PLANNING BOARD SECOND MEETING OCTOBER 20 2020 4PM ZOOM AGENDA
CONDUCTED WITH ZOOM
OCTOBER 20, 2020 4:00 PM – TUESDAY

Join Zoom Meeting
https://zoom.us/j/2610095007?pwd=d01aMVlrY0hINVFGd25RcGpyZS83QT09
OR
Tel – 1-646 876 9923 US (New York)
ID # 261 009 5007
Password 281 797

Please take notice that the Manasquan Planning Board will convene a remote meeting on October 20, 2020 4:00 PM. (The Board had previously advertised the said meeting, but the within notice is being re-advertised so as to publicize the remote nature of the same.) Due to the Coronavirus/COVID-19 Borough and State Directives, the said meeting is being held remotely, through a web-meeting conference communication system. The remote meeting format will allow Board Members and the Public to simultaneously hear, listen to, participate in, digest, observe, comment on, and/or otherwise object to any and all Board decisions/actions. The remote meeting format, as aforesaid, will allow the Borough's Planning Board to conduct business, without violating any Executive Orders, without violating any COVID-19 Health and Safety Protocol, and while still complying with the spirit and intent of Prevailing Provisions of New Jersey Law. (Please note that the public access to the Municipal Building is not currently permitted).

Members of the public are welcome to, and encouraged to, participate by observing/participating in the remote meeting. The meeting will be held via Zoom. You can access the meeting through the Zoom App via a smartphone or tablet, via a special link on your computer, or by telephone. Note the information printed above.

PUBLIC MEETING

Salute to the Flag
Roll Call
Sunshine Law Announcement

APPLICATION

1. APPLICATION #10-2020 SEPE 34 BROAD STREET

OTHER BUSINESS

Comments from individual board members

ADJOURNMENT

Broad Street 34, LLC
Preliminary & Final Major Site Plan
34, 36, 40, 44 Broad Street
Lots 25.01, 25.02, 26 and 27, Block 64

EXHIBIT LIST

A-1 Engineer's Colorized Plan titled "Exhibit 1" existing site overview, dated September 16, 2020;

A-2 Engineer's Colorized Plan titled "Exhibit 2" proposed site plan overview, dated September 16, 2020;

A-3 Site Plans – Full Set, dated October 25, 2019, and revised through July 7, 2020;

A-4 Plan titled "Sight Triangle Exhibit, Drawing EX-1," dated March 17, 2020, revised July 7, 2020;

A-5 Plan titled "Turning Template Exhibit, Drawing EX-2," dated March 17, 2020, revised July 7, 2020;

A-6 Plan titled "Turning Template Exhibit, Drawing EX-3," dated March 17, 2020, revised July 7, 2020;

A-7 Stormwater Management Report, dated July 6, 2020;

A-8 Stormwater Management Operation & Maintenance Manual dated July 6, 2020;

A-9 Professional Traffic Engineering and Parking Evaluation dated June 18, 2019, revised January 22, 2020;

A-10 Architect's Floor Plans and Elevations, dated June 29, 2020;

A-11 Architect's Rendering, dated June 21, 2020;

A-12 Survey dated August 9, 2018;

A-13 Application for development;

A-14 Settlement Agreement between the Borough of Manasquan and Fair Share Housing Center;

A-15 Settlement Agreement between the Borough of Manasquan, Broad Street 34, LLC, and Union Avenue 33, LLC;

A-16 Letter prepared by Jaclyn J. Flor, PE, PP of Engenuity Infrastructure, dated July 16, 2020, responding to the Board Engineer's Review Letter of February 13, 2020;

A-17 A supplement to the Professional Traffic Engineering and Parking Evaluation titled "Trip Generation Summary" dated September 24, 2020, prepared by Klein Traffic Consulting, LLC, consisting of 1 sheet;

BD-1 Boro Engineering, Engineering Review Letter 8/26/2020.

EXHIBIT PLAN 1

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: PAS
DRAWN BY: PAS
SHEET CHK'D BY: JJF
CROSS CHK'D BY:
APPROVED BY:
DATE: SEPTEMBER 16, 2020

ENGENUITY INFRASTRUCTURE

ENGENUITY INFRASTRUCTURE
2 BRIDGE AVENUE , SUITE 323
RED BANK, NJ 07701
732.741.3176
ENGENUITYNJ.COM

EXHIBIT PLAN 1
TAX BLOCK 64
LOTS 25.01, 25.02, 26 & 27
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

OWNER / DEVELOPER / APPLICANT:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE: (732) 522-0197

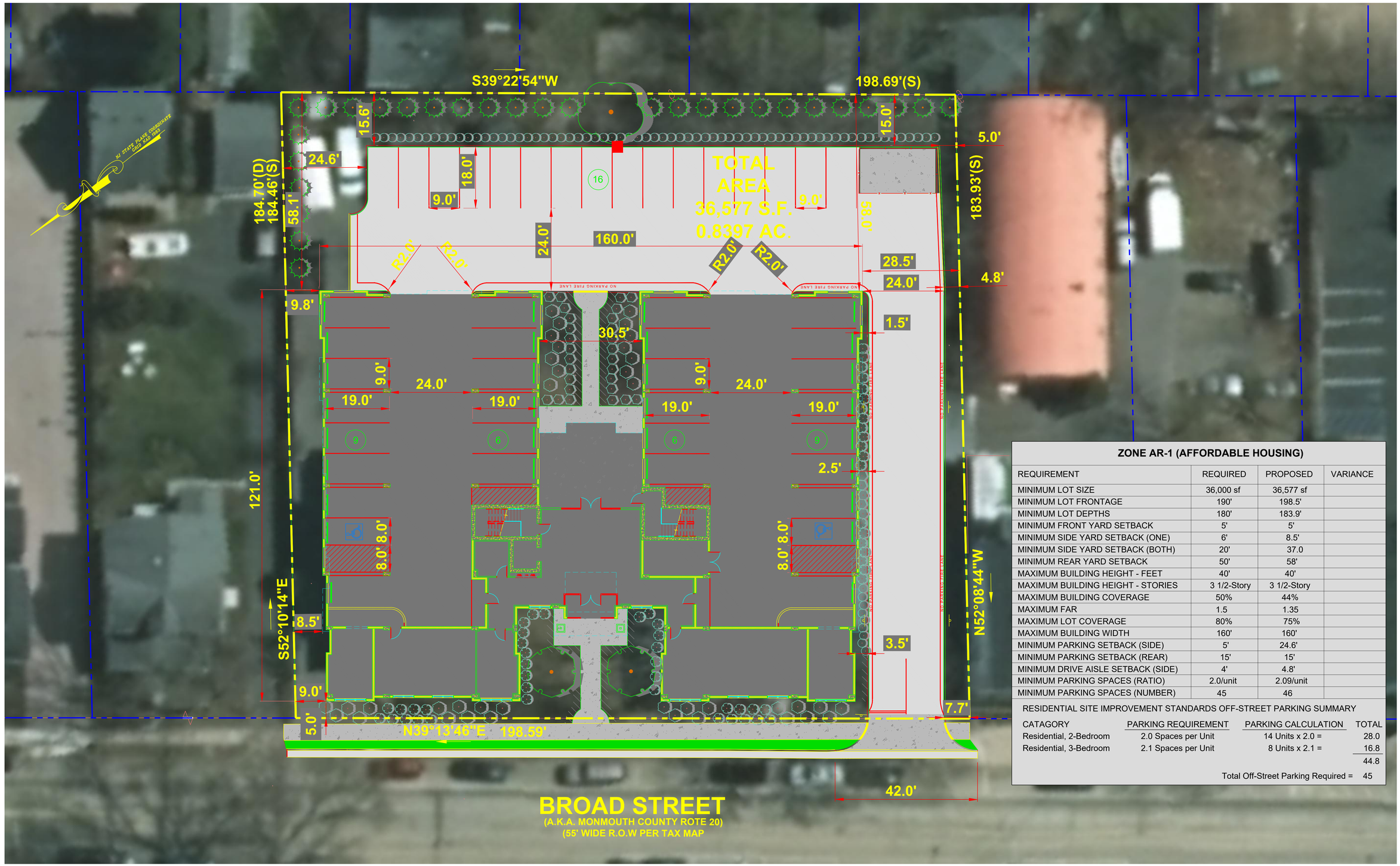
JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000

09/16/2020
DATE

PROJECT NO. SEPE-00020
DRAWING EX-1
SHEET NO. 1 OF 2

FILE NAME: N:\SEPE MANASQUAN APARTMENTS\SEPE-00020 – 33-44 BROAD\PLANS\EXHIBIT PLAN.DWG PRASANNA 9/18/2020 1:32 PM

NOT FOR CONSTRUCTION



ZONE AR-1 (AFFORDABLE HOUSING)

REQUIREMENT	REQUIRED	PROPOSED	VARIANCE
MINIMUM LOT SIZE	36,000 sf	36,577 sf	
MINIMUM LOT FRONTAGE	190'	198.5'	
MINIMUM LOT DEPTHS	180'	183.9'	
MINIMUM FRONT YARD SETBACK	5'	5'	
MINIMUM SIDE YARD SETBACK (ONE)	6'	8.5'	
MINIMUM SIDE YARD SETBACK (BOTH)	20'	37.0	
MINIMUM REAR YARD SETBACK	50'	58'	
MAXIMUM BUILDING HEIGHT - FEET	40'	40'	
MAXIMUM BUILDING HEIGHT - STORIES	3 1/2-Story	3 1/2-Story	
MAXIMUM BUILDING COVERAGE	50%	44%	
MAXIMUM FAR	1.5	1.35	
MAXIMUM LOT COVERAGE	80%	75%	
MAXIMUM BUILDING WIDTH	160'	160'	
MINIMUM PARKING SETBACK (SIDE)	5'	24.6'	
MINIMUM PARKING SETBACK (REAR)	15'	15'	
MINIMUM DRIVE AISLE SETBACK (SIDE)	4'	4.8'	
MINIMUM PARKING SPACES (RATIO)	2.0/unit	2.09/unit	
MINIMUM PARKING SPACES (NUMBER)	45	46	

RESIDENTIAL SITE IMPROVEMENT STANDARDS OFF-STREET PARKING SUMMARY

CATAGORY	PARKING REQUIREMENT	PARKING CALCULATION	TOTAL
Residential, 2-Bedroom	2.0 Spaces per Unit	14 Units x 2.0 =	28.0
Residential, 3-Bedroom	2.1 Spaces per Unit	8 Units x 2.1 =	16.8
			44.8
		Total Off-Street Parking Required =	45

EXHIBIT PLAN 2

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: PAS
DRAWN BY: PAS
SHEET CHK'D BY: JJF
CROSS CHK'D BY:
APPROVED BY:
DATE: SEPTEMBER 16, 2020

ENGENUITY INFRASTRUCTURE
2 BRIDGE AVENUE , SUITE 323
RED BANK, NJ 07701
732.741.3176
ENGENUITYNJ.COM

EXHIBIT PLAN 2
TAX BLOCK 64
LOTS 25.01, 25.02, 26 & 27
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

OWNER / DEVELOPER / APPLICANT:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE: (732) 522-0197

JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000
09/16/2020
DATE

PROJECT NO. SEPE-00020
DRAWING
EX-2
SHEET NO.
2 OF 2

FILE NAME: N:\SEPE MANASQUAN APARTMENTS\SEPE-00020 – 33-44 BROAD\PLANS\EXHIBIT PLAN.DWG PRASANNA 9/18/2020 2:35 PM

NOT FOR CONSTRUCTION

PROPOSED BUILDING FOR:
BROAD STREET 34, LLC

34, 36, 40 & 44 BROAD STREET, MANASQUAN, NJ

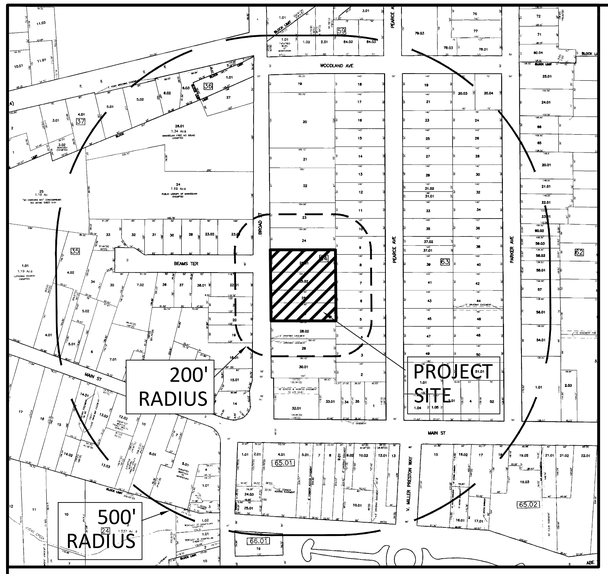
TAX MAP SHEET 11 DATED JAN. 2006

BLOCK 64 LOTS 25.01, 25.02, 26 & 27

ZONE AR-1

MAJOR SITE PLAN

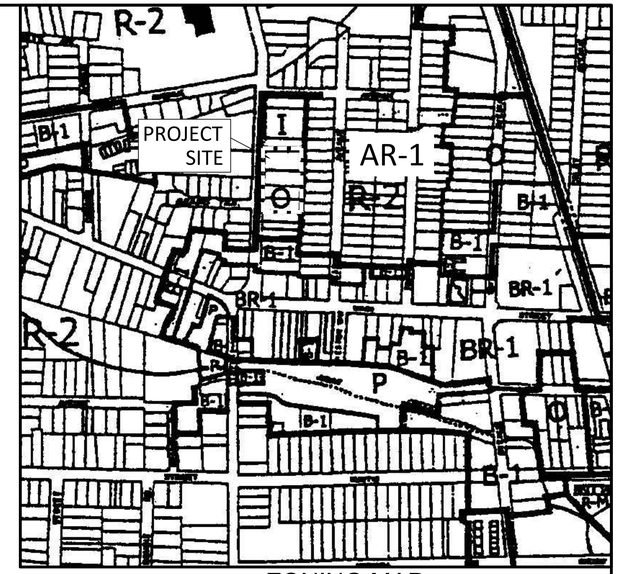
OCTOBER 25, 2019



KEY MAP

SHEETS 3, 5, 11 & 12

SCALE 1"=200'



ZONING MAP

MARCH 2009

NOT TO SCALE

200' PROPERTY OWNERS LIST:

Block	Lot	Owner Complete Name	Property Address	Mailing Street	Mailing City, State, Zip Code
35	19	BOSSONE, DOMINIC J	25 BROAD ST	713 HOWELL DR	BRIELLE,NJ 087301429
35	20	HOVERTER, TERENCE F & CHRISTINA M	27 BROAD ST	27 BROAD ST	MANASQUAN, NJ 087362906
35	21	STUDICK, ROSEMARY & O'TOOLE, DARREN	35-35-1/2 BROAD ST	1312 ATLANTIC AVE	MANASQUAN, NJ 08736
35	22.01	PARELL, ANNA MARIE	39 BROAD ST	39 BROAD ST	MANASQUAN, NJ 087362906
35	23.01	JAWIDZIK,WALTER&PIGNATELLI,LORRAINE	9-51 BROAD ST	49 BROAD ST	MANASQUAN, NJ 08736
35	23.02	ZUPKO, DAVID A	10 BEAMS TER	10 BEAMS TER	MANASQUAN, NJ 08736
35	24	PUBLIC LIBRARY OF MANASQUAN	55 BROAD ST	55 BROAD ST	MANASQUAN, NJ 087362930
63	38.01	TURNBACH, JEROME J & AIMEE R	7 BEAMS TER	7 BEAMS TER	MANASQUAN, NJ 087362905
63	35	BRASH, PHILIP & LAURA	46 PEARCE AVE	46 PEARCE AVE	MANASQUAN, NJ 087363009
63	37.01	PLACE, HAROLD D III & LISA M	38 PEARCE AVE	38 PEARCE AVE	MANASQUAN, NJ 087363009
63	41	DARA TA, JANNE	34 PEARCE AVE	34 PEARCE AVE	MANASQUAN, NJ 087363009
64	43	BATE, WILLIAM J & DONNA W	30 PEARCE AVE	30 PEARCE AVE	MANASQUAN, NJ 087363009
64	4	LAVALLA, JAMES J JR	21 PEARCE AVE	21 PEARCE AVE	MANASQUAN, NJ 08736
64	5	GALLAGHER, MATTHEW & MICHELLE	25 PEARCE AVE	25 PEARCE AVE	MANASQUAN, NJ 087363008
64	6	BROWN, DUSTIN C & JESSICA L	29 PEARCE AVE	29 PEARCE AVE	MANASQUAN, NJ 087363008
64	7	SERRATELLI, ARCHIBALD A JR & JOAN D	33 PEARCE AVE	33 PEARCE AVE	MANASQUAN, NJ 087363008
64	8	BRENNAN, ANDREW & ANDREA	37-37-1/2 PEARCE AVE	37 PEARCE AVE	MANASQUAN, NJ 087363008
64	9	WALTSAK, ANNE C	39 PEARCE AVE	39 PEARCE AVE	MANASQUAN, NJ 087363008
64	10	ENERSON, DOROTHY	43 PEARCE AVE	43 PEARCE AVE	MANASQUAN, NJ 087363008
64	11	WHITE, JOHN F JR & DIANA M	49 PEARCE AVE	49 PEARCE AVE	MANASQUAN, NJ 087363008
64	12	CARTER, JOANNE M	51 PEARCE AVE	51 PEARCE AVE	MANASQUAN, NJ 087363008
64	13	GUNSCH, THOMAS H & JANET R	57 PEARCE AVE	57 PEARCE AVE	MANASQUAN, NJ 087363008
64	22	FOUR S ASSOCIATES	58 BROAD ST	84 BROAD ST	MANASQUAN, NJ 087362907
64	23	54 BROAD ST, LLC C/0 SHEKLIAN, MARK	54 BROAD ST	11 DRAWBRIDGE ST	MANASQUAN, NJ 087362943
64	24	ROBINSON, CHRISTOPHER D & TARA A	50-50-1/2 BROAD ST	50 BROAD ST	MANASQUAN, NJ 087362907
64	25.01	BRADENTON BCH DEVELOPMENT C/0 SEPE	44 BROAD ST	12-1 OSBORN AVE	MANASQUAN, NJ 087362942
64	25.02	SEPE, WILLIAM B	40 BROAD ST	44 BROAD ST.	MANASQUAN, NJ 087362907
64	26	SEPE, WILLIAM R	36 BROAD ST	12-1 OSBORN AVE	MANASQUAN, NJ 087362942
64	27	BRADENTON BEACH DEVELOPMENT, LLC	34 BROAD ST	126 MAIN ST	MANASQUAN, NJ 087363558
64	28.02	SIEMPRE MANANA LLC C/0 LIBRIZZI	30 BROAD ST	276 E VIRGINIA AVE	MANASQUAN, NJ 087363618
64	29	24-26 BROAD STREET - MANASQUAN, LLC	24-26 BROAD ST	2135 BRIDGE AVE	POINT PLEASANT, NJ 08742

200' UTILITIES OWNERS LIST:

Jersey Central Power & Light Co
Customer Service PO Box 16001
Reading, PA 19612-6001

Verizon
PO Box 4833
Trenton, NJ 4833 08650-4833

NJ Natural Gas Company
1415 Wyckoff Rd
PO Box
Wall, NJ 1378 07715-0001

Cablevision
1111 Stewart Ave.
Bethpage, NY Ave 11714-3533

NJ American Water Company
Attn: Corporate Secretary
131 Woodcrest Rd
PO Box 5079
Cherry Hill, 5079 NJ 08034-5079

Monmouth County Highway Dep't.
250 Center St.
Freehold, NJ St 07728-2465

State of New Jersey
Attn: Commissioner of Transportation
Department of Transportation
1035 Parkway Ave
Trenton, NJ Ave 08625-2309

OWNER/APPLICANT/DEVELOPER:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE:(732) 522-0197

ENGINEER:
ENGENUITY INFRASTRUCTURE, LLC
JACLYN J. FLOR, PE, PP, CME
NJ PE# 24GE04542600
NJ PP# 33LI00592000
2 BRIDGE AVENUE, SUITE 323
RED BANK, NJ 07701
PHONE: (732)741-3176
JFLOR@ENGENUITYNJ.COM

ATTORNEY:
GIORDANO, HALLERAN & CIESLA
ATTORNEYS AT LAW
JOHN A. SARTO, ESQ.
125 HALF MILE ROAD
SUITE 300
RED BANK, NJ 07701-6777
PHONE: (732) 219-5496

GENERAL NOTES:

1. ALL WORK TO CONFORM WITH THE LATEST EDITION OF THE FOLLOWING:
   -NJDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
   -MONMOUTH COUNTY DESIGN STANDARDS
   -MUNICIPAL DESIGN STANDARDS
   -CURRENT MANUFACTURERS SPECIFICATIONS, STANDARDS, AND REQUIREMENTS
   -CURRENT, PREVAILING UTILITY COMPANY OR AUTHORITY SPECIFICATIONS, STANDARDS, AND REQUIREMENTS
2. ALL BARRIER FREE CONSTRUCTION TO BE IN ACCORDANCE WITH THE NJ UNIFORM CONSTRUCTION CODE, SUBCHAPTER 7: BARRIER FREE SUBCODE & ADA REQUIREMENTS AS NECESSARY.
3. CONTRACTOR IS RESPONSIBLE FOR ALL WORKER SAFETY, TRAINING, AND SAFETY DEVICE USAGE FOR AND DURING THE CONSTRUCTION OF THE IMPROVEMENTS SHOWN ON THIS PLAN.
4. THE CONTRACTOR IS DESIGNATED AS RESPONSIBLE PARTY DURING CONSTRUCTION OF THE IMPROVEMENTS HEREON. AS SUCH, CONTRACTOR WILL PROVIDE ADEQUATE SAFETY TRAINING, EQUIPMENT AND OVERSIGHT.
5. CONTRACTOR IS RESPONSIBLE FOR ALL REQUIRED PERMITS AND APPROVALS FOR CONSTRUCTION OF THE DEPICTED SITE IMPROVEMENTS.
6. ALL DISTURBED AREAS ON SITE TO BE STABILIZED IN ACCORDANCE WITH THE FREEHOLD SOIL CONSERVATION DISTRICT STANDARDS.
7. ALL AREAS NOT COVERED BY IMPERVIOUS SURFACE SHALL BE SEEDED OR OTHERWISE STABILIZED IN ACCORDANCE WITH SOIL EROSION CONTROL SPECIFICATIONS SET FORTH IN THE STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY, 7TH EDITION, REVISED JULY 2017.
8. THE NEW JERSEY CALL SYSTEM SHOULD BE CONTACTED PRIOR TO EXCAVATION ON-SITE OR WITHIN R.O.W. (800) 272-1000
9. ALL UTILITY CONNECTIONS AND RELOCATIONS ARE SHOWN SCHEMATICALLY. THE CONTRACTOR SHALL CONTACT AND COORDINATE WITH EACH UTILITY COMPANY TO PROVIDE THE MOST APPROPRIATE LOCATION FOR UTILITY CONNECTIONS AND/OR RELOCATIONS.
10. EXISTING SITE AND UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN COLLECTED FROM VARIOUS SOURCES AND IS NOT GUARANTEED AS TO ACCURACY OR COMPLETENESS.
11. ALL TRAFFIC SIGNS AND STRIPING SHALL CONFORM WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
12. ANY DAMAGE TO EXISTING STRUCTURES AS A RESULT OF THIS DEVELOPMENT, SHALL BE REPAIRED AT THE SOLE EXPENSE OF THE CONTRACTOR.
13. CONCRETE SHALL BE NJDOT CLASS "B" UNLESS OTHERWISE STATED HEREON OR WITHIN THE CONSTRUCTION DETAILS.
14. ALL IMPROVEMENTS SHOWN HEREON "TO BE REMOVED" SHALL BE DISPOSED OF IN A MANNER NOT CONTRARY TO LOCAL OR STATE ORDINANCES.
15. CONTRACTOR TO NOTIFY THE UNDERSIGNED PROFESSIONAL IF FIELD CONDITIONS VARY FROM THAT WHICH IS SHOWN HEREON.
16. THIS PLAN SET HAS BEEN PREPARED FOR MUNICIPAL AND AGENCY APPROVALS. THIS PLAN NOT TO BE UTILIZED FOR CONSTRUCTION UNTIL MARKED "FOR CONSTRUCTION".
17. SURVEY INFORMATION SHOWN HEREON TAKEN FROM A PLAN ENTITLED "BOUNDARY & TOPOGRAPHICAL, TAX LOTS 25.01, 25.02, 26 & 27" PREPARED BY DPK CONSULTING DATED AUGUST 9, 2018.
18. EXISTING UTILITY CONNECTIONS TO BE UTILIZED WHERE FEASIBLE & APPROVED BY UTILITY AUTHORITY.
19. ALL IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CURRENT A.D.A. STANDARDS, AS APPLICABLE.
20. ALL CURB, SIDEWALK AND PAVEMENT SHALL BE RESTORED TO THE SATISFACTION OF THE BOARD'S ENGINEER.

PLAN INDEX

APPROVED AS A MAJOR SITE PLAN BY
THE MANASQUAN BOROUGH PLANNING BOARD
ON _____.

_____
CHAIRPERSON DATE

ATTEST:

_____
SECRETARY DATE

I HAVE REVIEWED THIS SITE PLAN AND CERTIFY THAT IT MEETS ALL CODES AND ORDINANCES UNDER MY JURISDICTION.

_____
BOROUGH ENGINEER DATE

I HEREBY CERTIFY THAT ALL THE REQUIRED IMPROVEMENTS HAVE BEEN INSTALLED OR A POND POSTED IN COMPLIANCE WITH ALL APPLICABLE CODES AND ORDINANCES

_____
BOROUGH ENGINEER DATE

_____
BOROUGH CLERK DATE

_____
BUILDING PERMIT ISSUED DATE

I CONSENT TO THE FILING OF THIS SITE PLAN WITH THE PLANNING BOARD OF THE BOROUGH OF MANASQUAN

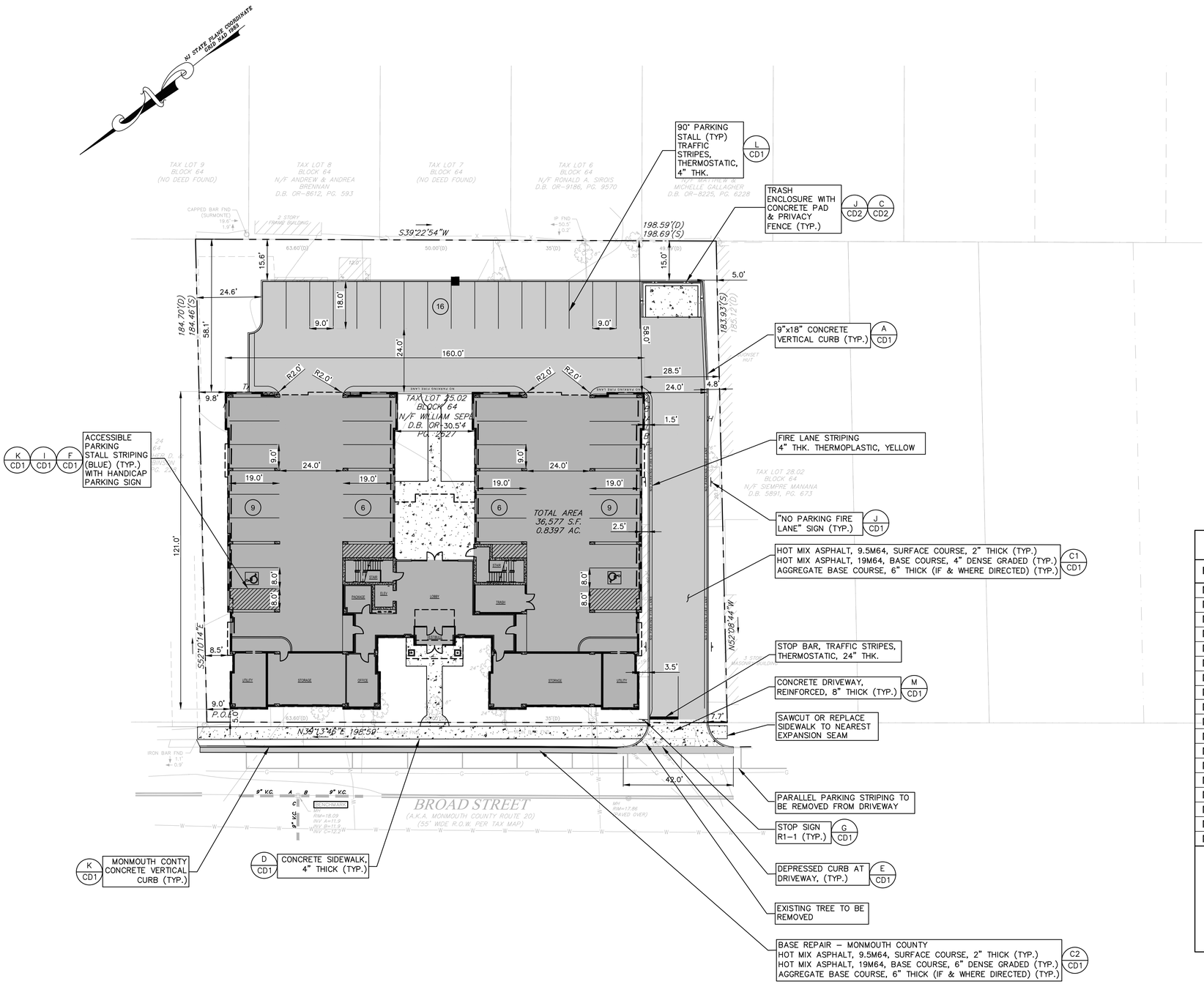
_____
OWNER DATE

I HEREBY CERTIFY THAT I HAVE PREPARED THIS STE PLAN AND THAT ALL THE DIMENSIONS AND INFORMATION ARE CORRECT

_____
JACLYN J. FLOR, PE, PP, CME DATE
NJ PE# 24GE04542600
NJ PP# 33LI00592000

PROJECT NO. SEPE-00020
DRAWING T-1
SHEET NO. 1 OF 10

NOT FOR CONSTRUCTION



SITE PLAN

GENERAL NOTES:

1. SURVEY INFORMATION SHOWN HEREON BASED ON A PLAN ENTITLED "BOUNDARY & TOPOGRAPHIC SURVEY, TAX LOTS 25.01, 25.02, 26, & 27" PREPARED BY DPK CONSULTING DATED AUGUST 9, 2018
2. ENGENUITY INFRASTRUCTURE MAKES NO GUARANTEES THAT THE UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN-SERVICE OR ABANDONED. ENGENUITY INFRASTRUCTURE FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. ENGENUITY INFRASTRUCTURE HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL UTILITIES IN THE FIELD PRIOR TO EXCAVATION. THE CONTRACTOR SHALL ALSO BE REQUIRED TO CALL FOR A MARK-OUT PRIOR TO ANY WORK.
3. PREMISES ARE COMMONLY KNOWN AS 34-44 BROAD STREET , MANASQUAN BOROUGH , MONMOUTH COUNTY, NEW JERSEY.
4. PREMISES ARE ALSO KNOWN AS BLOCK 64, LOTS 25.01, 25.02, 26, AND 27 AS SHOWN ON THE OFFICIAL TAX MAPS OF THE BOROUGH OF MANASQUAN, MONMOUTH COUNTY, NEW JERSEY.
5. ALL PROPOSED IMPROVEMENTS SHALL BE A.D.A. COMPLIANT, WHERE APPLICABLE.
6. IF THIS DOCUMENT DOES NOT CONTAIN A RAISED SEAL OF THE UNDERSIGNED PROFESSIONAL, IT IS NOT AN AUTHORIZED ORIGINAL DOCUMENT.
7. THE LAYOUT AND DESIGN ARE SUBJECT TO FURTHER MODIFICATION TO COMPLY WITH APPROVALS FROM AGENCIES HAVING JURISDICTION OVER THE SITE.
8. ALL NEW UTILITIES ARE PROPOSED TO BE LOCATED UNDERGROUND.

