19'56" East, 682.58 feet to a point; being the **True Point of Beginning**, and having an area of 0.481 Acres (20,967 sf), more or less.

Legal description for Tract 3 Hackney Property

Beginning at an Existing Iron Pipe located at the Southwest corner of Lot 1, "William E. Gerringer Subdivision", Recorded at Map Book 1982, Page 24, Wake County Registry. Said Existing Iron Pipe having North Carolina Geodetic Coordinates (NAD 83, 2011) N: 719,823.90', E: 2,025,316.49' Said point is also located on the Northern Margin of Olive Chapel Road, Thence, following the Northern Margin of Olive Chapel Road; South 70°32'42" West, 65.39 feet to a point; Thence, Leaving said Right of Way, North 09°38'52" West, 536.92 feet to a point; Thence, South 78°41'14" West, 566.96 feet to a point; Thence, North 11°18'46" West, 791.04 feet to a point; Thence, North 78°41'14" East, 615.50 feet to an Existing Iron Pipe; Thence, South 11°18'46" East, 500.58 feet to an Existing Iron Pipe; Thence, South 11°21'53" East, 392.29 feet to an Existing Iron Pipe; Thence, South 11°20'41" East, 425.59 feet to an Existing Iron Pipe, being the Point of **Beginning**, and having an area of 11.871 Acres, more or less.

Together with the following area located within the public right of way of Olive Chapel Road

Beginning at an Existing Iron Pipe located at the Southwest corner of Lot 1, "William E. Gerringer Subdivision", Recorded at Map Book 1982, Page 24, Wake County Registry. Said Existing Iron Pipe having North Carolina Geodetic Coordinates (NAD 83, 2011) N: 719,823.90', E: 2,025,316.49' Said point is also located on the Northern Margin of Olive Chapel Road; Thence, South 11°20'41" East, 30.29 feet to a point; Thence, South 70°32'42" West, 66.30 feet to a point; Thence, North 09°38'52" West, 30.43 feet to a point; Thence, North 70°32'42" East, 65.39 feet to an Existing Iron Pipe, being the Point of Beginning, and having an area of 0.045 acres (1,975 sf), more or less.

"Attachment B"

PD PLAN

Hackney Planned Unit Development

APEX, NORTH CAROLINA

APPLICANT

WithersRavenel
137 S Wilmington Street Suite 200
Raleigh, NC 27601

Date: March 24, 2021

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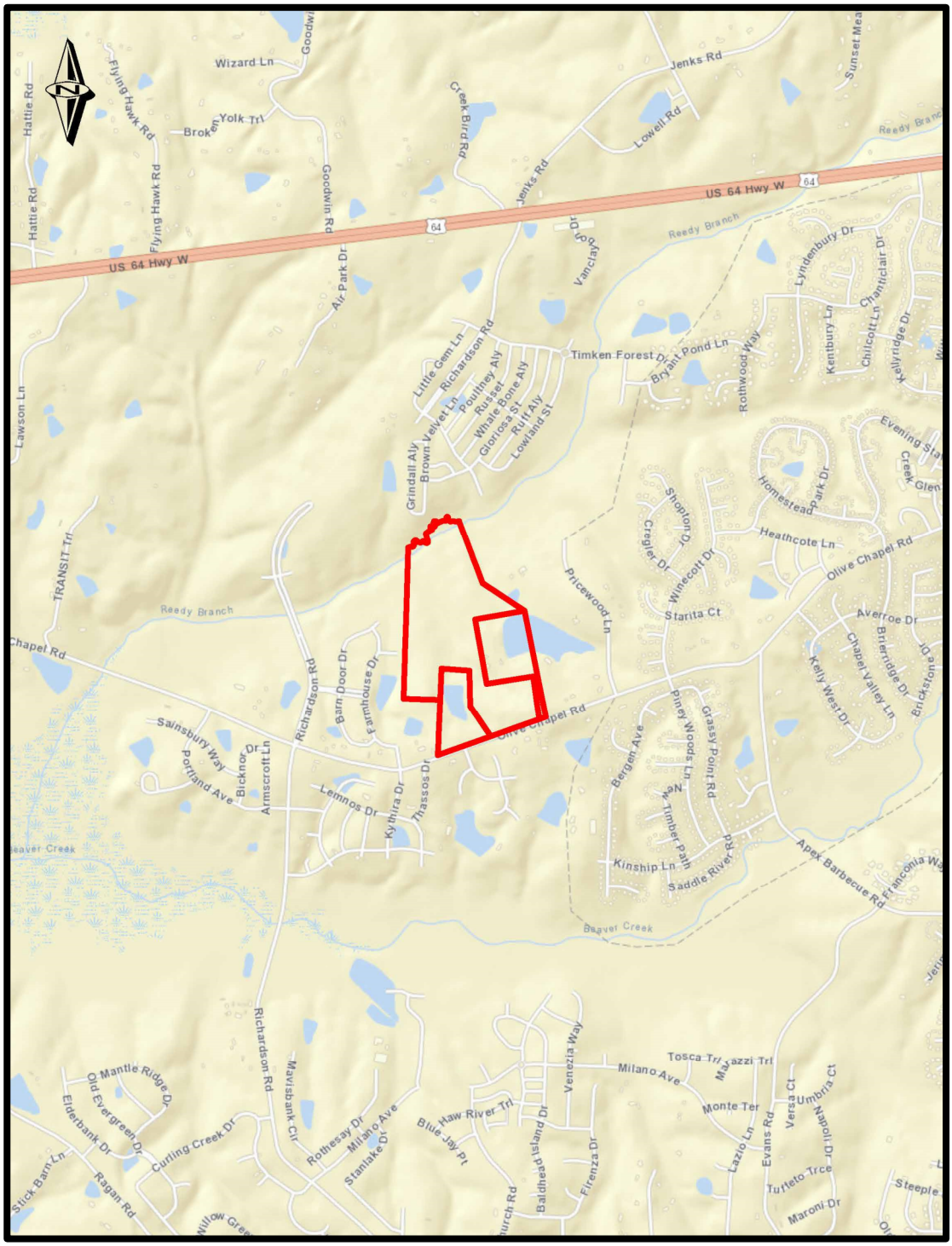
1.0 VICINITY MAP



Project Parcels: Not to Scale

2.0 PROJECT DATA

Name of Project	Hackney Planned Unit Development	
PIN(s)	0721492629 0722406699 0722411102	
Preparer/Owner Information	Prepared by	WithersRavenel 137 S. Wilmington Street, Suite 200 Raleigh, NC 27601 Phone: 919.469.3340 Fax: 919.467.6008 Email: Brendie Vega, AICP, CNU-A bvega@withersravenel.com Bryant Inge, PE binge@withersravenel.com
	Owners	Hackney, Charles Leon Hackney, Judy G Goodwin, Edwin A 2505 Olive Chapel Rd Apex, NC 27502-6788
Current Zoning Designation	Rural Residential (RR) & Residential-80W (R-80W)	
Proposed Zoning Designation	Planned Unit Development (PUD-CZ)	
Current 2045 Land Use Map Designation	Medium Density Residential	
Proposed 2045 Land Use Map Designation	No Proposed Change (Medium Density)	
Area of Tracts (ac.)	10.01, 11.91, & 57.87 (73.64 ac. total)	

3.0 PROPOSED LIST OF USES

The Rezoned Lands may be used for, and only for, the uses listed immediately below. The permitted uses are subject to the limitations and regulations stated in the UDO and any additional limitations or regulations stated below. For convenience, some relevant sections of the UDO may be referenced; such references do not imply that other sections of the UDO do not apply.

Residential

- Single-Family
- Accessory Dwelling Unit
- Townhouse

Non-Residential

- Utility, Minor
- Greenway
- Park, Active
- Park, Passive

4.0 PURPOSE STATEMENT

The Hackney Planned Unit Development Conceptual Layout has been designed in order to help establish appropriately sized residential opportunities along Olive Chapel Road. Development is intended to reflect the neighboring residential communities in both density and product. This residential development philosophy is in line with the 2045 Apex Future Land Use Plan designation of “Medium Density Residential”. The site will provide a mixture of amenities and strategic infrastructure connections for future residents to navigate the community.

5.0 PROPOSED DESIGN AND ARCHITECTURAL CONTROLS

Maximum Densities (du/Acre)	3.5 du/acre		
Maximum Height of Buildings	50 feet		
Setbacks: Single-Family	Front: 5' from façade 20' from garage to back of sidewalk	Side: 5' Corner Side: 8'	Rear: 10'
Setbacks: Townhouse, Front loaded	Front: 10' from façade 20' from garage to back of sidewalk	Side: 5' Building to Building: 10'	Rear: 10'
Setbacks: Townhouse, Alley loaded	Front: 10' from façade	Side: 5' Building to Building: 10'	Rear: 5'
Amount and Percentage of Built Upon Area Allowed	70%		
Amount and Percentage of Proposed Built Upon Area (Max)	70%		

1. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
2. The roofline cannot be a single mass; it must be broken up horizontally and vertically between every unit.
3. Garage doors must have windows, decorative details or carriage-style adornments on them.
4. The rear and side elevations of the units that can be seen from the right-of-way shall have trim around the windows.

5. The visible side of a townhome on a corner lot facing the public street shall contain at least 2 decorative elements such as, but not limited to, the following elements:

- Windows
- Bay window
- Recessed window
- Decorative window
- Trim around the windows
- Wrap-around porch or side porch
- Two or more building materials
- Decorative brick/stone
- Decorative trim
- Decorative shake
- Decorative air vents on gables
- Decorative gable
- Decorative cornice
- Column
- Portico
- Balcony
- Dormer

6. The garage cannot protrude more than 1-foot from either the front façade or porch.

6.0 BUFFERS

Perimeter Buffers shall be designated as such:

North	100' Stream Buffer*
East	20' Type A Buffer
South	30' Type E Buffer**
West	20' Type A Buffer

* In addition to the 100' riparian buffer on the north, an additional 100' buffer will be established. This additional 100' may include utilities, trails and other active or passive recreation.

**A 30' Type B Buffer shall be provided if homes along Olive Chapel Road are not alley-loaded.

7.0 NATURAL RESOURCES AND ENVIRONMENT

Watershed

The Hackney Planned Unit Development is located within the Primary Watershed Protection Overlay District and is therefore subject to the requirements outlined in Section 6.1 of the Town of Apex Unified Development Ordinance.

Floodplain

The parcels that make up the Site do contain a small portion of FEMA designated 100-year floodplains near the site s northern termination according to FEMA FIRM Panel 3720072200J, effective 05/02/2006.

Resource Conservation

The Site is also subject to the Resource Conservation Area requirements outlined in the Town of Apex Unified Development Ordinance.

The PUD will meet the requirements of:

8.1.2.C.1 *Planned Developments.* The RCA for all planned developments shall be determined by the Town Council per Sec. 2.3.4.F.1.c and per Sec. 8.1.2.C.4, 5, 6, 7, or 10 as applicable.

8.1.2.C.4 *Development located south and west of NC 540.* All developments which do not meet the criteria of subsections 8.1.2.C.3 or 10 and which are located south and west of NC 540 shall provide buffers and RCA equal to or greater than 30% of the gross site acreage for single-family and townhome uses and 25% of the gross site acreage for multi-family, mixed-use, and non-residential uses.

Per UDO Section 7.2.5.B.8, if any mass grading is proposed in the single-family sections of the PUD, the following provision will apply to lot coverage area for single-family: An additional five percent (5%) Resource Conservation Area (RCA) shall be set aside. This requirement is added to the standard RCA percentage requirement found in Sec. 8.1.2.C Size of the RCA.

Tree Replanting

Existing deciduous trees greater than 18" in diameter (DBH), as identified in the tree survey, that are removed by site development shall be replaced by planting a 1.5" caliper native tree from the Town of Apex Design and Development Manual as a street tree or as other required landscaping. Excess required tree replacement will occur in common open space areas.

Clean Energy

Residential dwelling units will be provided with solar conduit to accommodate the future installation of solar panels.

If permitted by the electric company, the developer will install photo-voltaic solar panels on the pool house roof for connection to the electrical grid. The photo-voltaic system will be designed to produce 5 kilowatts. The system may be either owned or leased and will be turned over to the HOA.

Water Quality

Signs will be installed near SCMs in order to:

1. Reduce pet waste near SCM drainage areas.
2. Reduce fertilizer near SCM drainage areas.

Installation of Pet Waste Stations in common areas will occur within the neighborhood.

Planting and Landscaping

Install Warm Season grasses (Bermuda, Zoysia, etc) in lawn areas to reduce the need for irrigation and chemicals.

Install required Street Trees, Buffer and Re-Vegetation plantings that consist of a variety of native plant materials recognized by the New Hope Audubon Society or the NCSU manual for Landscaping for Wildlife with Native Plants as being bird and pollinator friendly; as allowed by the Town of Apex Design & Development Manual or approved by Apex Staff.

Specify pocket park plantings that are recognized by the NC Wildlife Federation as being Native Pollinator Plants as part of the Statewide Butterfly Highway initiative.

Include at least 4 native hardwood tree varieties in the proposed plantings, as allowed by the Apex Design and Development Manual.

Environmental Resources

The site will provide the following:

1. Purchase 20 bird houses from the New Hope Audubon Society (or other non-profit) and install in natural areas within the site.
2. Retain the 2 existing ponds if engineering studies confirm that the existing dams are structurally sound and meet regulatory requirements.

Historic Preservation

According to the North Carolina Historic Preservation Office s HPOWEB 2.0 Mapping application, there are no historic structures contained on the Site.

8.0 STORMWATER MANAGEMENT REQUIREMENTS

The parcels on which the development is proposed upon currently consist of a few existing structures, some cleared lands, and wooded lands. Two ponds exist on the parcels and drain to Reedy Branch Creek, eventually feeding into Jordan Lake. The proposed development plan will require stormwater management measures in accordance with Sections 6.1 and 7.5.7 in the Town of Apex Unified Development Ordinance. Stormwater captured on the site will be conveyed to proposed Stormwater Control Measures, which will be identified on plans during the major subdivision or site plan approval stage. Post-development peak runoff shall not exceed pre-development peak runoff for the 24-hour, 1-year and 10-year storm events in accordance with the Unified Development Ordinance. Treatment for the first 1-inch of runoff will be provided such that the removal of 85% Total Suspended Solids is achieved. All stormwater devices will meet the design requirements of NCDENR and the Town of Apex.

9.0 PARKS, RECREATION AND CULTURAL RESOURCES

The Apex Parks, Recreation and Cultural Resources Advisory Commission met on December 9, 2020 and unanimously recommended a fee-in-lieu of dedication with credit for construction of greenway which connects Sidepath along Hasse Ave to the west connecting to the Reedy Branch Greenway in Smith Farm. The fee rate will be set at the time of Town Council Review/ Approval and the credit for construction will be calculated prior to construction plan approval. Per the UDO Art 14, the greenway must be completed and accepted prior to 25% of the building permits for the project being issued.

10.0 PARKING AND LOADING

All parking provided on the Site will comply with the requirements outlined in Section 8.3 of the Town of Apex Unified Development Ordinance. Per 8.3.4(C) of the UDO, guest parking shall be designated within common areas and be distributed throughout residential projects. Striped on-street parking may be counted toward guest parking requirements. For Townhouse, guest parking shall be distributed so that there is at least one parking space within 200' of each townhouse lot.

11.0 SIGNAGE

All signage on the Site will comply with the requirements outlined in Section 8.7 of the Town of Apex Unified Development Ordinance.

12.0 PUBLIC FACILITIES REQUIREMENTS

All utilities shall meet the Town of Apex Master Utility Maps.

Sanitary Sewer Service

All on-site sanitary sewer lines will be extended to the property lines to allow future interconnectivity of properties. The design of the sanitary sewer will be according to the Town of Apex Engineering Standards and Specifications while accounting for downstream capacity and future upstream development. Sanitary Sewer easements will be established for public sewer outside of the Public R/W.

Gas

The Public Service Company of North Carolina (PSNC) will require a revenue analysis based on the proposed development in order to determine the applicable costs to the developer for installation of infrastructure.

Electric Service

The Site is in the service area of both the Town of Apex Electric Utilities and Progress Energy and the applicant will select the Town of Apex to serve as the electric provider.

Roadways

The Site will require an internal public roadway network and parking spaces. The onsite transportation circulation system shall be consistent with the Town of Apex Transportation Plan and the Town of Apex Standard Specifications and Standard Details and show required right-of-way widths and road sections.

Hasse Avenue will be constructed between Olive Chapel Road and its current terminus north of the project. Olive Chapel Road will be widened to include construction of a 100-foot eastbound left-turn lane with appropriate deceleration length and taper and a 100-foot westbound right-turn lane with appropriate deceleration length and taper subject to NCDOT review and approval. The Olive Chapel Road turn lane widening will be completed prior to platting Hasse Avenue access to Olive Chapel Road and the connection to Hasse Avenue north of the project will be completed prior to the last plat in the subdivision.

A 6-foot bike lane and 5-foot paved shoulder will be located on the north side of Olive Chapel Road per the bike/ped systems map.

Per the Long-Range Transportation Map, the following roadway sections apply to this development:

- Olive Chapel Road = 4-Lane with median, widening, 110' ROW, must provide 55' from centerline
- N/S = Future Major Collector, 60' ROW
- E/W = Future Local Connection, 50' ROW

There will be no private driveways permitted along Olive Chapel Road.

Alleys

Alleys may be proposed to vary from Town standards in order to accommodate water and sewer utilities, provided they maintain the same or greater width of pavement and right of way, subject to staff review and approval at the time of subdivision and construction plans.

Water Service

All on-site water lines will be designed according to Town of Apex Engineering Standards and Specifications.

Transit

According to the Apex 2045 Transportation Plan, there are no existing or proposed transit routes designated on or adjacent to the Site.

Pedestrian Facilities

The development plan will incorporate sidewalk infrastructure along Olive Chapel Road as well as the internal street network. A trail will serve as a connection from the western portion of the community to the Reedy Branch Greenway, thus in compliance with the future land use plan.

Sidewalks will be provided on both sides of all streets for single-family detached homes. There will be a 10-foot side path provided along minor collector roads as show on the bike/ped plan.

Prior to platting the 75th lot in the neighborhood, the Developer will extend a 5' sidewalk approximately 860 feet along the north side of Olive Chapel to the western limits of the Linden Subdivision. Developer will attempt to obtain the required right-of-way and/or easements for construction of this sidewalk from the adjacent property owners. If the required right-of-way and/or easements cannot be obtained by that time, a Fee-in-Lieu in the amount of 125% of the estimated cost of construction plus fair market value of the property to be acquired, shall be assessed. Any performance guarantee provided for this section of sidewalk shall be released upon acceptance of said fee-in-lieu by the Town.

13.0 PHASING PLAN

The Hackney Planned Unit Development will be constructed in phases according to economic considerations and infrastructure requirements.

Please note the following considerations for the phasing plan:

1. Access points are preliminary in nature and subject to Town of Apex and NCDOT review and approval.
2. Limits of land disturbance within each phase shall be determined at the master subdivision plan and site plan stages.
3. Public utilities shall be provided for each phase of development.

14.0 CONSISTENCY WITH 2045 LAND USE PLAN

The Apex 2045 Future Land Use Map depicts the future land use of the three parcels as Medium Density Residential. Medium Density Residential lands are described in the Land Use Plan as consisting of single-family homes, duplexes, and townhomes with densities between three (3) and seven (7) dwelling units per acre. It is intended to act as a transition between higher and lower residential densities. The maximum density proposed for the Hackney Planned Unit Development is four (4) dwelling units per acre.

The Hackney Planned Unit Development proposes medium density residential housing options appropriate to its proximity to the Olive Chapel Road thoroughfare and are consistent with uses found in the surrounding communities. The uses proposed for the site are directly in line with the uses stated in the 2045 Future Apex Land Use Plan thus the proposed rezoning is consistent with the Town's future plans for this area.

15.0 CONSISTENCY WITH UNIFIED DEVELOPMENT ORDINANCE

The proposed development is consistent with all applicable requirements of the Town of Apex Unified Development Ordinance.

16.0 ELEVATIONS

Elevations provided are representative of architecture, materials, and housing types. Final elevations submitted at Major Subdivision Plan will meet the requirements of the Architectural Controls in 5.0 of this PD Plan.

17.0 AFFORDABLE HOUSING

If the Town of Apex has a fund or other mechanism in place to receive donations to construct, subsidize, or participate in the development of affordable housing units (the "Fund"), the developer will contribute $215 per lot to this Fund prior to the first residential Certificate of Occupancy. In the event the Fund has not been established by the Town of Apex, the money will be conveyed to a local non-profit working on affordable housing initiatives. The developer will work with the Town of Apex to identify a mutually acceptable local non-profit organization to receive these funds.

PLANNED UNIT DEVELOPMENT

HACKNEY

APEX, NORTH CAROLINA

APRIL 20, 2021

SITE DATA

2045 LAND USE PLAN DESIGNATION	CURRENT	MEDIUM DENSITY RESIDENTIAL			
	PROPOSED	NO CHANGE			
ZONING	CURRENT	RURAL RESIDENTIAL (RR) (R-80W)			
	PROPOSED	PLANNED UNIT DEVELOPMENT (PUD-CZ)			
AREA OF TRACTS IN PROPOSED PUD	0722-41-1102	51.725 ACRES			
	0721-49-2629	10.007 ACRES			
	0722-40-6699	11.916 ACRES			
	TOTAL:	73.648 ACRES			
AREA DESIGNATED AS MIXED-USE ON 2045 LAND USE MAP	0 ACRES				
AREA OF MIXED-USE PROPERTY PROPOSED AS NON-RESIDENTIAL DEVELOPMENT	N/A				
PERCENT OF MIXED-USE PROPERTY PROPOSED AS NON-RESIDENTIAL DEVELOPMENT	N/A				
REQUESTED SEWER CAPACITY	TO BE DETERMINED				
MAXIMUM RESIDENTIAL DENSITY	3.5 DU/ACRE				
MAXIMUM BUILDING HEIGHT	50'-0"				
SETBACKS: SINGLE FAMILY	FRONT: 5 FT FROM FACADE 20 FT FROM GARAGE TO BACK OF SIDEWALK		REAR: 10 FT	SIDE: 5 FT	CORNER SIDE: 8 FT
SETBACKS: TOWNHOUSE, FRONT LOADED	FRONT: 10 FT FROM FACADE 20 FT FROM GARAGE TO BACK OF SIDEWALK		REAR: 10 FT	SIDE: 5 FT	BUILDING TO BUILDING: 10 FT
SETBACKS: TOWNHOUSE, ALLEY LOADED	FRONT: 10 FT FROM FACADE		REAR: 5 FT	SIDE: 5 FT	BUILDING TO BUILDING: 10 FT
WATERSHED	JORDAN LAKE WATERSHED, PRIMARY WATERSHED PROTECTION OVERLAY				
HISTORIC STRUCTURES	N/A				
COMMUNITY AMENITIES	COMMUNITY GATHERING SPACE WITH BENCHES, TOT LOT				
SITE BUFFERS	NORTH	100' RIPARIAN BUFFER *IN ADDITION TO THE 100' RIPARIAN BUFFER ON THE NORTH, AN ADDITIONAL 100' BUFFER WILL BE ESTABLISHED. THIS ADDITIONAL 100' MAY INCLUDE UTILITIES, TRAILS, AND OTHER ACTIVE OR PASSIVE RECREATION.			
	EAST	20' TYPE A BUFFER			
	SOUTH	30' TYPE E BUFFER *A 30' TYPE B BUFFER SHALL BE PROVIDED IF HOMES ALONG OLIVE CHAPEL ROAD ARE NOT ALLEY LOADED.			
	WEST	20' TYPE A BUFFER			

ZONING CONDITIONS

1. THE APEX PARKS, RECREATION AND CULTURAL RESOURCES ADVISORY COMMISSION MET ON DECEMBER 9, 2020 AND UNANIMOUSLY RECOMMENDED A FEE-IN-LIEU OF DEDICATION WITH CREDIT FOR CONSTRUCTION OF GREENWAY WHICH CONNECTS SIDEPATH ALONG HASSE AVE TO THE WEST CONNECTING TO THE REEDY BRANCH GREENWAY IN SMITH FARM. THE FEE RATE WILL BE SET AT THE TIME OF TOWN COUNCIL REVIEW/APPROVAL AND THE CREDIT FOR CONSTRUCTION WILL BE CALCULATED PRIOR TO CONSTRUCTION PLAN APPROVAL. PER THE UDO ART 14, THE GREENWAY MUST BE COMPLETED AND ACCEPTED PRIOR TO 25% OF THE BUILDING PERMITS FOR THE PROJECT BEING ISSUED.

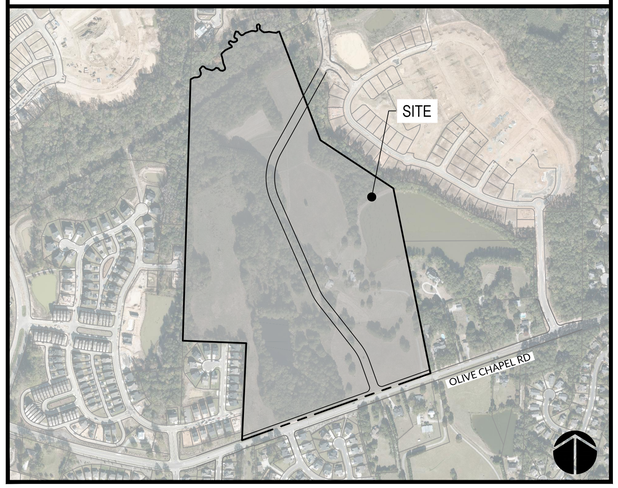
2. HASSE AVENUE WILL BE CONSTRUCTED BETWEEN OLIVE CHAPEL ROAD AND ITS CURRENT TERMINUS NORTH OF THE PROJECT. OLIVE CHAPEL ROAD WILL BE WIDENED TO INCLUDE CONSTRUCTION OF A 100-FOOT EASTBOUND LEFT-TURN LANE WITH APPROPRIATE DECELERATION LENGTH AND TAPER AND A 100-FOOT WESTBOUND RIGHT-TURN LANE WITH APPROPRIATE DECELERATION LENGTH AND TAPER SUBJECT TO NCDOT REVIEW AND APPROVAL. THE OLIVE CHAPEL ROAD TURN LANE WIDENING WILL BE COMPLETED PRIOR TO PLATTING HASSE AVENUE ACCESS TO OLIVE CHAPEL ROAD AND THE CONNECTION TO HASSE AVENUE NORTH OF THE PROJECT WILL BE COMPLETED PRIOR TO THE LAST PLAT IN THE SUBDIVISION.

3. THERE WILL BE NO PRIVATE DRIVEWAYS ALONG OLIVE CHAPEL ROAD.

4. ALLEYS MAY BE PROPOSED TO VARY FROM TOWN STANDARDS IN ORDER TO ACCOMMODATE WATER AND SEWER UTILITIES, PROVIDED THEY MAINTAIN THE SAME OR GREATER WIDTH OF PAVEMENT AND RIGHT-OF-WAY, SUBJECT TO STAFF REVIEW AND APPROVAL AT THE TIME OF SUBDIVISION AND CONSTRUCTION PLANS.

5. PRIOR TO PLATTING THE 75th LOT IN THE NEIGHBORHOOD, THE DEVELOPER WILL EXTEND A 5' SIDEWALK APPROXIMATELY 860 FEET ALONG THE NORTH SIDE OF OLIVE CHAPEL TO THE WESTERN LIMITS OF THE LINDEN SUBDIVISION. THE DEVELOPER WILL ATTEMPT TO OBTAIN THE REQUIRED RIGHT-OF-WAY AND/OR EASEMENTS FOR CONSTRUCTION OF THIS SIDEWALK FROM THE ADJACENT PROPERTY OWNERS. IF THE REQUIRED RIGHT-OF-WAY AND/OR EASEMENTS CANNOT BE OBTAINED BY THAT TIME, A FEE-IN-LIEU IN THE AMOUNT OF 125% OF THE ESTIMATED COST OF CONSTRUCTION PLUS FAIR MARKET VALUE OF THE PROPERTY TO BE ACQUIRED, SHALL BE ASSESSED. ANY PERFORMANCE GUARANTEE PROVIDED FOR THIS SECTION OF SIDEWALK SHALL BE RELEASED UPON ACCEPTANCE OF SAID FEE-IN-LIEU BY THE TOWN.

SITE MAP
1"=500'



VICINITY MAP
1"=2000'

INDEX OF SHEETS

SHEET NUMBER	SHEET TITLE
0.0	COVER
1.0	EXISTING CONDITIONS
2.0	CONCEPTUAL LAYOUT PLAN
3.0	CONCEPTUAL UTILITY PLAN
4.0	CONCEPTUAL STORMWATER MANAGEMENT PLAN

PREPARED BY:

WithersRavenel
Engineers | Planners | Surveyors

115 MacKenan Drive | Cary, NC 27511 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

PLANNER: BRENDIE VEGA, AICP
BVEGA@WITHERSRAVENEL.COM

CIVIL ENGINEER: BRYANT INGE, PE
BINGE@WITHERSRAVENEL.COM

PRELIMINARY
NOT APPROVED FOR CONSTRUCTION

K:\18\18-0510\180517.20-Hackney_Tract-Apex\CAD\Drawing Sets\PUD\0.0 COVER.dwg- Tuesday, April 20, 2021 4:17:01 PM - INGE, BRYANT

EXISTING CONDITION NOTES:

1. TOPOGRAPHIC AND UTILITY INFORMATION BASED ON AVAILABLE GIS MAPPING. PRELIMINARY BOUNDARY SURVEY PREPARED BY WITHERSRAVENEL DATED 09/25/20.
2. WETLAND/STREAM INFORMATION BASED ON EVALUATION BY S&EC DATED 09/18/20 (APEX 20-004).
3. REGULATORY FEMA MAPPED FLOODPLAINS EXIST ON SITE PER FIRM MAP #3720072200J (5/2/06).
4. THE SUBJECT PROPERTY IS LOCATED WITHIN THE TOWN OF APEX PRIMARY WATERSHED PROTECTION OVERLAY DISTRICT.
5. ALL EXISTING STRUCTURES ON THE SUBJECT PROPERTY SHALL BE REMOVED PER TOWN OF APEX STANDARDS AND REQUIREMENTS.

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

MICHAEL BASS
SHERRIE BASS
DB 14367, PG 1240
LOT 3
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503445

ELIZABETH PERKINS
DB 14268, PG 331
LOT 1
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503152

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 6
LINDEN SUBDIVISION
BM 2020, PG 1334
PIN No. 0722424038

HASSE AVE
60' R/W

CRESCENT APEX, LLC
DB 17044, PG 924 RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

S 11°18'46" E
300.58'

S 11°21'53" E
392.29'

S 11°20'41" E
425.59'

N 09°38'52" W
538.92'

S 20°45'12" E
790.03'

S 65°51'07" E
67.18'

N 78°41'44" E
65.50'

EXISTING POND

50' BUFFER

GRAVEL DRIVE

S 78°41'44" W
306.66'

TRACT 3
PIN No. 0722406699
CHARLES L. HACKNEY
JUDY G. HACKNEY
DB 3195, PG 151
BM 1982, PG 1057
11.871 ACRES (OUTSIDE R/W)
0.045 ACRES (WITHIN R/W)
11.916 (TOTAL ACRES)

SHED

SHED

ONE STORY FRAME
RESIDENCE
#2500 OLIVE CHAPEL RD

BARN

BARN

N 11°18'46" W
797.04'

S 87°41'17" W
408.82'

OLIVE CHAPEL ROAD
(SR 1160)
VARIABLE WIDTH R/W

40' UTILITY AND
PIPELINE EASEMENT
DB 14343, PG 2028

EXISTING 1% ANNUAL
FLOOD ZONE
(ZONE AE)

N 01°36'11" E
2872.71' (TIE LINE)

APPROXIMATE
100' BUFFER

N 01°42'16" E
643.96' TO CL CREEK
643.96' TO EIP

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

FLOODWAY (OUT)

FLOODWAY (IN)

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

EXISTING
WETLANDS

C/L OF STREAM

50' BUFFER

TRACT 1
PIN No. 0722411102
JUDY G. HACKNEY
DB 1400, PG 236
BM 1983, PG 57
51.28 ACRES (OUTSIDE R/W)
0.445 ACRES (WITHIN R/W)
51.725 (TOTAL ACRES)

EXISTING
WETLANDS

S 80°58'41" E
436.47'

S 24°47'28" E
445.61'

S 42°33'11" E
308.62'

TRACT 2
PIN No. 0721492629
EDWIN A. GOODWIN
DB 3195, PG 149 BM 1983, PG 57
9.526 ACRES (OUTSIDE R/W)
0.481 ACRES (WITHIN R/W)
10.007 (TOTAL ACRES)

EXISTING POND

N 02°31'45" E
382.15'

S 01°15'56" W
682.56'

RILEYS
POND DRIVE
50' R/W

PORTION OF PROPERTY
TO BE ANNEXED

TOWN OF APEX ELECTRIC
UTILITY EASEMENT
PER DB 13318, PG 1911

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 924
PIN No. 0722219077

N 01°42'16" E
1151.65'

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 923
PIN No. 0722219077

ROWBOAT ROAD
50' R/W

N 02°31'45" E
324.17'

N 87°28'05" W
49.58'

WATER
TOWER LANE
50' R/W

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"FUTURE REC SITE"
SMITH FARM PUD, PH 1
BM 2018, PG 922 & 923
PIN No. 0722303175

SMITH FARMS OF APEX HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 1
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0721396548

SMITH FARMS OF APEX
HOMEOWNERS
ASSOCIATION, INC
DB 17177, PG 741
COMMON AREA 3
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0722309093

FARMHOUSE DRIVE
50' R/W

SMITH FARMS OF APEX
HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 2
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN NO. 0721397362

THASSOS DRIVE
50' R/W

PRELIMINARY
NOT APPROVED FOR
CONSTRUCTION

GRAPHIC SCALE
100 0 50 100 200
1 inch = 100 ft.