LEGEND

- PRINCIPAL & ACCESSORY STRUCTURES
- NEW CONCRETE
- FULL DEPTH PAVEMENT

ZONE AR-1 (AFFORDABLE HOUSING)

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			44.8
		Total Off-Street Parking Required =	45

1" = 20'
10 0 20

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	7/7/20	PAS	JJF	REVISED PLANS AS PER BOARD ENGINEER'S COMMENTS

DESIGNED BY: PAS
DRAWN BY: PAS
SHEET CHK'D BY: JJF
CROSS CHK'D BY:
APPROVED BY:
DATE: OCTOBER 25, 2019

ENGENUITY INFRASTRUCTURE

ENGENUITY INFRASTRUCTURE
2 BRIDGE AVENUE , SUITE 323
RED BANK, NJ 07701
732.741.3176
ENGENUITYNJ.COM

SITE PLAN
TAX BLOCK 64
LOTS 25.01, 25.02, 26 & 27
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

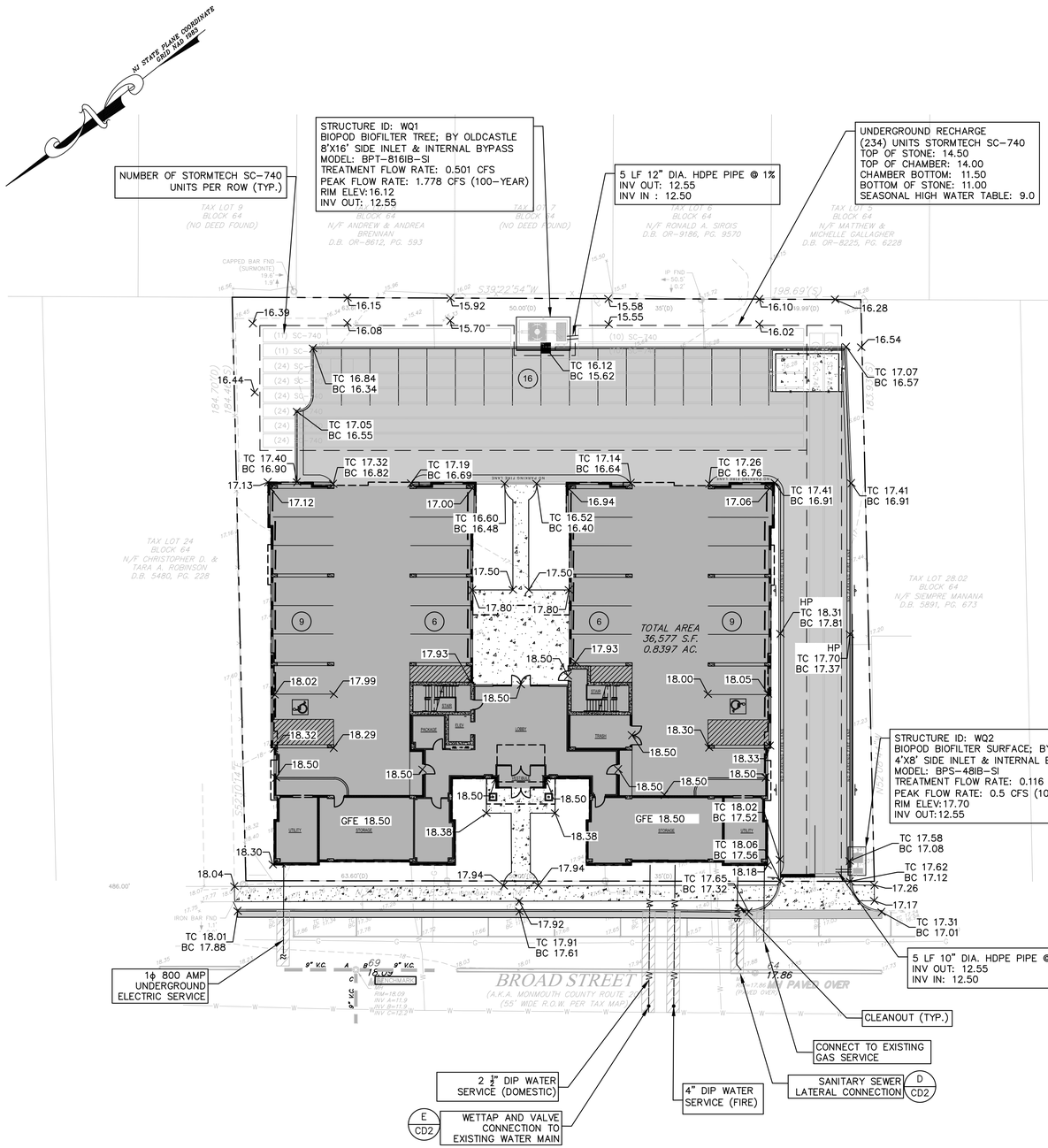
OWNER / DEVELOPER / APPLICANT:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE: (732) 522-0197

JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000
10/25/19
DATE

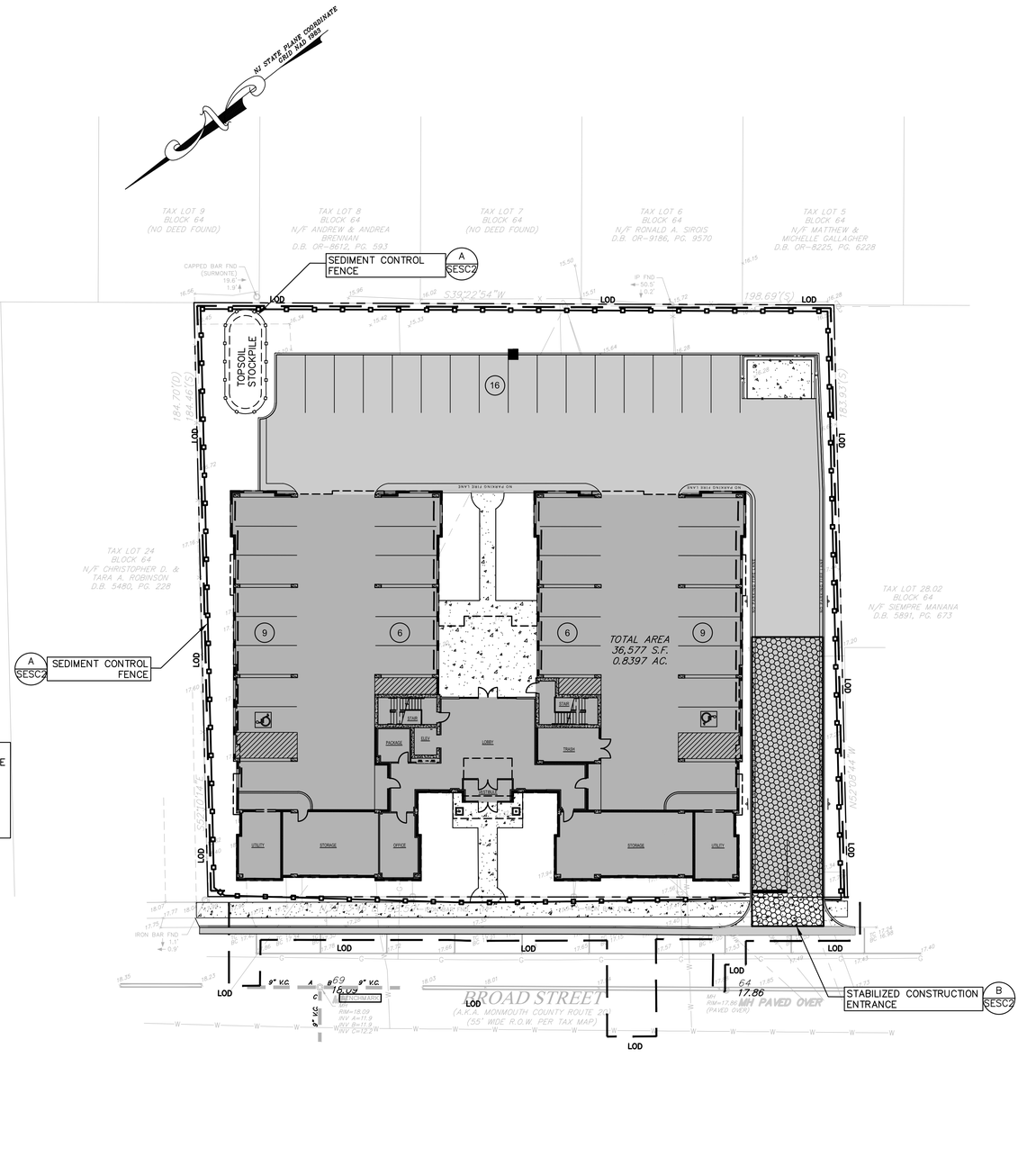
PROJECT NO. SEPE-00020
DRAWING CP-1
SHEET NO. 2 OF10

NOT FOR CONSTRUCTION

FILE NAME: N:\SEPE MANASQUAN APARTMENTS\SEPE-00020 - 33-44 BROAD\PLANS\CP REVISED 4-16-2020.DWG PRASANNA 7/16/2020



GRADING & UTILITY PLAN



SESC PLAN

1" = 20'
10 0 20

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	7/7/20	MJB	JJF	REVISED PLANS AS PER BOARD ENGINEER'S COMMENTS

DESIGNED BY: PAS
DRAWN BY: PAS
SHEET CHK'D BY: JJF
CROSS CHK'D BY:
APPROVED BY:
DATE: OCTOBER 25, 2019

ENGENUITY INFRASTRUCTURE
2 BRIDGE AVENUE , SUITE 323
RED BANK, NJ 07701
732.741.3176
ENGENUITYNJ.COM

GRADING AND SESC PLAN
TAX BLOCK 64
LOTS 25.01, 25.02, 26 & 27
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

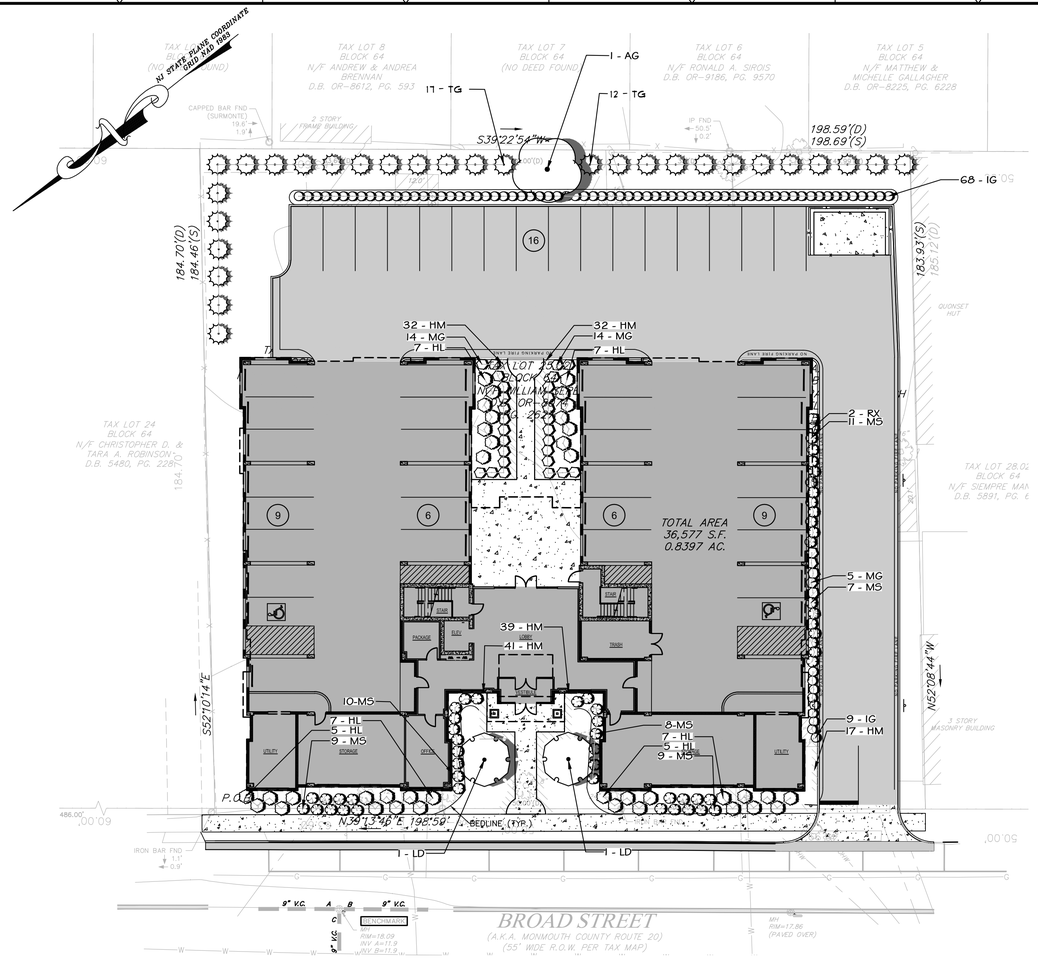
OWNER / DEVELOPER / APPLICANT:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE: (732) 522-0197

JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000
10/25/19
DATE

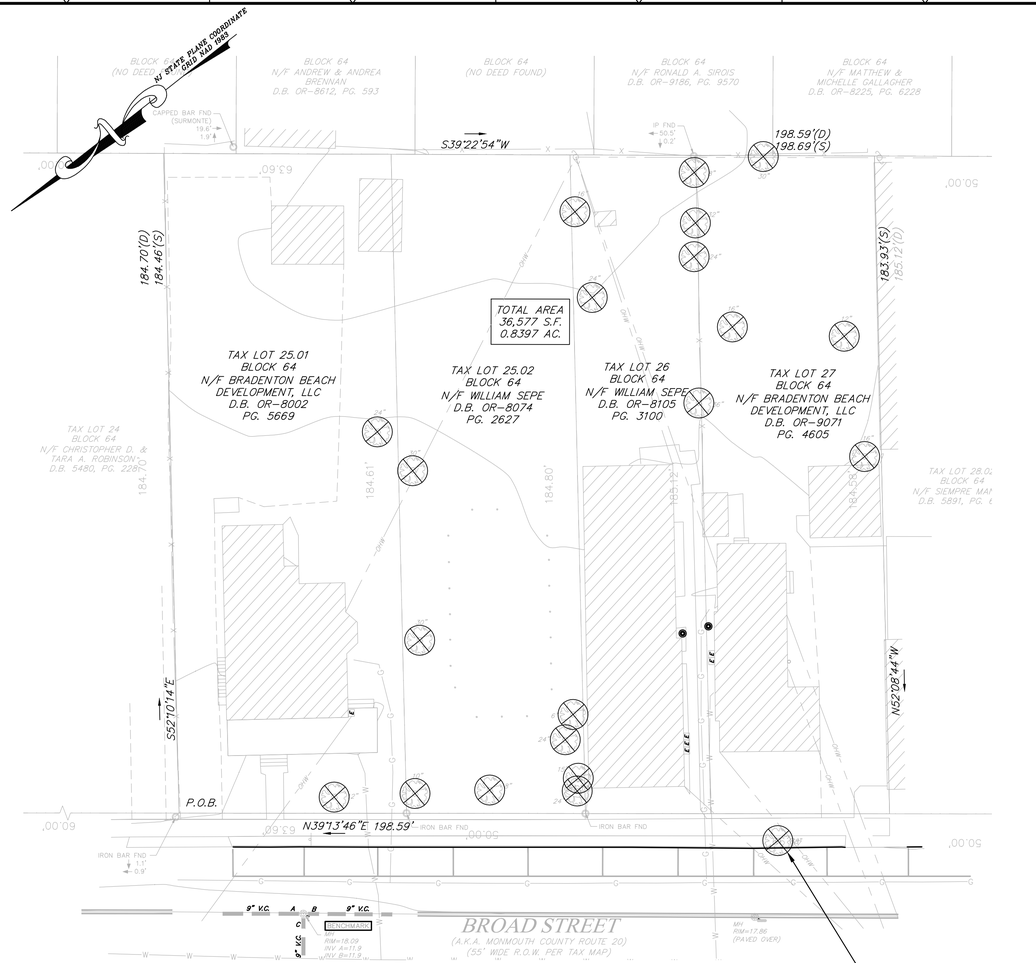
PROJECT NO. SEPE-00020
DRAWING GR/SE-1
SHEET NO. 3 OF 10

NOT FOR CONSTRUCTION

FILE NAME:



LANDSCAPE PLAN



TREE REMOVAL PLAN

PLANT SCHEDULE

TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	CAL.	HT.	ROOT	COMMENTS
	AG	1	Acer rubrum 'October Glory' TM	October Glory Maple	2" – 2 1/2" CAL.		B&B	FULL SPECIMEN
	LD	2	Lagerstroemia indica 'Dallas Red'	Red Crape Myrtle	---	6' – 7' HT.	B&B	FULL SPECIMEN
	TG	29	Thuja occidentalis 'Green Giant'	Green Giant Arborvitae	---	6' – 7' HT.	B&B	FULL TO GROUND
SHRUBS	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER	COMMENTS	
	HL	38	Hydrangea paniculata 'Little Lime'	Little Lime Hydrangea	3 gal.	Pot	3' O.C.	
	IG	68	Ilex glabra 'Shamrock'	Inkberry	2.5' –3'	5 Gal.	3' O.C.	
	MG	33	Miscanthus sinensis 'Gracillimus'	Maiden Grass	3 gal.	Pot	FULL PLANTS	
	MS	54	Miscanthus sinensis 'Morning Light'	Eulalia Grass	3 gal.	Pot	FULL PLANTS	
	RX	2	Rosa x 'Radrazz'	Knock Out Shrub Rose	3 gal.	Pot	3' O.C.	
GROUND COVERS	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER	COMMENTS	SPACING
	HM	161	Hemerocallis x 'Stella de Oro'	Stella de Oro Daylily	2 gal.	Pot	FULL PLANTS	18" O.C.

1" = 20'
10 0 20

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LANDSCAPE AND TREE REMOVAL PLAN
TAX BLOCK 64
LOTS 25.01, 25.02, 26 & 27
BOROUGH OF MANASQUAN
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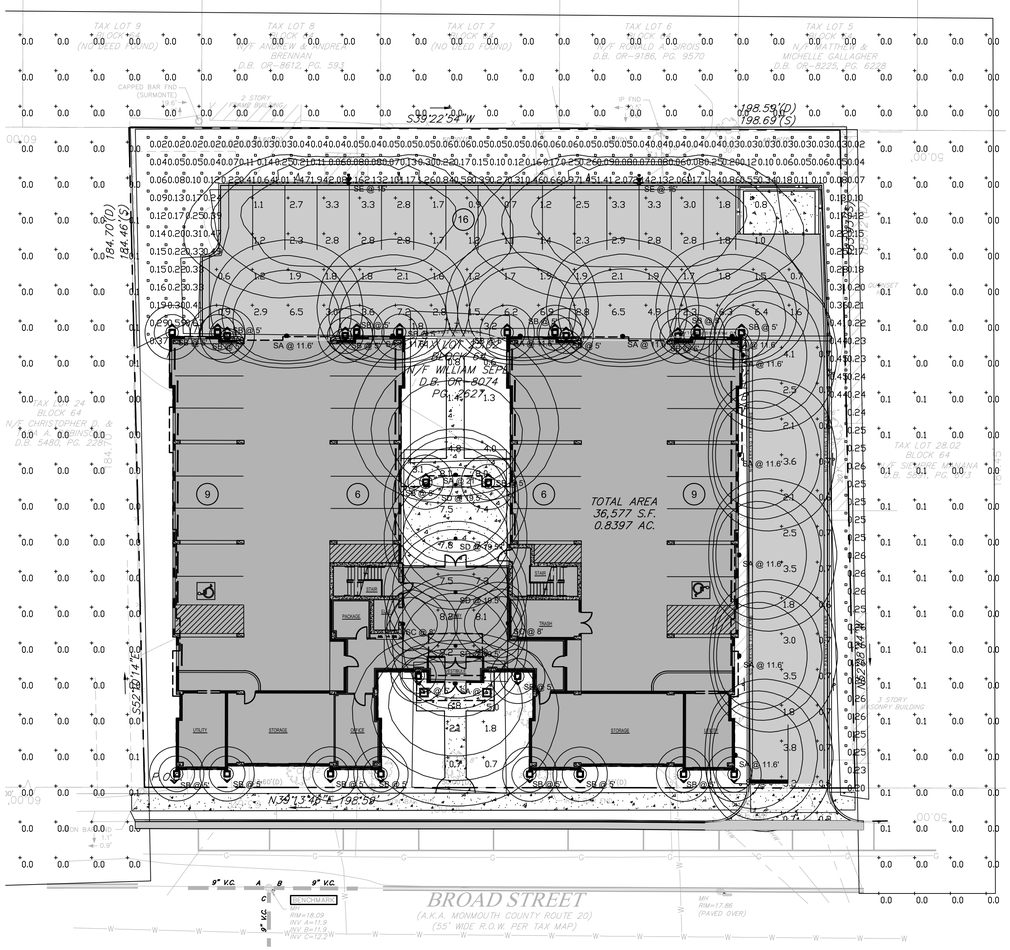
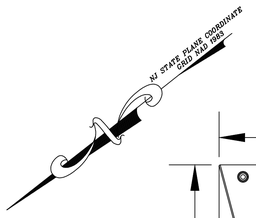
10/25/19
DATE

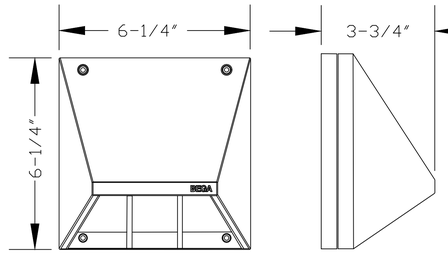
PROJECT NO. SEPE-00020
DRAWING LS-1
SHEET NO. 4 OF 10

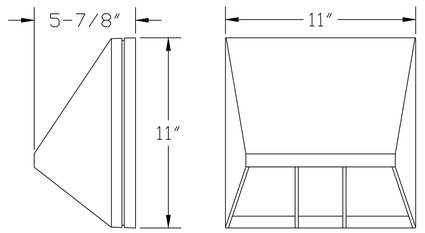
NOT FOR CONSTRUCTION

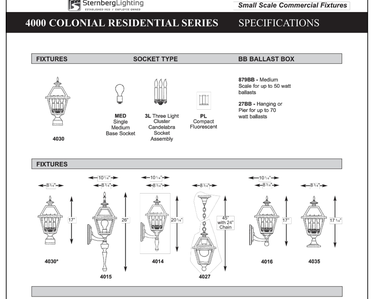
FILE NAME: N:\SEPE MANASQUAN APARTMENTS\SEPE-00020 – 33-44 BROAD\PLANS\CP REVISED 4-16-2020.DWG PRASANNA 7/16/2020

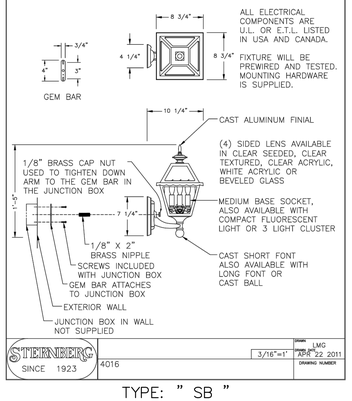


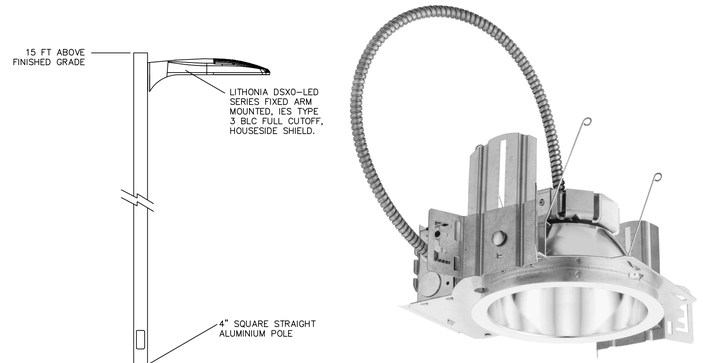












TYPE "SC"
BEGA B22-292 LED 3K FULL CUTOFF
FULL CUTOFF OPTICS

NOTES:
1. LUMINAIRE # 22 260 – SEE SPECIFICATIONS

TYPE "SA"
BEGA B22-292 LED 3K FULL CUTOFF
FULL CUTOFF OPTICS

SternbergLighting
ESTABLISHED 1923 / EMPLOYEE OWNED

Small Scale Commercial Fixtures

4000 COLONIAL RESIDENTIAL SERIES SPECIFICATIONS

FIXTURES **SOCKET TYPE** **BB BALLAST BOX**

4030

MED Single Medium Base Socket

3L Three Light Cluster Candelabra Socket Assembly

PL Compact Fluorescent

879BB - Medium Scale for up to 50 watt ballasts

27BB - Hanging or Pier for up to 70 watt ballasts

FIXTURES

NOTE: 4000 Series requires ballast box.
Add 2" to 4" on extensions for ballast box.
3 Lite cluster is 25 watt max lamp per socket.
*Remote ballast box required if HID or CF.

SternbergLighting
ESTABLISHED 1923 / EMPLOYEE OWNED

555 Lawrence Ave. Roselle, IL 60172 • 847-588-3400 • Fax 847-588-3440
www.sternberglighting.com Email: info@sternberglighting.com 1-14

4016 COLONIAL RESIDENTIAL SERIES

ALL ELECTRICAL COMPONENTS ARE U.L. OR E.T.L. LISTED IN USA AND CANADA.

FIXTURE WILL BE PREWIRED AND TESTED. MOUNTING HARDWARE IS SUPPLIED.

STERNBERG
SINCE 1923
4016
3/16"=1'
DRAWN LMG
DRAWN DATE APR 22 2011
DRAWING NUMBER

TYPE: " SB "

LITHONIA LIGHTING

Catalog Number	
Notes	
Type	

FEATURES & SPECIFICATIONS

INTENDED USE — Typical applications include corridors, lobbies, conference rooms and private offices.

CONSTRUCTION — Galvanized steel mounting/plaster frame; galvanized steel junction box with bottom-hinged access covers and spring latches. Reflectors are retained by torsion springs.

Vertically adjustable mounting brackets with commercial bar hangers provide 3-3/4" total adjustment.

Two combination ½"-3/4" and four ½" knockouts for straight-through conduit runs. Capacity: 8 (4 in, 4 out). No. 12 AWG conductors, rated for 90°C.

Accommodates 12"-24" joist spacing.

Passive cooling thermal management for 25°C standard; high ambient (40°C) option available. Light engine and drivers are accessible from above or below ceiling.

Max ceiling thickness 1-1/2".

OPTICS — LEDs are binned to a 3-step SDCM; 80 CRI minimum.

LED light source concealed with diffusing optical lens.

General illumination lighting with 1.0 S/MH and 55° cutoff to source and source image.

Self-flanged anodized reflectors in specular, semi-specular, or matte diffuse finishes. Also available in white and black painted reflectors.

ELECTRICAL — Multi-volt (120-277V, 50/60Hz) 0-10V dimming drivers mounted to junction box, 10% or 1% minimum dimming level available.

0-10V dimming fixture requires two (2) additional low-voltage wires to be pulled.

70% lumen maintenance at 50,000 hours.

LISTINGS — Certified to US and Canadian safety standards. Damp location standard (wet location, covered ceiling optional). ENERGY STAR® certified product.

WARRANTY — 5-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.
All values are design or typical values, measured under laboratory conditions at 25 °C.
Specifications subject to change without notice.

LDN6

6" OPEN and WALLWASH LED
Non-IC
New Construction Downlight

A+ Capable options indicated by this color background.

ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Example: LDN6 35/15 LO6AR LSS MVOLT EZ10

LDN6					
Series	**Color temperature**	**Lumens**[1]		**Aperture/Trim Color**	**Finish**	**Voltage**
LDN6 6" round	27/ 2700K 30/ 3000K 35/ 3500K 40/ 4000K 50/ 5000K	05 500 lumens 10 1000 lumens 15 1500 lumens 20 2000 lumens	25 2500 lumens 30 3000 lumens 40 4000 lumens 50 5000 lumens	LO6 Downlight LW6 Wallwash	AR Clear WR[1] White BR[1] Black	LSS Semi-specular LD Matte diffuse LS Specular	MVOLT Multi-volt 120 120V 277 277V 347[1] 347V

Driver **Options**

TYPE: " SD "

TYPE: " SE "
N.T.S.

1" = 20'
10 0 20

LIGHTING PLAN

Statistics: BROAD ST REV 5 7-1-20						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
CENTER SIDEWALK 1	+	2.9 fc	6.8 fc	0.7 fc	9.7:1	4.1:1
CENTER SIDEWALK 2	+	2.3 fc	4.8 fc	0.6 fc	8.0:1	3.8:1
DRIVEWAY	+	1.7 fc	4.1 fc	0.3 fc	13.7:1	5.7:1
OFF SITE	+	0.0 fc	0.1 fc	0.0 fc	N/A	N/A
REAR ARKING	+	2.6 fc	7.1 fc	0.6 fc	11.8:1	4.3:1
UNDER CANOPY	+	8.0 fc	9.2 fc	7.3 fc	1.3:1	1.1:1

Schedule: MANASQUAN SITE BROAD ST., REV 5 7-1-2020 LLG/DMC																
Symbol	Label	Image	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage	Efficiency	Distribution	Polar Plot	Notes
	SA		11	BEGA USA.	1DW/22 260 3K-MV-COLOR	22260	LED 29.8W	1	22260.IES	3557	0.9	34	100%		Max: 2644cd	
	SB		24	STERNBERG LTG	1DW/4016-CSA-MED INC-COLOR WLL MOUNTED 5FT AFG			1	G5.IES	700	0.9	20	78%		Max: 936cd	
	SC		2	BEGA	1DW/22 292 3K-MV-COLOR	22292	LED 7.9W	1	22292.ies	617	0.9	7.9	100%		Max: 516cd	
	SD		4	Lithonia Lighting	1DR/LDN6 30/30 LO6AR LSS/WL	6IN LDN, 3000K, 3000LM, 80CRI, CLEAR, SEMI-SPECULAR REFLECTOR	LED	1	LDN6_30_30_LO6AR_LSS.ies	2785	0.9	34.69	100%	DIRECT, SC-0=1.02, SC-90=1.03	Max: 2890cd	
	SE		2	Lithonia Lighting	1D/DSX0 LED P2 30K BLC MVOLT-COLOR-R12-5G-COLOR-3FT PEDESTAL	DSX0 LED P2 30K BLC MVOLT	LED	1	DSX0_LED_P2_30K_BLC_MVOLT.ies	4572	0.9	49	100%	TYPE III, SHORT, BUG RATING: B1 - U0 - G1	Max: 3263cd	

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	7/7/20	PAS	JJF	REVISED PLANS AS PER BOARD ENGINEER'S COMMENTS

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DATE: OCTOBER 25, 2019

ENGENUITY
INFRASTRUCTURE

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2 BRIDGE AVENUE , SUITE 323
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LIGHTING PLAN
TAX BLOCK 64
LOTS 25.01, 25.02, 26 & 27
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

OWNER / DEVELOPER / APPLICANT:
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126 MAIN STREET
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PHONE: (732) 522-0197

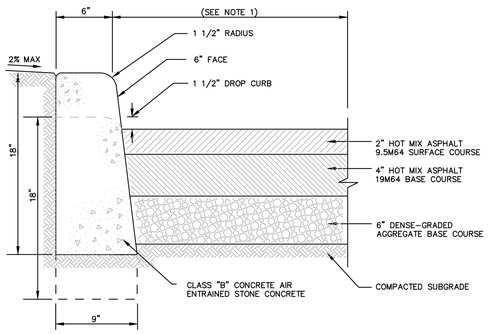
JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
10/25/19
DATE
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000

PROJECT NO. SEPE-00020
DRAWING
LI-1
SHEET NO.
5 OF 10

FILE NAME: N:\SEPE MANASQUAN APARTMENTS\SEPE-00020 – 33-44 BROAD\PLANS\CP REVISED 4-16-2020.DWG PRASANNA 7/16/2020

NOT FOR CONSTRUCTION

ENGENUITY INFRASTRUCTURE AND ARE NOT TO BE USED, IN WHOLE OR PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF ENGENUITY INFRASTRUCTURE.