TREE LEGEND

OAK	
POPLAR	
GUM	
MAPLE	
CEDAR	
PINE	

EXISTING DECIDUOUS TREES TO BE REMOVED (>18" DBH)

TYPE	QUANTITY
OAK	46
POPLAR	22
GUM	17
MAPLE	5
TOTAL	90

No.	Revision	Date	By

Designer: WR	Scale: 1" = 100'
Drawn By: WR	Date: 02/26/2021
Checked By: WR	Job No.: 02180517.20

HACKNEY

APEX WAKE COUNTY NORTH CAROLINA

EXISTING CONDITIONS

WithersRavenel
Engineers | Planners | Surveyors
115 MacKenan Drive | Cary, NC 27511 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

Sheet No. 1.0

K:\18\1805\02180517.20\Hackney Tract\Apex\CAD\Drawing Set\PUD1.0 EXISTING CONDITIONS.dwg, Friday, February 26, 2021 10:30:02 AM, INGE.BRYANT

NOTES:

1. PLAN SHEETS ARE INTENDED FOR ILLUSTRATIVE USE ONLY.
2. PER 2.3.4(F)(1)(A)(IV) OF THE UDO, SIDEWALKS MUST BE PROVIDED ON BOTH SIDES OF ALL STREETS FOR SINGLE-FAMILY DETACHED HOMES IN PUD-CZ DEVELOPMENT DISTRICTS.
3. PER 2.3.4(F)(1)(F)(I) OF THE UDO, THE PD PLAN FOR PUD-CZ SHALL DEMONSTRATE A SAFE AND ADEQUATE ON-SITE TRANSPORTATION CIRCULATION SYSTEM. THE ON-SITE TRANSPORTATION CIRCULATION SYSTEM SHALL BE INTEGRATED WITH THE OFF-SITE TRANSPORTATION CIRCULATION SYSTEM OF THE TOWN. THE PD PLAN FOR PUD-CZ SHALL BE CONSISTENT WITH THE APEX TRANSPORTATION PLAN AND THE TOWN OF APEX STANDARD SPECIFICATIONS AND STANDARD DETAILS AND SHOW REQUIRED RIGHT-OF-WAY WIDTHS AND ROAD SECTIONS.
4. PER UDO SECTION 7.2.5.B.8, IF ANY MASS GRADING IS PROPOSED IN THE SINGLE-FAMILY SECTIONS OF THE PUD, THE FOLLOWING PROVISION WILL APPLY TO LOT COVERAGE AREA FOR SINGLE-FAMILY: AN ADDITIONAL FIVE PERCENT (5%) RESOURCE CONSERVATION AREA (RCA) SHALL BE SET ASIDE. THIS REQUIREMENT IS ADDED TO THE STANDARD RCA PERCENTAGE REQUIREMENT FOUND IN SEC. 8.1.2.C SIZE OF THE RCA.
5. COLLECTOR ROAD ALIGNMENT LOCATION WILL BE DETERMINED AT THE MAJOR SUBDIVISION PLAN STAGE.
6. EXISTING PONDS WILL BE EVALUATED BY A LICENSED ENGINEER. EVALUATION RECOMMENDATIONS MAY REQUIRE A CHANGE TO SIZE, BOUNDARY OR REMOVAL OF EXISTING PONDS.
7. A 30' TYPE B SHALL BE PROVIDED IF HOMES ALONG OLIVE CHAPEL ROAD ARE NOT ALLEY LOADED.

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

MICHAEL BASS
SHERRIE BASS
DB 14367, PG 1240
LOT 3
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503445

ELIZABETH PERKINS
DB 14268, PG 331
LOT 1
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503152

HASSE AVE
60' R/W

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 6
LINDEN SUBDIVISION
BM 2020, PG 1334
PIN No. 0722424038

CRESCENT APEX, LLC
DB 17044, PG 924 RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

20' TYPE A

EXISTING POND

50' BUFFER

THE PROPOSED WIDENING ON THE NORTH SIDE OF OLIVE CHAPEL ROAD WILL INCLUDE A 6' BIKE LANE AND 5' PAVED SHOULDER.

THE PROPOSED WIDENING OF OLIVE CHAPEL ROAD WILL COMPLY WITH THE TOWN OF APEX THOROUGHFARE PLAN. THE PROPOSED ROAD SECTION ON THE PROJECT SIDE OF THE CENTERLINE WILL BE A MEDIAN DIVIDED 4-LANE SECTION (110' ROW).

OLIVE CHAPEL ROAD
(SR 1160)
VARIABLE WIDTH R/W

40' UTILITY AND PIPELINE EASEMENT DB 14343, PG 2028

SCM #2

EXISTING 1% ANNUAL FLOOD ZONE (ZONE AE)

30' BUFFER SEE NOTE #7

LANDSCAPED MEDIAN AT SITE ENTRANCE

THE PROPOSED COLLECTOR ROAD WILL COMPLY WITH THE TOWN OF APEX THOROUGHFARE PLAN. THE PROPOSED ROAD SECTION WILL BE 60' WIDTH RIGHT-OF-WAY AND INCLUDE A 10' WIDTH SIDE PATH ON ONE SIDE.

PROVIDE TRAIL CONNECTION FOR COMMUNITY ACCESS TO REEDY BRANCH GREENWAY

EXISTING WETLANDS

50' BUFFER

C/L OF STREAM

SCM #3

EXISTING POND

APPROXIMATE 100' BUFFER

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

CONNECTION TO GREENWAY WITHIN SMITH FARM

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

EXISTING WETLANDS

30' BUFFER SEE NOTE #7

SCM #1

THE PROPOSED LOCAL CONNECTIONS WILL COMPLY WITH THE TOWN OF APEX THOROUGHFARE PLAN. THE PROPOSED ROAD SECTION WILL BE 50' WIDTH RIGHT-OF-WAY.

THE PROPOSED LOCAL CONNECTIONS WILL COMPLY WITH THE TOWN OF APEX THOROUGHFARE PLAN. THE PROPOSED ROAD SECTION WILL BE 50' WIDTH RIGHT-OF-WAY.

FLOODWAY (OUT)
(IN)

FLOODWAY (OUT)
(IN)

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 924
PIN No. 0722219077

20' TYPE A

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 923
PIN No. 0722219077

ROWBOAT ROAD
50' R/W

WATER TOWER LANE
50' R/W

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"FUTURE REC SITE"
SMITH FARM PUD, PH 1
BM 2018, PG 922 & 923
PIN No. 0722303175

SMITH FARMS OF APEX HOMEOWNERS ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 1
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0721396648

SMITH FARMS OF APEX HOMEOWNERS ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 3
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0722309093

FARMHOUSE DRIVE
50' R/W

SMITH FARMS OF APEX HOMEOWNERS ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 2
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN NO. 0721397362

RILEYS
POND DRIVE
50' R/W

THASSOS DRIVE
50' R/W

LEGEND

- RESIDENTIAL
- STREAM
- STREAM BUFFER
- PERIMETER BUFFER
- STREETSCAPE
- EXISTING POND
- S.C.M.
- WETLAND
- ROADWAY CONNECTION
- GREENWAY CONNECTION

GRAPHIC SCALE
100 0 50 100 200
1 inch = 100 ft.

PRELIMINARY
NOT APPROVED FOR CONSTRUCTION

No.	Revision	Date	By

Designer: WR	Scale: 1" = 100'
Drawn By: WR	Date: 02/26/2021
Checked By: WR	Job No.: 02180517.20

HACKNEY

APEX WAKE COUNTY NORTH CAROLINA

CONCEPTUAL LAYOUT PLAN

WithersRavenel
Engineers | Planners | Surveyors
115 MacKenan Drive | Cary, NC 27511 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

Sheet No. 2.0

K:\180\02180517.20\Hackney Tract\Apex\CAD\Drawing Set\PUD\2.0 CONCEPT LAYOUT PLAN.dwg Friday, February 26, 2021 10:31:12 AM - MIKE.BRYANT

UTILITY NOTES:

1. WATER AND SANITARY SEWER WILL BE OWNED AND MAINTAINED BY THE TOWN OF APEX.
2. FIRE HYDRANTS, VALVES, SERVICES, METERS, AND APPURTENANCES SHALL BE DESIGNED PER THE TOWN OF APEX CONSTRUCTION SPECIFICATIONS AND SHALL BE SHOWN ON THE CONSTRUCTION PLANS.
3. ALL UTILITY EASEMENTS SHALL BE PROVIDED AS NECESSARY. DELINEATION WILL BE DETERMINED WITH FINAL DESIGN OF INTERNAL PUBLIC STREETS AT THE SUBDIVISION PLAN STAGE. MINIMUM UNDISTURBED BUFFER WIDTHS SHALL BE EXCLUSIVE OF UTILITY EASEMENTS UNLESS APPROVED BY THE DIRECTOR OF THE PUBLIC WORKS & UTILITIES DEPARTMENT.
4. THE DEVELOPER WILL ACTIVELY WORK WITH THE TOWN OF APEX TO PRESERVE EXISTING TREES ON SITE. THESE AREAS SHALL INCLUDE REQUIRED LANDSCAPE BUFFERS, RCA AREAS, NON-BUFFERED AND NON-RCA AREAS, AREAS OF PROPOSED UTILITY LINES, AND ADJACENT TO THE SUBJECT PROPERTY, TO THE MAXIMUM EXTENT POSSIBLE.
5. UTILITY LAYOUT FOR WATER AND SEWER IS CONCEPTUAL. FINAL DESIGN WILL BE DETERMINED AT THE SUBDIVISION PLAN STAGE.
6. IN NATURAL DRAINAGE WAYS, SEWER SHALL BE EXTENDED TO THE PROPERTY LINES TO READILY ENABLE FUTURE CONNECTIONS TO ADJOINING PROPERTY. SEWER DESIGN SHALL ACCOUNT FOR FUTURE UPSTREAM DEVELOPMENT BASED ON THE CURRENT LAND USE PLAN, AND SHALL INCLUDE EVALUATION OF EXISTING DOWNSTREAM SEWER CAPACITY.

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

MICHAEL BASS
SHERRIE BASS
DB 14367, PG 1240
LOT 3
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503445

ELIZABETH PERKINS
DB 14268, PG 331
LOT 1
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503152

APPROXIMATE LOCATION OF
EXISTING TOWN OF APEX WATERLINE

HASSE AVE
60' R/W

CRESCENT APEX, LLC
DB 17044, PG 924 RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 6
LINDEN SUBDIVISION
BM 2020, PG 1334
PIN No. 0722424038

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

EXISTING POND

SEE UTILITY NOTE 6

50' BUFFER

SEWER LINE

WATER LINE

40' UTILITY AND
PIPELINE EASEMENT
DB 14343, PG 2028

EXISTING 1% ANNUAL
FLOOD ZONE
(ZONE AE)

OLIVE CHAPEL ROAD
(SR 1160)
VARIABLE WIDTH R/W

APPROXIMATE LOCATION OF
EXISTING 12" TOWN OF APEX WATERLINE

EXISTING
WETLANDS

50' BUFFER

C/L OF STREAM

EXISTING POND

APPROXIMATE
100' BUFFER

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

PROPOSED CONNECTION
TO EXISTING MANHOLE

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

EXISTING
WETLANDS

RILEYS
POND DRIVE
50' R/W

FLOODWAY (OUT)

FLOODWAY (IN)

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 924
PIN No. 0722219077

TOWN OF APEX ELECTRIC
UTILITY EASEMENT
PER DB 13318, PG 1911

ROWBOAT ROAD
50' R/W

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 923
PIN No. 0722219077

WATER
TOWER LANE
50' R/W

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"FUTURE REC SITE"
SMITH FARM PUD, PH 1
BM 2018, PG 922 & 923
PIN No. 0722303175

SMITH FARMS OF APEX HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 1
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0721396648

SMITH FARMS OF APEX
HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 3
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0722309093

FARMHOUSE DRIVE
50' R/W

SMITH FARMS OF APEX
HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 2
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN NO. 0721397362

THASSOS DRIVE
50' R/W

GRAPHIC SCALE
100 0 50 100 200
1 inch = 100 ft.

PRELIMINARY
NOT APPROVED FOR
CONSTRUCTION

No.	Revision	Date	By

Designer: WR	Scale: 1" = 100'
Drawn By: WR	Date: 04/20/2021
Checked By: WR	Job No.: 02180517.20

HACKNEY

APEX WAKE COUNTY NORTH CAROLINA

CONCEPTUAL UTILITY PLAN

WithersRavenel
Engineers | Planners | Surveyors
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Sheet No. 3.0

K:\2018\02180517.20\Hackney Tract Apex\CADD\Drawing Sets\PD03.3 PRELIMINARY UTILITY PLAN.dwg - Tuesday, April 20, 2021 4:25:15 PM - INGE.BRYANT

STORMWATER MANAGEMENT NOTES:

1. TOPOGRAPHIC AND UTILITY INFORMATION BASED ON AVAILABLE GIS MAPPING. PRELIMINARY BOUNDARY SURVEY PREPARED BY WITHERSRAVENEL.
2. WETLAND/STREAM INFORMATION BASED ON EVALUATION BY S&EC DATED 09/18/20.
3. REGULATORY FEMA MAPPED FLOODPLAINS EXIST ON SITE PER FIRM MAP #3720072200J (5/2/06).
4. THE SUBJECT PROPERTY IS LOCATED WITHIN THE TOWN OF APEX PRIMARY WATERSHED PROTECTION OVERLAY DISTRICT.
5. STORMWATER MANAGEMENT FACILITIES SHALL BE DESIGNED PER THE TOWN OF APEX STANDARDS AND REGULATIONS FOR STORMWATER QUANTITY AND QUALITY (UDO SECTION 6.1.7 B).
6. ALL APPLICABLE LOCAL AND STATE ENVIRONMENTAL PERMITS SHALL BE OBTAINED PRIOR TO START OF CONSTRUCTION.
7. STORMWATER TREATMENT WILL BE HANDLED BY INDIVIDUAL OR REGIONAL FACILITIES WITHIN THE SUBJECT PROPERTY OR ADJACENT OFF-SITE DRAINAGE EASEMENT.
8. THE POST DEVELOPMENT PEAK FLOW RATE OF ON-SITE STORMWATER WILL NOT EXCEED THE PRE-DEVELOPMENT PEAK FLOW RATE IN ACCORDANCE WITH THE UDO.

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

MICHAEL BASS
SHERRIE BASS
DB 14367, PG 1240
LOT 3
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503445

ELIZABETH PERKINS
DB 14268, PG 331
LOT 1
"WILLIAM E. GERRINGER"
BM 1982, PG 24
PIN No. 0722503152

HASSE AVE
60' R/W

CRESCENT APEX, LLC
DB 17044, PG 924 RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 6
LINDEN SUBDIVISION
BM 2020, PG 1334
PIN No. 0722424038

CRESCENT APEX, LLC
DB 17044, PG 924
RCA 1
LINDEN SUBDIVISION
BM 2019, PG 1364 & 1366
PIN No. 0722512006

EXISTING POND

50' BUFFER

40' UTILITY AND
PIPELINE EASEMENT
DB 14343, PG 2028

SCM #2

EXISTING 1% ANNUAL
FLOOD ZONE
(ZONE AE)

EXISTING
WETLANDS

50' BUFFER

C/L OF STREAM

SCM #3

EXISTING POND

APPROXIMATE
100' BUFFER

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

EXISTING
WETLANDS

LENNAR CAROLINAS, LLC
DB 16720, PG 1045
TRACT 3
"BOUNDARY SURVEY"
BM 2017, PG 379
PIN No. 0722229350

FLOODWAY (OUT)

(N)

FLOODWAY (OUT)

(N)

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 924
PIN No. 0722219077

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"RCA AREA"
SMITH FARM PUD, PH 1
BM 2018, PG 923
PIN No. 0722219077

SCM #1

ROWBOAT ROAD
50' R/W

WATER
TOWER LANE
50' R/W

LENNAR CAROLINAS, LLC
DB 16720, PG 1062
"FUTURE REC SITE"
SMITH FARM PUD, PH 1
BM 2018, PG 922 & 923
PIN No. 0722303175

SMITH FARMS OF APEX HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 1
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0721396648

SMITH FARMS OF APEX
HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 3
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN No. 0722309093

FARMHOUSE DRIVE
50' R/W

SMITH FARMS OF APEX
HOMEOWNERS
ASSOCIATION, INC.
DB 17177, PG 741
COMMON AREA 2
HALEY AT SMITH FARMS
BM 2018, PG 934
PIN NO. 0721397362

THASSOS DRIVE
50' R/W

OLIVE CHAPEL ROAD
(SR 1160)
VARIABLE WIDTH R/W

RILEYS
POND DRIVE
50' R/W

GRAPHIC SCALE
100 0 50 100 200
1 inch = 100 ft.

PRELIMINARY
NOT APPROVED FOR
CONSTRUCTION

No.	Revision	Date	By

Designer: WR	Scale: 1" = 100'
Drawn By: WR	Date: 02/26/2021
Checked By: WR	Job No.: 02180517.20

HACKNEY

APEX WAKE COUNTY NORTH CAROLINA

CONCEPTUAL STORMWATER MANAGEMENT PLAN

WithersRavenel
Engineers | Planners | Surveyors
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Sheet No. 4.0

K:\180\02180517.20\Harvey Tract Apex\CAD\Drawing Sheet\Plan\04.0 STORMWATER MANAGEMENT PLAN.dwg Friday, February 26, 2021 10:32:15 AM JNGE, BRYANT

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: UNFINISHED BUSINESS

Meeting Date: April 27, 2021

Item Details

Presenter(s): Vance Holloman, Finance Director

Department(s): Finance Department

Requested Motion

Motion to approve a Resolution providing for the Sale and Issuance of a $5,000,000 Town of Apex, North Carolina General Obligation Street and Sidewalk Improvement Bond, Series 2021. The resolution also authorizes the execution and delivery of a Bond Purchase Agreement with Pinnacle Bank.

Approval Recommended?

Yes

Item Details

The Sale and Issuance Resolution addresses the issuance, sale, form and certain post issuance procedures for the Street and Sidewalk Improvement Bonds. The Bonds are being privately placed with Pinnacle Bank so the Resolution also authorizes the execution of the Bond Purchase Agreement. A substantially complete version of that Agreement is attached.

Attachments

- Sale and Issuance Resolution Apex 2021 GO Bonds
- Draft Bond Purchase Agreement

The Town Council of the Town of Apex, North Carolina met in a regular meeting in the Council Chambers of the Town Hall located at 73 Hunter Street in Apex, North Carolina, the regular place of meeting, at 6:00 p.m. on April 27, 2021.

Present: Mayor Jacques Gilbert, presiding, and Council Members

Absent: Council Members

Also present:

* * * * * *

_____ introduced the following resolution the title of which was read and a copy of which had been previously distributed to each Council Member:

RESOLUTION PROVIDING FOR THE SALE AND ISSUANCE OF A $5,000,000 TOWN OF APEX, NORTH CAROLINA GENERAL OBLIGATION STREET AND SIDEWALK IMPROVEMENT BOND, SERIES 2021

BE IT RESOLVED by the Town Council (the "Town Council") of the Town of Apex, North Carolina (the "Town"):

Section 1. The Town Council has determined and does hereby find and declare as follows:

(a) An order authorizing $15,000,000 Street and Sidewalk Improvement Bonds (the "Street and Sidewalk Improvement Bonds") was adopted by the Town Council on September 1, 2015, which order was approved by the vote of a majority of the qualified voters of the Town who voted thereon at a referendum duly called and held on November 3, 2015. $3,000,000 of the Street and Sidewalk Improvement Bonds have heretofore been issued.

(b) No notes have been issued in anticipation of the receipt of the proceeds of the sale of said bonds and it is necessary to issue $5,000,000 of the Street and Sidewalk Improvement Bonds at this time.

(c) The maximum period of usefulness of the street and sidewalk improvements to be provided with the proceeds of said bonds is estimated as a period of twenty (20) years from May 20, 2021, the date of the bonds authorized hereby, and that such period expires on May 20, 2041.

Section 2. Pursuant to said order there shall be issued a bond in the aggregate principal amount of $5,000,000 designated "Town of Apex, North Carolina General Obligation Street and

Sidewalk Improvement Bond, Series 2021" (the "Bond") and dated the date of delivery thereof. The Bond shall (a) mature in annual principal installments on May 1 in the following years and amounts: $500,000 2022 to 2031, inclusive, and (b) bear interest on the outstanding principal amount (computed on the basis of a 360-day year consisting of twelve 30-day months) at a rate of 1.05% per annum (subject to adjustment as provided below), which interest shall be payable on each May 1 and November 1, beginning November 1, 2021, until payment of such principal sum, all as shall be set forth in the Bond Purchase Agreement and the Bond.

In the event of a Determination of Taxability (hereinafter defined), the interest rate payable on the Bond, from and after the Inclusion Date (hereinafter defined), shall be adjusted to preserve the owner's after-tax economic yield with respect to the interest paid on the Bond. In addition, upon request of the owner of the Bond, the Town shall pay to the owner of the Bond (a) an amount necessary to reimburse the owner for any interest, penalties or other charges assessed by the Internal Revenue Service and the Department of Revenue by reason of the owner's failure to include the interest on the Bond in its gross income for income tax purposes and (b) additional interest as a result of the increase in the interest rate on all previous payments made by the Town after the Inclusion Date. In the event of a Determination of Taxability, the owner of the Bond shall provide the Town with a new debt service schedule which reflects the new interest rate which will replace the debt service schedule set forth in Exhibit A to the Bond.

The Town shall give prompt written notice to the owner of the Bond upon the Town's determination or receipt of any notice or information from any source whatsoever to the effect that a Determination of Taxability shall have occurred.

"Determination of Taxability" means and shall be deemed to have occurred on the date when (a) the Town shall receive notice from the owner of the Bond that the Internal Revenue Service has assessed as includable in gross income the interest on the Bond due to the occurrence of an Event of Taxability or (b) the Town or the owner of the Bond shall receive notice from the Commissioner or any District Director of the Internal Revenue Service that the interest on the Bond is includable in the gross income of such owner for federal income tax purposes due to the occurrence of an Event of Taxability.

"Event of Taxability" means the occurrence or existence of any fact, event or circumstance caused by the failure of the Town to comply with any covenants in the Bond or any document or certificate executed by the Town in connection with the transactions contemplated by the Bond which has the effect of causing the interest on the Bond to be includable in the gross income of the owner of the Bond for federal income tax purposes.

"Inclusion Date" means the effective date that the interest on the Bond is includable in the gross income of the owner of the Bond as a result of a Determination of Taxability.

In addition, upon failure of the Town to pay the principal of or interest on the Bond within fifteen (15) days after the same becomes due and payable, the Bond shall bear interest at the lesser of (a) the stated interest rate on the Bond plus 4.00% per annum or (b) the maximum rate permitted by law, until such time as such payment default has been remedied.

The Bond shall bear interest from the interest payment date next preceding the date on which it is authenticated, unless it is (a) authenticated upon an interest payment date, in which event it shall bear interest from such interest payment date or (b) authenticated prior to the first interest payment date, in which event it shall bear interest from its date; provided, however, that if at the time of authentication interest is in default, the Bond shall bear interest from the date to which interest has been paid.

The principal of and interest on the Bond shall be payable in any coin or currency of the United States of America which is legal tender for the payment of public and private debts on the respective dates of payment thereof.

The definitive Bond shall be initially issued as one fully-registered bond, without coupons, numbered R-1 and shall be initially registered in the name of "Pinnacle Bank," as the initial owner of the Bond (the "Purchaser").

Section 3. The Bond shall bear the manual or facsimile signatures of the Mayor or Mayor Pro Tem and the Town Clerk or any deputy or assistant Town Clerk of the Town and the official seal or a facsimile of the official seal of the Town shall be impressed or imprinted, as the case may be, on the Bond.

The certificate of the Local Government Commission of North Carolina to be endorsed on the Bond shall bear the manual or facsimile signature of the Secretary of said Commission and the certificate of authentication of the Bond Registrar (hereinafter defined) to be endorsed on the Bond shall be executed as provided hereinafter.

In case any officer of the Town or the Local Government Commission of North Carolina whose manual or facsimile signature shall appear on the Bond shall cease to be such officer before the delivery of the Bond, such manual or facsimile signature shall nevertheless be valid and sufficient for all purposes the same as if such officer had remained in office until such delivery, and the Bond may bear the manual or facsimile signatures of such persons as at the actual time of the execution of the Bond shall be the proper officers to sign the Bond although at the date of the Bond such persons may not have been or be such officers.

The Bond shall not be valid or become obligatory for any purpose or be entitled to any benefit or security under this resolution until it shall have been authenticated by the execution by the Bond Registrar of the certificate of authentication endorsed thereon.

The Bond and the endorsements thereon shall be in substantially the following form:

No. R-1 $5,000,000

United States of America
State of North Carolina

TOWN OF APEX, NORTH CAROLINA
GENERAL OBLIGATION STREET AND SIDEWALK IMPROVEMENT BOND
SERIES 2021

Final Maturity Date	Interest Rate
May 1, 2031	1.05%

The Town of Apex, a municipal corporation in the State of North Carolina (the "Town"), is justly indebted and for value received hereby promises to pay to

PINNACLE BANK

or registered assigns or legal representative, the principal sum of FIVE MILLION DOLLARS ($5,000,000) in annual principal installments on each May 1 as set forth in Exhibit A attached hereto and made a part hereof (each, a "Principal Payment Date"), with a Final Maturity Date as specified above, and to pay interest from the date hereof on the unpaid portion of said principal sum until payment thereof (computed on the basis of a 360-day year consisting of twelve 30-day months) at the Interest Rate specified above (subject to adjustment as provided below), such interest being payable on each May 1 and November 1, beginning November 1, 2021, as set forth in Exhibit A attached hereto (each, an "Interest Payment Date").

This Bond shall bear interest from the Interest Payment Date next preceding the date on which it is authenticated, unless it is (a) authenticated upon an Interest Payment Date, in which event it shall bear interest from such Interest Payment Date or (b) authenticated prior to the first Interest Payment Date, in which event it shall bear interest from the date hereof; provided, however, that if at the time of authentication interest is in default, this Bond shall bear interest from the date to which interest has been paid.

The principal of and the interest on this Bond shall be payable in any coin or currency of the United States of America which is legal tender for the payment of public and private debts on the respective dates of payment thereof. Upon payment in full of the principal of and interest on this Bond, the owner of this Bond shall promptly cancel and surrender this Bond at the office of the Finance Director of the Town in Apex, North Carolina (the "Bond Registrar"). For the prompt payment hereof, both principal and interest as the same shall become due, the faith and credit of the Town are hereby irrevocably pledged.

In the event of a Determination of Taxability (hereinafter defined), the interest rate payable on this Bond, from and after the Inclusion Date (hereinafter defined), shall be adjusted to preserve the owner's after-tax economic yield with respect to the interest paid on this Bond. In addition, upon request of the owner of this Bond, the Town shall pay to the owner of this Bond (a) an amount necessary to reimburse the owner for any interest, penalties or other charges assessed by the Internal Revenue Service and the Department of Revenue by reason of the owner's failure to include the interest on this Bond in its gross income for income tax purposes and (b) additional interest as a result of the increase in the interest rate on all previous payments made by the Town after the Inclusion Date. In the event of a Determination of Taxability, the owner of this Bond shall provide the Town with a new debt service schedule which reflects the new interest rate which will replace the debt service schedule set forth in Exhibit A hereto.

The Town shall give prompt written notice to the owner of this Bond upon the Town's determination or receipt of any notice or information from any source whatsoever to the effect that a Determination of Taxability shall have occurred.

"Determination of Taxability" means and shall be deemed to have occurred on the date when (a) the Town shall receive notice from the owner of this Bond that the Internal Revenue Service has assessed as includable in gross income the interest on this Bond due to the occurrence of an Event of Taxability or (b) the Town or the owner of this Bond shall receive notice from the Commissioner or any District Director of the Internal Revenue Service that the interest on this Bond is includable in the gross income of such owner for federal income tax purposes due to the occurrence of an Event of Taxability.

"Event of Taxability" means the occurrence or existence of any fact, event or circumstance caused by the failure of the Town to comply with any covenants in this Bond or any document or certificate executed by the Town in connection with the transactions contemplated by this Bond which has the effect of causing the interest on this Bond to be includable in the gross income of the owner of this Bond for federal income tax purposes.

"Inclusion Date" means the effective date that the interest on this Bond is includable in the gross income of the owner of this Bond as a result of a Determination of Taxability.

In addition, upon failure of the Town to pay the principal of or interest on this Bond within fifteen (15) days after the same becomes due and payable, this Bond shall bear interest at the lesser of (a) the stated interest rate on this Bond plus 4.00% per annum or (b) the maximum rate permitted by law, until such time as such payment default has been remedied.

This Bond is being issued by the Town for the purpose of providing funds, together with any other available funds, to pay the costs of street and sidewalk improvements for the Town and the fees and expenses incurred in connection with the sale and issuance of this Bond. This Bond is being issued under and pursuant to The Local Government Bond Act, as amended, Article 7, as amended, of Chapter 159 of the General Statutes of North Carolina, an order adopted by the Town Council of said Town, which order was approved by the vote of a majority of qualified voters who voted thereon at a referendum duly called and held, and a resolution duly adopted by said Town Council (the "Resolution").

The principal installments of this Bond are subject to redemption prior to their stated Principal Payment Dates at the option of the Town, from any moneys that may be made available for such purpose, either in whole or in part on any business day at a redemption price equal to 100% of the principal amount of this Bond to be redeemed, plus accrued interest thereon to the date fixed for redemption.

The principal installments of this Bond shall be redeemed only in whole multiples of $1,000. If less than all of the principal installments of this Bond are called for redemption, the principal installments of this Bond to be redeemed shall be in inverse order of the scheduled maturities unless otherwise consented to by the owner of this Bond.

At least thirty (30) days prior to the redemption date of any principal installments of this Bond to be redeemed (unless otherwise waived by the owner of this Bond), the Bond Registrar shall cause a notice of any such redemption to be mailed first class, postage prepaid, to the owner of this Bond.

Any notice of redemption may state that the redemption to be effected is conditioned upon the receipt by the Bond Registrar on or prior to the redemption date of moneys sufficient to pay the redemption price of and interest on this Bond or portion thereof to be redeemed and that if such moneys are not so received, such notice shall be of no force or effect and this Bond or portion thereof to be redeemed shall not be required to be redeemed. In the event that such notice contains such a condition and moneys sufficient to pay the redemption price of and interest on this Bond or portion thereof to be redeemed are not so received by the Bond Registrar on or prior to the redemption date, the redemption shall not be made, and the Bond Registrar shall within a reasonable time thereafter give notice, in the manner in which the notice of redemption was given, that such moneys were not so received.

On the date designated for redemption, notice having been given as aforesaid, the portion of the principal installments of this Bond so called for redemption shall become due and payable at the redemption price provided for redemption of such principal installments on such date, plus accrued interest to such date.

The Bond Registrar shall keep at his or her office the books of the Town for the registration of transfer of this Bond. The transfer of this Bond may be registered only upon such books and as otherwise provided in the Resolution upon the surrender hereof to the Bond Registrar, together with an assignment duly executed by the registered owner hereof or his attorney or legal representative in such form as shall be satisfactory to the Bond Registrar. Upon any such registration of transfer, the Bond Registrar shall deliver in exchange for this Bond a new Bond registered in the name of the transferee in an aggregate principal amount equal to the outstanding principal amount of this Bond, containing the same principal installments and bearing interest at the same rate. This Bond may not be exchanged for any denomination other than the outstanding principal amount thereof. Notwithstanding the foregoing, the Bond Registrar shall not register the transfer of this Bond to any person or entity other than a bank, insurance company or similar financial institution or any other person or entity approved by the Local Government Commission of North Carolina.

It is hereby certified and recited that all acts, conditions and things required by the Constitution and laws of North Carolina to happen, exist and be performed precedent to and in the issuance of this Bond have happened, exist and have been performed in regular and due form and time as so required; that provision has been made for the levy and collection of a direct annual tax, without limitation as to rate or amount, upon all taxable property within the Town sufficient to pay the principal of and the interest on this Bond as the same shall become due; and that the total indebtedness of the Town, including this Bond, does not exceed any constitutional or statutory limitation thereon.

This Bond shall not be valid or become obligatory for any purpose or be entitled to any benefit or security under the Resolution until this Bond shall have been authenticated by the execution by the Bond Registrar of the certificate of authentication endorsed hereon.

IN WITNESS WHEREOF, the Town of Apex, North Carolina, by resolution duly adopted by its Town Council, has caused this Bond to be signed by its Mayor and Town Clerk and its official seal to be impressed hereon, all as of the ___ day of May, 2021.

[Do not sign] _____
Mayor

[SEAL]

[Do not sign] _____
Town Clerk

CERTIFICATE OF LOCAL GOVERNMENT COMMISSION

The issuance of the within Bond has been approved under the provisions of The Local Government Bond Act of North Carolina.

[Do not sign] _____
Secretary, Local Government Commission

CERTIFICATE OF AUTHENTICATION

This Bond is the Bond of the series designated herein and issued under the provisions of the within-mentioned Resolution.

[Do not sign] _____
Finance Director, as Bond Registrar

Date of authentication: _____

ASSIGNMENT

FOR VALUE RECEIVED the undersigned registered owner thereof hereby sells, assigns and transfers unto _____
_____
_____

the within Bond and all rights thereunder and hereby irrevocably constitutes and appoints_____
_____,

attorney to register the transfer of said bond on the books kept for registration thereof, with full power of substitution in the premises.

Dated: _____

In the presence of:

NOTICE: The signature must be guaranteed by an institution which is a participant in the Securities Transfer Agent Medallion Program (STAMP) or similar program.

The signature to this assignment must correspond with the name as it appears on the face of the within Bond in every particular, without alteration of enlargement or any change whatever.