NOTE: 1) IN AREAS WHERE EXISTING PAVEMENT IS TO REMAIN, A 2' WIDE PAVEMENT REPAIR STRIP SHALL BE CONSTRUCTED ALONG PROPOSED CURB. THE FOLLOWING ITEMS OF WORK WITHIN THE REPAIR STRIP ARE INCLUDED UNDER 9" x 18" CONCRETE VERTICAL CURB:

- SAWCUT
- CONCRETE CURING AND SEALING COMPOUND
- EXCAVATION, UNCLASSIFIED
- BACKFILL MATERIAL
- COMPACTED SUBGRADE
- DENSE-GRADED AGGREGATE BASE COURSE
- HOT MIX ASPHALT 19M64 BASE COURSE - REMOVAL OF MONOLITHIC CONCRETE CURB AND GUTTER (IF REQUIRED)

2) CURB DEPTH SHALL BE MAINTAINED AT DROP CURBS.

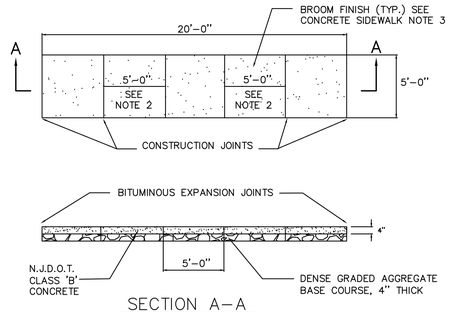
3) 4" THICK, COARSE AGGREGATE SIZE NO. 57 SHALL BE CONSTRUCTED UNDERNEATH PROPOSED CURB IN WET FIELD CONDITIONS AS DIRECTED BY ENGINEER.

4) TOP OF CURB SHALL NOT BE SET HIGHER THAN ADJACENT EXISTING OR PROPOSED SIDEWALK UNDER ANY CONDITION.

5) ALL CONCRETE SURFACES SHALL BE TREATED WITH A CONCRETE CURING AND SEALING COMPOUND.

9"X18" CONCRETE VERTICAL CURB

DETAIL A / CD1 — NTS



SECTION A–A

CONCRETE SIDEWALK NOTES:

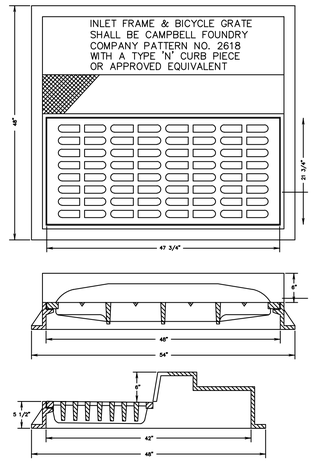
1. A PREFORMED, BITUMINOUS EXPANSION JOINT ½" THICK, 5" WIDE, AND EXTENDING THE FULL WIDTH OF THE WALK, UNBROKEN, SHALL BE INSTALLED EVERY TWENTY (20) FEET.
2. CONSTRUCTION JOINTS SHALL BE INSTALLED EVERY FIVE (5) FEET THE FULL WALK WIDTH. HOWEVER, WHERE SIDEWALK IS DISTINCTLY WIDER THAN 5 FEET, THE JOINT SPACING IS TO BE INCREASED TO PROVIDE APPROXIMATELY SQUARE CONCRETE SIDEWALK FLAGS BETWEEN JOINTS. CONSTRUCTION AND EXPANSION JOINT SPACING WHERE SIDEWALK ABUTS THE EXISTING SIDEWALK IN THE COUNTY RIGHT-OF-WAY SHALL MATCH THE EXISTING JOINT SPACING.
3. THERE SHALL BE A BROOM FINISH WITH THE EDGES FINISHED WITH A SUITABLE TOOL. CONCRETE FINISHING WHERE THE SIDEWALK ABUTS THE EXISTING SIDEWALK IN THE COUNTY RIGHT-OF-WAY SHALL MATCH THE EXISTING CONCRETE FINISHING.
4. CONCRETE SIDEWALK THAT ABUT BUILDINGS SHALL PROVIDE A 6" TO 8" THICK HAUNCH FOR A WIDTH OF 6" TO 8".
5. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, CONSTRUCTION WHICH DOES NOT CONFORM TO THE TOLERANCES SPECIFIED (IE. WHICH EXCEEDS THE MAXIMUM OR IS LESS THAN THE MINIMUM) WILL BE REMOVED AND REPLACED WITHOUT COST TO THE OWNER.
6. CONCRETE FOR CURBS, SIDEWALKS, CURB RAMPS AND MONOLITHIC CURB RAMP CRADLES SHALL BE NJDOT CLASS B.
7. EXPANSION JOINTS WITH PREFORMED EXPANSION JOINT FILLER FOR CONCRETE (BITUMINOUS TYPE), SHALL BE PROVIDED AS FOLLOWS.

   3.1 ½" THICK AT LONGITUDINAL INTERVALS OF APPROXIMATELY TWENTY FEET (20') AND BETWEEN ALL SIDEWALK CURB RAMPS AND MONOLITHIC CURB RAMP CRADLES.

   3.2 ½" THICK BETWEEN CURB AND SIDEWALK, AROUND ALL STRUCTURES OR APPURTENANCES, SUCH AS MANHOLES, JUNCTION BOXES AND UTILITY POLES, AND ADJACENT TO ANY FIXED STRUCTURE.
8. EXPANSION JOINT MATERIAL SHALL BE TRIMMED AS TO BE SLIGHTLY BELOW THE SURFACE OF THE CONCRETE.
9. JOINT SEALER WHERE SHOWN OR REQUIRED SHALL CONFORM TO NJDOT SPECIFICATION 914. HOT-POURED JOINT SEALER SHALL CONFORM TO ASTM D 6690. COLD-APPLIED JOINT SEALER SHALL CONFORM TO ASTM D 5893, TYPE SL OR TYPE NS.
10. TOOLED JOINTS SHALL BE PROVIDED WITH A GROOVING TOOL SO AS TO DIVIDE THE CONCRETE SURFACE INTO BLOCKS AS CLOSELY APPROACHING A SQUARE AS PRACTICABLE. GROOVES SHALL BE CUT TO A DEPTH OF AT LEAST ¼ INCH AND SHALL BE FINISHED WITH AN EDGING TOOL HAVING A RADIUS OF ¼ INCH.
11. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, EXPANSION AND TOOLED JOINTS IN CONCRETE SURFACES SHALL BE ALIGNED WITH JOINTS IN CURBS.
12. PUBLIC SIDEWALK CURB RAMPS, TURNING SPACES, BLENDED TRANSITIONS AND CLEAR SPACES WITHIN THE PEDESTRIAN ACCESS ROUTE SHALL NOT CONTAIN GRATINGS, COVERS, UTILITY BOXES OR SIMILAR OBSTRUCTION. OUTSIDE OF THE ABOVE AREAS, GRATINGS IN PUBLIC SIDEWALKS MAY HAVE OPENINGS NO GREATER THAN ½ INCH WIDE MEASURED PARALLEL TO DIRECTION OF TRAVEL.

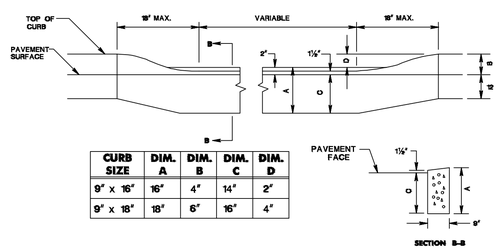
CONCRETE SIDEWALK

DETAIL D / CD1 — NTS

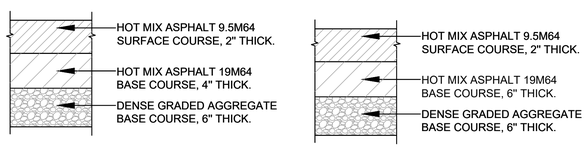


TYPE 'B' INLET FRAME

DETAIL B / CD1 — NTS

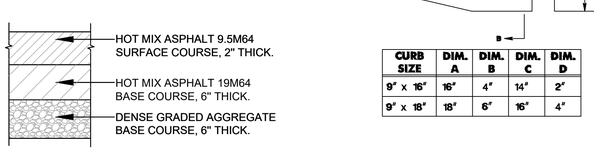


CURB SIZE	DIM. A	DIM. B	DIM. C	DIM. D
9" x 16"	16"	4"	14"	2"
9" x 18"	18"	6"	16"	4"



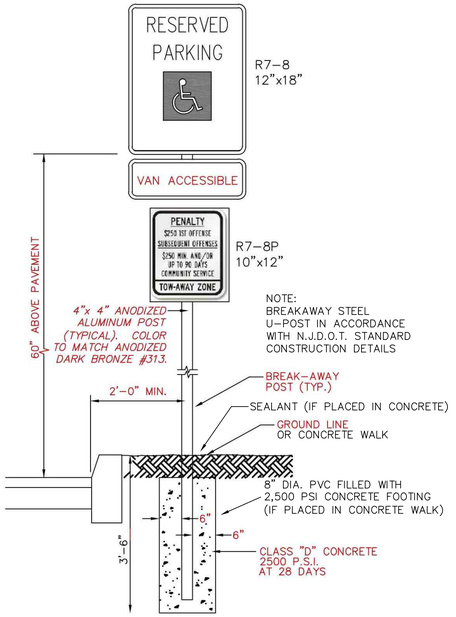
PAVEMENT REPAIR DETAIL

HOT MIX ASPHALT DETAIL C1 / CD1 — NTS



MONMOUTH COUNTY PAVEMENT REPAIR DETAIL

HOT MIX ASPHALT DETAIL C2 / CD1 — NTS



NOTE: ALL TRAFFIC CONTROL SIGNAGE TO BE PER MUTCD.

GENERAL NOTES – SIGN POSTS:

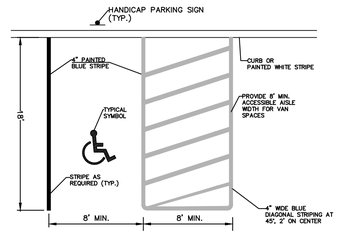
1. ALL POSTS TO BE OF ADEQUATE LENGTH TO MEET THE REQUIREMENTS FOR ERECTION AS STATED IN THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AND AS INDICATED BELOW.
2. ALL SMALL SIGN SUPPORTS TO BE OF THE BREAKAWAY TYPE WITH EXCEPTION OF THOSE INSTALLED BEHIND GUIDE RAIL OR OTHER ROADSIDE BARRIER.
3. ALL STEEL POSTS AND BRACKETS TO BE CUT, BENT, AND HOLES PUNCHED AND DRILLED BEFORE GALVANIZING. GALVINIZING TO BE ACCORDING TO ASTM A123.
4. ALL STEEL U-POST SIGN SUPPORTS MUST BE INSTALLED FACING THE PREDOMINANT TRAFFIC FLOW. USE A MOUNTING BRACKET ON SIDE MOUNTED SIGNS SUCH AS "ONE WAY" SIGNS INSTALLED IN MEDIANS.
5. SIGN PANEL SIZES ARE TO DETERMINE POST TYPE AND NUMBER AS SHOWN ON THIS DETAIL.
6. BOLTS ARE NOT TO PROTRUDE MORE THAN 3/4" BEYOND THE NUT WHEN TIGHT, BUT ARE TO ENGAGE ALL THREADS IN THE NUT.
7. WHEN SIGNS ARE INSTALLED ON SLOPES 10H:1V OR FLATTER, THE MINIMUM VERTICAL CLEARANCE REQUIREMENTS FOR SIGNS ARE:

   FOR SINGLE POST INSTALLATIONS – THE MINIMUM DISTANCE BETWEEN THE EDGE OF THE PAVEMENT AND THE BOTTOM OF ANY PANEL MUST BE 7 FEET, AND THE MINIMUM DISTANCE FROM EDGE OF PAVEMENT TO THE TOP OF ANY SIGN PANEL MUST BE 9 FEET.

   WHERE GRADING OF 110H:1V OR FLATTER CANNOT BE OBTAINED, OR WHERE CURB OR BERM IS GREATER THAN 4 INCHES, THE MINIMUM VERTICAL CLEARANCE WILL BE MEASURED FROM THE GROUND LINE TO THE BOTTOM OF THE SIGN.
8. THE HORIZONTAL OFFSET FROM EDGE OF PAVEMENT TO EDGE OF SIGN IS DERIVED FROM SECTION 2A.19 OF THE MUTCD.
9. EXTRUDED ALUMINUM SIGN PANELS ARE NOT PERMITTED FOR USE WITH STEEL U-POST SIGN SUPPORTS.

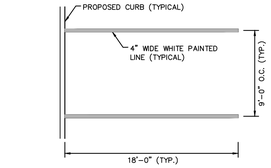
TYPICAL HANDICAP PARKING SIGN

DETAIL I / CD1 — NTS



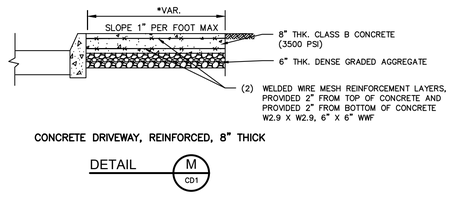
ACCESSIBLE PARKING STALL STRIP

DETAIL K / CD1



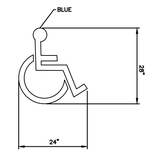
90° PARKING STALL

DETAIL L / CD1



CONCRETE DRIVEWAY, REINFORCED, 8" THICK

DETAIL M / CD1



STROKE WIDTH: MINIMUM/STANDARD = 3"

ADA SYMBOL

DETAIL F / CD1 — NTS

NO PARKING FIRE LANE

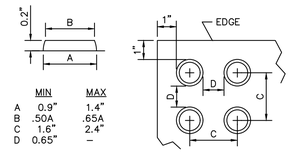
12" x 18" (1.5 S.F.)

NOTES:

1. SIGN SHALL BE WHITE WITH RED TEXT AND BORDER

NO PARKING FIRE LANE SIGN

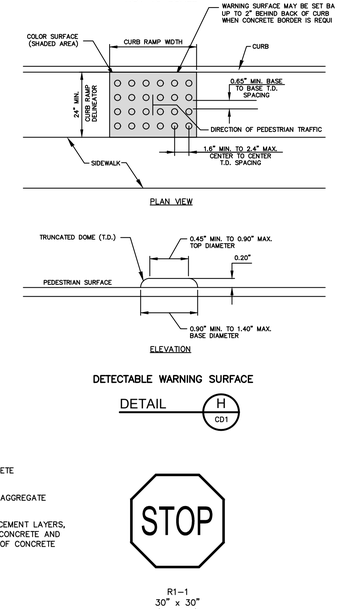
DETAIL J / CD-1 — NTS



DETAIL – DETECTABLE WARNING

(SEE GENERAL NOTE 11)

NOT TO SCALE



DETECTABLE WARNING SURFACE

DETAIL H / CD1

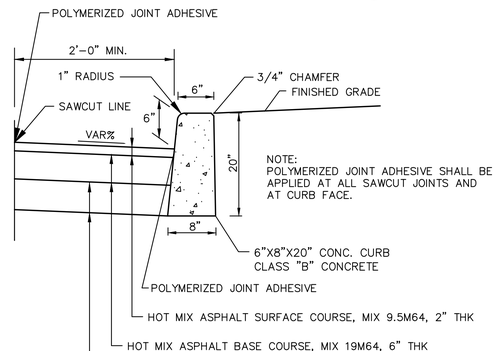
R1-1
30" x 30"
(5.5 S.F.)

GENERAL NOTES – SIGNS:

1. DIMENSIONS, COLORS, AND DETAILS OF SIGNS AND SYMBOLS TO FOLLOW STANDARDS IN THE CURRENT "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".
2. ALL SIGNS TO BE ASTM D 4956 TYPE III SHEETING.

SIGN

DETAIL G / CD1 — NTS



MONMOUTH COUNTY CURB AND PAVEMENT REPAIR

DETAIL K / CD1 — NTS

CONSTRUCTION DETIALS

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	7/7/20	PAS	JJF	REVISED PLANS AS PER BOARD ENGINEER'S COMMENTS

DESIGNED BY: PAS
DRAWN BY: PAS
SHEET CHK'D BY: JJF
CROSS CHK'D BY:
APPROVED BY:
DATE: OCTOBER 25, 2019

ENGENUITY INFRASTRUCTURE

ENGENUITY INFRASTRUCTURE
2 BRIDGE AVENUE , SUITE 323
RED BANK, NJ 07701
732.741.3176
ENGENUITYNJ.COM

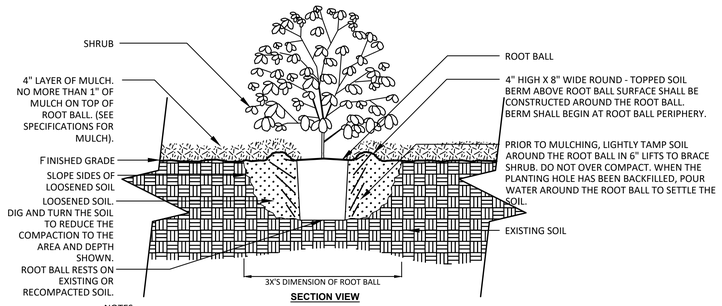
CONSTRUCTION DETAILS PLAN-1
TAX BLOCK 64
LOTS 25.01, 25.02, 26 & 27
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

OWNER / DEVELOPER / APPLICANT:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE: (732) 522-0197

JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000
10/25/19
DATE

PROJECT NO. SEPE-00020
DRAWING CD-1
SHEET NO. 6 OF 10

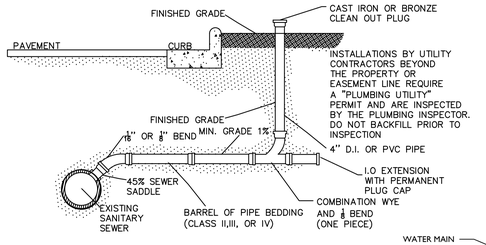
NOT FOR CONSTRUCTION



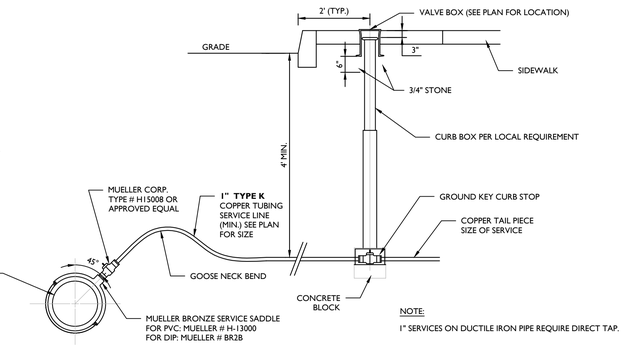
SECTION VIEW

NOTES:
1. SHRUBS SHALL BE OF QUALITY PRESCRIBED IN THE ROOT OBSERVATIONS DETAIL AND SPECIFICATIONS.
2. SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS RELATED TO THIS DETAIL.

SHRUB PLANTING
DETAIL A CD2 — NTS

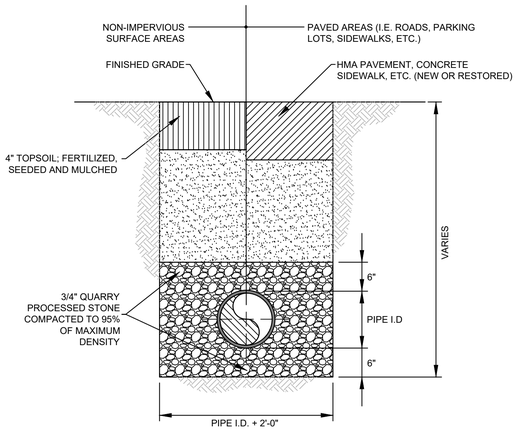


SANITARY SEWER LATERAL CONNECTION
DETAIL D CD2 — NTS

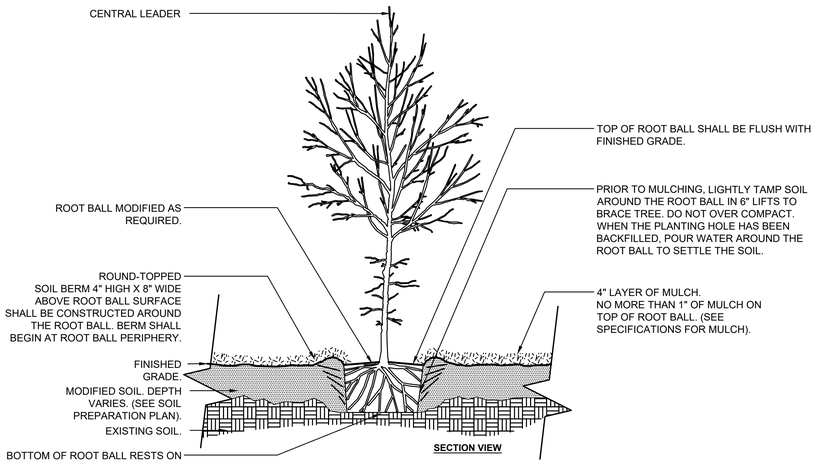


NOTE:
1" SERVICES ON DUCTILE IRON PIPE REQUIRE DIRECT TAP.

WATER SERVICE CONNECTION
DETAIL E CD2 — NTS

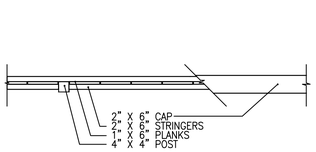


PVC PIPE BEDDING
DETAIL G CD2 — NTS



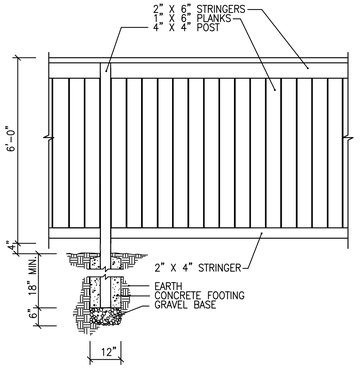
SECTION VIEW

TREE PLANTING
DETAIL B CD2 — NTS

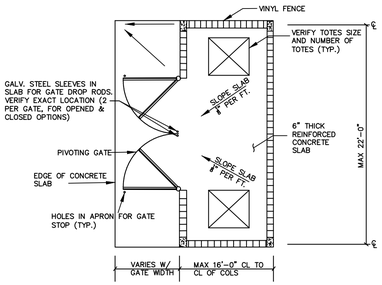


TOP VIEW

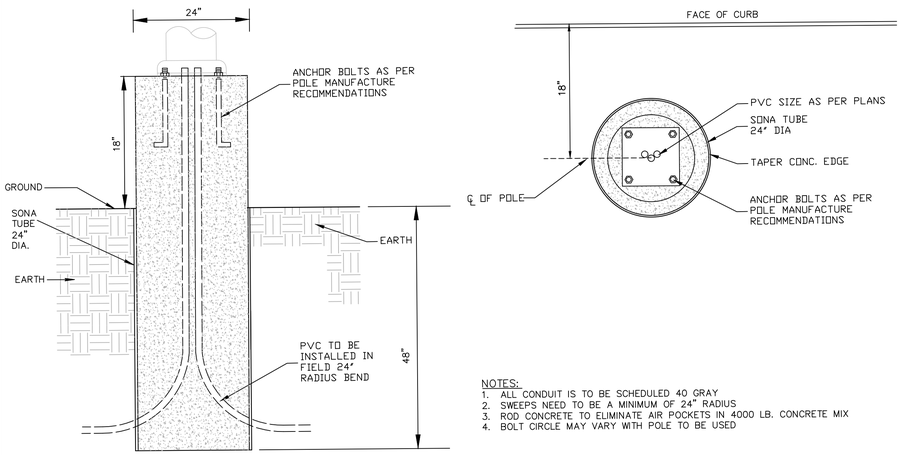
NOTES:
- ALL NAILS AND HARDWARE TO BE HOT DIPPED GALVANIZED
- POSTS TO BE WOLMANIZED PINE GRADE C OR BETTER
- STRINGERS AND PLANKS TO BE WESTERN RED CEDAR #1



PRIVACY FENCE
DETAIL C CD2 — NTS

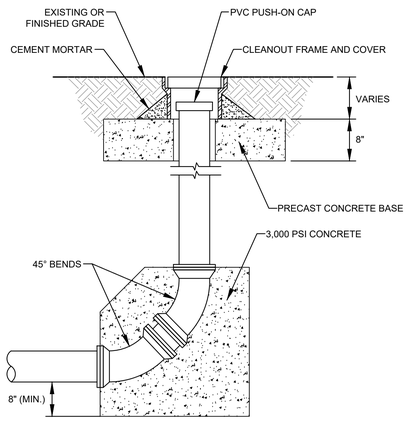


TRASH ENCLOSURE
DETAIL J CD2 — NTS

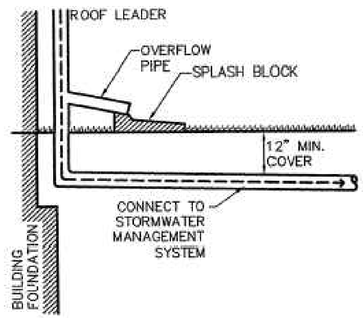


NOTES:
1. ALL CONDUIT IS TO BE SCHEDULED 40 GRAY
2. SWEEPS NEED TO BE A MINIMUM OF 24" RADIUS
3. ROD CONCRETE TO ELIMINATE AIR POCKETS IN 4000 LB. CONCRETE MIX
4. BOLT CIRCLE MAY VARY WITH POLE TO BE USED

POURED CONCRETE LIGHT FOUNDATION
DETAIL I CD2 — NTS



CLEANOUT
DETAIL F CD2 — NTS



ROOF LEADER DETAIL
DETAIL K CD2 — NTS

CONSTRUCTION DETIALS

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	7/7/20	PAS	JJF	REVISED PLANS AS PER BOARD ENGINEER'S COMMENTS

DESIGNED BY: PAS
DRAWN BY: PAS
SHEET CHK'D BY: JJF
CROSS CHK'D BY:
APPROVED BY:
DATE: OCTOBER 25, 2019

ENGENUITY INFRASTRUCTURE

ENGENUITY INFRASTRUCTURE
2 BRIDGE AVENUE , SUITE 323
RED BANK, NJ 07701
732.741.3176
ENGENUITYNJ.COM

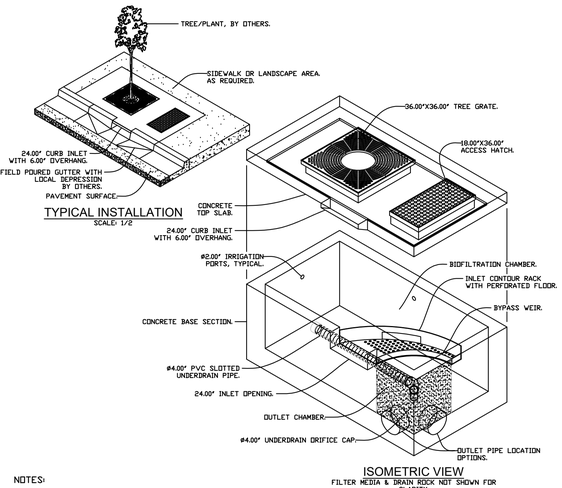
CONSTRUCTION DETAILS PLAN-2
TAX BLOCK 64
LOTS 25.01, 25.02, 26 & 27
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

OWNER / DEVELOPER / APPLICANT:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE: (732) 522-0197

JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000
10/25/19
DATE

PROJECT NO. SEPE-00020
DRAWING CD-2
SHEET NO. 7 OF 10

NOT FOR CONSTRUCTION



TYPICAL INSTALLATION
SCALE: 1/2

ISOMETRIC VIEW
FILTER MEDIA & DRAIN ROCK NOT SHOWN FOR CLARITY.

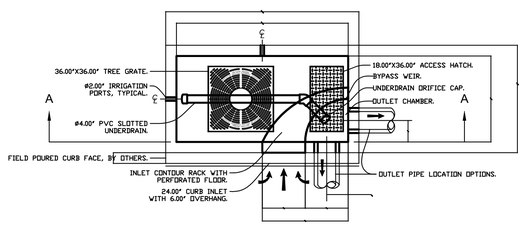
NOTES:

1. RIGHT CONFIGURATION SHOWN, MIRROR LEFT CONFIGURATION OF INLET RACK AND BYPASS WEIR IS AVAILABLE
   TO ACCOMMODATE OTHER OUTLET PIPE LOCATIONS.
2. STANDARD UNITS CAN ACCOMMODATE UP TO A 15 INCH DIAMETER RCP OUTLET PIPE.
3. SEPARATE BYPASS STRUCTURE IS REQUIRED IF PEAK FLOW RATE EXCEEDS 2.0 CFS INTERNAL BYPASS CAPACITY.
4. 18"X36' DIAMOND PLATE ACCESS HATCH STANDARD, SLIP RESISTANT OPTION AVAILABLE.
5. CONTACT OLDCASTLE® INFRASTRUCTURE FOR ENGINEERING ASSISTANCE AND DETAIL DRAWINGS.
6. CONCRETE COMPONENTS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C890 & C913.
7. VEGETATION BY OTHERS. CUSTOMER TO SPECIFY. INSTALLED AT TIME OF ACTIVATION. THE OWNER IS RESPONSIBLE FOR THE SURVIVAL OF THE VEGETATION AND MUST MAINTAIN AS NECESSARY.

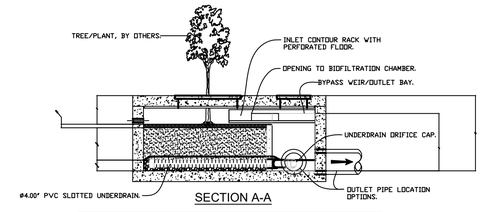
Bioretention/ Biofiltration

Oldcastle® INFRASTRUCTURE
PH: 800.579.8819 | oldcastlestormwater.com

DRAWING NO.	REV	ECO	DATE
BPT-IB-SI	A	ECO-0155	JPR 6/12/18 SHEET 1 OF 2



PLAN VIEW



SECTION A-A

MODEL	VAULT SIZE [1] (ID)		VAULT FOOTPRINT [1] (OD)		TREATMENT FLOW CAPACITY [2] (GPM/CFS)	TREATMENT FLOW CAPACITY [3] (GPM/CFS)
	A DIM	B DIM	A1 DIM	B1 DIM		
BPT-4IB-SI	4'	6'	5'	7'	33.4 / 0.074	37.5 / 0.084
BPT-4IB-SI	4'	8'	5'	9'	46.2 / 0.103	51.9 / 0.116
BPT-412IB-SI	4'	12'	5'	13'	71.8 / 0.160	80.7 / 0.180
BPT-6IB-SI	6'	6'	7'	7'	52.6 / 0.117	59.1 / 0.132
BPT-6IB-SI	6'	8'	7'	9'	71.8 / 0.160	80.7 / 0.180
BPT-612IB-SI	6'	12'	7'	13'	110.2 / 0.245	123.9 / 0.276
BPT-8IB-SI	8'	12'	9'	13'	148.5 / 0.331	167.0 / 0.372
BPT-816IB-SI	8'	16'	9'	17'	199.8 / 0.445	224.7 / 0.501

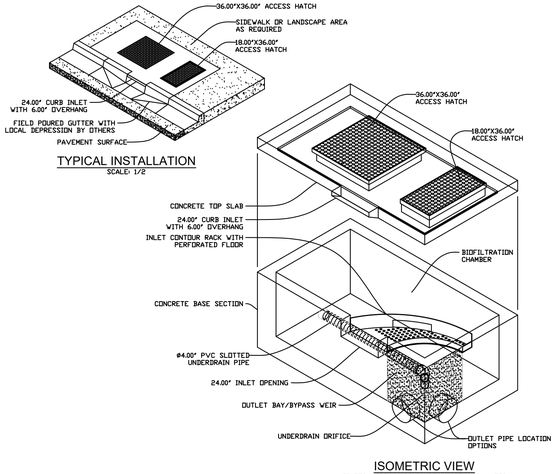
1. All Dimensions Are Nominal
2. Based on an WA Ecology GULD Approval for Basic, Enhanced & Phosphorus.
   At 1.60 gpm/sf Media Surface Area.
3. Based on an NJCAT Verification & NJ DEP Certification. At 1.80 gpm/sf Media Surface Area.