EXHIBIT A

$5,000,000
Town of Apex, North Carolina
General Obligation Street and Sidewalk Improvement Bond
Series 2021

DEBT SERVICE SCHEDULE

Payment Date	Principal	Interest	Total
November 1, 2021		$23,479.17	$ 23,479.17
May 1, 2022	$500,000.00	26,250.00	526,250.00
November 1, 2022		23,625.00	23,625.00
May 1, 2023	500,000.00	23,625.00	523,625.00
November 1, 2023		21,000.00	21,000.00
May 1, 2024	500,000.00	21,000.00	521,000.00
November 1, 2024		18,375.00	18,375.00
May 1, 2025	500,000.00	18,375.00	518,375.00
November 1, 2025		15,750.00	15,750.00
May 1, 2026	500,000.00	15,750.00	515,750.00
November 1, 2026		13,125.00	13,125.00
May 1, 2027	500,000.00	13,125.00	513,125.00
November 1, 2027		10,500.00	10,500.00
May 1, 2028	500,000.00	10,500.00	510,500.00
November 1, 2028		7,875.00	7,875.00
May 1, 2029	500,000.00	7,875.00	507,875.00
November 1, 2029		5,250.00	5,250.00
May 1, 2030	500,000.00	5,250.00	505,250.00
November 1, 2030		2,625.00	2,625.00
May 1, 2031	500,000.00	2,625.00	502,625.00

Section 4. The principal installments of the Bond are subject to redemption prior to their stated Principal Payment Dates at the option of the Town, from any moneys that may be made available for such purpose, either in whole or in part on any business day at a redemption price equal to 100% of the principal amount of the Bond to be redeemed, plus accrued interest thereon to the date fixed for redemption.

The principal installments of the Bond shall be redeemed only in whole multiples of $1,000. If less than all of the principal installments of the Bond are called for redemption, the principal installments of the Bond to be redeemed shall be in inverse order of the scheduled maturities unless otherwise consented to by the owner of the Bond.

At least thirty (30) days prior to the redemption date of any principal installments of the Bond to be redeemed (unless otherwise waived by the owner of the Bond), the Bond Registrar shall cause a notice of any such redemption to be mailed first class, postage prepaid, to the owner of the Bond.

Any notice of redemption may state that the redemption to be effected is conditioned upon the receipt by the Bond Registrar on or prior to the redemption date of moneys sufficient to pay the redemption price of and interest on the Bond or portion thereof to be redeemed and that if such moneys are not so received, such notice shall be of no force or effect and the Bond or portion thereof to be redeemed shall not be required to be redeemed. In the event that such notice contains such a condition and moneys sufficient to pay the redemption price of and interest on the Bond or portion thereof to be redeemed are not so received by the Bond Registrar on or prior to the redemption date, the redemption shall not be made, and the Bond Registrar shall within a reasonable time thereafter give notice, in the manner in which the notice of redemption was given, that such moneys were not so received.

On the date designated for redemption, notice having been given as aforesaid, the portion of the principal installments of the Bond so called for redemption shall become due and payable at the redemption price provided for redemption of such principal installments on such date, plus accrued interest to such date.

Section 5. The Bond Registrar shall keep at his or her office the books of the Town for the registration of transfer of the Bond. The transfer of the Bond may be registered only upon such books and as otherwise provided in this resolution upon the surrender hereof to the Bond Registrar, together with an assignment duly executed by the registered owner thereof or his attorney or legal representative in such form as shall be satisfactory to the Bond Registrar. Upon any such registration of transfer, the Bond Registrar shall deliver in exchange for the Bond a new Bond registered in the name of the transferee in an aggregate principal amount equal to the outstanding principal amount of the Bond, containing the same principal installments and bearing interest at the same rate. The Bond may not be exchanged for any denomination other than the outstanding principal amount thereof. Notwithstanding the foregoing, the Bond Registrar shall not register the transfer of the Bond to any person or entity other than a bank, insurance company or similar financial institution or any other person or entity approved by the Local Government Commission of North Carolina.

In all cases in which the transfer of the Bond shall be registered hereunder, the Bond Registrar shall authenticate and deliver at the earliest practicable time a new Bond in accordance with the provisions of this resolution. Any Bond surrendered in any such registration of transfer shall forthwith be canceled by the Bond Registrar. The Town or the Bond Registrar may make a charge for shipping and out-of-pocket costs for every such registration of transfer of the Bond sufficient to reimburse it for any tax or other governmental charge required to be paid with

respect to such registration of transfer, but no other charge shall be made by the Town or the Bond Registrar for registering the transfer of the Bond under this resolution.

The person or entity in whose name the Bond shall be registered shall be deemed and regarded as the absolute owner thereof for all purposes, and payment of or on account of the principal or interest on the Bond shall be made only to or upon the order of the registered owner thereof or his legal representative. All such payments shall be valid and effectual to satisfy and discharge the liability upon the Bond and interest thereon, to the extent of the sum or sums so paid.

The Town shall appoint such registrars, transfer agents, depositaries or other agents as may be necessary for the registration and registration of transfer of the Bond within a reasonable time according to then current commercial standards and for the timely payment of principal and interest with respect to the Bond. The Finance Director of the Town, or any person at any time acting in such capacity, is hereby appointed the registrar, transfer agent and paying agent for the Bond (collectively the "Bond Registrar"), subject to the right of the Town Council of the Town to appoint another Bond Registrar, and as such shall keep at his or her office in the Town, the books of the Town for the registration, registration of transfer and payment of the Bond as provided in this resolution.

Section 6. The Town covenants that, to the extent permitted by the Constitution and laws of the State of North Carolina, it will comply with the requirements of the Internal Revenue Code of 1986, as amended or as may be amended from time to time (the "Code"), and any Treasury regulations now or hereafter promulgated thereunder, to the extent necessary so that interest on the Bond will not be included in gross income of the owner thereof for purposes of federal income taxation.

Section 7. The proposal set forth in the Bond Purchase Agreement, to be dated as of the date of delivery thereof (the "Bond Purchase Agreement"), among the Local Government Commission of North Carolina, the Town and the Purchaser, the form of which is presented at this meeting, providing for the purchase of the Bond by the Purchaser at a purchase price equal to 100% of the principal amount of the Bond, subject to the approval thereof by the Local Government Commission, is hereby approved. The Local Government Commission is hereby requested to sell and award the Bond to the Purchaser on behalf of the Town, subject to the approval of the Town, in accordance with the terms of the Bond Purchase Agreement. The Mayor, the Town Manager and the Finance Director of the Town are each hereby individually designated to approve on behalf of the Town the sale of the Bond to the Purchaser for such purchase price and upon such terms and conditions as the officer approving the sale shall determine, subject to the provisions of this resolution. The Mayor, the Town Manager and the Finance Director of the Town are each hereby individually authorized and directed in the name and on behalf of the Town to execute and deliver the Bond Purchase Agreement in substantially the form presented, together with such modifications as the officer executing and delivering the Bond Purchase Agreement, with the advice of counsel, may deem necessary and appropriate, such execution and delivery to be conclusive evidence of the approval and authorization in all respects of the form and content thereof.

Section 8. In the event that it is necessary to modify the terms and provisions of this resolution as it relates to the particular terms and provisions of the Bond, the Mayor, the Town Manager and the Finance Director of the Town shall each be authorized, individually or collectively, to approve any such modifications, which modifications shall be evidenced by a certificate executed and delivered by the Mayor, the Town Manager or the Finance Director on the date of issuance of the Bond; provided, however, that any such modifications shall be consistent with the general tenor of this resolution; and provided further that such modifications shall not increase the authorized principal amount of the Bond, extend the final maturity date of the Bond or materially increase the interest rate to be borne by the Bond.

The Mayor, the Town Manager, the Finance Director and the Town Clerk and any deputy or assistant Town Clerk of the Town are hereby authorized and directed to execute and deliver such closing and other documents necessary for the purpose of facilitating the sale and issuance of the Bond in a manner consistent with the terms of this resolution. All actions heretofore taken by the Mayor, the Town Manager, the Finance Director or the Town Clerk or any deputy or assistant Town Clerk of the Town for the purpose of facilitating the sale and issuance of the Bond in a manner consistent with the terms of this resolution are hereby authorized, ratified and approved.

The officers of the Town and the agents and employees of the Town are hereby authorized and directed to do all acts and things required of them by the provisions of this resolution, the Bond and the Bond Purchase Agreement for the full, punctual and complete performance of the terms, covenants, provisions and agreements of the same.

Section 9. This resolution shall take effect upon its adoption.

Upon motion of Council Member _____, seconded by Council Member _____, the foregoing resolution entitled "RESOLUTION PROVIDING FOR THE SALE AND ISSUANCE OF A $5,000,000 TOWN OF APEX, NORTH CAROLINA GENERAL OBLIGATION STREET AND SIDEWALK IMPROVEMENT BOND, SERIES 2021" was adopted by the following vote:

Ayes:_____

_____

Noes:_____

_____

* * * * * *

I, Donna B. Hosch, Town Clerk of the Town of Apex, North Carolina, DO HEREBY CERTIFY that the foregoing is a true copy of so much of the proceedings of the Town Council of said Town at a regular meeting held on April 27, 2021, as relates in any way to the adoption of the foregoing resolution authorizing the sale and issuance of a general obligation bond of said Town and that said proceedings are to be recorded in the minutes of said Town Council.

I DO HEREBY FURTHER CERTIFY that proper notice of such regular meeting was given as required by North Carolina law.

WITNESS my hand and the official seal of said Town this 27th day of April, 2021.

_____
Town Clerk

[SEAL]

Draft No. 2
April 19, 2021

BOND PURCHASE AGREEMENT

among

Town of Apex, North Carolina,

Local Government Commission

and

Pinnacle Bank

concerning

$5,000,000
Town of Apex, North Carolina
General Obligation Street and Sidewalk Improvement Bond
Series 2021

BOND PURCHASE AGREEMENT

concerning

$5,000,000
Town of Apex, North Carolina
General Obligation Street and Sidewalk Improvement Bond
Series 2021

May 20, 2021

Town of Apex, North Carolina
Apex, North Carolina

Local Government Commission
Raleigh, North Carolina

Ladies and Gentlemen:

Pinnacle Bank (the "Purchaser") hereby offers to enter into this Bond Purchase Agreement with the Local Government Commission, a division of the Department of State Treasurer of the State of North Carolina (the "LGC"), and the Town of Apex, North Carolina (the "Town"), which, upon acceptance of this offer by the LGC and approval of this offer and of the LGC's acceptance thereof by the Town, will be binding upon the LGC, the Town and the Purchaser.

1. Purchase and Sale of the Bond. Upon the terms and conditions hereof and upon the basis of the representations set forth herein, the Purchaser hereby agrees to purchase, and the LGC and the Town hereby agree to sell to the Purchaser, the Town of Apex, North Carolina General Obligation Street and Sidewalk Improvement Bond, Series 2021, dated the date hereof, in the aggregate principal amount of $5,000,000 (the "Bond"). The purchase price for the Bond shall be $5,000,000, representing the aggregate par amount of the Bond. The delivery and payment for the Bond and other actions contemplated hereby shall take place at the time thereof being herein sometimes called the "Closing."

The Bond shall consist of one fully-registered bond certificate in the aggregate principal amount of $5,000,000, shall be dated as of May 20, 2021, and shall bear interest from its date at a rate of 1.05% per annum and shall mature, subject to prior redemption, in annual principal installments, all as more particularly described in Exhibit A attached hereto, with a final maturity on May 1, 2031. The Bond shall be issued under and pursuant to The Local Government Bond Act, as amended, Article 7, as amended, of Chapter 159 of the General Statutes of North Carolina (the "Act"), an order adopted by the Town Council of the Town on September 1, 2015 (the "Bond Order"), which Bond Order was approved by the vote of a majority of the qualified voters of the Town who voted thereon at a referendum duly called and held on November 3, 2015, and a resolution adopted by said Town Council on April 27, 2021 authorizing the sale and issuance of the Bond (the "Resolution").

The proceeds of the Bond are to be used to provide funds, together with other available funds, to (a) construct, extend, widen, resurface and improve streets, sidewalks and multi-use paths inside and outside the corporate limits of said Town, including, without limitation, any related land, easements, rights of way and streetscape, traffic signal and utility improvements (the "Project") and (b) pay the fees and expenses incurred in connection with the sale and issuance of the Bond.

2. Representations of the Purchaser; Purchase for Own Account. (a) The Purchaser hereby acknowledges and represents, in respect of the Bond, that:

(i) the Purchaser is familiar with the Town;

(ii) the Purchaser has been furnished with all financial and other information about the Town, the Project and the Bond as requested by the Purchaser; and

(iii) the Town has made available to the Purchaser the opportunity to obtain additional information about the Town and the Bond.

(b) The Purchaser further acknowledges and represents in respect of the Bond that a part of the Purchaser's business consists of making loans as evidenced by the purchase, holding and sale of obligations of the same general character as the Bond, and the Purchaser has such knowledge and experience in financial and business matters that it is capable of evaluating the merits and risks inherent in making the loan evidenced by the purchase of the Bond. The Purchaser has made such investigation of the Bond and of the financial condition and operations of the Town as it deems necessary to evaluate the merits and risks inherent in making the loan evidenced by the purchase of the Bond. The Purchaser is aware that there may be no secondary market for the Bond and that it may be required to hold the Bond for an indefinite period. The Purchaser represents that it is purchasing the Bond for its own account with no present intention to resell or distribute the Bond or any interest therein; provided, however, that the Purchaser reserves the right at all times to control the disposition of its assets, including the Bond, and reserves the right to sell, assign and transfer the Bond or fractional interests in the Bond to other banks, insurance companies or similar financial institutions or any other entity approved by the LGC, including participating arrangements among such entities.

3. Representations and Warranties of the Town. The Town, by its acceptance hereof, represents and warrants to the Purchaser as follows:

(a) The Town is a municipal corporation duly organized and validly existing under the laws of the State of North Carolina, and is authorized and empowered to provide financing for the Project by causing the Bond to be issued.

(b) The Town has the full legal right, power and authority to adopt the Bond Order and the Resolution, to issue the Bond and to execute and deliver this Bond Purchase Agreement and to perform its respective obligations hereunder and thereunder.

(c) The Bond has been duly authorized pursuant to the Constitution and the laws of the State of North Carolina, including the Act.

(d) The Bond Order and the Resolution have been duly adopted by the Town Council, are in full force and effect and have not been modified or amended in any manner.

(e) The Town has duly authorized (i) the execution and delivery of this Bond Purchase Agreement, (ii) the issuance, sale and delivery of the Bond to the Purchaser and (iii) such action as may be required on the part of the Town to consummate the transactions contemplated by such documents.

(f) This Bond Purchase Agreement constitutes a legal, valid and binding obligation of the Town enforceable in accordance with its terms, except as enforcement thereof may be limited by bankruptcy, insolvency, reorganization, moratorium or similar laws affecting the enforcement of creditors' rights generally and by general equitable principles.

(g) The Town is not in violation of any applicable constitutional provision, law or administrative rule or regulation of the State of North Carolina or of the United States of America or in default under any agreement, resolution, indenture or instrument to which the Town is a party or by which the Town or its property is bound, the effect of which violation or default would materially affect the ability of the Town to perform its obligations under this Bond Purchase Agreement, the Bond Order, the Resolution or the Bond, and no event has occurred and is continuing which with the passage of time or the giving of notice, or both, would constitute such a violation or default hereunder or thereunder.

(h) The execution and delivery of this Bond Purchase Agreement, the adoption of the Bond Order and the Resolution and performance of the obligations of the Town hereunder or thereunder do not and will not conflict with, result in the creation or imposition of any lien, charge or encumbrance upon any of the assets of the Town (other than as specified in the Bond and the Bond Order) pursuant to the terms of, or constitute a default under, any agreement, indenture or instrument to which the Town is a party or by which the Town or its property is bound, or result in a violation of any applicable constitutional provision, law or administrative regulation or any order, rule or regulation of any court or governmental agency having jurisdiction over the Town or its property, except as provided and permitted by such documents.

(i) Except for any action that may be required by applicable federal or state securities laws, no consent, authorization or order of, or filing or registration with, any court or governmental agency not already obtained or made is required for the execution, delivery and performance of this Bond Purchase Agreement or the consummation of the transactions contemplated hereunder and thereunder, and any such consent, authorization or order so obtained is in full force and effect.

(j) Any certificate signed by an authorized officer of the Town and delivered to the Purchaser shall be deemed a representation and warranty of the Town to the Purchaser as to the statements made therein.

(k) To the best knowledge of the Town, there is no litigation or any other proceeding before or by any court, public board, agency or body, pending or threatened against or affecting the Town or any of the members of the Town Council in their respective capacities as such (nor is there any basis therefor), wherein an unfavorable decision, ruling or finding would in any way materially adversely affect (i) the transactions contemplated by this Bond Purchase Agreement,

(ii) the organization, existence or powers of the Town or the title to the office of any of the members of said Town Council, (iii) the properties or assets or the condition, financial or otherwise, of the Town, (iv) the validity or enforceability of this Bond Purchase Agreement, the Bond Order, the Resolution or the Bond (or any other agreement or instrument of which the Town is a party or used or contemplated for use in the consummation of the transactions contemplated hereby) or (v) the federal or State of North Carolina tax treatment of interest on the Bond.