US Patents Pending

Bioretention/ Biofiltration

Oldcastle® INFRASTRUCTURE
PH: 800.579.8819 | oldcastlestormwater.com

DRAWING NO.	REV	ECO	DATE
BPT-IB-SI	A	ECO-0155	JPR 6/12/18 SHEET 2 OF 2



TYPICAL INSTALLATION
SCALE: 1/2

ISOMETRIC VIEW
FILTER MEDIA & DRAIN ROCK NOT SHOWN FOR CLARITY.

NOTES:

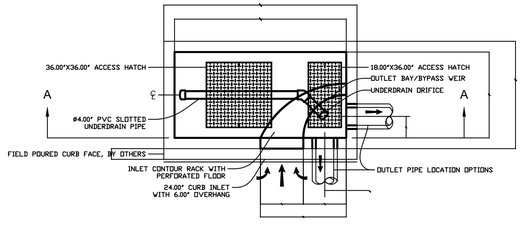
1. RIGHT CONFIGURATION SHOWN, MIRROR LEFT CONFIGURATION OF INLET RACK AND BYPASS WEIR IS AVAILABLE
   TO ACCOMMODATE OTHER OUTLET PIPE LOCATIONS.
2. STANDARD UNITS CAN ACCOMMODATE UP TO A 15 INCH DIAMETER RCP OUTLET PIPE.
3. SEPARATE BYPASS STRUCTURE IS REQUIRED IF PEAK FLOW RATE EXCEEDS 2.0 CFS INTERNAL BYPASS CAPACITY.
4. DIAMOND PLATE ACCESS HATCH STANDARD, SLIP RESISTANT OPTION AVAILABLE.
5. CONTACT OLDCASTLE INFRASTRUCTURE™ FOR ENGINEERING ASSISTANCE AND DETAIL DRAWINGS.
6. CONCRETE COMPONENTS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C890 & C913.

US Patents Pending

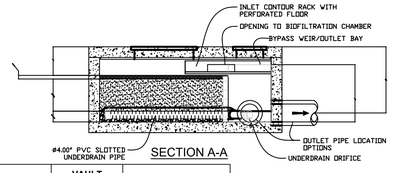
Bioretention/ Biofiltration

Oldcastle Infrastructure™ A CRH COMPANY

DRAWING NO.	REV	ECO	DATE
BPS-IB-SI	D	ECO-0169 CJS 3/6/20	PFS 3/9/20 SHEET 1 OF 2



PLAN VIEW



SECTION A-A

MODEL	VAULT SIZE [1] (ID)		VAULT FOOTPRINT [1] (OD)		TREATMENT FLOW CAPACITY (GPM/CFS)	
	A DIM	B DIM	A1 DIM	B1 DIM	1.6 GPM/SF (WA GULD[2])	1.8 GPM/SF (NJCAT[3])
BPS-4IB-SI	4'	6'	5'	7'	33.4 / 0.074	37.5 / 0.084
BPS-4IB-SI	4'	8'	5'	9'	46.2 / 0.103	51.9 / 0.116
BPS-412IB-SI	4'	12'	5'	13'	71.8 / 0.160	80.7 / 0.180
BPS-6IB-SI	6'	6'	7'	7'	52.6 / 0.117	59.1 / 0.132
BPS-6IB-SI	6'	8'	7'	9'	71.8 / 0.160	80.7 / 0.180
BPS-612IB-SI	6'	12'	7'	13'	110.2 / 0.245	123.9 / 0.276
BPS-812IB-SI	8'	12'	9'	13'	148.5 / 0.331	167.0 / 0.372
BPS-816IB-SI	8'	16'	9'	17'	199.8 / 0.445	224.7 / 0.501

[1] All Dimensions are nominal, ID=Inside Dimension, OD=Outside Dimension.
[2] Treartment flow capacity at 1.6 gpm/sf media surface area based on an WA Ecology GULD Approval for Basic, Enhanced & Phosphorus.
[3] Treatment flow capacity at 1.8 gpm/sf media surface area based on an NJCAT Verification & NJ DEP Certification.

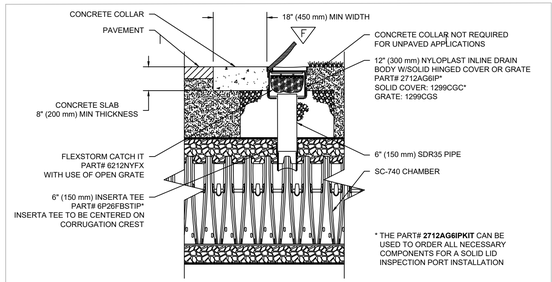
SITE SPECIFIC DATA				
Structure ID				WQ2
Model Size				BPS-4IB-SI
Orientation (Left or Right)				Right
Treatment Flow Rate (cfs)				0.116 cfs
Peak Flow Rate (2 cfs max.)				0.5 cfs
Rim Elevation				17.70
Pipe Data	Pipe Location (Front or Side)	Pipe Size (15" max.)	Pipe Type	Invert Elevation*
Outlet	Side	10 in	HDPE	14.20
* Invert Elevation is 3.5' below Rim Elevation.				
Notes:				

US Patents Pending

Bioretention/ Biofiltration

Oldcastle Infrastructure™ A CRH COMPANY

DRAWING NO.	REV	ECO	DATE
BPS-IB-SI	D	ECO-0169 CJS 3/6/20	PFS 3/9/20 SHEET 2 OF 2



3 SC-740 6" (150 mm) INSPECTION PORT DETAIL

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

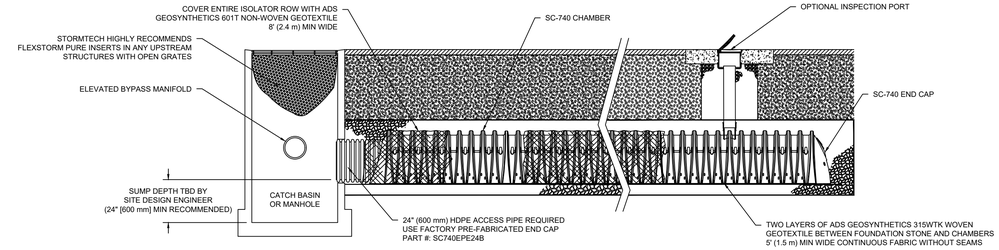
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

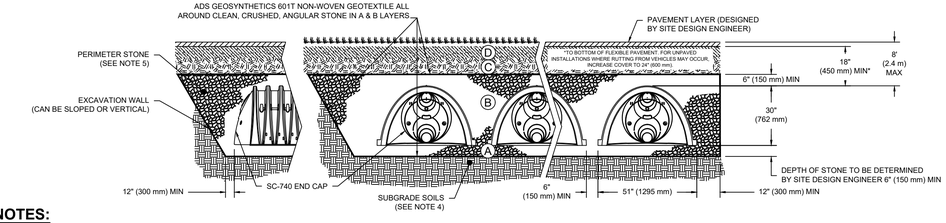


2 SC-740 ISOLATOR ROW DETAIL

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE (B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE (A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
6. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

1 SC-740 CROSS SECTION DETAIL

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	7/7/20	PAS	JJF	REVISED PLANS AS PER BOARD ENGINEER'S COMMENTS

DESIGNED BY: PAS
DRAWN BY: PAS
SHEET CHK'D BY: JJF
CROSS CHK'D BY:
APPROVED BY:
DATE: OCTOBER 25, 2019

ENGENUITY INFRASTRUCTURE

ENGENUITY INFRASTRUCTURE
2 BRIDGE AVENUE , SUITE 323
RED BANK, NJ 07701
732.741.3176
ENGENUITYNJ.COM

CONSTRUCTION DETAILS PLAN-3
TAX BLOCK 64
LOTS 25.01, 25.02, 26 & 27
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

OWNER / DEVELOPER / APPLICANT:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE: (732) 522-0197

JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000
10/25/19
DATE

PROJECT NO. SEPE-00020
DRAWING CD-3
SHEET NO. 8 OF 10

NOT FOR CONSTRUCTION

FILE NAME: N:\SEPE MANASQUAN APARTMENTS\SEPE-00020 – 33-44 BROAD\PLANS\CP REVISED 4-16-2020.DWG PRASANNA 7/16/2020 1:30 PM

STANDARD FOR
TEMPORARY VEGETATIVE COVER FOR SOIL STABILIZATION

Definition

Establishment of temporary vegetative cover on soils exposed for periods of two to 6 months which are not being graded, not under active construction or not scheduled for permanent seeding within 60 days.

Purpose

To temporarily stabilize the soil and reduce damage from wind and water erosion until permanent stabilization is accomplished.

Water Quality Enhancement

Provides temporary protection against the impacts of wind and rain, slows the overland movement of stormwater runoff, increases infiltration and retains soil and nutrients on site, protecting streams or other stormwater conveyances.

Where Applicable

On exposed soils that have the potential for causing off-site environmental damage.

Methods and Materials

I. Site Preparation

A. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and mulch anchoring. All grading should be done in accordance with Standards for Land Grading, p. 19-1.

B. Install needed erosion control practices or facilities such as diversions, grade stabilization structures, channel stabilization measures, sediment basins, and water-ways. See Standards 11 through 42.

C. Immediately prior to seeding, the surface should be scarified 6" to 12" where there has been soil compaction. This practice is permissible only where there is no danger to underground utilities (cables, irrigation systems, etc.).

II. Seedbed Preparation

A. Apply ground limestone and fertilizer according to soil test recommendations such as offered by Rutgers Co-operative Extension. Soil sample mailers are available from the local Rutgers Cooperative Extension offices. Fertilizer shall be applied at the rate of 500 pounds per acre or 11 pounds per 1,000 square feet of 10-20-10 or equivalent with 50% water insoluble nitrogen unless a soil test indicates otherwise. Apply limestone per soil testing. Calcium carbonate is the equivalent and standard for measuring the ability of liming materials to neutralize soil acidity and supply calcium and magnesium to grasses and legumes.

B. Work lime and fertilizer into the soil as nearly as practical to a depth of 4 inches with a disc, springtooth harrow, or other suitable equipment. The final harrowing or discing operation should be on the general contour. Continue tillage until a reasonably uniform seedbed is prepared.

C. Inspect seedbed just before seeding. If traffic has left the soil compacted, the area must be retilled as above.

D. Soils high on sulfides or having a pH of 4 or less refer to Standard for Management of High Acid Producing Soils, pg. 1-1.

III. Seeding

A. Select seed from recommendations in Table.

SEED SELECTION	SEEDING RATES 1/ (pounds)		OPTIMUM SEEDING DATE 2/ Based on Plant Hardiness Zone 3/			OPTIMUM SEED DEPTH 4/ (inches)
	Per Acre	Per 1,000 Sq. Ft.	ZONE 5	ZONE 6	ZONE 7	
COOL SEASON GRASSES						
Perennial ryegrass	100	1.0	3/15-6/1 8/1-9/15	3/1-5/15 8/15-10/1	2/15-5/1 8/15-10/15	0.5
Spring Oats	86	2.0	3/15-6/1 8/1-9/15	3/1-5/15 8/15-10/1	2/15-5/1 8/15-10/15	1.0
Winter Barley	96	2.2	8/1-9/15	8/15-10/1	8/15-10/15	1.0
Annual ryegrass	100	1.0	3/15-6/1 8/1-9/15	3/1-6/1 8/1-9/15	2/15-5/1 8/15-10/15	0.5
Winter Cereal Rye	112	2. 8	8/1-11/1	8/1-11/15	8/1-12/15	1.0
WARM SEASON GRASSES						
Pearl millet	20	0.5	6/1-8/1	5/15-8/15	5/1-9/1	1.0
Millet (German or Hungarian)	30	0.7	6/1-8/1	5/15-8/15	5/1-9/1	1.0

1. Seeding rate for warm season grass, shall be adjusted to reflect the amount of Pure Line Seed (PLS) as determined by a germination test result. No adjustment is required for cool season grasses.
2. May be planted throughout summer if soil moisture is adequate or can be irrigated
3. Plant Hardiness Zone (see below)
4. Twice the depth for sandy soils

Zone 5b (-10 to -15) Portions of Sussex and Warren Counties

Zone 6a (-5 to -10) Portions of Sussex, Warren, Passaic, Morris, Somerset and Hunterdon counties.

Zone 6b (0 to -5) Portions of Bergen, Camden, Essex and Gloucester, Hunterdon, Mercer, Middlesex, Hudson, Monmouth, Ocean, Burington, Morris, Passaic, Somerset, Union, Atlantic, Cumberland, and Cape May counties.

Zone 7a (5 to 0) Portions of Camden, Gloucester, Salem, Cumberland, Cape May, Atlantic, Burlington, Ocean, and Monmouth counties.

Zone 7b (10 to 5) Portions of Cape May, Atlantic, Ocean and Monmouth counties.

B. Conventional Seeding - Apply seed uniformly by hand, cyclone (centrifugal) seeder, drop seeder, drill or cultipacker seeder. Except for drilled, hydroseeded or cultipacked seedings, seed shall be incorporated into the soil, to a depth of 1/4 to 1/2 inch, by raking or dragging. Depth of seed placement may be 1/4 inch deeper on coarse textured soil.

C. Hydroseeding is a broadcast seeding method usually involving a truck or trailer mounted tank, with an agitation system and hydraulic pump for mixing seed, water and fertilizer and spraying the mix onto the prepared seedbed. Mulch shall not be included in the tank with seed. Short fibered mulch may be applied with a hydroseeder following seeding. (also see Section IV Mulching) Hydroseeding is not a preferred seeding method because seed and fertilizer are applied to the surface and not incorporated into the soil. Poor seed to soil contact occurs reducing seed germination and growth. Hydroseeding may be used for areas too steep for conventional equipment to traverse or too obstructed with rocks, stumps, etc.

D. After seeding, firming the soil with a corrugated roller will assure good seed-to-soil contact, restore capillarity, and improve seeding emergence. This is the preferred method. When performed on the contour, sheet erosion will be minimized and water conservation on site will be maximized.

IV. Mulching

Mulching is required on all seeding. Mulch will insure against erosion before grass is established and will promote faster and earlier establishment. The existence of vegetation sufficient to control soil erosion shall be deemed compliance with this mulching requirement.

A. Straw or Hay. Unrotted small grain straw, hay free of seeds, or salt hay to be applied at the rate of 1-1/2 to 2 tons per acre (70 to 90 pounds per 1,000 square feet), except that where a crimper is used instead of liquid mulch-binder (tackifying or adhesive agent), the rate of application is 3 tons per acre. Mulch chopper-blowers must not grind the mulch. Hay mulch is not recommended for establishing fine turf or lawns due to the presence of weed seed.

Application. Spread mulch uniformly by hand or mechanically so that approximately 95% of the soil surface will be covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000 square feet sections and distribute 70 to 90 pounds within each section.

Anchoring shall be accomplished immediately after placement to minimize loss by wind or water. This may be done by one of the following methods, depending upon the size of the area, steepness of slopes, and costs.

1. Peg and Twine. Drive 8 to 10 inch wooden pegs to within 2 to 3 inches of the soil surface every 4 feet in all directions. Stakes may be driven before or after applying mulch. Secure mulch to soil surface by stretching twine between pegs in a cris-cross and a square pattern. Secure twine around each peg with two or more round turns.

2. Mulch Nettings - Staple paper, jute, cotton, or plastic nettings to the soil surface. Use a degradable netting in areas to be mowed.

3. Crimper (mulch anchoring tool). A tractor-drawn implement, somewhat like a disc harrow, especially designed to push or cut some of the broadcast long fiber mulch 3 to 4 inches into the soil so as to anchor it and leave part standing upright. This technique is limited to areas traversable by a tractor, which must operate on the contour of slopes. Straw mulch rate must be 3 tons per acre. No tackifying or adhesive agent is required.

4. Liquid Mulch-Binders - May be used to anchor salt hay or straw mulches.

a. Applications should be heavier at edges where wind catches the mulch, in valleys, and at crests of banks. Remainder of area should be uniform in appearance.

b. Use one of the following:

(1) Organic and Vegetable Based Binders - Naturally occurring, powder based, hydrophilic materials when mixed with water formulates a gel and when applied to mulch under satisfactory curing conditions will form membraned networks of insoluble polymers. The vegetable gel shall be physiologically harmless and not result in a phytotoxic effect or impede growth of turfgrass. Use at rates and weather conditions as recommended by the manufacturer to anchor mulch materials. Many new products are available, some of which may need further evaluation for use in this state.

(2) Synthetic binders - High polymer synthetic emulsion, miscible with water when diluted and following application to mulch, drying and curing shall no longer be soluble or dispersible in water. It shall be applied at rates recommended by the manufacturer and remain tacky until germination of grass.

B. Wood-fiber or paper-fiber mulch. Shall be made from wood, plant fibers or paper containing no growth or germination inhibiting materials, used at the rate of 1,500 ponds per acre (or as recommended by the project manufacturer) and may be applied by a hydroseeder. This mulch shall not be mixed in the tank with seed. Use is limited to flatter slopes and during optimum seeding periods in spring and fall.

C. Pelletized mulch. Compressed and extruded paper and/or wood fiber product, which may contain co-polymers, tackifiers, fertilizers and coloring agents. The dry pellets, when applied to a seeded area and watered, form a mulch mat. Pelletized mulch shall be applied in accordance with the manufacturers recommendations. Mulch may be applied by hand or mechanical spreader at the rate of 60-75 lbs/1,000 square feet and activated with 0.2 to 0.4 inches of water. This material has been found to be beneficial for use on small lawn or renovation areas, seeded areas where weed-seed free mulch is desired or on sites where straw mulch and tackifier agent are not practical or desirable.

Applying the full 0.2 to 0.4 inches of water after spreading pelletized mulch on the seed bed is extremely important for sufficient activation and expansion of the mulch to provide soil coverage.

STANDARD FOR
PERMANENT VEGETATIVE COVER FOR SOIL STABILIZATION

Definition

Establishment of permanent vegatative cover on exposed soils where perennial vegetation is needed for long term protection.

Purpose

To permanently stabilize the soil, assuring conservation of soil and water, and to enhance the environment.

Who is Responsible

The Township of Howell is responsible for the maintenance of permanent soil erosion and sediment control measures after completion of construction. The contractor shall be responsible during construction.

Water Quality Enhancement

Slows the over-land movement of stormwater runoff,increases infiltration and retains soil and nutrients on site, protecting streams or other stormwater conveya nces.

Where Applicable

On exposed soils that have a potential for causing off-site environmental damage.

Methods and Materials

I. Site Preparation

A. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and mulch anchoring. All grading should be done in accordance with Standards for Land Grading.

B. Immediately prior to seeding and topsoil application, the subsoil shall be evaluated for compaction in accordance with the Standard for Land Grading.

C. Topsoil should be handled only when it is dry enough to work without damaging the soil structure . A uniform application to a depth of 5 inches (unsettled) is required on all sites. Topsoil shall be amended with organic matter, as needed, in accordance with Standard for Topsoiling.

D. Install needed erosion control practices or facilities such as diversions, grade stabilization structures, channel stabilization measures, sediment basins, and waterways.

Seedbed Preparation

II. A. Uniformly apply ground limestone and fertilizer to topsoil which has been spread and firmed, according to soil test recommendations such as offered by Rutgers Co-operative Extension Soil sample mailers are available from the local Rutgers Cooperative Extension offices (http://njaes.rutgers.edu/county/). Fertilizer shall be applied at the rate of 500 pounds per acre or 11 pounds 1,000 square feet of 10-10-10 or equivalent with 50% water insoluble nitrogen unless a soil test indicates otherwise and incorporated into the surface 4 inches. If fertilizer is not incorporated, apply one-half the rate described above during seed-bed preparation and repeat another one-half the rate application of the same fertilizer within 3 to 5 weeks after seeding.

B. Work lime and fertilizer into the soil as nearly as practical to a depth of 4 inches with a disc, springtooth harrow, or other suitable equipment. The final harrowing or discing operation should be on the general contour. Continue tillage until a reasonable uniform seedbed is prepared.

C. High acid producing soil.
Soils having a pH of 4 or less or containing iron sulfide shall be covered with a minimum of 12 inches of soil having a pH of 5 or more before initiating seedbed preparation. See standard for Management of High Acid Producing Soils.

II. Seeding

A. Use a mixture recommended by Rutgers Cooperative Extension or Natural Resources Conservation Service which is approved by the Soil Conservation District. The recommended seed mixture is as follows: Fine Fescue (Blend) 45 lbs. per acre ,10 lbs per 1000 sq. ft., Hard Fescue 20 lbs. per acre .50 lbs per 1,000 sq. ft. Chewing Fescue 5 lb s per .10 lbs per 1,000 sq. ft., Tall fescue 265 lbs. per acre or 6 lbs. per 1,000 sq. Ft : Perennial ryegrass (blend) 20 lbs. per acre or .5 lbs. per 1,000 sq. Ft : Turf type tall fescue 350 lbs per acre 8 lbs per 1,000 sq. ft. : Hard fescue 175 lbs. per acre or 4 lbs. per 1,000 sq. Ft : Chewing fescue 45 lbs. per acre or 1 lbs. per 1,000 sq. Ft : Strong creeping red fescue 45 lbs. per acre or 1 lbs. per 1,000 sq. Ft : Perennial ryegrass 10 lbs. per acre or .25 lbs. per 1,000 sq. Ft Optimal planting period 3/1-4/30 or 8/15-10/15. Seed germination shall have been tested within 12 months of the planting date. No seed shall be accepted with a germination test date more than 12 months old unless retested

1. Seeding rates specified are required when a report of compliance is requested prior to actual establishment of permanent vegetation. Up to 50% reduction in rates may be used when permanent vegetation is established prior to a report of compliance inspection. These rates apply to all methods of seeding. Establishing permanent vegetation means 80% vegetative coverage with the specified seed mixture for the seeded area and mowed once.

2. Warm-season mixtures are grasses and legumes which maximize growth at high temperatures, generally 85o F and above. See Table 4-3 mixtures 1 to 7. Planting rates for warm-season grasses shall be the amount of Pure Live Seed (PLS) as determined by germination testing results.

3. Cool-season mixtures are grasses and legumes which maximize growth at temperatures below 85oF. Many grasses become active at 65oF. See Table 4-3, mixtures 8-20. Adjustment of planting rates to compensate for the amount of PLS is not required for cool season grasses.

B. Conventional Seeding - Apply seed uniformly by hand, cyclone (centrifugal) seeder, drop seeder, drill or cultipacker seeder. Except for drilled, hydroseeded or cultipacked seedings, seed shall be incorporated into the soil within 24 hours of seedbed preparation to a depth of 1/4 to 1/2 inch, by raking or dragging. Depth of seed placement may be 1/4 inch deeper on coarse textured soil.

C. After seeding, firming the soil with a corrugated roller will assure good seed-to-soil contact, restore capillarity, and improve seeding emergence. This is the preferred method. When performed on the contour, sheet erosion will be minimized and water conservation on site will be maximized.

D. Hydroseeding is a broadcast seeding method usually involving a truck or trailer mounted tank, with an agitation system and hydraulic pump for mixing seed, water and fertilizer and spraying the mix onto the prepared seedbed. Mulch shall not be included in the tank with seed. Short fibered mulch may be applied with a hydroseeder following seeding. Hydroseeding is not a preferred seeding method because seed and fertilizer are applied to the surface and not incorporated into the soil. Poor seed to soil contact occurs reducing seed germination and growth. Hydroseeding may be used for areas too steep for conventional equipment to traverse or too obstructed with rocks, stumps, etc.

IV. Mulching

Mulching is required on all seeding. Mulch will protect against erosion before grass is established and will promote faster and earlier establishment. The existence of vegetation sufficient to control soil erosion shall be deemed compliance with this mulching requirement.

A. Straw or Hay. Unrotted small grain straw, hay free of seeds, or salt hay to be applied at the rate of 1-1/2 to 2 tons per acre (70 to 90 pounds per 1,000 square feet), except that where a crimper is used instead of liquid mulch-binder (tackifying or adhesive agent), the rate of application is 3 tons per acre. Mulch chopper-blowers must not grind the mulch. Hay mulch is not recommended for establishing fine turf or lawns due to the presence of weed seed.

Application - Spread uniformly by hand mechanically so that approximately 85% of the soil surface will be covered. For uniform distribution of hand-spread mulch, divide area into approximately 1,000 square feet sections and distribute 70 to 90 pounds within each section.

Anchoring should be accomplished immediately after placement to minimize loss by wind or water. This may be done by one of the following methods, depending upon the size of the area, steepness of slopes, and costs.

1. Peg and Twine - Drive 8 to 10 inch wooden pegs to within 2 to 3 inches of the soil surface every 4 feet in all directions. Stakes may be driven before or after applying mulch. Secure mulch to soil surface by stretching twine between pegs in a criss-cross and a square pattern. Secure twine around each peg with two or more round turns.

2. Mulch Nettings - Staple paper, jute, cotton, or plastic nettings to the soil surface. Use a degradable netting in areas to be mowed.

3. Crimper (mulch anchoring tool) - A tractor-drawn implement, somewhat like a disc-harrow, especially designed to push or cut some of the broadcast long fiber mulch 3 to 4 inches into the soil so as to anchor it and leave part standing upright. This technique is limited to areas traversable by a tractor, which must operate on the contour of slopes. Straw mulch rate must be 3 tons per acre. No tackifying or adhesive agent is required.

4. Liquid Mulch-Binders - May be used to anchor salt hay or straw mulches.

a. Applications should be heavier at edges where wind catches the mulch, in valleys, and at crests of banks. Remainder of area should be uniform in appearance.

b. Use one of the following:

(1) Organic and Vegetable Based Binders - Naturally occurring, powder based, hydrophilic materials when mixed with water formulates a gel and when applied to mulch under satisfactory curing conditions will form membraned networks of insoluble polymers. The vegetable gel shall be physiologically harmless and not result in a phytotoxic effect or impede growth of turfgrass. Use at rates and weather conditions as recommended by the manufacturer to anchor mulch materials. Many new products are available, some of which may need further evaluation for use in this state.

(2) Synthetic binders - High polymer synthetic emulsion, miscible with water when diluted and following application to mulch, drying and curing shall no longer be soluble or dispersible in water. It shall be applied at rates recommended by the manufacturer and remain tacky until germination of grass.

B. Wood-fiber or paper-fiber mulch. Shall be made from wood, plant fbers or paper containing no rowth or germination inhibiting materials, used at the rate of 1,500 poun per acre (or as recommen d by the product manufacturer) and may be applied by a hydroseeder. This mulch shall not be mixed in the tank with the seed. Use is limited to flatter slopes and during optimum seeding periods in spring and fall.

C. Pelletized mulch. Compressed and extruded paper and/or wood fiber product, which may contain co-polymers, tackifiers, fertilizers and coloring agents. The dry pellets, when applied to a seeded area and watered, form a mulch mat. Pelletized mulch shall be applied in accordance with the manufacturers recommendations. Mulch may be applied by hand or mechanical spreader at the rate of 60-75 lbs/1,000 square feet and activated with 0.2 to 0.4 inches of water. This material has been found to be beneficial for use on small lawn or renovation areas, seeded areas where weed-seed free mulch is desired or on sites where straw mulch and tackifier agent are not practical or desirable.

Applying the full 0.2 to 0.4 inches of water after spreading pelletized mulch on the seed bed is extremely important for sufficient activation and expansion of the mulch to provide soil coverage.

V. Irrigation (where feasible)

If soil moisture is deficient, and mulch is not used, supply new seedings with adequate water (a minimum of 1/4 inch twice a day until vegetation is well established). This is especially true when seedings are made in abnormally dry or hot weather or on droughty sites.

VI. Topdressing

Since soil organic matter content and slow release nitrogen fertilizer (water insoluble) are prescribed in Section 2A - Seedbed Preparation in this Standard, no follow-up of topdressing is mandatory. An exception may be made where gross nitrogen deficiency exists in the soil to the extent that turf failure may develop. In that instance, topdress with 10-10-10 or equivalent at 300 pounds per acre or 7 pounds per 1,000 square feet every 3 to 5 weeks until the gross nitrogen deficiency in the turf is ameliorated.

VII. Establishing Permanent Vegetative Stabilization

The quality of permanent vegetation rests with the contractor. The timing of seeding, preparing the seedbed, applying nutrients, mulch and other management are essential. The seed application rate is required when a Report of Compliance is requested prior to actual establishment of permanent vegetation. Up to 50% reduction in application rates may be used when permanent vegetation is established prior to requesting a Report of Compliance from the district. This rate applies to all methods of seeding. Establishing permanent vegetation means 80% vegetative cover (of the seeded species) and mowed once.

STANDARD
FOR
STABILIZATION WITH MULCH ONLY

Definition

Stabilizing exposed soils with non-vegetative materials exposed for periods longer than 14 days

Purpose

To protect exposed soil surfaces from erosion damage and to reduce offsite environmental damage.

Water Quality Enhancement

Provides temporary mechanical protectionagainst wind or rainfall induced soil erosion until permanent vegitative cover may be established.

Where Applicable

This practice is applicable to areas subject to erosion, where the season and other conditions may not be suitable for growing an erosion-resistant cover or where stabilization is needed for a short period until more suitable protection can be applied.

Method and Materials

1. Site Preparation

A. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and mulch anchoring. All grading should be done in accordance with Standards for Land Grading

B. Install needed erosion control practices or facilities such as diversions, grade stabilization structures, channel stabilization measures, sediment basins, and waterways. See Standards 11 through 42.

2. Protective Materials

A. Unrotted small-grain straw, at 2.0 to 2.5 tons per acre, is spread uniformly at 90 to 115 pounds per 1,000 square feet and anchored with a mulch anchoring tool, liquid mulch binders, or netting tie down. Other suitable materials may be used if approved by the Soil Conservation District. The approved rates above have been met when the mulch covers the ground completely upon visual inspection, i.e. the soil cannot be seen below the mulch.

B. Synthetic or organic soil stabilizers may be used under siutable conditions and in quanlyities as recommended by the manufacturer.

C. Wood-fiber or paper-fiber mulch at the rate of 1,500 pounds per acre (or according to the manufacturer's requirements) may be applied by a hydroseeder.

D. Mulch netting, such as paper jute, excelsior, cotton, or plastic, may be used.

E. Woodchips applied uniformly to a minimum depth of 2 inches may be used. Woodchips will not be used on areas where flowing water could wash them into an inlet and plug it.