4. Representations and Warranties of the LGC. The LGC, by its acceptance hereof, represents and warrants to the Purchaser that:

(a) The LGC is duly organized and validly existing as a division of the Department of the State Treasurer of the State of North Carolina, vested with the rights and powers conferred upon it pursuant to Chapter 159 of the General Statutes of North Carolina, as amended.

(b) The LGC has full power and authority to approve the issuance and provide for the sale of the Bond as provided in this Bond Purchase Agreement, and the LGC has taken or will take all action required by the Act or other applicable laws in connection therewith.

(c) The LGC has duly authorized the execution and delivery of this Bond Purchase Agreement and has taken or will take all action necessary or appropriate to carry out the sale and delivery of the Bond to the Purchaser.

(d) The execution and delivery of this Bond Purchase Agreement and the performance by the LGC of its obligations hereunder are within the powers of the LGC and, to the best of the LGC's knowledge, will not conflict with or constitute a breach or result in a violation of (i) any federal or North Carolina constitutional or statutory provision, (ii) any agreement or other instrument to which the LGC is a party or by which it is bound, or (iii) any order, rule, regulation, decree or ordinance of any court, government or governmental authority having jurisdiction over the LGC.

(e) Except for any action required by applicable federal or state securities laws, no consent, approval, authorization or order of any governmental or regulatory authority, other than the approvals of the Town as herein required, is required to be obtained by the LGC as a condition precedent to the issuance or sale of the Bond or the execution and delivery of this Bond Purchase Agreement or the performance by the LGC of its obligations hereunder.

(f) There is no litigation or any other proceeding before any court or governmental body or agency pending or, to the knowledge of the LGC, threatened against or involving the LGC to restrain or enjoin the issuance or delivery of the Bond or the execution or delivery by the LGC of this Bond Purchase Agreement and the performance of its obligations hereunder.

5. Payment and Delivery. At 10:00 a.m., North Carolina time, on May 20, 2021, or at such other time or on such earlier or later date as mutually agreed upon, the Town and the LGC will deliver or cause to be delivered the Bond to the Purchaser. Simultaneously with such delivery of the Bond, the Purchaser shall pay the purchase price for the Bond as specified in Section 1 hereof to the Town in immediately available funds to the account with the Purchaser specified by the Town. The Closing on the Bond will be held at the offices of Womble Bond

Dickinson (US) LLP in Raleigh, North Carolina, or at such other place as the Town and the Purchaser may mutually agree upon.

6. Conditions of Closing. The Purchaser has entered into this Bond Purchase Agreement in reliance upon the representations and warranties of the Town and the LGC contained herein and to be contained in the documents and instruments to be delivered at Closing and upon the performance by the Town and the LGC of their respective obligations hereunder, as of the date hereof. Accordingly, the Purchaser's obligation under this Bond Purchase Agreement to purchase and pay for the Bond shall be subject to the performance by the Town and the LGC of their respective obligations to be performed hereunder and under such documents and instruments at or prior to Closing, and shall also be subject to the following conditions:

(a) At the time of Closing (i) the representations and warranties of the Town and the LGC, respectively, contained herein shall be true, complete and correct, (ii) the Bond Order, the Resolution and this Bond Purchase Agreement shall be in full force and effect and shall not have been amended, modified or supplemented except as may have been agreed to by the Purchaser and (iii) the Town and the LGC shall have duly adopted and there shall be in full force and effect such other orders and resolutions as in the opinion of Womble Bond Dickinson (US) LLP, Raleigh, North Carolina ("Bond Counsel"), shall be necessary in connection with the transactions contemplated hereby, and such orders and resolutions shall not have been amended, modified or supplemented, except as may have been agreed to by the Purchaser.

(b) On or prior to the date of Closing, the Purchaser shall have received the following documents in form and substance reasonably satisfactory to the Purchaser:

(1) an opinion of Bond Counsel, dated as of the date of Closing, addressed to the Purchaser or together with a reliance letter to the Purchaser, in form and substance satisfactory to the Purchaser;

(2) an executed copy of this Bond Purchase Agreement;

(3) certified copies of all proceedings of the Town relating to approvals or authorizations for the Bond and the execution and delivery of this Bond Purchase Agreement, including the adoption of the Bond Order and the Resolution;

(4) certified copy of the approving resolutions of the LGC authorizing the sale and issuance of the Bond; and

(5) executed copies of the Tax Certificate of the Town and Internal Revenue Service Form 8038-G; and

(6) such additional certificates (including appropriate incumbency and no-litigation certificates), instruments, opinions or other documents as the Purchaser may reasonably request.

All representations and warranties of the Town and the LGC set forth in this Bond Purchase Agreement shall remain operative and in full force and effect regardless of (i) any

investigation made by or on behalf of the Purchaser or any person controlling the Purchaser and (ii) acceptance of and payment for the Bond.

7. Financial Reporting. The Town hereby agrees to provide to the Purchaser (or any permitted assignee of the Bond) within 210 days of the end of each fiscal year of the Town, the audited financial statements of the Town for the fiscal year then ended. This requirement may be satisfied by posting such audited financial statements of the Town to the Electronic Municipal Market Access website operated by the Municipal Securities Rulemaking Board or any successor thereto. The Town also hereby agrees to the provide to the Purchaser (or any permitted assignee of the Bond) upon request any other reasonable financial information relating to the Town or the Bond (excluding any privileged or confidential information required or permitted by law to be withheld). The provisions in this Section shall survive the sale and delivery of the Bond and the termination of this Bond Purchase Agreement.

8. Limitation of Liability of the LGC. The members, officers and employees of the LGC shall not be personally liable under this Bond Purchase Agreement.

9. Counterparts. This Bond Purchase Agreement may be executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same instrument.

10. Notices. Any notice or other communication to be given under this Bond Purchase Agreement may be given by delivering the same in writing by first-class mail, postage prepaid, to the following addresses:

To the Town:

Town of Apex, North Carolina
73 Hunter Street
Apex, North Carolina 27502
Attention: Finance Director

To the LGC:

Local Government Commission
Longleaf Building
3200 Atlantic Avenue
Raleigh, North Carolina 27604
Attention: Secretary

To the Purchaser:

Pinnacle Bank
3515 Glenwood Avenue, Suite 100
Raleigh, NC 27612
Attention: Jim Graham

11. Governing Law. This Bond Purchase Agreement shall be governed by, and construed in accordance with, the laws of the State of North Carolina.

12. Severability. In the event any provision of this Bond Purchase Agreement shall be held invalid or unenforceable by a court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provision hereof.

13. Role of Purchaser. The Town acknowledges and agrees that (a) the Purchaser's purchase of the Bond is in an arm's length commercial transaction with the Town in which the Purchaser is acting solely as a principal and not as a municipal advisor, financial advisor or fiduciary to the Town or any other person or entity regardless of whether the Purchaser or an affiliate has or is currently acting as such on a separate transaction; (b) the Purchaser has not assumed any advisory or fiduciary responsibility to the Town with respect to the transaction contemplated hereby and the discussions, undertakings and procedures leading thereto (irrespective of whether the Purchaser or its affiliates have provided other services or are currently providing other services to the Town on other matters); (c) the only obligations the Purchaser has to the Town with respect to the transaction contemplated hereby expressly are set forth herein and in the related financing documents; and (d) the Town has consulted its own legal, accounting, tax, financial and other advisors, as applicable, to the extent it has deemed appropriate.

14. Privately Negotiated Loan. The Town acknowledges and agrees that the Purchaser is purchasing the Bond in evidence of a privately negotiated financing and in that connection the Bond shall not be (a) assigned a separate rating by any municipal securities rating agency, (b) registered with The Depository Trust Company or any other securities depository, (c) issued pursuant to any type of offering document or official statement or (d) assigned a CUSIP number by Standard & Poor's CUSIP Service.

[Remainder of page left blank intentionally]

This Bond Purchase Agreement shall become effective upon the execution of the acceptance hereof by a duly authorized member of the LGC and the Town and shall be valid and enforceable as of the time of such acceptance.

PINNACLE BANK

By:_____
Senior Vice President

[Counterpart signature page to Bond Purchase Agreement, dated May 20, 2021, among the Town of Apex, North Carolina, the Local Government Commission and Pinnacle Bank]

Accepted:

LOCAL GOVERNMENT COMMISSION

By:_____
Secretary

[Counterpart signature page to Bond Purchase Agreement, dated May 20, 2021, among the Town of Apex, North Carolina, the Local Government Commission and Pinnacle Bank]

Approved:

TOWN OF APEX, NORTH CAROLINA

By:_____
Finance Director

EXHIBIT A

$5,000,000
Town of Apex, North Carolina
General Obligation Street and Sidewalk Improvement Bond
Series 2021

DEBT SERVICE SCHEDULE

Payment Date	Principal	Interest	Total
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November 1, 2025		15,750.00	15,750.00
May 1, 2026	500,000.00	15,750.00	515,750.00
November 1, 2026		13,125.00	13,125.00
May 1, 2027	500,000.00	13,125.00	513,125.00
November 1, 2027		10,500.00	10,500.00
May 1, 2028	500,000.00	10,500.00	510,500.00
November 1, 2028		7,875.00	7,875.00
May 1, 2029	500,000.00	7,875.00	507,875.00
November 1, 2029		5,250.00	5,250.00
May 1, 2030	500,000.00	5,250.00	505,250.00
November 1, 2030		2,625.00	2,625.00
May 1, 2031	500,000.00	2,625.00	502,625.00

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: OLD BUSINESS

Meeting Date: April 27, 2021

Item Details

Presenter(s): Vance Holloman, Finance Director

Department(s): Finance Department

Requested Motion

Motion to approve proposed guidelines for the Town's Customer Assistance Program, approve an agreement with Western Wake Crisis Ministries to assist the Town in determining eligibility of customers to participate in the program and authorize staff to execute that agreement. Also to approve Budget Ordinance Amendment No. 18 which appropriates funds to provide assistance to eligible customers and pay associated administrative cost.

Approval Recommended?

Yes

Item Details

Staff has been working for several months to establish a customer assistance program (CAP) to assist customers who have suffered financial hardships due to COVID 19 and are behind on their utility bills. Western Wake Crisis Ministry, Inc. (WWCM) has agreed to assist the Town by performing eligibility determinations of applicants based upon criteria established in the CAP guidelines. The Town will credit assistance to the customer's account based upon the eligibility determinations made by WWCM. The Town will reimburse WWCM for expenses incurred in making the eligibility determinations. Funds to provide the assistance and pay these expenses will come from the Town's General Fund. The source of funding is the refund of prior year grant funds from the NC Rural Center.

These documents were presented to Council for approval at its April 13th meeting. At that time Council asked that staff examine alternative guidelines that would prorate the award amounts based upon different income levels expressed as a percentage of the US poverty level. Staff conferred with WWCM about the appropriate levels at which to prorate the awards of assistance. They recommended that awards not be prorated for applicants whose income levels was no more than 150% of the US poverty level. Based upon their input and Councils request for three income categories, staff recommends that the awards be set as follows based upon income level:

Income Level	Maximum Award
No more than 150% of the US poverty level	100% of the outstanding balance up to $636
Greater than 150% but equal to or less than 175% of the US poverty level	75% of the outstanding balance up to $477
Greater than 175% but equal to or less than 200% of the US poverty level	50% of the outstanding balance up to $318

The proposed guidelines have been updated to reflect this change. Changes are highlighted in red.

Attachments

- Apex Customer Assistance Program Guidelines
- Apex Western Wake Crisis Ministry CAP Agreement
- Budget Ordinance Amendment No. 18
- 2021 US Poverty Levels
- Federal Poverty Thresholds with Hourly Wages

Apex Customer Assistance Program Guidelines

Purpose: COVID 19 has negatively impacted the economy and the financial stability of many customers of the Town of Apex ("Town") utility system. The Town declared a moratorium on the disconnection of service and assessment of related fees in March, 2020 and has currently extended that suspension through May 31, 2021. There are currently over 1,800 residential customers whose account would be subject to disconnection if the moratorium was lifted. As the Council considers lifting the moratorium they want to establish a customer assistance program ("CAP") to help those customers. It is anticipated that the CAP will continue after the impacts of COVID have passed in order to help less fortunate members of the community.

Funding and Use of Funds: The CAP will be funded entirely from the Town's General Fund and voluntary contributions from utility customers. Funds will be used to reduce the outstanding balance of eligible customers and to reimburse cost incurred by human service organizations that make CAP eligibility determinations under the terms of written agreements with the Town.

Funds set aside for CAP will be applied to the outstanding balance of eligible customers by the recording of these transactions in the Town's accounting records. Reimbursement of expenditures occurred by human service organizations will be paid by check.

Staff Involvement: The Town's Finance, Administration and Legal Departments have been involved in establishing the program in collaboration with Western Wake Crisis Ministry ("WWCM").

Program Requirements: To be eligible for assistance the account must be served by the Apex utility system. The account service address must be within the corporate limits of the Town of Apex due to the assistance being funded predominately by the Town's General Fund. The account must be subject to disconnection or disconnected. If a moratorium on disconnections is in place, the account meets this requirement if it would be subject to disconnection if the moratorium were not in place.

Eligibility Criteria: The flowing eligible criteria are in place for the CAP:

The applicant must be a resident at the service address of the account,

The applicant must be a US citizen or lawfully present in the US and

The household must meet the income eligibility requirements. (Income equal to or less than 200% of the federal poverty level.)

Eligibility Determinations: Determinations will be made by a human services organization that is independent of the Town. WWCM has agreed to make eligibility determinations in accordance with the terms of an agreement with the Town.

Due to the large number of potential applicants the Town and WWCM have agreed that a system of scheduling appointments for applicants and sharing that information will be put in place. The applicant will not be disconnected prior to WWCM having adequate time to process the application and make an eligibility determination. If an applicant misses their initial appointment, these terms will apply to a second appointment only but to no rescheduled appointments thereafter.

Administration of Awards: The maximum award amount made to an applicant's outstanding balance will be $636.00, or the total outstanding balance, whichever is lesser. $636.00 is the current average outstanding balance of a residential customer subject to disconnection. In order to be awarded the maximum amount of assistance, the applicant's household income may not exceed 150% of the federal poverty level. Applicants whose household income is greater than 150% but equal to or less than 175% of the federal poverty level may receive up to 75% of the maximum amount, $477. Applicants whose household income is greater than 175% but equal to or less than 200% off the federal poverty level may receive up to 50% of the maximum amount, $318.

Each applicant is eligible to be awarded assistance only once prior to June 30, 2022. Thereafter, an applicant is eligible to receive assistance once each fiscal year.

WWCM will inform the Town of the applicants who are eligible. Awards will be subject to the availability of funds. Availability means an unexpended and unencumbered appropriation remains in the Town's General Fund sufficient to make the award. Staff will keep WWCM informed of the amount available for awards. Prior to accounts being credited for the award staff will confirm the residence is within the Town limits.

Communications: The CAP will be communicated to utility customers through mailings, emails, social media and the Town's website.

AGREEMENT FOR UTILTY CUSTOMER ASSISTANCE PROGRAM ADMINISTRATION SERVICES

This Agreement for Utility Customer Assistance Program Administration Services ("Agreement"), made as of the ____ day of _____, 20__, by and between the Town of Apex, a North Carolina municipal corporation (hereafter, "Town") and Western Wake Crisis Ministry, Inc., a North Carolina non-profit corporation (hereafter, "Agency").

RECITALS

WHEREAS, Town provides electric, water, sanitary sewer, and solid waste services to approximately 27,000 metered customers in the Apex area;

WHEREAS, many of these customers have suffered financial hardships as a result of the impact of COVID 19 upon the economy and their daily lives:

WHEREAS, Agency is a non-profit organization whose mission includes providing financial assistance to certain members of the public living in the community located within the service area of the Town of Apex;

WHEREAS, the Parties hereby agree to collaborate in the administration of the Town of Apex's Utility Customer Assistance Program (UCAP) that is intended to provide utility assistance funds to help approximately 800 eligible households in the Town of Apex pay their water, electric, and/or solid waste utility bill in fiscal year 2021-22;

WHEREAS, Agency will coordinate eligibility determination for the UCAP;

WHEREAS, Town shall be responsible for providing and administering all client assistance funds and credits to approved customer accounts; and

WHEREAS, this Agreement is authorized by NCGS 160A-20.1 and 160D-1311(a)(2).

NOW THEREFORE, in consideration of the mutual promises contained herein and for other good and valuable consideration, the receipt of which is acknowledged, the parties agree as follows:

ARTICLE 1
EFFECTIVE DATE AND SCOPE OF SERVICES

1. Recitals. The Recitals are incorporated into Agreement. This Agreement shall be effective upon execution by both parties ("Effective Date").

2. Purpose. The Town Utility Customer Assistance Program ("UCAP") is a Town of Apex funded program that provides for a one time utility assistance payment to help eligible households pay their water, sewer, electric and/or solid waste utility bills. Eligible households will receive up to a $636.00 credit, or a credit for the total amount past due, whichever is less, on their utility bill with the Town of Apex. It is expected that approximately 800 customers will receive utility assistance from the UCAP. This

Agreement is for UCAP administration services to be provided by Agency generally consisting of determining eligibility of utility customer applicants under the UCAP Guidelines provided by the Town ("Services"). Agency shall provide all Services in compliance with this Agreement and all requirements of the Utility Customer Assistance Program Guidelines ("Guidelines") attached hereto as Attachment A and incorporated herein by reference.