F. Gravel, crush stone, or slag at the rate of 9 cubic yards per 1,000 sq. ft. applied uniformly to a minimum depth of 3 inches may be used. Size 2 or 3 (ASTM C-33) is recommended.

3. Mulch anchoring should be accomplished immeadiately after placement of hay or straw mulch to minimize loss by wind or water. This may be done by one of the following methods, depending upon the size of the area and steepness of slopes.

A. Peg and Drive - Drive 8 to 10 inch peg to within 2 to 3 inches of the soil surface every 4 feet in all directions. Stakes may be driven before of after applying mulch. Secure mulch to soil surface by stretching twine between pegs in a cris-cross and square pattern. Secure twine around each peg with two or more round turns.

B. Mulch nettings - Staple paper, cotton, amd plastic nettings over mulch. Use a epradable netting in areas to be mowed. Netting is usually available in rolls 4 feet wide and 300 feet long.

C. Crimper Mulch Anchoring Coulter Tool - A tractor-drawn implement especially desinged to punch and anchor mulch into the soil surface. This practice affords maximum erosion control, but its use is limited to those slopes upon which the tractor can operate safely. Soil penetration should be about 3 to 4 inches. On sloping land, the operation should be on the contour.

D. Liquid Mulch - Binders

1. Application should be havier at edge where wind catches the mulch, in valleys, and at crests of banks. Remainder of area should be uniform in appearance.

2. Use one of the following:

a. Organic and Vegitable Based Binbers - Naturally occuring, powder based hydrophilic material that mixed with water formulates a gel and when applied to mulch under satisfactory curing conditions will form membrane networks of insoluble polymers. The vegetable gel shall be physiologically harmless and not result in a phytotoxic effect of impede growth of turfgrass. Vegetable based gels shall be applied at rates and weather conditions recommendedby the manufacturer.

b. Synthetic Binders - High polymer synthetic emulsion, miscible with water when diluted and following application to mulch, drying and curing shall no longer be soluble or dispersible in water. It shall be applied at rates and weather conditions recommended by the manufacturer and remain tacky until germination of grass.

SOIL EROSION AND SEDIMENT CONTROL NOTES

1. THE FREEHOLD SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED FORTY-EIGHT (48) HOURS IN ADVANCE OF ANY SOIL DISTURBING ACTIVITY.
2. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES ARE TO BE INSTALLED PRIOR TO SOIL DISTURBANCE, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
3. ANY CHANGES TO THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLANS WILL REQUIRE THE SUBMISSION OF REVISED SOIL EROSION AND SEDIMENT CONTROL PLANS TO THE DISTRICT FOR RE-CERTIFICATION. THE REVISED PLANS MUST MEET ALL CURRENT STATESOIL EROSION AND SEDIMENT CONTROL STANDARDS.
4. N.J.S.A 4:24-39 ET. SEQ. REQUIRES THAT NO CERTIFICATES OF OCCUPANCY BE ISSUED BEFORE THE DISTRICT DETERMINES THAT A PROJECT OR PORTION THEREOF IS IN FULL COMPLIANCE WITH THE CERTIFIED PLAN AND STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY AND A REPORT OF COMPLIANCE HAS BEEN ISSUED. UPON WRITTEN REQUEST FROM THE APPLICANT, THE DISTRICT MAY ISSUE A REPORT OF COMPLIANCE WITH CONDITIONS ON A LOT-BY-LOT OR SECTION-BY-SECTION BASIS, PROVIDED THAT THE PROJECT OR PORTION THEREOF IS IN SATISFACTORY COMPLIANCE WITH THE SEQUENCE OF DEVELOPMENT AND TEMPORARY MEASURES FOR SOIL EROSION AND SEDIMENT CONTROL HAVE BEEN IMPLEMENTED, INCLUDING PROVISIONS FOR STABILIZATION AND SITE WORK.
5. ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN SIXTY (60) DAYS, AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY RECEIVE A TEMPORARY SEEDING. IF THE SEASON PREVENTS THE ESTABLISHMENT OF TEMPORARY COVER, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF 2 TO 2 ½ TONS PER ACRE, ACCORDING TO THE STANDARD FOR STABILIZATION WITH MULCH ONLY.
6. IMMEDIATELY FOLLOWING INITIAL DISTURBANCE OR ROUGH GRADING, ALL CRITICAL AREAS SUBJECT TO EROSION (I.E. SOIL STOCKPILES, STEEP SLOPES AND ROADWAY EMBANKMENTS) WILL RECEIVE TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH OR A SUITABLE EQUIVALENT, AND A MULCH ANCHOR, IN ACCORDANCE WITH STATE STANDARDS.
7. A SUB-BASE COURSE WILL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS TO STABILIZE STREETS, ROADS, DRIVEWAYS, AND PARKING AREAS, IN AREAS WHERE NO UTILITIES ARE PRESENT, THE SUB-BASE SHALL BE INSTALLED WITHIN FIFTEEN (15) DAYS OF THE PRELIMINARY GRADING.
8. THE STANDARD FOR STABILIZED CONSTRUCTION ACCESS REQUIRES THE INSTALLATION OF A PAD OF CLEAN CRUSHED STONE AT POINTS WHERE TRAFFIC WILL BE ACCESSING THE CONSTRUCTION SITE. AFTER INTERIOR ROADWAYS ARE PAVED, INDIVIDUAL LOTS REQUIRE A STABILIZED CONSTRUCTION ACCESS CONSISTING OF ONE INCH TO TWO INCH (1"-2") STONE FOR A MINIMUM LENGTH OF TEN FEET (10') EQUAL TO THE LOT ENTRANCE WIDTH. ALL OTHER ACCESS POINTS SHALL BE BLOCKED OFF.
9. ALL SOIL WASHED, DROPPED, SPILLED, OR TRACKED OUTSIDE THE LIMIT OF DISTURBANCE OR ONTO PUBLIC RIGHT-OF-WAYS WILL BE REMOVED IMMEDIATELY.
10. PERMANENT VEGETATION IS TO BE SEEDED OR SODDED ON ALL EXPOSED AREAS WITHIN TEN (10) DAYS AFTER FINAL GRADING.
11. AT THE TIME THAT SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER SHALL BE REMOVED OR TREATED IN SUCH A WAY THAT IT WILL PERMANENTLY ADJUST THE SOIL CONDITIONS AND RENDER IT SUITABLE FOR VEGETATIVE GROUND COVER. IF THE REMOVAL OR TREATMENT OF THE SOIL WILL NOT PROVIDE SUITABLE CONDITIONS, NON-VEGETATIVE MEANS OF PERMANENT GROUND STABILIZATION WILL HAVE TO BE EMPLOYED.
12. IN ACCORDANCE WITH THE STANDARD FOR MANAGEMENT OF HIGH ACID PRODUCING SOILS, ANY SOIL HAVING A PH OF 4 OR LESS OR CONTAINING IRON SULFIDES SHALL BE ULTIMATELY PLACED OR BURIED WITH LIMESTONE APPLIED AT THE RATE OF 10 TONS/ACRE, (OR 450 LBS/1,000 SQ FT OF SURFACE AREA) AND COVERED WITH A MINIMUM OF 12'OF SETTLED SOIL WITH A PH OF 5 OR MORE, OR 24'WHERE TREES OR SHRUBS ARE TO BE PLANTED.
13. CONDUIT OUTLET PROTECTION MUST BE INSTALLED AT ALL REQUIRED OUTFALLS PRIOR TO THE DRAINAGE SYSTEM BECOMING OPERATIONAL.
14. UNFILTERED DEWATERING IS NOT PERMITTED. NECESSARY PRECAUTIONS MUST BE TAKEN DURING ALL DEWATERING OPERATIONS TO MINIMIZE SEDIMENT TRANSFER. ANY DEWATERING METHODS USED MUST BE IN ACCORDANCE WITH THE STANDARD FOR DEWATERING.
15. SHOULD THE CONTROL OF DUST AT THE SITE BE NECESSARY, THE SITE WILL BE SPRINKLED UNTIL THE SURFACE IS WET, TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED OR MULCH SHALL BE APPLIED AS REQUIRED BY THE STANDARD FOR DUST CONTROL.
16. STOCKPILE AND STAGING LOCATIONS ESTABLISHED IN THE FIELD SHALL BE PLACED WITHIN THE LIMIT OF DISTURBANCE ACCORDING TO THE CERTIFIED PLAN. STAGING AND STOCKPILES NOT LOCATED WITHIN THE LIMIT OF DISTURBANCE WILL REQUIRE CERTIFICATION OF A REVISED SOIL EROSION AND SEDIMENT CONTROL PLAN. CERTIFICATION OF A NEW SOIL EROSION AND SEDIMENT CONTROL PLAN MAY BEREQUIRED FOR THESE ACTIVITIES IF AN AREA GREATER THAN 5,000 SQUARE FEET IS DISTURBED.
17. ALL SOIL STOCKPILES ARE TO BE TEMPORARILY STABILIZED IN ACCORDANCE WITH SOIL EROSION AND SEDIMENT CONTROL NOTE #6.
18. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR ANY EROSION OR SEDIMENTATION THAT MAY OCCUR BELOW STORMWATER OUTFALLS OR OFFSITE AS A RESULT OF CONSTRUCTION OF THE PROJECT.

SOIL EROSION AND SEDIMENT CONTROL NOTES

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	7/7/20	PAS	JJF	REVISED PLANS AS PER BOARD ENGINEER'S COMMENTS

DESIGNED BY: PAS
DRAWN BY: PAS
SHEET CHK'D BY: JJF
CROSS CHK'D BY:
APPROVED BY:
DATE: OCTOBER 25, 2019

ENGENUITY INFRASTRUCTURE
2 BRIDGE AVENUE , SUITE 323
RED BANK, NJ 07701
732.741.3176
ENGENUITYNJ.COM

SOIL EROSION AND SEDIMENT CONTROL NOTES
TAX BLOCK 64
LOTS 25.01, 25.02, 26 & 27
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

OWNER / DEVELOPER / APPLICANT:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE: (732) 522-0197

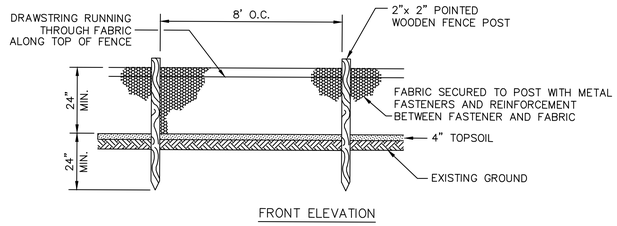
JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000

10/25/19
DATE

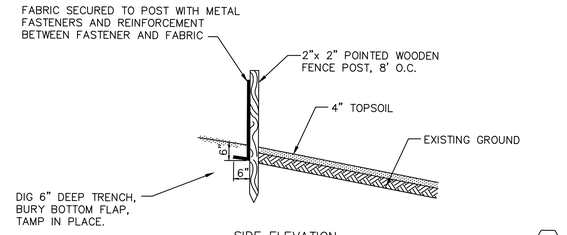
PROJECT NO. SEPE-00020
DRAWING SESC-1
SHEET NO. 9 OF 10

NOT FOR CONSTRUCTION

FILE NAME: N:\SEPE MANASQUAN APARTMENTS\SEPE-00020 - 33-44 BROAD\PLANS\CP REVISED 4-16-2020.DWG PRASANNA 7/16/2020 1:30 PM



FRONT ELEVATION

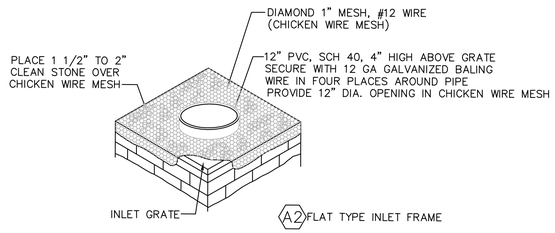


SIDE ELEVATION

PLAN SYMBOL C1

SEDIMENT CONTROL FENCE

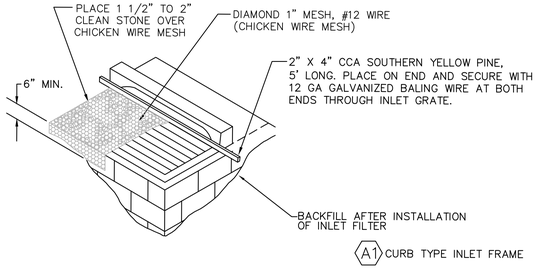
DETAIL A — NTS — SESC2



A2 FLAT TYPE INLET FRAME

GENERAL NOTES:

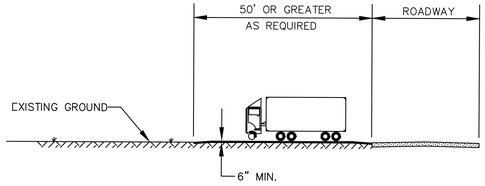
1. CONTRACTOR TO CLEAN INLET FILTER AFTER EVERY STORM.
2. FILTER FABRIC, WOOD PIECE OR PVC PIPE TO BE REMOVED AFTER PAVING OR FINAL GRADING AND ESTABLISHMENT OF VEGETATION.

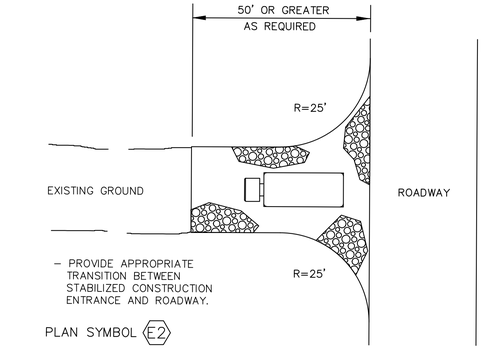


A1 CURB TYPE INLET FRAME

INLET FILTER PROTECTION

DETAIL C — NTS — SESC2





PLAN SYMBOL E2

Stone Size – Use ASTM C–33, size No. 2 (2 ½ to 1 ½ in) or 3 (2 to 1 in). Use clean crushed angular stone. Crushed concrete of similar size may be substituted but will require more frequent upgrading and maintenance.

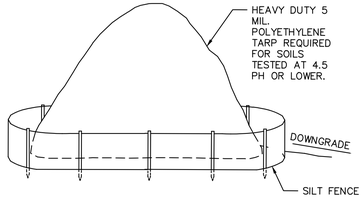
Table 29–1: Lengths of Construction Exits on Sloping Roadbeds

Percent Slope of Roadway	Length of Stone Required	
	Coarse Grained Soils	Fine Grained Soils
0 to 2%	50 Feet	100 Feet
2 to 5%	100 Feet	200 Feet
> 5%	Entire surface stabilized with Hot Mix Asphalt Base Course, Mix I–2[1]	

1. As prescribed by local ordinance or other governing authority.

STABILIZED CONSTRUCTION ENTRANCE

DETAIL B — NTS — SESC2

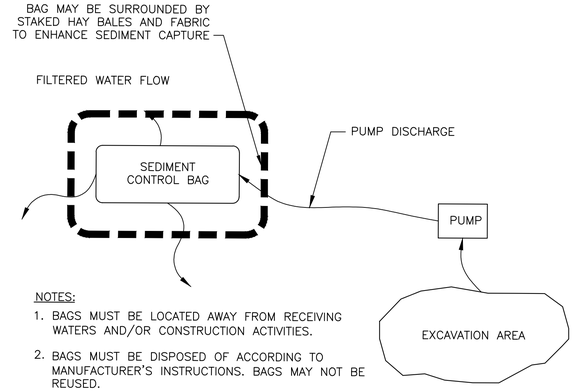


NOTES:

1. ALL STOCKPILES SHALL NOT TO BE LOCATED WITHIN 50 FEET OF A FLOODPLAIN, SLOPE, ROADWAY OR DRAINAGE FACILITY.

TOPSOIL STOCKPILE

DETAIL D — NTS — SESC2



NOTES:

1. BAGS MUST BE LOCATED AWAY FROM RECEIVING WATERS AND/OR CONSTRUCTION ACTIVITIES.
2. BAGS MUST BE DISPOSED OF ACCORDING TO MANUFACTURER'S INSTRUCTIONS. BAGS MAY NOT BE REUSED.

SEDIMENT CONTROL BAG FOR DEWATERING

DETAIL E — NTS — SESC2

PROPOSED CONSTRUCTION SEQUENCE — APPROX. DURATION:

1.	APPLICATION OF PROPER MEASURES FOR THE CONTROL OF SOIL EROSION & SEDIMENT CONTROL.	2 DAYS
2.	CLEARING OF THE SITE (INCLUDING DEMOLITION OF STRUCTURES).	10 DAYS
3.	TEMPORARY STABILIZATION OF AREAS INITIALLY DISTURBED. STABILIZATION TO BE ACCOMPLISHED BY USE OF TEMPORARY SEEDING AND/OR STRAW MULCHING OR EQUIVALENT MATERIAL AT A RATE OF TWO TONS PER ACRE, ACCORDING TO STATE STANDARDS.	1 DAYS
4.	CONSTRUCT BUILDING AND RELATED APPURTENANCES.	180 DAYS
5.	INSTALLATION OF STORMWATER SYSTEM.	15 DAYS
6.	INSTALLATION OF CURB, SIDEWALK AND OTHER MATERIALS FOR ROADWAY CONSTRUCTION.	5 DAYS
7.	INSTALLATION OF TOPSOILING, FERTILIZING, SEEDING, AND MULCHING.	1 DAYS
8.	REMOVAL OF SOIL EROSION AND SEDIMENT CONTROL DEVICES AFTER ESTABLISHED VEGETATIVE GROWTH HAS OCCURRED.	1 DAYS

THE TOTAL ESTIMATED TIME OF CONSTRUCTION IS 215 DAYS*

* NOTE: PROPOSED CONSTRUCTION SEQUENCE IS PROVIDED FOR SOIL CONSERVATION DISTRICT USE ONLY.

TOTAL PROJECT DISTURBED AREA = 0.8397 ACRES
NO LAND DISTURBING CONSTRUCTION ACTIVITIES ARE TO OCCUR OUTSIDE THE INDICATED LIMITS OF DISTURBANCE.

1. THE FREEHOLD SOIL CONSERVATION DISTRICT SHALL BE NOTIFIED FORTY–EIGHT (48) HOURS IN ADVANCE OF ANY SOIL DISTURBING ACTIVITY.

   FREEHOLD SOIL CONSERVATION DISTRICT
   4000 KOZLOSKI RD
   FREEHOLD, NJ 07728
   TEL. (732)683–8500

2. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES ARE TO BE INSTALLED PRIOR TO SOIL DISTURBANCE, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
3. ANY CHANGES TO THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLANS WILL REQUIRE THE SUBMISSION OF REVISED SOIL EROSION AND SEDIMENT CONTROL PLANS TO THE DISTRICT FOR RE–CERTIFICATION. THE REVISED PLANS MUST MEET ALL CURRENT STATE SOIL EROSION AND SEDIMENT CONTROL STANDARDS.
4. N.J.S.A 4:24–39 ET. SEQ. REQUIRES THAT NO CERTIFICATES OF OCCUPANCY BE ISSUED BEFORE THE DISTRICT DETERMINES THAT A PROJECT OR PORTION THEREOF IS IN FULL COMPLIANCE WITH THE CERTIFIED PLAN AND STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY AND A REPORT OF COMPLIANCE HAS BEEN ISSUED. UPON WRITTEN REQUEST FROM THE APPLICANT, THE DISTRICT MAY ISSUE A REPORT OF COMPLIANCE WITH CONDITIONS ON A LOT–BY–LOT OR SECTION–BY–SECTION BASIS, PROVIDED THAT THE PROJECT OR PORTION THEREOF IS IN SATISFACTORY COMPLIANCE WITH THE SEQUENCE OF DEVELOPMENT AND TEMPORARY MEASURES FOR SOIL EROSION AND SEDIMENT CONTROL HAVE BEEN IMPLEMENTED, INCLUDING PROVISIONS FOR STABILIZATION AND SITE WORK.
5. ANY DISTURBED AREAS THAT WILL BE LEFT EXPOSED MORE THAN SIXTY (60) DAYS, AND NOT SUBJECT TO CONSTRUCTION TRAFFIC, WILL IMMEDIATELY RECEIVE A TEMPORARY SEEDING. IF THE SEASON PREVENTS THE ESTABLISHMENT OF TEMPORARY COVER, THE DISTURBED AREAS WILL BE MULCHED WITH STRAW, OR EQUIVALENT MATERIAL, AT A RATE OF 2 TO 2 ½ TONS PER ACRE, ACCORDING TO THE STANDARD FOR STABILIZATION WITH MULCH ONLY.
6. IMMEDIATELY FOLLOWING INITIAL DISTURBANCE OR ROUGH GRADING, ALL CRITICAL AREAS SUBJECT TO EROSION (I.E. SOIL STOCKPILES, STEEP SLOPES AND ROADWAY EMBANKMENTS) WILL RECEIVE TEMPORARY SEEDING IN COMBINATION WITH STRAW MULCH OR A SUITABLE EQUIVALENT, AND A MULCH ANCHOR, IN ACCORDANCE WITH STATE STANDARDS.
7. A SUB–BASE COURSE WILL BE APPLIED IMMEDIATELY FOLLOWING ROUGH GRADING AND INSTALLATION OF IMPROVEMENTS TO STABILIZE STREETS, ROADS, DRIVEWAYS, AND PARKING AREAS. IN AREAS WHERE NO UTILITIES ARE PRESENT, THE SUB–BASE SHALL BE INSTALLED WITHIN FIFTEEN (15) DAYS OF THE PRELIMINARY GRADING.
8. THE STANDARD FOR STABILIZED CONSTRUCTION ACCESS REQUIRES THE INSTALLATION OF A PAD OF CLEAN CRUSHED STONE AT POINTS WHERE TRAFFIC WILL BE ACCESSING THE CONSTRUCTION SITE. AFTER INTERIOR ROADWAYS ARE PAVED, INDIVIDUAL LOTS REQUIRE A STABILIZED CONSTRUCTION ACCESS CONSISTING OF ONE INCH TO TWO INCH (1" – 2") STONE FOR A MINIMUM LENGTH OF TEN FEET (10') EQUAL TO THE LOT ENTRANCE WIDTH. ALL OTHER ACCESS POINTS SHALL BE BLOCKED OFF.
9. ALL SOIL WASHED, DROPPED, SPILLED, OR TRACKED OUTSIDE THE LIMIT OF DISTURBANCE OR ONTO PUBLIC RIGHT–OF–WAYS WILL BE REMOVED IMMEDIATELY.
10. PERMANENT VEGETATION IS TO BE SEEDED OR SODDED ON ALL EXPOSED AREAS WITHIN TEN (10) DAYS AFTER FINAL GRADING.
11. AT THE TIME THAT SITE PREPARATION FOR PERMANENT VEGETATIVE STABILIZATION IS GOING TO BE ACCOMPLISHED, ANY SOIL THAT WILL NOT PROVIDE A SUITABLE ENVIRONMENT TO SUPPORT ADEQUATE VEGETATIVE GROUND COVER SHALL BE REMOVED OR TREATED IN SUCH A WAY THAT IT WILL PERMANENTLY ADJUST THE SOIL CONDITIONS AND RENDER IT SUITABLE FOR VEGETATIVE GROUND COVER. IF THE REMOVAL OR TREATMENT OF THE SOIL WILL NOT PROVIDE SUITABLE CONDITIONS, NON–VEGETATIVE MEANS OF PERMANENT GROUND STABILIZATION WILL HAVE TO BE EMPLOYED.
12. IN ACCORDANCE WITH THE STANDARD FOR MANAGEMENT OF HIGH ACID PRODUCING SOILS, ANY SOIL HAVING A PH OF 4 OR LESS OR CONTAINING IRON SULFIDES SHALL BE ULTIMATELY PLACED OR BURIED WITH LIMESTONE APPLIED AT THE RATE OF 8 TONS/ACRE, (OR 450LBS/1,000 SQ FT OF SURFACE AREA) AND COVERED WITH A MINIMUM OF 12" OF SETTLED SOIL WITH A PH OF 5 OR MORE, OR 24" WHERE TREES OR SHRUBS ARE TO BE PLANTED.
13. CONDUIT OUTLET PROTECTION MUST BE INSTALLED AT ALL REQUIRED OUTFALLS PRIOR TO THE DRAINAGE SYSTEM BECOMING OPERATIONAL.
14. UNFILTERED DEWATERING IS NOT PERMITTED. NECESSARY PRECAUTIONS MUST BE TAKEN DURING ALL DEWATERING OPERATIONS TO MINIMIZE SEDIMENT TRANSFER. ANY DEWATERING METHODS USED MUST BE IN ACCORDANCE WITH THE STANDARD FOR DEWATERING.
15. SHOULD THE CONTROL OF DUST AT THE SITE BE NECESSARY, THE SITE WILL BE SPRINKLED UNTIL THE SURFACE IS WET, TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED OR MULCH SHALL BE APPLIED AS REQUIRED BY THE STANDARD FOR DUST CONTROL.
16. STOCKPILE AND STAGING LOCATIONS ESTABLISHED IN THE FIELD SHALL BE PLACED WITHIN THE LIMIT OF DISTURBANCE ACCORDING TO THE CERTIFIED PLAN. STAGING AND STOCKPILES NOT LOCATED WITHIN THE LIMIT OF DISTURBANCE WILL REQUIRE CERTIFICATION OF A REVISED SOIL EROSION AND SEDIMENT CONTROL PLAN. CERTIFICATION OF A NEW SOIL EROSION AND SEDIMENT CONTROL PLAN MAY BE REQUIRED FOR THESE ACTIVITIES IF AN AREA GREATER THAN 5,000 SQUARE FEET IS DISTURBED.
17. ALL SOIL STOCKPILES ARE TO BE TEMPORARILY STABILIZED IN ACCORDANCE WITH SOIL EROSION AND SEDIMENT CONTROL NOTE #6.
18. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR ANY EROSION OR SEDIMENTATION THAT MAY OCCUR BELOW STORMWATER OUTFALLS OR OFFSITE AS A RESULT OF CONSTRUCTION OF THE PROJECT.

SOIL EROSION AND SEDIMENT CONTROL DETAILS

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	7/7/20	PAS	JJF	REVISED PLANS AS PER BOARD ENGINEER'S COMMENTS

DESIGNED BY: PAS
DRAWN BY: PAS
SHEET CHK'D BY: JJF
CROSS CHK'D BY:
APPROVED BY:
DATE: OCTOBER 25, 2019

ENGENUITY INFRASTRUCTURE
2 BRIDGE AVENUE , SUITE 323
RED BANK, NJ 07701
732.741.3176
ENGENUITYNJ.COM

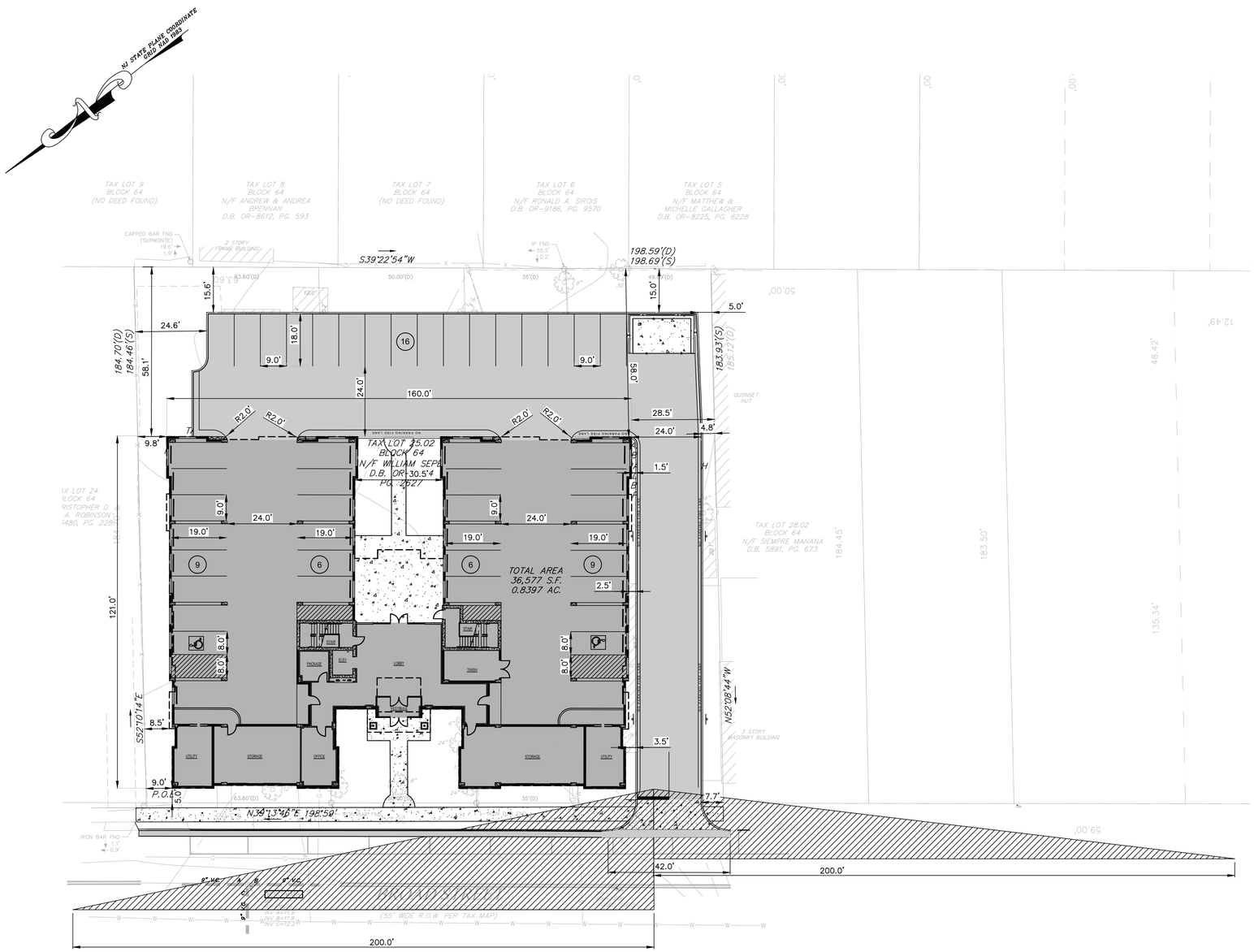
SOIL EROSION AND SEDIMENT CONTROL DETAILS
TAX BLOCK 64
LOTS 2 & 3
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

OWNER / DEVELOPER / APPLICANT:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE: (732) 522-0197

JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000
10/25/19
DATE

PROJECT NO. SEPE-00020
DRAWING
SESC-2
SHEET NO.
10 OF 10

NOT FOR CONSTRUCTION



GENERAL NOTES:

1. SURVEY INFORMATION SHOWN HEREON BASED ON A PLAN ENTITLED "BOUNDARY & TOPOGRAPHIC SURVEY, TAX LOTS 25.01, 25.02, 26, & 27" PREPARED BY DPK CONSULTING DATED AUGUST 9, 2018
2. ENGENUITY INFRASTRUCTURE MAKES NO GUARANTEES THAT THE UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN-SERVICE OR ABANDONED. ENGENUITY INFRASTRUCTURE FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. ENGENUITY INFRASTRUCTURE HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL UTILITIES IN THE FIELD PRIOR TO EXCAVATION. THE CONTRACTOR SHALL ALSO BE REQUIRED TO CALL FOR A MARK-OUT PRIOR TO ANY WORK.
3. PREMISES ARE COMMONLY KNOWN AS 34-44 BROAD STREET , MANASQUAN BOROUGH , MONMOUTH COUNTY, NEW JERSEY.
4. PREMISES ARE ALSO KNOWN AS BLOCK 64, LOTS 25.01, 25.02, 26, AND 27 AS SHOWN ON THE OFFICIAL TAX MAPS OF THE BOROUGH OF MANASQUAN, MONMOUTH COUNTY, NEW JERSEY.
5. ALL PROPOSED IMPROVEMENTS SHALL BE A.D.A. COMPLIANT, WHERE APPLICABLE.
6. IF THIS DOCUMENT DOES NOT CONTAIN A RAISED SEAL OF THE UNDERSIGNED PROFESSIONAL, IT IS NOT AN AUTHORIZED ORIGINAL DOCUMENT.
7. THE LAYOUT AND DESIGN ARE SUBJECT TO FURTHER MODIFICATION TO COMPLY WITH APPROVALS FROM AGENCIES HAVING JURISDICTION OVER THE SITE.
8. ALL NEW UTILITIES ARE PROPOSED TO BE LOCATED UNDERGROUND.

LEGEND

- PRINCIPAL & ACCESSORY STRUCTURES
- NEW CONCRETE
- FULL DEPTH PAVEMENT

SIGHT TRIANGLE EXHIBIT

1" = 20'
10 0 20

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	7/7/20	PAS	JJF	REVISED PLANS AS PER BOARD ENGINEER'S COMMENTS

DESIGNED BY: PAS
DRAWN BY: PAS
SHEET CHK'D BY: JJF
CROSS CHK'D BY:
APPROVED BY:
DATE: MARCH 17, 2020

ENGENUITY INFRASTRUCTURE

ENGENUITY INFRASTRUCTURE
2 BRIDGE AVENUE , SUITE 323
RED BANK, NJ 07701
732.741.3176
ENGENUITYNJ.COM

SIGHT TRIANGLE EXHIBIT
TAX BLOCK 64
LOTS 25.01, 25.02, 26 & 27
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

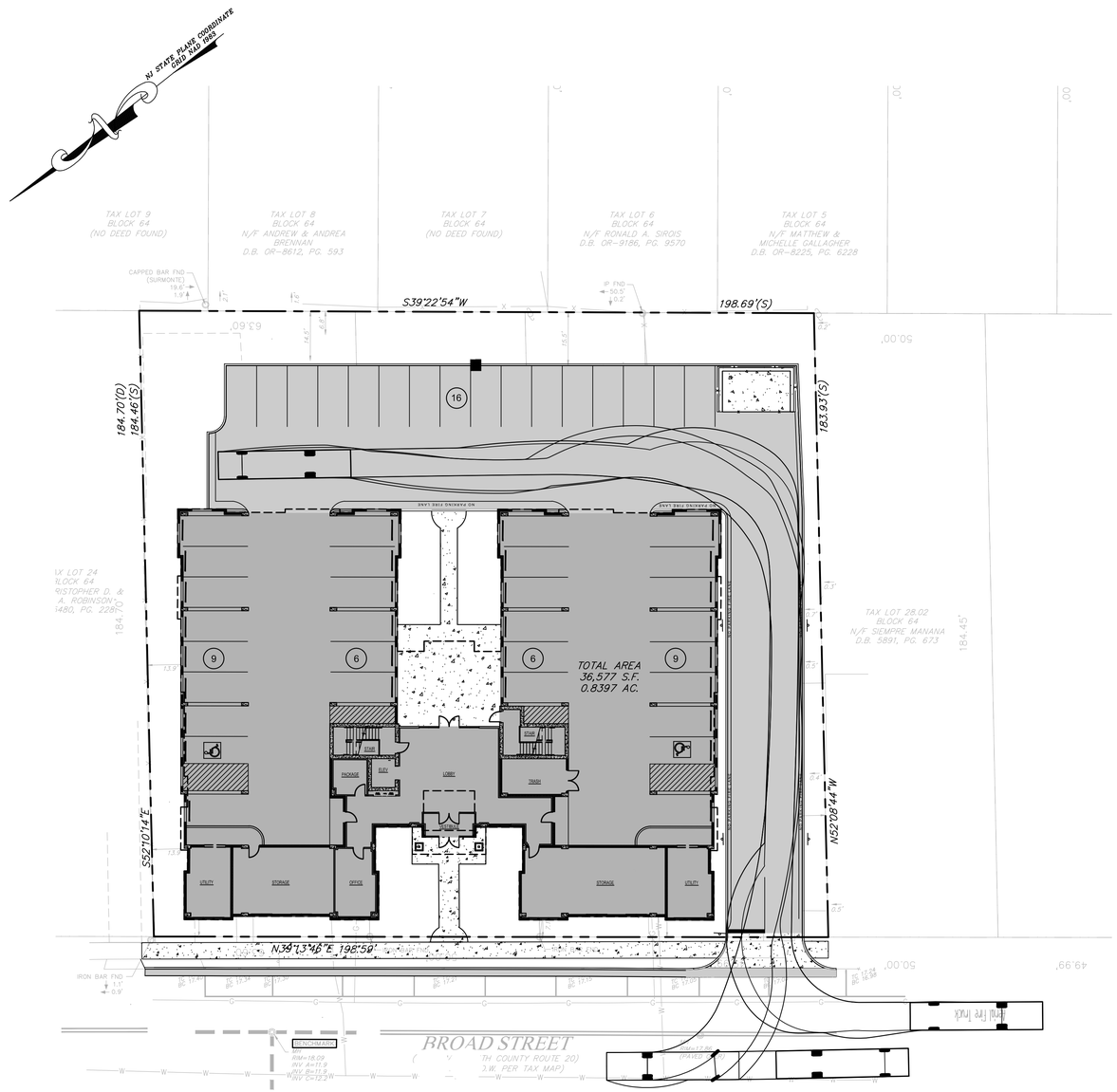
OWNER / DEVELOPER / APPLICANT:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE: (732) 522-0197

JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000
03/17/2020
DATE

PROJECT NO. SEPE-00020
DRAWING EX-1
SHEET NO. 1 OF 1

FILE NAME: N:\SEPE MANASQUAN APARTMENTS\SEPE-00020 - 33-44 BROAD\PLANS\CP REVISED 4-16-2020.DWG PRASANNA 7/14/2020

NOT FOR CONSTRUCTION



GENERAL NOTE:

1. THIS TURNING TEMPLATE REPRESENTS A 39 FT LONG AERIAL FIRE TRUCK.

TURNING TEMPLATE EXHIBIT-2

1" = 20'
10 0 20

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	7/7/20	PAS	JJF	REVISED PLANS AS PER BOARD ENGINEER'S COMMENTS

DESIGNED BY: PAS
DRAWN BY: PAS
SHEET CHK'D BY: JJF
CROSS CHK'D BY:
APPROVED BY:
DATE: MARCH 17, 2020

ENGENUITY INFRASTRUCTURE

ENGENUITY INFRASTRUCTURE
2 BRIDGE AVENUE , SUITE 323
RED BANK, NJ 07701
732.741.3176
ENGENUITYNJ.COM

TURNING TEMPLATE EXHIBIT
TAX BLOCK 64
LOTS 25.01, 25.02, 26 & 27
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

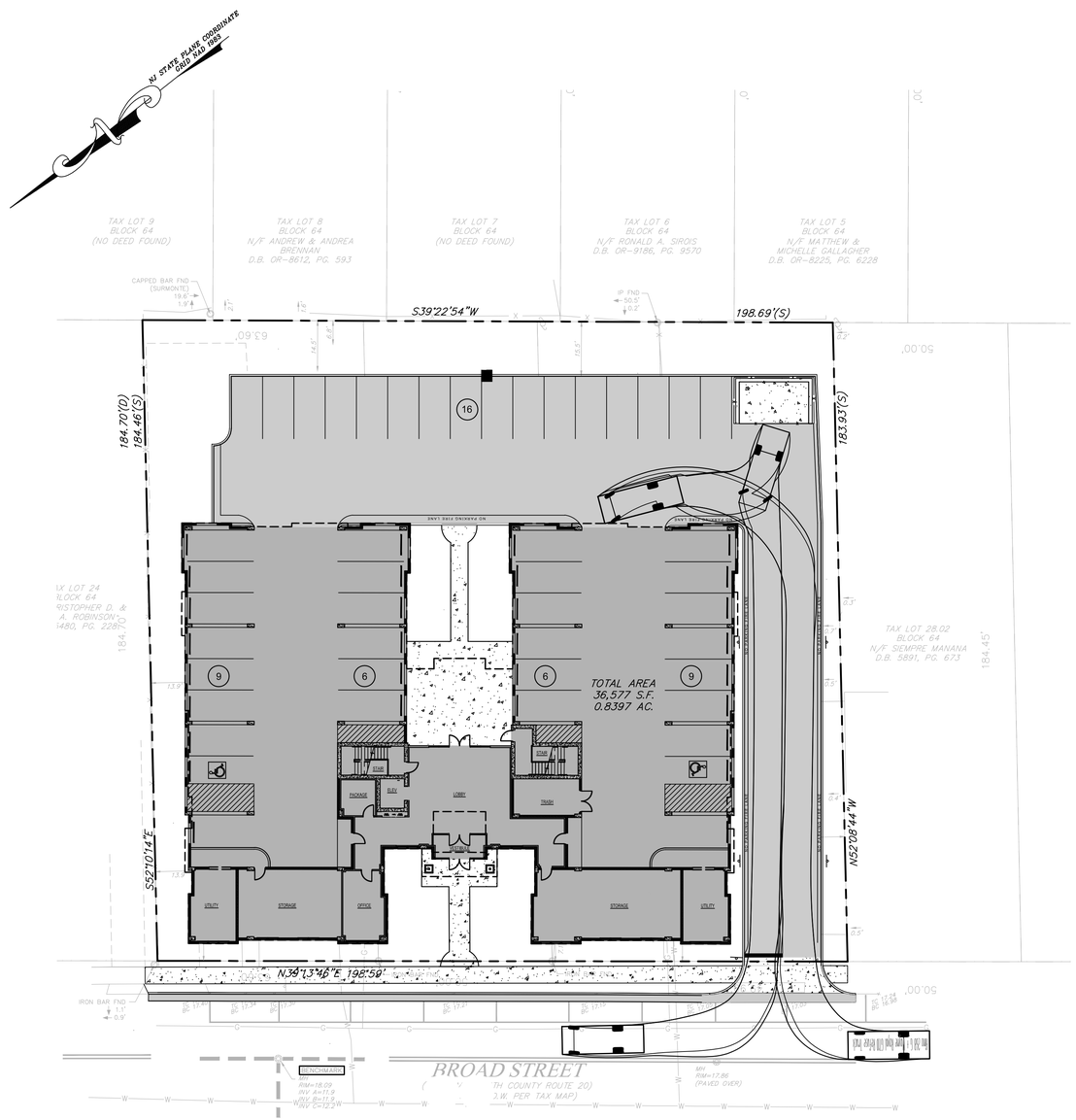
OWNER / DEVELOPER / APPLICANT:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE: (732) 522-0197

JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000
03/17/2020
DATE

PROJECT NO. SEPE-00020
DRAWING EX-2
SHEET NO. 1 OF 1

FILE NAME: N:\SEPE MANASQUAN APARTMENTS\SEPE-00020 - 33-44 BROAD\PLANS\TEMP\CP REVISED TURING TEMPLATE.DWG PRASANNA

NOT FOR CONSTRUCTION



GENERAL NOTE:

1. THIS TURNING TEMPLATE REPRESENTS A 23' – 5 3/4" LONG REAR LOADING REFUSE VEHICLE WHICH IS DETERMINED TO BE THE CRITICAL DESIGN VEHICLE FOR THIS SITE AND ALL OTHERS VEHICLES ENTERING WILL BE SMALLER.

TURNING TEMPLATE EXHIBIT-1

1" = 20'
10 0 20

REV. NO.	DATE	DRWN	CHKD	REMARKS
1	7/7/20	PAS	JJF	REVISED PLANS AS PER BOARD ENGINEER'S COMMENTS

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03/17/2020
DATE

PROJECT NO. SEPE-00020
DRAWING EX-3
SHEET NO. 1 OF 1

FILE NAME: N:\SEPE MANASQUAN APARTMENTS\SEPE-00020 – 33-44 BROAD\PLANS\TEMP\CP REVISED TURING TEMPLATE.DWG PRASANNA

NOT FOR CONSTRUCTION

STORMWATER MANAGEMENT REPORT

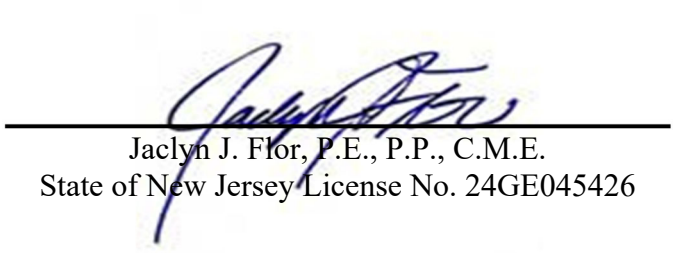
FOR:

Broad Street 34, LLC
34 Broad Street,
Manasquan, NJ 08736

July 6, 2020

PREPARED BY:

ENGenuity Infrastructure
2 Bridge Avenue, Suite 323
Red Bank, New Jersey 07701
(732) 741-3176



Jaclyn J. Flor, P.E., P.P., C.M.E.
State of New Jersey License No. 24GE045426

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I. PROJECT DESCRIPTION

This stormwater management report has been prepared to address the impacts of stormwater runoff from the development detailed in the accompanying Site Plans prepared by Engenuity Infrastructure. The project site is located within the Borough of Manasquan; Lot 25.01, 25.02, 26, and 27 in Block 64, commonly known as 34-44 Broad Street. Broad Street 34, LLC is the owner and Applicant of the subject lot

The scope of the development consists of the demolition of the existing structures on the subject lots and the construction of a new 3-story residential affordable housing building. In addition to the construction of the new building, additional site improvements will also include the replacement of sidewalk and curb along the property frontage, onsite landscaping, lighting, and a reinforced concrete driveway apron. The site is 0.84 acres in total of which 0.678-acres is proposed to be disturbed.

The existing ground cover changes are indicated on the Existing and Proposed Drainage Areas Maps in Appendix E and are tabulated in Section VII below. The improvements associated with the project (new roofing, driveway, and sidewalk) require approximately 0.307 acres of additional new impervious area. Hence the project is considered a Major Development because the onsite impervious area is increasing by one quarter acre or more

There are no wetlands in the project vicinity and no wetlands impacts or transition area impacts are proposed. The project is not located within a floodplain or flood hazard area and no permits from the NJ Department of Environmental Protections (NJDEP) are required.

II. DESIGN METHODOLOGY

A computer generated hydrologic and hydraulic model was developed for the site utilizing the TR-55 methodology for 'Urban Hydrology for Small Watersheds'. A computer program, Hydraflow Hydrographs produced by Intelisolve, was utilized for the computational outputs of the same.

Existing and Proposed sub-drainage areas were delineated within the overall subject drainage area. Drainage areas were separated based upon drainage patterns and their relationship to disconnected and directly connected impervious coverage. Soil data was obtained from current USGS SSURGO Mapping for Monmouth County. Composite Curve Numbers (CN) were calculated manually for input into the computer model, as prepared in accordance with The TR55 methodology. Times of concentration were calculated for each drainage area using TR-55 Sheet Flow, Shallow Concentrated Flow and Channel Flow parameters. Runoff hydrographs were developed using the Soil Conservation Service Type III unit hydrograph, with a shape factor of 484, to develop hydrographs for the 2-, 10-, 25- and 100-year frequencies. A custom distribution was created to model the NJDEP water quality design storm (1.25 inches of rainfall over a two-hour period) as defined in the NJDEP Best Management Practices Manual.

III. PRE-DEVELOPMENT CONDITIONS

The site is presently occupied by three (3) 2-1/2 story dwellings, three (3) sheds and a garage with associated sidewalk, driveways, and accessory structures and amenities. The property is bounded by the improved right-of-way of Broad street to the east. The site is separated into two distinct drainage areas. The majority of the site containing 0.776 acres (designated as EX DA-1) drains in southerly direction towards the rear of the subject lots. The studied analysis point #1 for drainage

area EX DA-1 is located near an existing utility pole in the rear center of the subject property. The second drainage area (designated as EX DA-2) drains towards the northwest to the Broad street right-of-way. This drainage area flows to the studied analysis point #2 in the eastern corner of the site.

IV. POST-DEVELOPMENT CONDITIONS

The post-development drainage areas will maintain the existing runoff pattern, with stormwater runoff being directed towards both the rear drainage area (PR DA-3) and also to the Broad street right-of-way (PR DA-4). The entire roof area of the dwelling indicated as PR DA-1 IMP on the enclosed drainage area map will be directed to the proposed underground stormwater recharge system. As the roof area is generally considered clean no additional water quality treatment was necessary for this drainage area

The onsite parking area and driveways are split into two drainage areas. The parking areas that drain toward the rear of the property is designated as PR DA-2, containing 0.232 acres. To address the water quality requirements for this sub drainage area a water quality unit 'BioPod Biofilter Tree, was selected. The peak flow rate for PR DA-2 for the water quality storm is 0.457 cfs, which is less than the maximum flow Treatment flow rate for the 8'X16' BioPod with internal bypass (0.499 cfs indicated in NJDEP certification letter contained in Appendix D)

The remaining driveway area that drains towards Broad Street is indicated as drainage area PR DA-4, containing 0.117 acres. To address the water quality requirements for this sub drainage area a water quality unit 'BioPod Biofilter Tree, was selected. The peak flow rate for PR DA-4 for the water quality storm is 0.109 cfs, which is less than the maximum flow Treatment flow rate for the 4'X8' BioPod with internal bypass (0.115 cfs indicated in Appendix D)

V. SOILS

The NRCS SURGO Custom Soil Resource Report for Monmouth County, New Jersey for the site identifies the in-situ soils as DouB Downer-Urban Land complex, 0 to 5 percent slopes. This soil type is characterized by loamy fluviomarine deposits and/or gravelly fluviomarine deposit, and is found to be a member of Hydrologic Soil Group A. A copy of the cited report is included in Appendix A.

An onsite subsurface soil investigation was prepared by Melick-Tully & Associates, included with this submission. Based upon the finding of this report infiltration is recommended due to the permeability tests result, which ranged from >20in/hr to 8.8in/hr. A factor of safety of 2 was applied to the slowest infiltration test for a design infiltration rate of 4.4 in/hr. The on-site test pits performed indicate a Seasonal High Water Table (SHWT) at elevation 9.0. The lowest portion of the proposed underground detention basin is at elevation 11.0, which meets the NJDEP's BMP manual's minimum 2-foot separation for underground recharge.

VI. ESTIMATED DRAIN TIME CALCULATION

$$Drain\ time = \frac{100 - Year\ Design\ Storm\ Volume}{Infiltration\ Area\ x\ Design\ Permiablity\ Rate}$$

$$Drain\ time = \frac{(17{,}429\ ft^3) \times (12\frac{in}{ft})}{(8{,}525\ ft^2)\ x\ (4.4\frac{in}{hr})}$$

$$Drain\ time = \ 5.58\ hours$$

VII. DISTURBANCE AND CHANGE IN IMPERVIOUS COVER

Based upon the total lot area the maximum land disturbance for the site is 0.840 acres. This does not meet the one acre of disturbance definition for a Major Development under N.J.A.C. 7:8. The existing portions of the site that contain impervious area includes 0.325 acres. The post development impervious coverage includes 0.632 acres. The proposed increase in impervious area is 0.307 acres, which meets the NJDEP's definition for a Major development, that increases the site impervious by a quarter acre or more under N.J.A.C 7:8.

VIII. STORMWATER MANAGEMENT COMPLIANCE

According to the definitions listed in the Stormwater Management Regulations A Major development" means any "development" that provides for ultimately disturbing one or more acres of land or increasing impervious surface by one quarter acre or more. Disturbance for the purpose of this rule is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting, or removing vegetation. Projects undertaken by any government agency which otherwise meet the definition of "major development" but which do not require approval under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq., are also considered "major development."

- N.J.A.C. 7:8-5.2 Stormwater management measures
    1. The design will comply with the necessary erosion control, required groundwater recharge, stormwater runoff quantity control and stormwater runoff water quality requirements by incorporating nonstructural strategies to the maximum extent possible, and through the use of structural BMP's as necessary.
    2. An operation and Maintenance manual is provided as required for the underground recharge and water quality units.

- N.J.A.C. 7:8-5.3 Nonstructural Stormwater Management Strategies.
    1. *Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;*

       In order to protect area of water quality benefits the proposed improvements and associated grading has been minimized to the greatest extent feasible.
    2. *Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces;*

       Proposed curbing and landscaped areas are proposed within the parking areas to break up impervious areas with proposed landscaping.
    3. *Maximize the protection of natural drainage features and vegetation;*

       The natural drainage patterns for the site have been maintained and disturbance

to the existing vegetation has been minimized to the greatest extent feasible.

4. *Minimize the decrease in the "time of concentration" from pre-construction to postconstruction. "Time of concentration" is defined as the time it takes for runoff to travel from the hydraulically most distant point of the drainage area to the point of interest within a watershed;*

   The time of construction from the pre- to post-development conditions were maintained to the maximum extent practical.

5. *Minimize land disturbance including clearing and grading;*

   All land disturbances have been minimized to the great extent feasible. Grading activities shall be limited to encourage positive drainage of the site, as well as to accommodate the functionality of the proposed development.

6. *Minimize soil compaction;*

   Areas of soil compaction are limited to the building and parking areas. Compaction shall be minimized in the open space areas.

7. *Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;*

   As a common practice, the majority of the landscaping selected in the design is comprised of native plant material proven to survive in the current environment. In addition, the majority of the open space within the project limits will be planted with native species, reducing the overall need for fertilizers and pesticides on the project.

8. *Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas;*

   An open channel drainage swale is provided along the northeastern side of the proposed building.

9. *Provide other source controls to prevent or minimize the use or exposure of pollutants at the site in order to prevent or minimize the release of those pollutants into stormwater runoff. These source controls include, but are not limited to:*

   i. *Site design features that help to prevent accumulation of trash and debris in drainage systems;*

   ii. *Site design features that help to prevent discharge of trash and debris from drainage systems;*

   iii. *Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and*

   iv. *When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules.*

   All of the proposed inlet curb pieces shall be Type 'N'-Eco models which will limit the entry of floatables into the stormwater system. Furthermore, trash and recycling receptacles are proposed throughout the site to help eliminate the source of site pollution.

- N.J.A.C. 7:8-5.4 Erosion Control, Groundwater Recharge and Runoff Quantity

  a.1. Erosion Control – The site has been designed in accordance with the Soil Erosion and Sediment Control Act.

  a.2. Groundwater recharge compliance
  Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the two-year storm is infiltrated.
  According to N.J.A.C. 7:8-5.4(a)2.ii This groundwater recharge requirement does not apply to projects within the "Urban redevelopment Area," "Urban Redevelopment Area is defined as previously developed portions of areas:
  "1. Delineated on the State Plan Policy map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes"
  As the project is located within the Metropolitan Planning Area (PA1), and the site is previously developed, the proposed development complies with the groundwater recharge requirement.

  a.3. Runoff Quantity Impacts
  iii Design stormwater management measures so that the post-construction peak runoff rates for the two, 10 and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed.

- N.J.A.C. 7:8-5.5 Stormwater Runoff Quality
  Remove Total Suspended Solids (TSS) for the Water quality storm event by 80%.

  To address this requirement two (2) Manufactured Treatment Devices have been selected that remove 80% TSS, as certified by NJCAT (see Appendix D). The treatment devices include: 4'x6' BioPod with Internal Bypass, and an 8'x16' BioPod with Internal Bypass as manufacture by Oldcastle Infrastructure.
  Additionally, the clean roof runoff from the drainage are PR DA-1 will be piped directly into the underground recharge system's storage bed.

  Maintenance of this stormwater treatment device and underground basin shall be the responsibility of the owner. The requirements for same are set forth in the Operations and Maintenance Manual accompanying this report.

IX. RUNOFF COEFFICIENTS

The project site includes four (4) different categories of groundcover for both the existing and proposed conditions. "Runoff curve number for urban areas" from the TR-55 Urban Hydrology for Small Watersheds, Based on Hydrologic Soil Group A, the following 'CN' values were derived:

- Open space, good condition ground cover……..CN = 39
- Gravel……..CN = 76
- Roof…….CN = 98
- Impervious cover (sidewalks, parking areas, roof, & sheds, etc.)……...CN = 98

X. TIME OF CONCENTRATION

The time of concentration or Tc is the time is takes runoff to travel from the hydraulically most distant point of the drainage area to the point of analysis in a watershed. The Tc was calculated in accordance with The NRCS Urban Hydrology for Small Watershed TR-55. The maximum sheet flow length utilized in the calculation is 100 ft. A minimum time of concentration of 6 mins was utilized for analysis and design. This minimum Tc corresponds to the maximum runoff based on drainage area and CN values.

XI. PERMIT REQUIREMENTS

There are no floodplains in the immediate project area and the improvements will not impact any wetlands or documented T&E habitats. The project is not located in a Historic District. No permits are required from the NJ Department of Environmental Protection (NJDEP). The total area of disturbance for the project exceeds 5,000-square feet, therefore Soil Erosion and Sediment Control Certification from the Freehold Soil Conservation District will be required for the project.

XII. SUMMARY OF RESULTS

The construction of the proposed Building and associated site improvements will result in no adverse stormwater impacts to the surrounding properties. There are no environmentally sensitive areas located within the project limits and no impacts are proposed to any wetlands, floodplains or streams.

Runoff calculations for the contributing on-site drainage areas are contained in Appendix B of this Report. Contributing drainage areas are shown on the Existing and Proposed Drainage area map contained in Appendix D.

The project will ultimately result in a net reduction of peak runoff rate and volumes for the proposed site. The existing site contained no storm sewer management system and all runoff flowed directly overland. Below is a summary of the Pre vs Post-Development Runoff rates and associated reductions for the 2, 10, and 100-year storm events. Additionally, Table 2 below is also provided indicating the total stormwater volume reduction for the site.

Table 1 -Pre to Post development Peak Flow Rates			
	2- Year	**10-Year**	**100-Year**
Pre-Development	0.991 cfs	1.574cfs	3.022 cfs
Post-Development	0.155 cfs	0.242 cfs	0.581 cfs
Post-Development % of Pre-Development	15.6 %	15.4%	19.1%

Table 2: Pre to Post Development Volume			
	2- Year	**10-Year**	**100-Year**
Pre-Development	3,210 ft^3	5,680 ft^3	12,175 ft^3
Post-Development	527 ft^3	993 ft^3	2,463 ft^3
Percent Reduction	83.6%	82.52%	79.8%

XIII. CONCLUSION

In review of the summary findings, it is shown that the proposed development of the site will not adversely impact any adjacent or downstream properties. All Local, County, and State requirements for erosion control, groundwater recharge, reductions in peak runoff rates, and water quality control are met in the proposed design.

Appendix A

- NRCS SURGO Custom Soil Resource Report for Monmouth County, NJ
- Soils and Foundation Investigation (Melick- Tully Associates)

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Monmouth County, New Jersey

Broad Street 34, LLC

May 16, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:632 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 30 60 120 180

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monmouth County, New Jersey
Survey Area Data: Version 12, Sep 15, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 8, 2014—Sep 2, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DouB	Downer-Urban land complex, 0 to 5 percent slopes	0.8	100.0%
Totals for Area of Interest		**0.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Monmouth County, New Jersey

DouB—Downer-Urban land complex, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 4j72
Elevation: 0 to 170 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: Not prime farmland

Map Unit Composition

Downer and similar soils: 60 percent
Urban land: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Downer

Setting

Landform: Knolls, low hills
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Loamy fluviomarine deposits and/or gravelly fluviomarine deposits

Typical profile

Ap - 0 to 10 inches: sandy loam
Bt1 - 10 to 16 inches: sandy loam
Bt2 - 16 to 36 inches: sandy loam
C1 - 36 to 48 inches: loamy sand
C2 - 48 to 80 inches: stratified sand to sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Urban Land

Setting

Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Woodstown

Percent of map unit: 5 percent
Landform: Drainageways, flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Sassafras

Percent of map unit: 5 percent
Landform: Low hills, knolls
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

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Melick-Tully
& Associates

A Division of GZA

SUBSURFACE INVESTIGATION

PROPOSED BUILDING and DRYWELLS
MR. BRAD SEPE
MANASQUAN, MONMOUTH COUNTY, NEW JERSEY

August 22, 2019
File No. 26.0091827.00

PREPARED FOR:
Mr. Brad Sepe
126 Main Street
Manasquan, New Jersey

Melick-Tully, A Division of GZA
117 Canal Road | South Bound Brook, NJ 08880
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Melick-Tully
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August 22, 2019
File No. 26.0091827.00

Mr. Brad Sepe
126 Main Street
Manasquan, New Jersey 08736

Attention: Mr. Brad Sepe

Report
Subsurface Investigation
Proposed Building and Drywells
Manasquan, Monmouth County, New Jersey

Introduction

This report summarizes the results of the subsurface investigation performed by Melick-Tully and Associates, a Division of GZA GeoEnvironmental, Inc. (MTA) to assist in design of proposed dry wells which may be required for the proposed structure to be constructed on Block 64, Lots 25.01, 25.02, 26 and 27 in Manasquan, Monmouth County, New Jersey. The subject property is located at 34-44 Broad Street. The approximate location of the site is shown on the Site Location Map, Plate 1.

Proposed Construction

Information provided to us indicates that the proposed construction would consist of a proposed three-story slab-on-grade multi-family residential building with parking to the east (rear) of the proposed building. An archway would be constructed in the center of the building that will allow access to the pavement areas from Broad Street. Dry wells may be required as part of the proposed construction. Plans indicate the dry wells would consist of a cast in-place structure or a bottom-less manhole, with the

invert(s) established at about 9 feet below the existing ground surface and surrounded by 12 inches of 2-1/2-inch stone.

Purpose and Scope of Work

The purpose of our services was to:

1) explore the subsurface soil and groundwater conditions within the proposed drywell areas;

2) obtain relatively undisturbed tube samples for laboratory permeability testing;

3) provide an allowable foundation design bearing capacity for the nearby proposed structure; and

4) summarize our findings in a brief written report.

To accomplish these purposes, a subsurface exploration program consisting of four supervised test pits was completed within accessible portions of the site. The test pits were advanced using a rubber-tire backhoe and extended to depths ranging from 11 to 14 feet below the existing ground surface. The approximate locations of the test pits performed for this study are shown on the Plot Plan, Plate 2.

All field work was completed under the direct technical supervision of a geologist from MTA. Our representative located the test pits in the field by tape measurement from existing features shown on the plans provided to us, maintained continuous logs of the test pits as the work proceeded and obtained representative bulk samples of the soils for identification purposes. In addition, relatively undisturbed tube samples were obtained from the test pits and subjected to laboratory tube permeameter permeability testing.

Detailed descriptions of the encountered subsurface conditions are presented on the Logs of Test Pits, Plates 3A through 3D. The soils were visually classified in general accordance with the USDA Textural Triangle shown on Plate 4.

The following discussion of our findings are subject to the limitations attached as an Appendix to this report.

Findings

The site consists of four contiguous lots containing one, two and one-half story multi-family dwelling; open space; a mixed-use two-story building; and a two-story dwelling. The northern and southern dwellings contain driveways that extend to the rear of each structure. The remaining areas consist of lawn, brush, or hardscaping. Utilities serviced the existing buildings.

Topsoil ranging from 9 to 14 inches was encountered at the surface of Test Pits 1, 2, and 4. Fill materials consisting of silt loams were encountered at the surface in Test Pit 3 and below the topsoil in Test Pit 1 and extended to depths of 1.5 and 2.5 feet below the existing ground surface, respectively. Natural clay loams extending to depths of 3 to 5 feet below the existing ground surface were encountered below the fill and surface materials.