3. Program Funds. The initial amount of Town funds ("Program Funds") to be disbursed by Town to eligible customers is five hundred and nine thousand dollars ($509,000.00). The Town may authorize additional funds for the UCAP. Program Funds shall only be used as payments for utility assistance to eligible households.

4. Agency Fee. The Agency shall collect from the Town its Fee as follows:

    a. Town shall provide compensation for the Agency UCAP Administrator position at $25/hour. The planning and program development is expected to take 10-15 hours. The ongoing program management is not expected to exceed 2 hours per week.
    b. Town shall provide compensation for the UCAP contractor(s), not to exceed two contractors, at $15/hour for 15-20 hours per week.
    c. Agency shall invoice Town every two weeks for the duration of the program.
    d. Terms of invoice are net 30 days.

5. Term. The term of this Agreement shall be for a period beginning on Effective Date and ending one (1) year from Effective Date.

6. Agency Representations. Agency represents and agrees that now and continuing for the term of Agreement, Agency:

    a. Is experienced, qualified, skilled and fully capable of performing Services in a competent and professional manner;
    b. Shall exercise reasonable care and diligence, and shall act in the best interest of Town;
    c. Shall act in accordance with Guidelines;
    d. Shall act in accordance with generally accepted standards of Agency's practice applicable to the locality; and shall comply with this Agreement and with all applicable federal, state and local laws, ordinances, codes, rules and regulations (collectively 'Laws and Regulations');
    e. Possesses all necessary qualifications, licenses and certifications;
    f. Shall assure that the individual(s) signing Agreement have the right and power to do so and bind Agency to the obligations set forth herein and such individuals do so personally warrant that they have such authority.

ARTICLE 2
RESPONSIBILITIES OF AGENCY

1. Compliance with Guidelines. Agency shall comply with Guidelines at all times. All defined terms used in this Agreement shall have the same meanings as used in

Guidelines. Failure of the Agency to comply with Guidelines shall be an event of default under this Agreement.

2. Agency Responsibilities.

    a. Agency shall assign appropriate Agency staff as UCAP Administrator to oversee the program and all UCAP contractor(s).
        i. UCAP Administrator will collaborate with Town to finalize the job description for newly hired UCAP contractor(s) specifically for the purpose of administering the UCAP. The number of UCAP contractor(s) shall be determined by call volume and required turnaround times.
        ii. UCAP Administrator will post the job description and screen applicants for the contractor position(s) and complete the hiring process. At least one UCAP contractor shall be bilingual.
        iii. UCAP Administrator will onboard and train the UCAP contractor(s) as soon as possible after hiring. Contractor(s) shall work remotely, estimated at 15-20 hours per week.
    b. Agency shall collaborate with Town to finalize all policies and procedures for the operation of the UCAP, including the process for customers to make appointments, determine criteria to qualify for financial assistance, required customer documentation, and all related actions necessary to complete the process efficiently.
        i. UCAP Administrator will act as liaison with an assigned Town representative as necessary to provide oversight of agreed upon UCAP policies and procedures.
    c. Agency shall create a web-based (e.g. Google Drive) tracking system for 24/7 access by Agency and Town for all documentation required for administration of the program.
    d. Agency and Town will collaborate to determine desired reporting frequency for reports from Agency to Town and reports from Town to Agency.
    e. Agency shall inform Town when feedback or direction is needed for troubleshooting specific cases or situations for which Agency cannot reach a resolution with the utility customer applicant.
    f. Agency shall provide appropriate referral guidance if and when a customer identifies another need for which Agency may be able to provide additional assistance (e.g. food instability, rent issues, etc.).

ARTICLE 3
RESPONSIBILITIES OF TOWN

1. Town's Responsibilities.

    a. Town shall collaborate with Agency to finalize all policies and procedures for the operation of the UCAP including the process for customers to make appointments, specific criteria to qualify for financial assistance, required customer documentation, and all related actions necessary to complete the process efficiently.

b. Town shall promote the UCAP through communications with utility customers via various channels, as available, including general information about Agency mission and services.
c. Town shall make referrals to utility customers who may qualify for financial assistance. Town shall assist utility customers in obtaining information and documentation required to complete the application process with the Agency.
d. Town shall assign a liaison to work directly with the Agency CAP Administrator to serve as an advisor and troubleshooting resource when necessary.
e. Town shall verify account balances prior to approval of UCAP applications.
f. Town shall process the appropriate financial transaction for all utility customers who have met the criteria and are qualified for financial assistance. Town shall communicate payment application and outstanding balance/account credit to customer after payment application.
g. Town shall assist customers with past due balances by establishing payment plans when appropriate.

ARTICLE 4
INSURANCE

1. Insurance. The Agency shall maintain valid general liability insurance in the minimum amount of $1,000,000 and provide certificate of such insurance naming the Town as an additional insured by endorsement to the policy. Additionally, Agency shall maintain and show proof of workers' compensation and employer's liability insurance in the minimum amount of $1,000,000. All required certificates of insurance, endorsements, and blanket additional insured policy provisions are attached as Exhibit 2.

ARTICLE 5
DAMAGES AND REMEDIES

1. Indemnity. To the fullest extent permitted by Laws and Regulations, Agency shall indemnify and hold Town, its officers and employees, harmless from and against all claims, costs, charges, civil penalties, fines, losses, liabilities, and damages (including but not limited to reasonable professionals' fees and charges and all court or other dispute resolution costs), by whomsoever brought or alleged, arising out of, resulting from, or in connection with (a) any breach by Agency of any term or condition of this Agreement or written amendment, (b) any breach or violation by Agency of any applicable Law or Regulation, or (c) any other cause resulting from any act or failure to act by Agency under this Agreement or written amendment, but only to the extent caused by any negligence or omission of Agency. This indemnification shall survive the termination of this Agreement.

2. Non-Exclusivity of Remedies/No Waiver of Remedies. The selection of one or more remedies for breach of this Agreement shall not limit that party's right to invoke any other remedy available under this Agreement or by law. No delay, omission or forbearance to exercise any right, power, or remedy accruing to a party shall impair any such right, power, or remedy or shall be construed to be a waiver of any breach

hereof or default hereunder. Every such right, power, or remedy may be exercised from time-to-time and as often as deemed expedient.

3. Waiver of Damages. Agency shall not be entitled to, and hereby waives any monetary claims for, or damages arising from or related to, lost profits, lost business opportunities, unabsorbed overhead, or any consequential damages.

ARTICLE 6
AMENDMENTS TO AGREEMENT

1. Changes in the Services. Changes in the Services or a change in duration or any other term of this Agreement shall be made only by a written amendment executed by both parties.

ARTICLE 7
TERMINATION AND SUSPENSION

1. Termination for Convenience of Town. This Agreement may be terminated without cause by Town and for its convenience upon ten (30) days written notice to Agency.

2. Other Termination. After ten (30) days written notice to the other party of its material breach of the Agreement, this Agreement may be terminated by the noticing party, provided that the other party has not taken all reasonable actions to remedy the breach.

3. Survival. Termination of this Agreement, for whatever reason, shall not terminate a party's representations and warranties nor nullify any indemnity or records retention required hereunder or under Guidelines.

4. Suspension.

    a. Town may order Agency in writing to suspend, delay, or interrupt all or any part of the Services for the convenience of Town.

    b. A suspension, delay, or interruption of the Services shall not terminate this Agreement.

ARTICLE 8
ADDITIONAL PROVISIONS

1. Limited Assignment/Delegation. This Agreement shall bind Agency and its successors and permitted assigns. Agency shall not assign or transfer its rights or interest in this Agreement (including the right to payment), nor shall Agency delegate its duties under this Agreement, without the Town's written consent, which the Town may grant or withhold in its sole discretion. The Town's consent shall not release Agency of any obligation under this Agreement and Agency and permitted assigns shall be subject

to all of Town's defenses. Any attempt to assign this Agreement without the prior written approval of Town shall be void. If Agency utilizes approved subcontractors, Agency shall be responsible for the scheduling, completeness, quality, accuracy, and timeliness of all their work. Town has the right to request that any subcontractor be replaced due to unsatisfactory performance.

2. Governing Law. The parties acknowledge this Agreement is a "business contract" subject to the provisions of N.C.G.S. Chapter 1G and agree that this Agreement and the rights and duties of the Parties shall be governed by the laws of the State of North Carolina, without regards to conflict of law's provisions. The Parties further agree that any dispute arising from this Agreement shall be litigated in the courts of the State of North Carolina and any and all suits or actions related to this Agreement shall be brought exclusively in Wake County, North Carolina. Service of process may be effected by delivery by any method permitted under the N.C. Rules of Civil Procedure.

3. Entire Agreement; Amendments. This Agreement represents the entire and integrated agreement between the Parties and supersedes all prior negotiations, representations, or agreements, either written or oral, including clickthrough agreements, clickwrap agreements, clickwrap licenses, or similar non-reciprocal agreements (collectively, "clickthrough agreement"). This Agreement may be amended only by written amendment signed by both parties. Neither party may amend, or seek to amend, this Agreement by clickthrough agreement.

4. Severability. If any provision of this Agreement is held as a matter of law to be unenforceable, the remainder of this Agreement shall be enforceable without such provision.

5. Notice. Whenever any provision of this Agreement requires the giving of written notice, it will be deemed to have been validly given if (i) delivered in person to the Project Manager, if to the Town, or to the Project Manager, or equivalent position, or officer/member of the entity that is the Agency, if to the Agency, or (ii) if delivered at or sent by a nationally recognized overnight courier service or overnight express mail or registered or certified mail, postage prepaid, to the Town's or Agency's address. The date of said notice shall be the date of such delivery, in the case of delivery in person, or mailing when sent by courier or mail.

   The notice address for the Town shall be:

   Town Manager
   Town of Apex
   PO Box 250
   Apex, NC 27502

   The notice address for the Agency shall be:

   _____
   _____
   _____

6. Gifts and Favors. Agency shall become aware of and comply with laws related to gifts and favors, conflicts of interest and the like, including G.S. §14-234, G.S. §133-1, and G.S. §133-32.

7. Public Records; Confidential Records and Information. Agency acknowledges that records made or received in connection with the transaction of public business, including records related to this Agreement in the possession of Agency, are public records and subject to public records requests. Agency must provide such records to Town upon request. Town may provide copies of such records, including copyrighted records, in response to public record requests, except that, upon request of and indemnification by Agency. Agency shall make Town aware of any public records requests made in regard to Services or this Agreement. If Agency, its employees or subcontractors, during provision of Services, becomes aware of or has access to confidential records or information or information otherwise protected from disclosure by Federal or State law ("Confidential Information"), Agency, its employees and subcontractors, shall not disclose any such Confidential Information.

8. Verification of Work Authorization; Anti-Human Trafficking. Agency, and all subcontractors, shall comply with Article 2, Chapter 64, of the North Carolina General Statutes. Agency warrants and agrees that no labor supplied by the Agency or the Agency's subcontractors in the performance of this Agreement shall be obtained by means of deception, coercion, intimidation, or force, or otherwise in violation of North Carolina law, specifically Article 10A, Subchapter 3 of Chapter 14 of the North Carolina General Statutes, Human Trafficking.

9. No Third-Party Beneficiaries. There are no third-party beneficiaries to Agreement.

10. Independent Contractor. Agency is an independent contractor and is solely responsible for its Services and the supervision of its employees and permitted subcontractors. All persons assigned by Agency to provide Services pursuant to this Agreement shall, for all purposes of this Agreement, be considered employees of Agency only. Agency shall assume the sole and exclusive responsibility for the payment of wages to individuals for services performed under this Agreement and the withholding of all applicable Federal, State, and local taxes, unemployment insurance, and maintaining workers compensation coverage in an amount and under such terms as required by law. If Town notifies Agency in writing that any person providing Services appears to be incompetent, disorderly, or otherwise unsatisfactory to Town, such person shall be removed from the project and shall not again be employed on it except with the prior written consent of Town.

11. Nondiscrimination. Neither party shall discriminate on any prohibited basis. Agency must comply with the Americans with Disabilities Act of 1990 ("ADA").

12. Pre-Audit Requirement. This Agreement has not been fully executed and is not effective until the Preaudit Certificate (if required by N.C.G.S. § 159-28) has been affixed and signed by the Town of Apex Finance Director.

13. Performance of Government Functions. Nothing contained in this Agreement shall be deemed or construed so as to restrict or inhibit the Town's police powers or regulatory authority.

14. No Waiver of Sovereign or Qualified Immunity. Nothing in this Agreement shall be construed to mandate purchase of insurance by Town pursuant to N.C.G.S. 160A-485 or to in any way waive Town's defense of sovereign or governmental immunity from any cause of action alleged or brought against any Party for any reason if otherwise available as a matter of law. No officer, agent, or employee of Town shall be subject to any personal liability by reason of the execution of this Agreement or any other documents related to the transactions contemplated hereby. Such officers, agents, or employees shall be deemed to execute this Agreement in their official capacities only, and not in their individual capacities. This section shall not relieve any such officer, agent, or employee from the performance of any official duty provided by law.

15. Further Assurances. Agency agrees that it will cooperate with Town and will execute and deliver, or cause to be delivered, all such other instruments, and will take all such other actions, as Town may reasonably request from time to time in order to effectuate the provisions and purposes of Agreement.

16. Principles of Interpretation and Definitions. In this Agreement, unless the context requires otherwise: (1) The singular includes the plural and the plural the singular. The pronouns "it" and "its" include the masculine and feminine. (2) References to statutes or regulations include all statutory or regulatory provisions consolidating, amending, or replacing the statute or regulation. References to contracts and agreements shall be deemed to include all amendments to them. The words "include," "including," etc. mean include, including, etc. without limitation. (3) References to a "Section" or "section" or "paragraph" shall mean a section or paragraph of this Agreement. (4) "Contract" and "Agreement," whether or not capitalized, refer to this instrument. (5) Titles of sections, paragraphs, and articles are for convenience only, and shall not be construed to affect the meaning of this Agreement. (6) "Duties" includes obligations. (7) The word "person" includes natural persons, firms, companies, associations, partnerships, trusts, corporations, governmental agencies and units, and other legal entities. (8) The word "shall" is mandatory. (9) The word "day" means calendar day. (10) Normal business hours means Monday through Friday from 8:00 a.m. until 5:00 p.m. Eastern Standard Time.

17. Electronic Signature. Pursuant to Article 40 of Chapter 66 of the North Carolina General Statutes (the Uniform Electronic Transactions Act) this Agreement and all documents related hereto containing an electronic or digitized signature are legally binding in the same manner as are hard copy documents executed by hand signature. Agency and Town hereby consent to use electronic or digitized signatures in accordance with the Town's Electronic Signature Policy and intend to be bound by the Agreement and any related documents. If electronic signatures are used, the Agreement shall be delivered in an electronic record capable of retention by the recipient at the time of receipt.

IN WITNESS WHEREOF, Agency and Town, being duly authorized, have caused these presents to be signed in their names as of the day and year first above written, on the following pages.

AGENCY	**TOWN**
Western Wake Crisis Ministry, Inc.	**Town of Apex**
By:_____ (signature)	By:_____ (signature)
Name:_____ (typed or printed name)	Name:_____ (typed or printed name)
Title:_____	Title:_____

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

_____
Finance Director

Attachment A
Town of Apex Housing Rehabilitation Program Guidelines

Attachment B
Insurance Certificate

[Attach Insurance Certificate Provided by NON-PROFIT prior to executing agreement.]

Town of Apex

Budget Ordinance Amendment No. 18

BE IT ORDAINED, by the Council of the Town of Apex that the following Budget Amendment for the Fiscal Year 2020-2021 Budget Ordinance be adopted:

GENERAL FUND

Section 1. Revenues:

Refunds of Prior Year Grants	$549,675
Total Revenues	**$549,675**

Section 2. Expenditures:

Special Appropriations-Customer Assistance Program	$549,675
Total Expenditures	**$549,675**

Section 3. Within five (5) days after adoption, copies of this Amendment shall be filed with the Finance Officer and Town Clerk.

Adopted this the 27th day of April, 2021

Attest:

Jacques K. Gilbert, Mayor

Donna B. Hosch, MMC, Town Clerk

PERSONS IN FAMILY / HOUSEHOLD	POVERTY GUIDELINE	Hourly Wage (assuming 40 hr/wk and 50 wk/yr)	150% Federal Poverty Level	Hourly Wage (assuming 40 hr/wk and 50 wk/yr)	200% Federal Poverty Level	Hourly Wage (assuming 40 hr/wk and 50 wk/yr)
1	$12,880	$ 6.44	$19,320.0	$ 9.66	$25,760	$ 12.88
2	$17,420	$ 8.71	$26,130.0	$ 13.07	$34,840	$ 17.42
3	$21,960	$ 10.98	$32,940.0	$ 16.47	$43,920	$ 21.96
4	$26,500	$ 13.25	$39,750.0	$ 19.88	$53,000	$ 26.50
5	$31,040	$ 15.52	$46,560.0	$ 23.28	$62,080	$ 31.04
6	$35,580	$ 17.79	$53,370.0	$ 26.69	$71,160	$ 35.58
7	$40,120	$ 20.06	$60,180.0	$ 30.09	$80,240	$ 40.12
8	$44,660	$ 22.33	$66,990.0	$ 33.50	$89,320	$ 44.66

*For families/households with more than 8 persons, add $4,540 for each additional person.