The clay loams were underlain by sands and loamy sands which extended to depths ranging from 10 to 12 feet below the existing ground surface. Test Pits 3 and 4 were terminated in this stratum. Sandy clay loams to sandy clays were encountered in Test Pits 1 and 2 at depths of 10 and 12 feet, respectively, and extended to the termination depth of both test pits, 14 feet.

Moderate to rapid groundwater seepage was encountered at depths ranging from approximately 8.5 to 9.8 feet below the ground surface. Mottling, which can be indicative of periodic seasonal saturation was encountered at depths ranging from approximately 7 to 8 feet below the existing ground surface.

Laboratory tube permeameter testing was performed on relatively undisturbed samples obtained from the deeper natural sandy soils in Test Pits 1 through 4 at depths ranging from 5 to 12 feet below the existing ground surface. The results of the permeability tests are summarized below:

Summary of Laboratory Permeability Test Results

Exploration No.	Depth of Sample (ft)	Permeability (in/hr)*	Visual Classification of Soil Tested
Test Pit 1	6	>20	Sand to Loamy Sand
Test Pit 1	9	>20	Sand
Test Pit 2	5	17	Loamy Sand
Test Pit 2	9	>20	Sand
Test Pit 3	5	10.5	Loamy Sand
Test Pit 3	7	>20	Sand
Test Pit 4	5	>20	Sand
Test Pit 4	7	>20	Loamy Sand
Test Pit 4	10	8.8	Loamy Sand

*Two replicates were tested and the slowest of the replicates is reported

The results of the laboratory permeability tests indicate the sandy and sandy loams encountered below the clay loam layer exhibited permeability rates ranging from 8.8 to >20 inches per hour. Moderate to rapid groundwater seepage was encountered at a depth of about 8 to 8.5 feet, with soil mottling at 7 to 8 feet below the ground surface, which would be above the invert elevation of the proposed dry wells shown on the plans provided and would have to be considered in the design.

Based on our observations during the test pits, it is our opinion that the proposed lightly loaded foundations for the future building established on the native, undisturbed stiff clayey soils or medium

dense sandy soils may be designed assuming a maximum net allowable bearing capacity of up to 3,000 pounds per square foot. Lightly loaded foundations supported on these materials generally experience post-construction settlements. Existing fill or disturbed soils resulting from building demolition would be unsuitable for foundation support. The presence of these materials and the suitability of additional fill and subgrades for foundation support would have to be confirmed at the time of construction by qualified personnel.

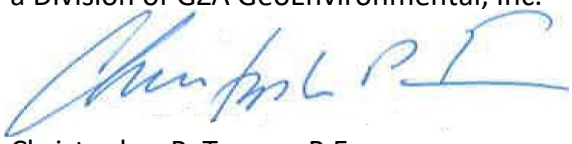
Please contact us if you have any questions regarding this information.

The following Plates and Appendix are attached and complete this report:

Plate 1 – Site Location Map
Plate 2 – Plot Plan
Plates 3A through 3D – Logs of Test Pits
Plate 4 – USDA Textural Triangle
Appendix – Limitations

Very truly yours,

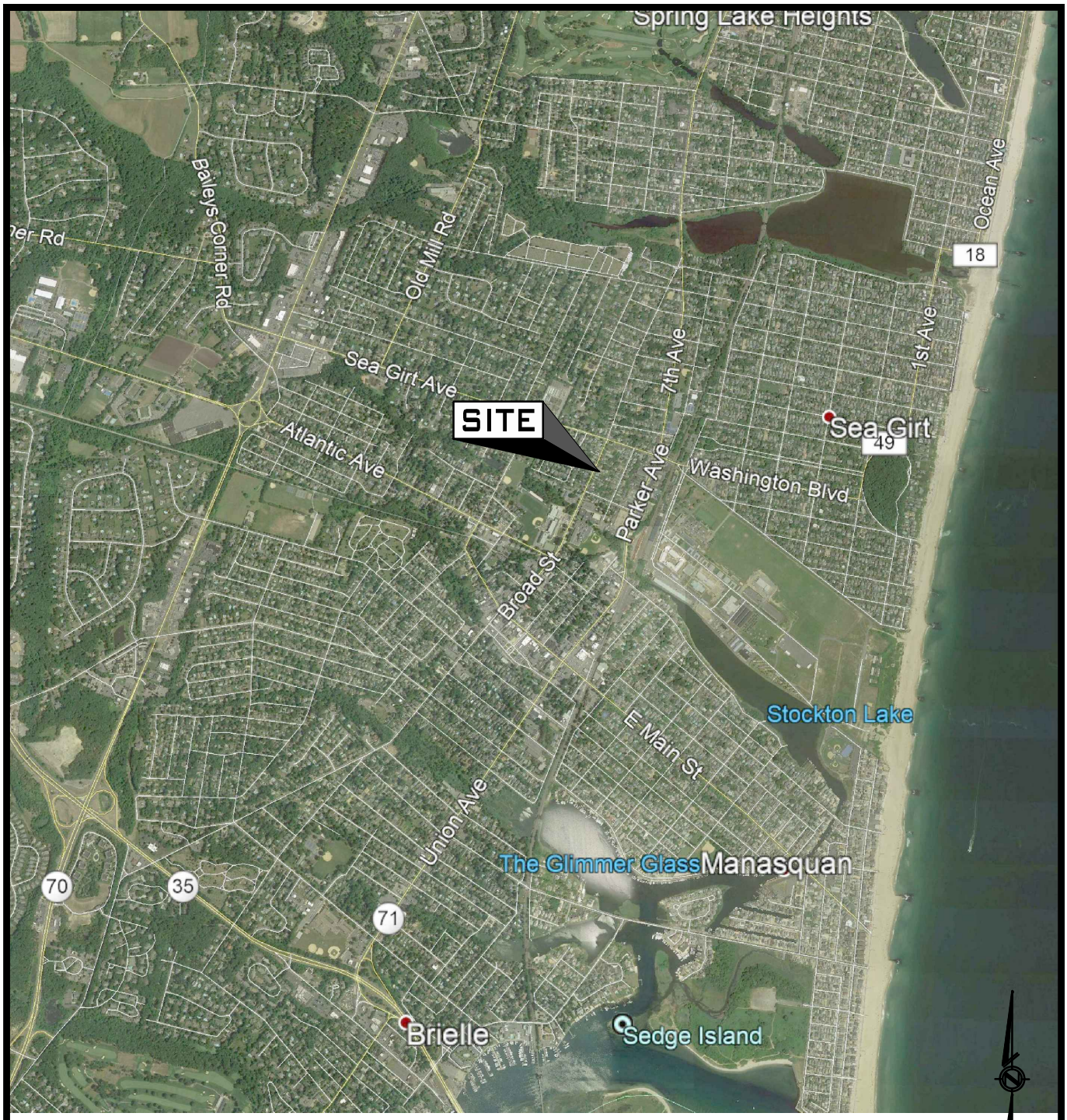
MELICK-TULLY and ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.



Christopher P. Tansey, P.E.
Associate Principal

Robert E. Schwankert, P.E.
Principal

CPT:RES/mh
(1 copy submitted via e-mail)



Aerial Photo courtesy of Google Earth Pro

MELICK–TULLY AND ASSOCIATES
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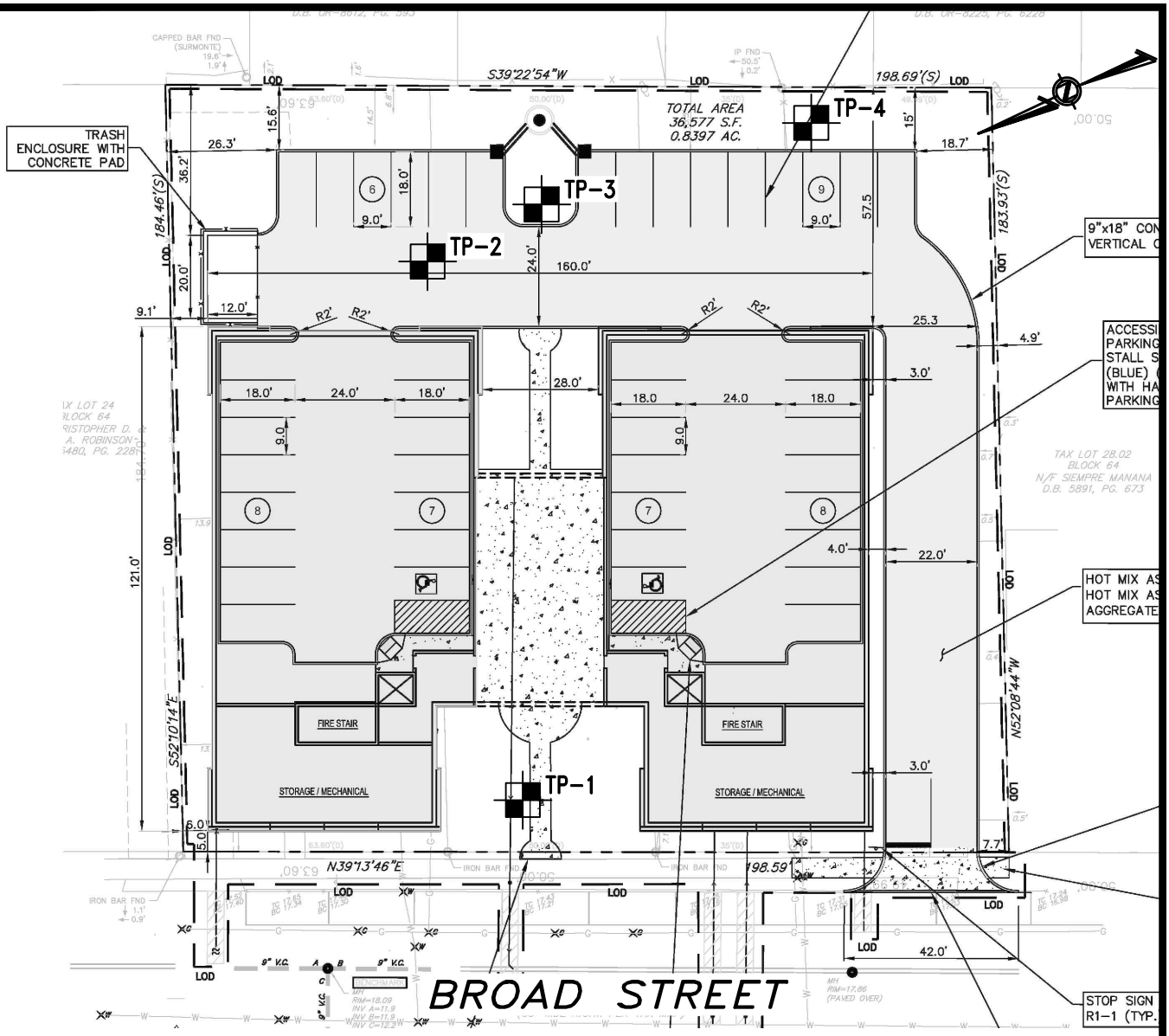
SITE LOCATION MAP

PROPOSED RESIDENTIAL BUILDING
34–44 BROAD STREET
MANASQUAN, NEW JERSEY
MR. BRAD SEPE

JOB NO.	FILE NO.	DR. BY	CHK. BY	DATE	SCALE	PLATE
26.0091827.00	–	VJD	CPT	6/27/19	1"=2,000'	1



KEY: TP-1 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

NOTES:
1. This drawing is part of Melick–Tully and Associates, a Division of GZA, Report No. 26.0091827.00 and should be read together with the report for complete evaluation.
2. General layout was obtained from a drawing prepared by Engenuity Infrastructure, entitled "major Site Plan", dated 5/13/19 scale 1"= 20'.

MELICK–TULLY AND ASSOCIATES
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PLOT PLAN

PROPOSED RESIDENTIAL BUILDING
34–44 BROAD STREET
MANASQUAN, NEW JERSEY
MR. BRAD SEPE

JOB NO.	FILE NO.	DR. BY	CHK. BY	DATE	SCALE	PLATE
26.0091827.00	–	VJD	CPT	6/27/19	1"=40'	2

LOG OF TEST PIT

TEST PIT NO. 1

COMPLETION DATE: 6/12/19 | SURFACE ELEVATION: N/A | WATER LEVEL: 9.8'

JOB NUMBER: 26.0091827.00 | READING DATE: 6/12/19

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	DEPTH (INCHES)	DESCRIPTION	DEPTH
			0-9	Topsoil - Brown (10YR, 5/3) silt loam, weak fine angular blocky, moist, friable, abrupt smooth boundary, common medium roots	
	S1, T1		9-34	FILL - Dark brown (10YR, 3/3) silt loam, with 2% asphalt, weak fine angular blocky, moist, friable, clear wavy boundary	
	S2, T2		34-60	Strong brown (7.5YR, 5/6) clay loam, moderate medium angular blocky, moist, friable	
5	S3, T3		60-84	Reddish yellow (7.5YR, 6/8) sand to loamy sand, single grain moist, loose, clear wavy boundary	5
	S4, T4		84-120	Brownish yellow (10YR, 6/6) sand, 15% gravel, single grain, moist, loose, gradual irregular boundary, few fine faint gray (10YR, 6/1) mottles encountered @ 96 inches to 120 inches	
10	S5, T5		120-168	Light brownish gray (10YR, 6/2) sandy clay loam to sandy clay, strong medium angular blocky, wet, friable	10
15				Test pit completed @ 14' Moderate groundwater seepage encountered @ 9.8'	15
20					20

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: CSK/pm 6/19

Sheet: 1 of 1 PLATE: 3A

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

LOG OF TEST PIT

TEST PIT NO. 2

COMPLETION DATE: 6/12/19 | SURFACE ELEVATION: N/A | WATER LEVEL: 9'

JOB NUMBER: 26.0091827.00 | READING DATE: 6/12/19

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	DEPTH (INCHES)	DESCRIPTION	DEPTH
			0-14	Topsoil - Brown (10YR, 2/1 silt loam, weak fine angular blocky, moist, friable, clear wavy boundary, common medium roots	
	S1, T1		14-48	Strong brown (7.5YR, 4/6) clay loam, 10% gravel, strong coarse subangular blocky, moist, friable, clear wavy boundary, few fine roots	
5	S2, T2		48-84	Brownish yellow (10YR, 6/8) loamy sand, 10% gravel, single grain, moist, loose, clear wavy boundary	5
	S3, T3		84-144	Reddish yellow (7.5YR, 6/8) sand, 15% gravel, single grain, moist to wet, loose, clear wavy boundary, few fine faint gray (10YR, 6/1) mottles encountered @ 88 inches to 144 inches	
10					10
	S4, T4		144-168	Brownish yellow (10YR, 6/6) sandy clay loam to sandy clay, 10% gravel, strong coarse subangular blocky, wet, friable, common medium distinct gray (10YR, 6/1) mottles encountered @ 144 inches to 168 inches	
15				Test pit completed @ 14' Moderate groundwater seepage encountered @ 9'	15
20					20

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: CSK/pm 6/19

Sheet: 1 of 1 PLATE: 3B

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

LOG OF TEST PIT

TEST PIT NO. 3

COMPLETION DATE: 6/12/19 | SURFACE ELEVATION: N/A | WATER LEVEL: 8.5'

JOB NUMBER: 26.0091827.00 | READING DATE: 6/12/19

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	DEPTH (INCHES)	DESCRIPTION	DEPTH
			0-18	Fill - Black (10YR, 2/1) silt loam, weak fine angular blocky, moist, friable, gradual irregular boundary, few fine roots	
	S1, T1		18-48	Strong brown (7.5YR, 5/4) clay loam, moderate medium angular blocky, moist, friable, clear wavy boundary, few fine roots	
5	S2, T2		48-72	Brownish yellow (10YR, 6/6) loamy sand, 10% gravel, single grain, moist, loose, clear wavy boundary	5
	S3, T3		72-144	Brownish yellow (10YR, 6/8) sand, 10% gravel, single grain, moist, loose, comon medium distinct gray (10YR, 6/1) mottles encountered @ 84 inches to 144 inches	
10	S4, T4				10
15				Test pit completed @ 12' Rapid groundwater seepage encountered @ 8.5'	15
20					20

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: CSK/pm 6/19

Sheet: 1 of 1 PLATE: 3C

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

LOG OF TEST PIT

TEST PIT NO. 4

COMPLETION DATE: 6/12/19 | SURFACE ELEVATION: | WATER LEVEL: 8.5'

JOB NUMBER: 26.0091827.00 | READING DATE: 6/12/19

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	DEPTH (INCHES)	DESCRIPTION	DEPTH
			0-12	Topsoil - Brown (10YR, 4/3) silt loam, weak fine angular blocky, moist, friable, gradual irregular boundary, many coarse roots	
	S1, T1		12-36	Strong brown (7.5YR, 5/6) clay loam, 10% gravel, strong medium angular blocky, moist, firm, clear wavy boundary, common medium roots	
5	S2, T2		36-82	Yellow (10YR, 8/6) sand, 10% gravel, single grain, moist, loose, clear wavy boundary	5
	S3, T3		82-132	Pale brown (10YR, 6/3) loamy sand, 10% gravel, single grain, wet, loose, few fine faint gray (10YR, 6/1) mottles encountered @ 86 inches to 132 inches	
10	S4, T4				10
				Test pit completed @ 11' Moderate groundwater seepage encountered @ 8.5'	
15					15
20					20

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: CSK/pm 6/19

Sheet: 1 of 1 PLATE: 3D

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

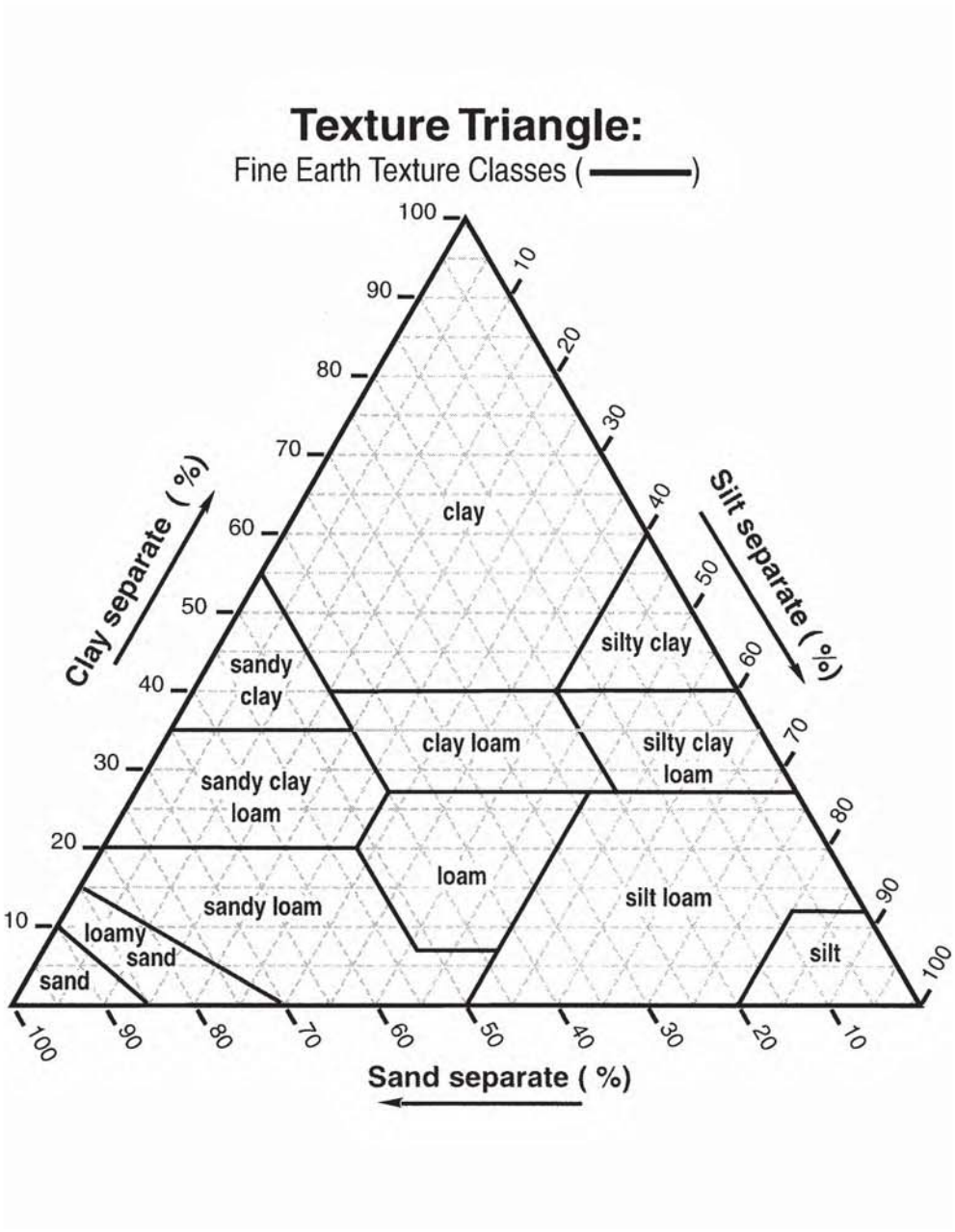

Texture Triangle:
Fine Earth Texture Classes (———)
Clay separate (%)
Silt separate (%)
Sand separate (%)
clay
silty clay
sandy clay
clay loam
silty clay loam
sandy clay loam
loam
silt loam
sandy loam
loamy sand
sand
silt
100
90
80
70
60
50
40
30
20
10

PLATE 4

APPENDIX

APPENDIX

Limitations

A. Subsurface Information

Locations: The locations of the explorations were approximately determined by tape measurement from existing site features shown on plans provided to us. Elevations of the explorations were not available. The locations of the explorations should be considered accurate only to the degree implied by the method used.

Interface of Strata: The stratification lines shown on the individual logs of the subsurface explorations represent the approximate boundaries between soil types, and the transitions may be gradual.

Field Logs/Final Logs: A field log was prepared for each exploration by a member of our staff. The field log contains factual information and interpretation of the soil conditions between samples. Our recommendations are based on the final logs as shown in this report and the information contained therein, and not on the field logs. The final logs represent our interpretation of the contents of the field logs, and the results of the laboratory observations and/or tests of the field samples.

Water Levels: Water level readings have been made in the explorations at times and under conditions stated on the individual logs. These data have been reviewed and interpretations made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater will occur due to variations in rainfall, temperature, and other factors.

Pollution/Contamination: Unless specifically indicated to the contrary in this report, the scope of our services was limited only to investigation and evaluation of the geotechnical engineering aspects of the site conditions, and did not include any consideration of potential site pollution or contamination resulting from the presence of chemicals, metals, radioactive elements, etc. This report offers no facts or opinions related to potential pollution/contamination of the site.

Environmental Considerations: Unless specifically indicated to the contrary in this report, this report does not address environmental considerations which may affect the site development, e.g., wetlands determinations, flora and fauna, wildlife, etc. The conclusions and recommendations of this report are not intended to supersede any environmental conditions which should be reflected in the site planning.

B. Applicability of Report

This report has been prepared in accordance with generally accepted soils and foundation engineering practices for the exclusive use of Mr. Brad Sepe for specific application to the design of the proposed dry wells on 33-44 Broad Street in Manasquan, New Jersey. No other warranty, expressed or implied, is made.

This report may be referred to in the project specifications for general information purposes only but should not be used as the technical specifications for the work, as it was prepared for design purposes exclusively.

C. Reinterpretation of Recommendations

Change in Location or Nature of Facilities: In the event that any changes in the nature, design or location of the dry wells are planned, the findings contained in this report shall not be considered valid unless the changes are reviewed, and conclusions of this report modified or verified in writing.

Changed Conditions During Construction: The findings submitted in this report are based in part upon the data obtained from four test pit excavations performed for this study. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

Changes in State-of-the-Art: The findings contained in this report are based upon the applicable standards of our profession at the time this report was prepared.

D. Use of Report by Prospective Bidders

This soils engineering report was prepared for the project by Melick-Tully and Associates, a Division of GZA GeoEnvironmental, Inc. (MTA) for design purposes and may not be sufficient to prepare an accurate bid. Contractors utilizing the information in the report should do so with the express understanding that its scope was developed to address design considerations. Prospective bidders should obtain the owner's permission to perform whatever additional explorations or data gathering they deem necessary to prepare their bid accurately.

E. Construction Observation

We recommend that MTA be retained to provide on-site soils engineering services during the earthwork construction and foundation phases of the work. This is to observe compliance with the design concepts and to allow changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

Appendix B

- Pre-Development Runoff Curve Number (CN)
- Post-Development Runoff Curve Number (CN)
- Hydraflow Hydrographs for Pre and Post-Development Stormwater Management Analysis (2, 10, & 100-year storm events)

Project	34 Broad Street
Job Number	SEPE-00020
Location	Manasquan, NJ

By MJB Date: 3/6/2020
Checked TCS Date 4/10/2020

PRE Development

Drainage Sub-area **EX DA-1 IMP**

Runoff Curve Number					
ID	Hydrologic Soil Group	Cover Description	CN	Area (Acres)	Product of CN x area
1	A	Parking lots, roofs, concrete	98	0.280	27.44
2	a	Gravel driveway	76	0.025	1.9
3					
4					
5					
6					
			Totals	**0.305**	**29.34**

CN (weighted) = Product of CN x area / Total area

CN	**96**

Project	34 Broad Street
Job Number	SEPE-00020
Location	Manasquan, NJ

By MJB Date: 3/6/2020
Checked TCS Date 4/10/2020

PRE Development

Drainage Sub-area **EX DA-1 PER**

Runoff Curve Number					
ID	Hydrologic Soil Group	Cover Description	CN	Area (Acres)	Product of CN x area
1	A	Open Space (Good cond.)	39	0.471	18.369
2					
3					
4					
5					
6					
			Totals	**0.471**	**18.369**

CN (weighted) = Product of CN x area / Total area

CN	**39**

Project: 34 Broad Street		By:	MJB	Date:	3/6/2020
Job Number: SEPE00020		Checked:	TCS	Date:	4/10/2020
Location: Manasquan					

PRE Development Drainage area: EX DA-1 PER

SHEET FLOW	Segment ID:	AB			
1 Surface Descripton		Grass			
2 Manning Roughness Coefficent, n		0.24			
3 Flow Length (100 ft MAX)		100			
4 2-Year 24 hour rainfall, P		3.38			
5 Land Slope (Ft/Ft)		0.015			
6 Time (Hours)		0.260			0.260 Hr
SHALLOW CONCENTRATED FLOW	Segment ID:	BC			
7 Surface Description (paved or unpaved)		Unpaved			
8 Flow Length, L (ft)		65			
9 Watercourse slope, s (ft/ft)		0.02			
10 Average Velocity, V (figure 3-1)		2			
11 Time (hr)		0.009			0.009 Hr
CHANNEL FLOW	Segment ID:				
12 Cross sectional flow area, a (ft^2)					
13 wetted perimeter, pw (ft)					
14 Hydarulic radius, r= a/ pw (ft)					
15 Channel Slope, s (ft/ft)					
16 Manning's roughness coefficent, n					
17 Velocity (ft/S) (USE 3.5 ft/s for DESIGN)					
18 Flow Length (ft)					
19 Time (hr)					0.000 Hr

TOTAL TIME OF CONCENTRATION IN DRAINAGE SUBAREA 0.269 Hr

OR

16 Mins

Project	34 Broad Street
Project Number	SEPE-00020
Location	Manasquan, NJ

By MJB Date: 3/6/2020
Checked TCS Date 4/10/2020

PRE Development

Drainage Sub-area **EX DA-2 IMP**

Runoff Curve Number					
ID	Hydrologic Soil Group	Cover Description	CN	Area (Acres)	Product of CN x
1	A	Parking lots, roofs, concrete	98	0.014	1.372
2	A	Gravel driveway	76	0.006	0.456
3					
4					
5					
6					
			Totals	**0.020**	**1.828**

CN (weighted) = Product of CN x area / Total area

CN	**91**

Project	34 Broad Street
Project Number	SEPE-00020
Location	Manasquan, NJ

By MJB Date: 3/6/2020
Checked TCS Date 4/10/2020

PRE Development

Drainage Sub-area **EX DA-2 PER**

Runoff Curve Number					
ID	Hydrologic Soil Group	Cover Description	CN	Area (Acres)	Product of CN x
1	A	Open Space (Good cond.)	39	0.044	1.716
2					
3					
4					
5					
6					
			Totals	**0.044**	**1.716**

CN (weighted) = Product of CN x area / Total area

CN	**39**

Project	34 Broad Street
Project Number	SEPE-00020
Location	Manasquan, NJ

By MJB Date: 3/6/2020
Checked TCS Date 7/7/2020

POST Development

Drainage Sub-area **PR DA-1 IMP**

Runoff Curve Number					
ID	Hydrologic Soil Group	Cover Description	CN	Area (Acres)	Product of CN x
1	A	Roof area	98	0.381	37.338
2					
3					
4					
5					
6					
			Totals	**0.381**	**37.338**

CN (weighted) = Product of CN x area / Total area

CN	**98**

Project	34 Broad Street
Project Number	SEPE-00020
Location	Manasquan, NJ

By MJB Date: 3/6/2020
Checked TCS Date 4/10/2020

POST Development

Drainage Sub-area **PR DA-2 IMP**

Runoff Curve Number					
ID	Hydrologic Soil Group	Cover Description	CN	Area (Acres)	Product of CN x
1	A	Asphalt, Concrete	98	0.206	20.188
2					
3					
4					
5					
6					
			Totals	**0.206**	**20.188**

CN (weighted) = Product of CN x area / Total area

CN	**98**

Project	34 Broad Street
Project Number	SEPE-00020
Location	Manasquan, NJ

By MJB Date: 3/6/2020
Checked TCS Date 4/10/2020

POST Development

Drainage Sub-area **PR DA-2 PER**

Runoff Curve Number					
ID	Hydrologic Soil Group	Cover Description	CN	Area (Acres)	Product of CN x
1	A	Open space (Good condtion)	98	0.026	2.548
2					
3					
4					
5					
6					
			Totals	**0.026**	**2.548**

CN (weighted) = Product of CN x area / Total area

CN	**98**

Project	34 Broad Street
Project Number	SEPE-00020
Location	Manasquan, NJ

By MJB Date: 3/6/2020
Checked TCS Date 4/10/2020

POST Development

Drainage Sub-area **PR DA-3 PER**

Runoff Curve Number					
ID	Hydrologic Soil Group	Cover Description	CN	Area (Acres)	Product of CN x
1	A	Open Space (Good cond.)	39	0.110	4.29
2					
3					
4					
5					
6					
			Totals	**0.110**	**4.29**

CN (weighted) = Product of CN x area / Total area

CN	**39**

Project	34 Broad Street
Project Number	SEPE-00020
Location	Manasquan, NJ

By MJB Date: 3/6/2020
Checked TCS Date 7/7/2020

POST Development

Drainage Sub-area **PR DA-4 IMP**

Runoff Curve Number					
ID	Hydrologic Soil Group	Cover Description	CN	Area (Acres)	Product of CN x
1	A	Asphalt and Concrete	98	0.049	4.802
2					
3					
4					
5					
6					
			Totals	**0.049**	**4.802**