2021 Federal Poverty Limits
(As of 1/13/21)

# in Fmly	100%	110%	120%	130%	140%	150%	160%	170%	175%	180%	190%	200%
1	12,880	14,168	15,456	16,744	18,032	19,320	20,608	21,896	22,540	23,184	24,472	25,760
2	17,420	19,162	20,904	22,646	24,388	26,130	27,872	29,614	30,485	31,356	33,098	34,840
3	21,960	24,156	26,352	28,548	30,744	32,940	35,136	37,332	38,430	39,528	41,724	43,920
4	26,500	29,150	31,800	34,450	37,100	39,750	42,400	45,050	46,375	47,700	50,350	53,000
5	31,040	34,144	37,248	40,352	43,456	46,560	49,664	52,768	54,320	55,872	58,976	62,080
6	25,580	28,138	30,696	33,254	35,812	38,370	40,928	43,486	44,765	46,044	48,602	51,160
7	40,120	44,132	48,144	52,156	56,168	60,180	64,192	68,204	70,210	72,216	76,228	80,240
8	44,660	49,126	53,592	58,058	62,524	66,990	71,456	75,922	78,155	80,388	84,854	89,320

Beyond 8 household memebrs, add $4,540 per member.

| Agenda Item | cover sheet

for consideration by the Apex Town Council

Item Type: NEW BUSINESS

Meeting Date: April 27, 2021

Item Details

Presenter(s): Dianne Khin, Director of Planning and Community Development

Department(s): Planning and Community Development

Requested Motion

Possible motion to approve Tree Planting Grant Program. The Tree Planting Grant Program is designed to provide incentive funds to tenants and property owners to install trees on residential private properties within Apex's corporate limits. The grant can provide up to 100% of the cost of the tree purchase and installation, up to a maximum of $750 per property.

Approval Recommended?

Yes

Item Details

Grant applications will be accepted yearly starting on September 1st. After grant approval, trees must be installed between October 1st and February 28th.

Planning Staff is requesting authority from Town Council to administer the Tree Planting Grant Program process. Town Council would allocate the funding for the grant through the yearly budgeting process.

The grant amount will be paid only when installation is completed and receipts are submitted to the Planning Department. If the actual costs are less than the cost estimates, the maximum amount shall not exceed 100% of the actual costs or the $750 limit, whichever is less. In no case shall a grant be issued higher than the original approved grant amount.

Eligibility Criteria include:

a. If the tenant is proposing the tree planting, the tenant must obtain the property owner's signature on the application.
b. Tree Planting Grant Program applications will be reviewed for completeness, appropriateness of planting location, and appropriateness of species of tree proposed for that location. No funds will be awarded for trees that are not in keeping with the appropriate planting standards of the Town.
c. Tree Planting Grant Program locations must be within Apex's corporate limits and must comply with all state and local regulations, including staying out of easements and/or gaining appropriate encroachment agreements from the Town of Apex.

Attachments

- Tree Planting Grant Program application

TREE PLANTING GRANT PROGRAM APPLICATION

Town of Apex, North Carolina

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

For more information on the Tree Planting Grant Program or for assistance in completing this application, please contact the Apex Planning Department at 919-249-3426.

The Tree Planting Grant Program is designed to provide incentive funds to tenants/property owners to install trees on residential private properties within Apex's corporate limits. The grant can provide up to 100% of the cost of the tree purchase and installation, up to a maximum of $750 per property. Grant applications will be accepted starting September 1. After grant approval, trees must be installed between October 1 and February 28.

1. Application requirements:
    a. Completed application form signed by the property owner.
    b. Photo(s) of the proposed planting location showing the current condition.
    c. 11" x 17" plot plan, plat, or aerial photograph (Google) showing property boundaries, location of utility easements, and proposed location of tree on site.
    d. Selection of proposed tree from Apex Design and Development Manual Large, Medium or Small Native Tree List. Abbreviated list is below.
    e. Tree container size shall be between 15 gallon and 30 gallon, while balled and burlapped (B&B) trees shall have a caliber 2.5" or less.
    f. Cost estimate from a qualified landscape professional. Cost estimates must be detailed in a line by line format.
    g. Trees shall be planted 5' away from underground utilities and 10' away from existing structures.
    h. Underground utilities shall be marked by contacting North Carolina 811 (https://nc811.org/). A North Carolina 811 ticket number must be included in the Tree Planting Grant Program Application.
2. Applications must be approved before work begins or no funds will be disbursed.
3. The Planning Staff has been granted authority to administer the Tree Planting Grant Program process by Town Council. Town Council allocates the funding for the grant through the yearly budgeting process.
4. Grant amount shall be paid only when installation is completed and receipts are submitted to the Planning Department. If the actual costs are less than the cost estimates, the maximum amount shall not exceed 100% of the actual costs or the $750 limit, whichever is less. In no case shall a grant be issued higher than the original approved grant amount.
5. Eligibility Criteria:
    a. If the tenant is proposing the tree planting, the tenant must obtain the property owner's signature on the application.
    b. Tree Planting Grant Program applications will be reviewed for completeness, appropriateness of planting location, and appropriateness of species of tree proposed for that location. No funds will be awarded for trees that are not in keeping with the appropriate planting standards of the Town, as deemed by Planning Staff.
    c. Tree Planting Grant Program locations must be within Apex's corporate limits and must comply with all state and local regulations, including staying out of easements and/or gaining appropriate encroachment agreements from the Town of Apex.

TREE PLANTING GRANT PROGRAM APPLICATION

Town of Apex, North Carolina

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Abbreviated Native Tree List			
LARGE TREES		MEDIUM TREES	SMALL TREES
Red Maple	Black Gum	American yellowwood	Downy Serviceberry
Sugar Maple	Longleaf Pine	Sourwood	Eastern Redbud
River Birch	Loblolly Pine	Virginia Pine	White Fringe Tree
Pignut Hickory	White Oak	Eastern arborvitae	Flowering Dogwood
Shagbark Hickory	Scarlet Oak		Washington Hawthorn
American Persimmon	Swamp Chestnut Oak		Green Hawthorn
American Beech	Nuttall Oak		Dahoon Holly
White Ash	Willow Oak		Yaupon Holly
American Holly	Shumard Oak		Little Gem Magnolia
Eastern Red Cedar	Baldcypress		Sweetbay Magnolia
Tulip Poplar	Basswood		American Red Plum
Southern Magnolia	Princeton Elm		

I have read the Tree Planting Grant Program information:

Applicant Signature _____ Date _____

Application #: _____ Submittal Date: _____

TREE PLANTING GRANT PROGRAM APPLICATION

Town of Apex, North Carolina

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Hard Copy Submittal Requirements: (Submit to Planning Department)

- One (1) copy of Tree Planting Program Application
- Photo(s) of the proposed planting location
- 11" x 17" plot plan, plat, or aerial photograph (Google) showing proposed planting location
- Cost estimates from a qualified landscape professional
- North Carolina 811 ticket number

Applicant Information:

Applicant: _____ Tax ID: _____

Address: _____

City: _____ State: _____ ZIP: _____

Phone: _____ Email: _____

Owner Information:

Owner: _____ Tax ID: _____

Address: _____

City: _____ State: _____ ZIP: _____

Phone: _____ Email: _____

Location Information:

Address: _____

Property PIN: _____ Owner or Tenant Occupied? _____

Current Building or Site Use: _____

Cost of Overall Proposal: _____ Tree Planting Grant Program Funds Requested: _____

North Carolina 811 Ticket Number: _____

Tree Selection:

1. Please provide the native tree species selected from the Apex Design and Development Manual including planting size below.

_____

_____

_____

_____

_____

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2. On a separate sheet, please provide a detailed cost estimate from a qualified landscape professional. Cost estimates must be detailed in a line by line format. Once the work is completed, please provide the Planning Department with a copy of the receipt(s) for all labor and supplies. Tree Planting Grant Program funds will not be released without receipt(s).

Owner/Applicant Signatures

I understand the limits and requirements of this program and if approved, agree to complete the project according to plan. In addition, I shall indemnify and hold harmless, the Town of Apex from and against any and all claims, actions, causes of action, demands, damages, losses, costs, expenses, and compensation of whatsoever kind and nature which may hereafter accrue on account of or in any way growing out of any and all known or unknown, foreseen and unforeseen bodily and personal injuries and property damage and consequences thereof, which might result from any occurrence in connection with this program.

Applicant Signature	Date
Owner Signature	Date
Staff Approval	Date

Conditions of Approval:

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for consideration by the Apex Town Council

Item Type: NEW BUSINESS

Meeting Date: April 27, 2021

Item Details

Presenter(s): Colleen Merays, Downtown & Small Business Development Coordinator

Department(s): Economic Development

Requested Motion

Possible motion to approve the Special Event Permit requests and Town Co-Sponsorship requests for 2021.

Approval Recommended?

Yes

Item Details

Name Of Event	Event Date(s)	Event Times	Event Organizer/Sponsor
Peak PROMenade (AFHS & AHS)	5/20/21 to 5/23/21	5PM - 9PM	Apex & Apex Friendship HS
2021 Spring Car Show	Sat., June 5, 2021	8:30AM - 12PM	Apex American Legion Post 124
Patriot Day - 9/11/21	Sat., Sept. 11, 2021	10AM - 11:30AM	Apex American Legion Post 124
Octoberfest	10/29 - 10/31/21	8AM - 10PM	Apex American Legion Post 124

Estimated Town Expenditures $ 5,799.62

These Co-Sponsored special event requests total $5,799.62 and include such services as Police, Public Works, Electric and Park, Recreation and Cultural Services. These events include closure of public streets, parking lots and use of the Historic Union Depot as detailed in the attachment. Approval of Co-Sponsorship is contingent upon event coordinators adhering to all rules and regulations as details in the Town of Apex Special Events Guide and Special Event Permit Application.

Attachments

- Cosponsored Special Event TOA Cost Breakdown Spreadsheet
- Cosponsored Special Event Application Cover Sheet

Town of Apex
2021 Cosponsored Special Event Applications

Event Name: Peak PROMenade

Event Date & Time:

- Peak PROMenande for Apex High School - Friday, May 21, 2021 (5 PM - 9 PM)
- Peak PROMenande for AFHS & AHS Exceptional Students - Saturday, May 22, 2021 (4 PM - 5 PM)
- Peak PROMenande for Apex Friendship High School - Saturday, May 22, 2021 (5 PM - 9 PM)

Roads & Parking Closed Date & Time: The Depot Parking Lot & Plaza

- Depot Parking Lot will close – Thursday, May 20 – 23, 2021

Rain Date: NA

Event Organizer: Apex & Apex Friendship High Schools

2021 Co-Sposonsorship Request: APD Student Resource Officers to help with crossing and security, The Depot & Halle public bathrooms be open.

2021 Estimated Town of Apex Cost: $323.44

Event Description: In the absence of a traditional prom, Apex seniors will celebrate with a "Peak PROMenade"! The event will take place over two nights at The Depot in downtown Apex, and will include a large covered tent, photo booth, selfie stations, a DJ, and special PROMenade party favors.

Questions to Consider: None

Town of Apex
2021 Cosponsored Special Event Applications

Event Name: Apex American Legion Spring Car Show 2021

Event Date & Time: Saturday, June 5, 2021 from 8:00 AM to 3:00 PM

Roads & Parking Closed Date & Time: Town Hall Parking Lot Closed June 5, 2021 from 7:00 AM to 5:00 PM

Rain Date: Saturday, June 12, 2021 from 8:00 AM to 3:00 PM

Event Organizer: Apex American Legion Post 124

2021 Co-Sposonsorship Request: Trash bins and liners, electric connection, and water barricades to block Town Hall Parking Lot

2021 Estimated Town of Apex Cost: $279.00

Event Description: Car show in Town Hall parking lot.

Questions to Consider: None

Town of Apex
2021 Cosponsored Special Event Applications

Event Name: Apex American Legion Patriot Day 9/11 – 20th Anniversary

Event Organizer: Apex American Legion Post 124

Event Date & Time: Saturday, September 11, 2021 from 10 AM to 1 PM

Roads & Parking Closed Date & Time: 9/11 Memorial corner of Saunders St. & N. Salem St.

- Saunders & N. Salem Street closed Saturday, September 11, 2021 from 8 AM – 2 PM

Rain Date: NA

2021 Co-Sposonsorship Request: Banner hanging, trash bins and liners, APD and barricades to street, electric connections behind memorial.

2021 Estimated Town of Apex Cost: $2,238.34

Event Description: This is a stand-alone event that American Legion hosts every year, where we lay a wreath to honor our first responders. We plan to rededicate the Service Memorial with the upgrades planed to the memorial. We have the 82nd Air Force band and NC State Bag Pipers Band scheduled to be here. We also have 2 retired NY city fire fighter scheduled to be here as guest speakers. Our program will take approximately 2.5 to 3 hours.

Questions to Consider: None

Town of Apex
2021 Cosponsored Special Event Applications

Event Name: Apex American Legion Octoberfest & Fall Car Show 2021

Event Organizer: Apex American Legion Post 124

Event Date & Time: Saturday, October 30, 2021 from 8:00 AM to 10:00 PM

Roads & Parking Closed Date & Time: Saunders Parking Lot and Gravel Lot

- Parking lot closed from Friday, October 29, 2021 @ 12PM – Saturday, October 30, 2021 11:00 PM

Rain Date: Saturday, November 6, 2020 from 8:00 AM to 10:00 PM

2020 Co-Sposonsorship Request: Banner hanging, trash bins and liners, and barricades to block parking lot, both electric and water in gravel parking lot area.

2020 Estimated Town of Apex Cost: $2,958.84

Event Description: Car show in Saunders St . Parking Lot, Chili Cook Off, Corn Hole Tournament, Kid's Zone, and Food Vendors.

Questions to Consider: None

Town of Apex Proposed 2021 Cosponsored Special Events - Potential Town Expenses

Name Of Event	Projected Attendance	Event Date(s)	Event Times	Event Organizer/Sponsor	Contact Person	Elec.	Fire	Parks	Parks (In-Kind)	Police	Police Equipment (In-Kind)	Public Works	PW Equipment (In-Kind)	2021 TOTAL
Peak PROMenade (AFHS & AHS)	900	5/20/21 to 5/23/21	5 PM - 9 PM	Apex High School & Apex Friendship High School	Elaine Hofmann / Matthew Wight					$323.44				$323.44
2021 Spring Car Show	6000	Saturday, June 5, 2021	8:30 AM - 12:00 PM	Apex American Legion Post 124	Mike Sayers	$279.00					156.90 (In-Kind)			$279.00
Patriot Day - 9/11/21 (20th Anniversary of 9/11)	6000	Saturday, September 11, 2021	10 AM - 11:30 AM	Apex American Legion Post 124	Mike Sayers	$93.00				$1,381.50		$763.84		$2,238.34
Octoberfest	10000	10/29/2021 to 10/31/21	8 AM - 10 PM	Apex American Legion Post 124	Mike Sayers	$279.00				$2,679.84				$2,958.84
														$5,799.62

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for consideration by the Apex Town Council

Item Type: NEW BUSINESS

Meeting Date: April 27, 2021

Item Details

Presenter(s): Shawn Purvis, Assistant Town Manager

Department(s): Administration

Requested Motion

Possible Motion to approve a Road and Utility Infrastructure Reimbursement Agreement with BIN – APEX LLC and to authorize the Town Manager to execute the same

Approval Recommended?

Yes

Item Details

In 2017, the Town and the property owner of Cash Corporate Center entered into an agreement to co-develop a 121.3-acre site for the purpose of industrial and/or commercial recruitment and to increase the business prospects of the Town. BIN – APEX LLC proposes to purchase 26 acres at Cash Corporate Center with the intent to construct a 300,000 sf building for a proposed new business that will create 220 new jobs. To facilitate coordination and timing, BIN – Apex LLC has offered to construct the road and install the utilities planned by the Town. This Reimbursement Agreement with BIN – APEX LLC describes the construction of Burma Drive (a roadway that extends into the interior of Cash Corporate Center) by BIN – APEX LLC, and the subsequent responsibilities of the Town and of BIN – APEX LLC, as well as describing public water and sewer in that general vicinity of the Town.

A copy of the Reimbursement Agreement will be forthcoming.

Attachments

- Forthcoming

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for consideration by the Apex Town Council

Item Type: UPDATES BY TOWN MANAGER

Meeting Date: April 27, 2021

Item Details

Presenter(s): Ralph Clark, Interim Town Manager

Department(s): Administration

Requested Motion

Updates on Town operations by Interim Town Manager Ralph Clark

Approval Recommended?

N/A

Item Details

N/A

Attachments

- N/A