CN (weighted) = Product of CN x area / Total area

CN	**98**

Project	34 Broad Street
Project Number	SEPE-00020
Location	Manasquan, NJ

By MJB Date: 3/6/2020
Checked TCS Date 7/7/2020

POST Development

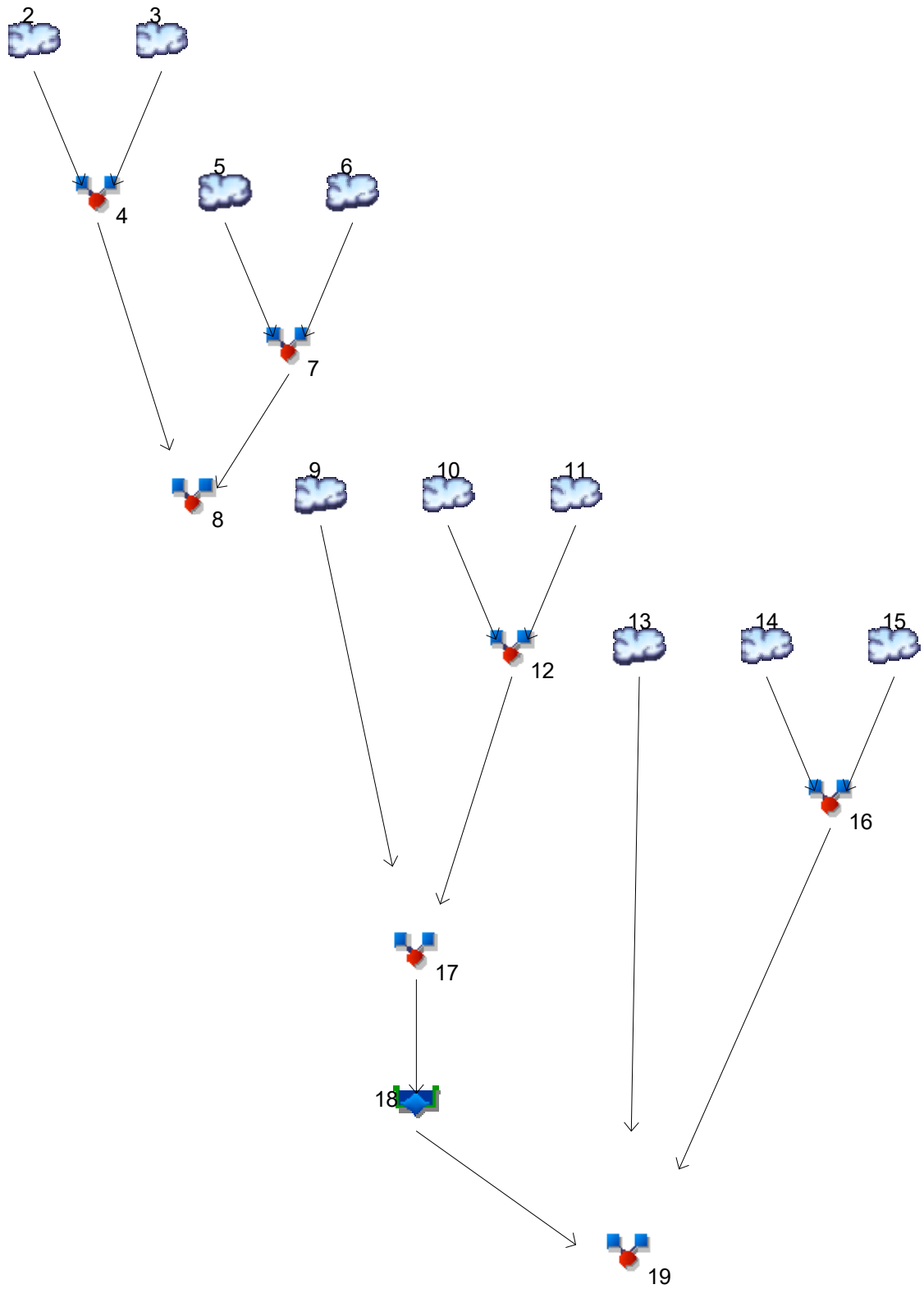
Drainage Sub-area **PR DA-4 PER**

Runoff Curve Number					
ID	Hydrologic Soil Group	Cover Description	CN	Area (Acres)	Product of CN x
1	A	Open Space (Good Condition)	39	0.068	2.652
2					
3					
4					
5					
6					
			Totals	**0.068**	**2.652**

CN (weighted) = Product of CN x area / Total area

CN	**39**

Watershed Model Schematic

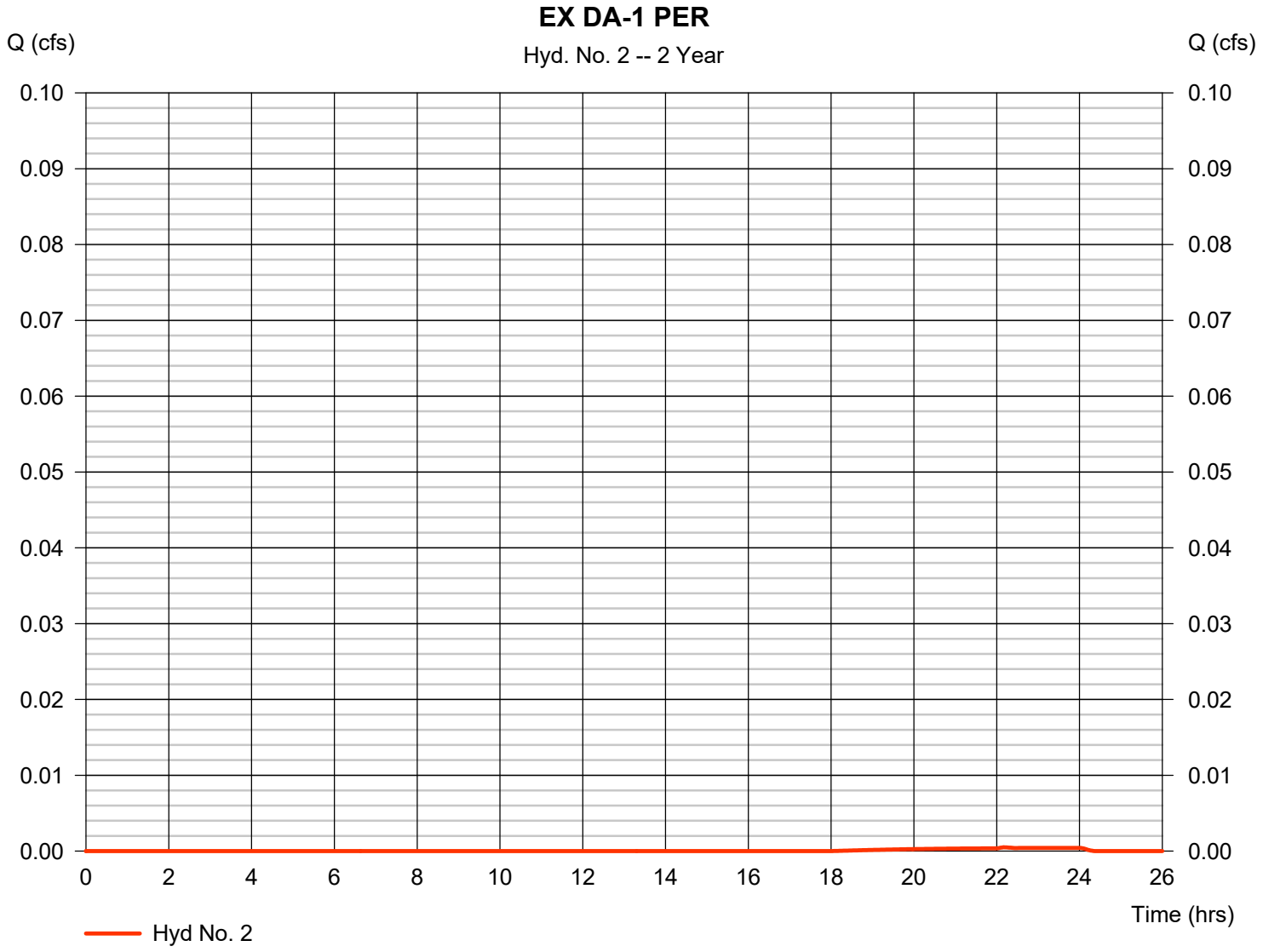


Hydrograph Report

Hyd. No. 2

EX DA-1 PER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.001 cfs
Storm frequency	= 2 yrs	Time to peak	= 22.17 hrs
Time interval	= 2 min	Hyd. volume	= 7 cuft
Drainage area	= 0.471 ac	Curve number	= 39
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 3.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



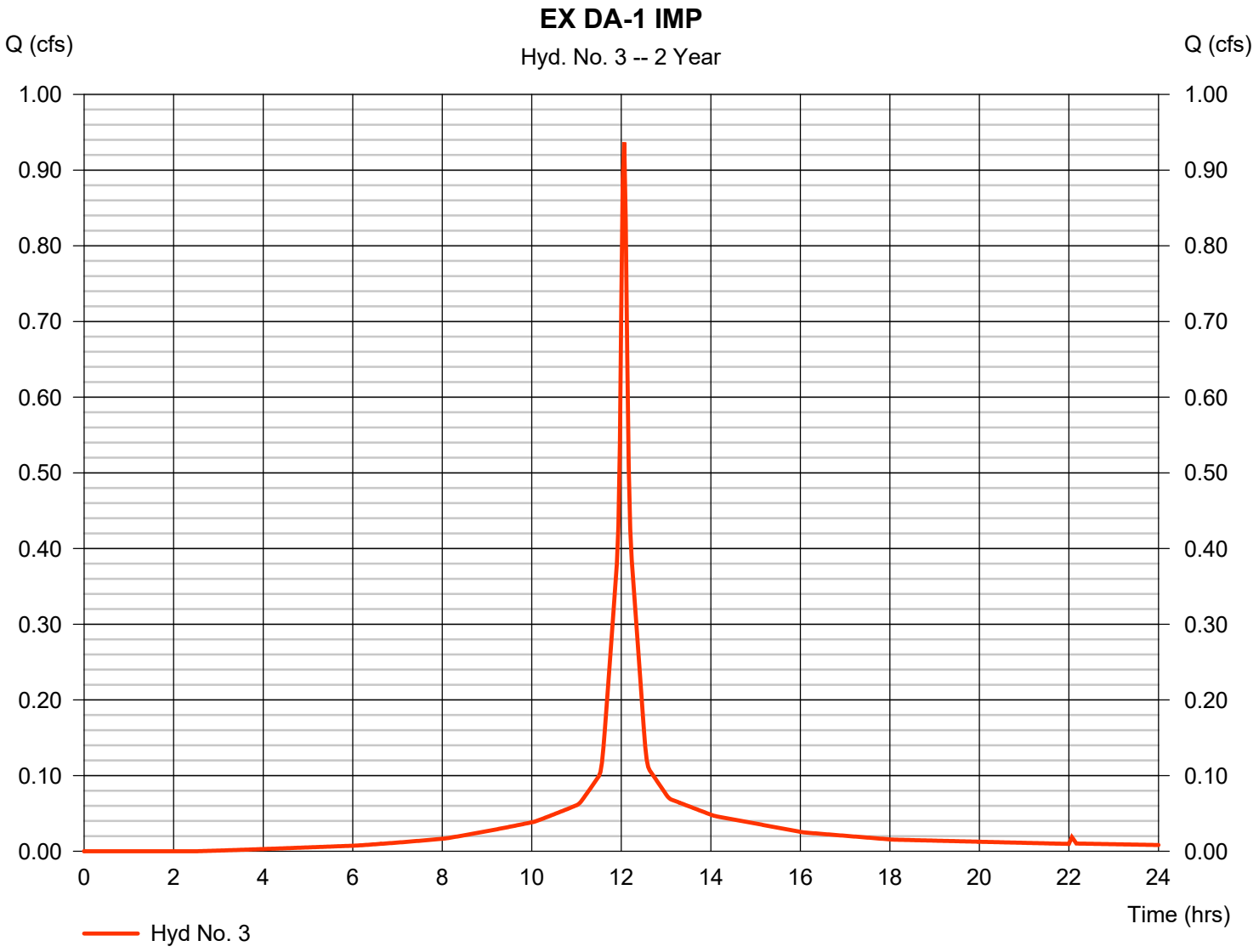
Hydrograph Report

Hyd. No. 3

EX DA-1 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.937 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,038 cuft
Drainage area	=	0.305 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.38 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.280 x 98) + (0.029 x 76)] / 0.305

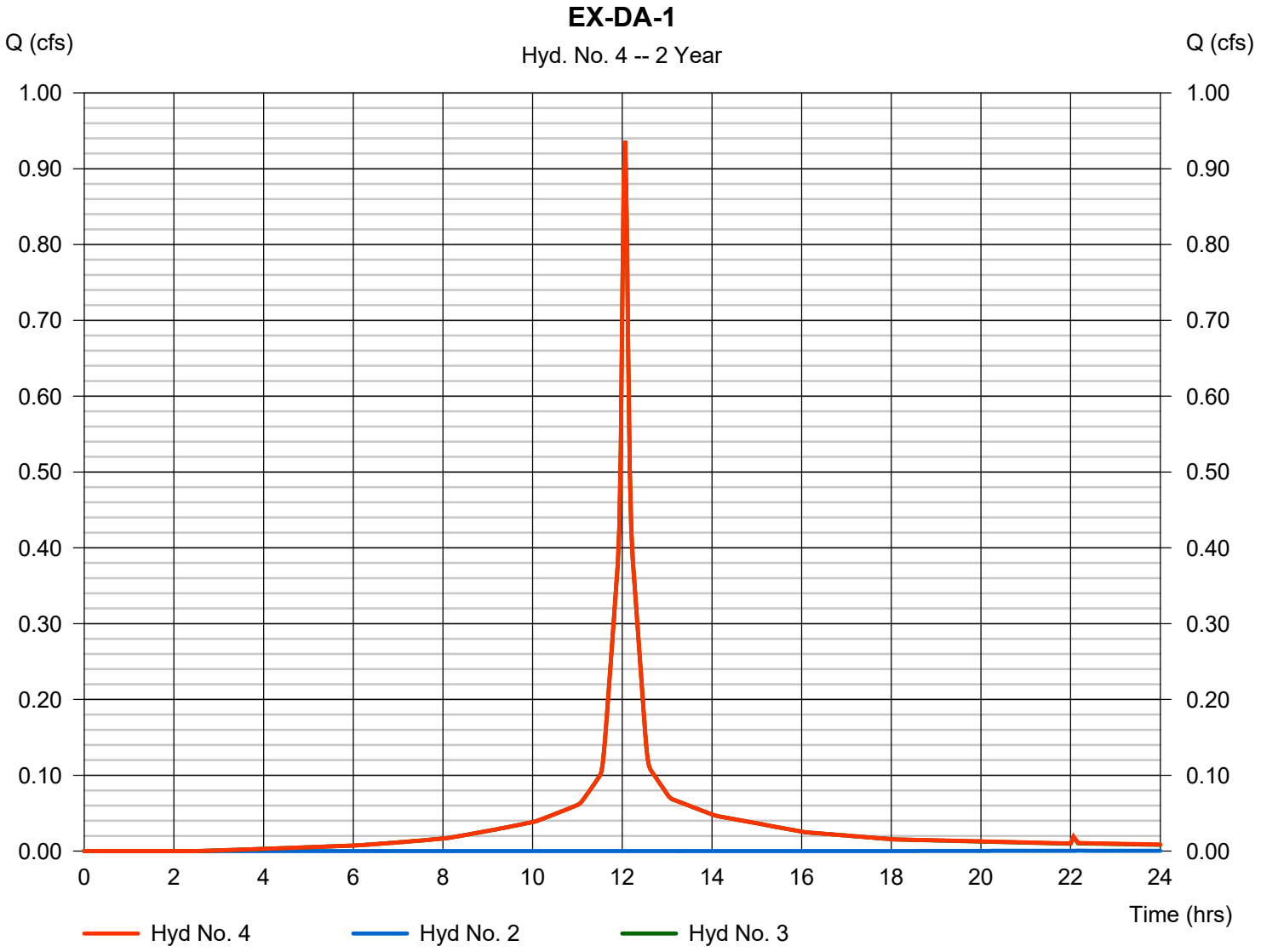


Hydrograph Report

Hyd. No. 4

EX-DA-1

Hydrograph type	=	Combine	Peak discharge	=	0.937 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,044 cuft
Inflow hyds.	=	2, 3	Contrib. drain. area	=	0.776 ac

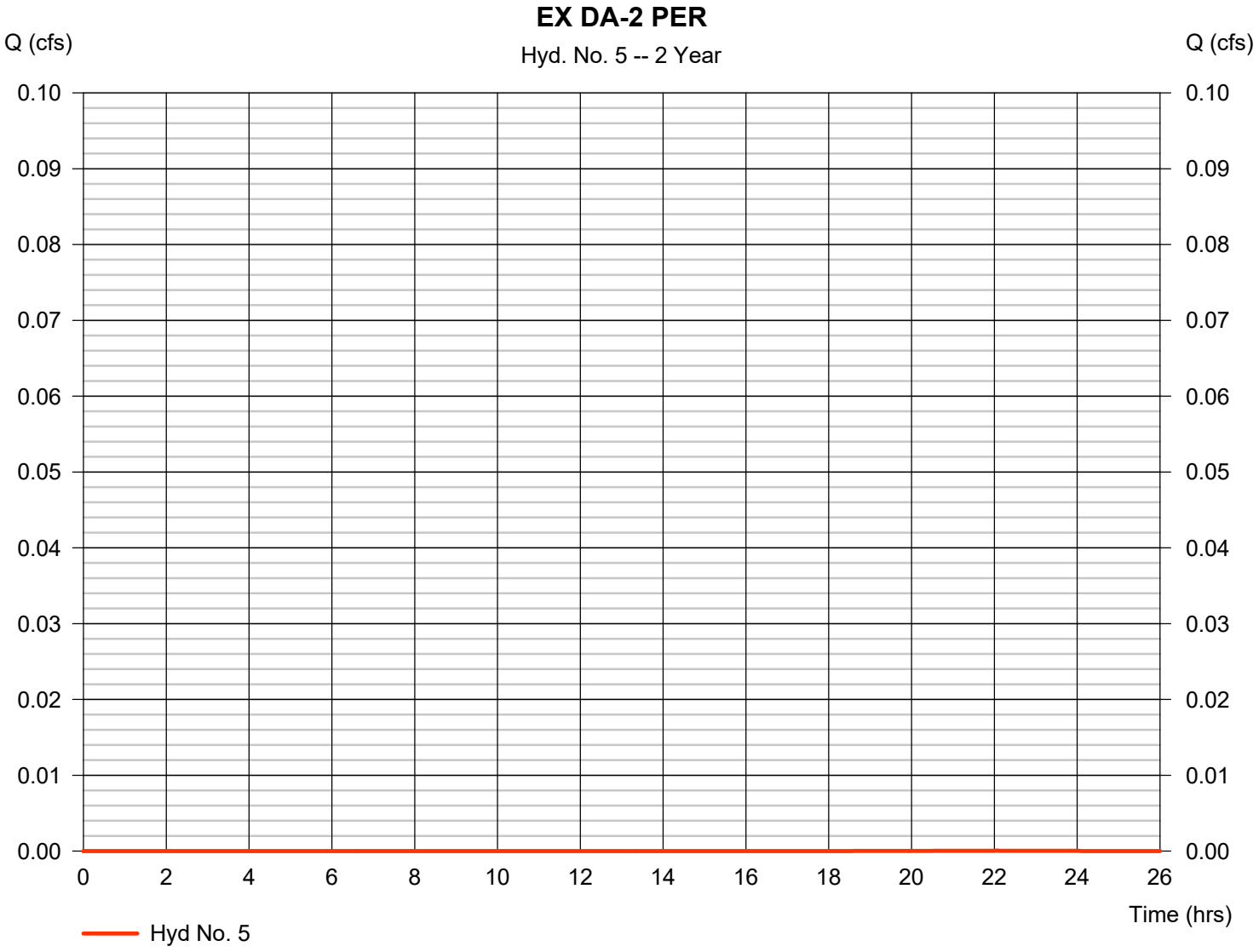


Hydrograph Report

Hyd. No. 5

EX DA-2 PER

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	22.07 hrs
Time interval	=	2 min	Hyd. volume	=	1 cuft
Drainage area	=	0.044 ac	Curve number	=	39
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.38 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



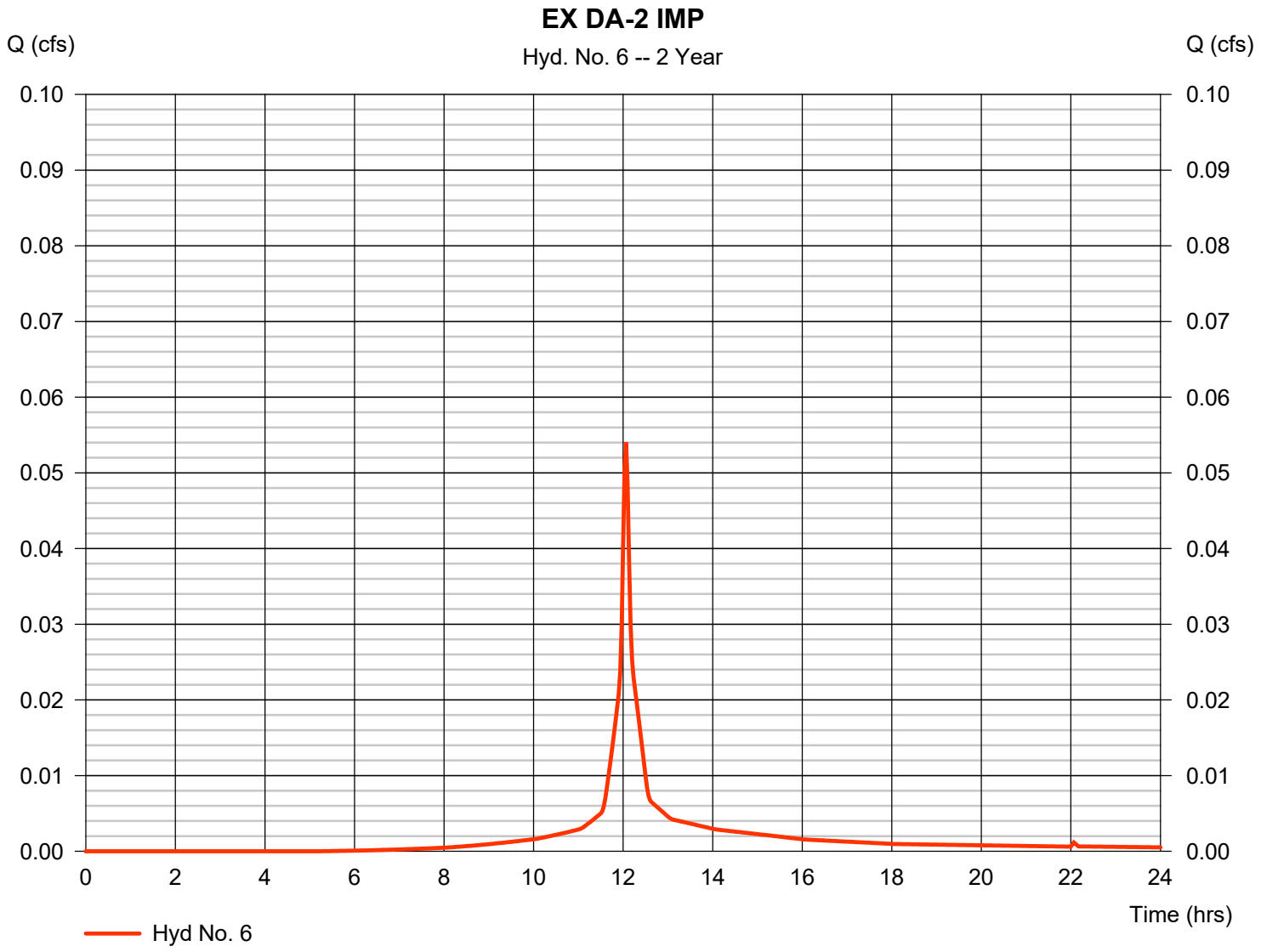
Hydrograph Report

Hyd. No. 6

EX DA-2 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.054 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	165 cuft
Drainage area	=	0.020 ac	Curve number	=	91*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.38 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.014 x 98) + (0.006 x 76)] / 0.020

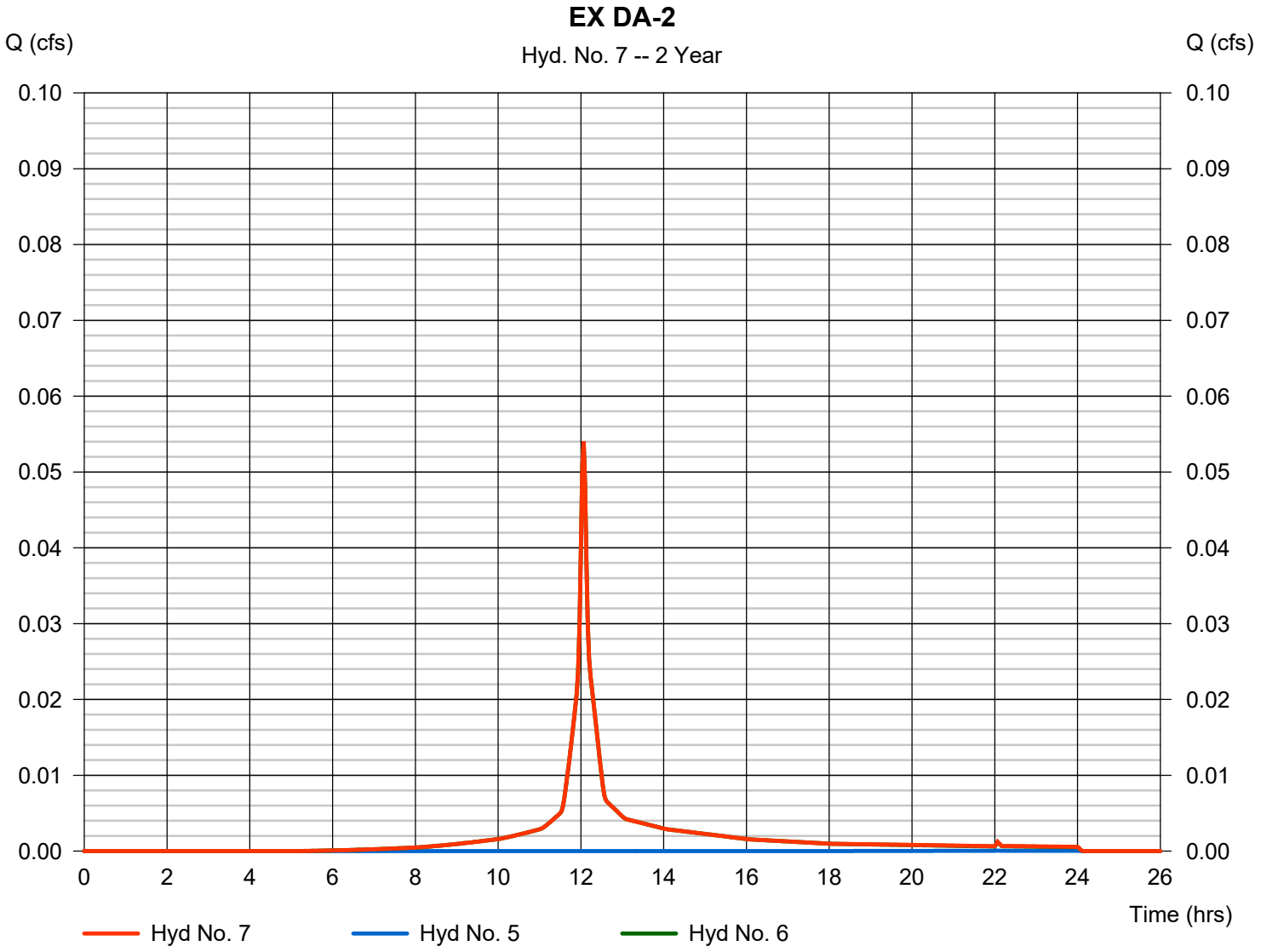


Hydrograph Report

Hyd. No. 7

EX DA-2

Hydrograph type	=	Combine	Peak discharge	=	0.054 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	166 cuft
Inflow hyds.	=	5, 6	Contrib. drain. area	=	0.064 ac

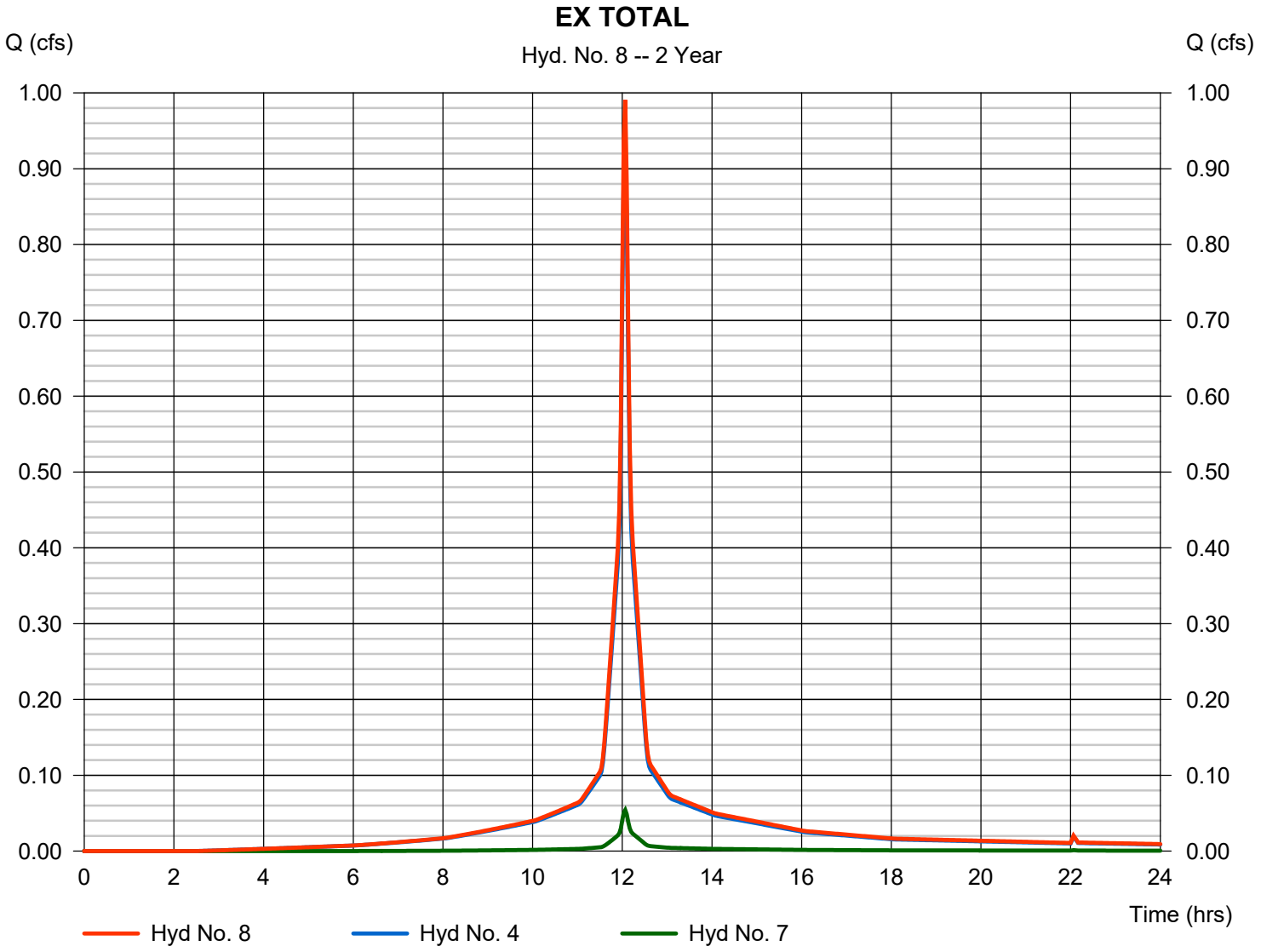


Hydrograph Report

Hyd. No. 8

EX TOTAL

Hydrograph type	=	Combine	Peak discharge	=	0.991 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,210 cuft
Inflow hyds.	=	4, 7	Contrib. drain. area	=	0.000 ac

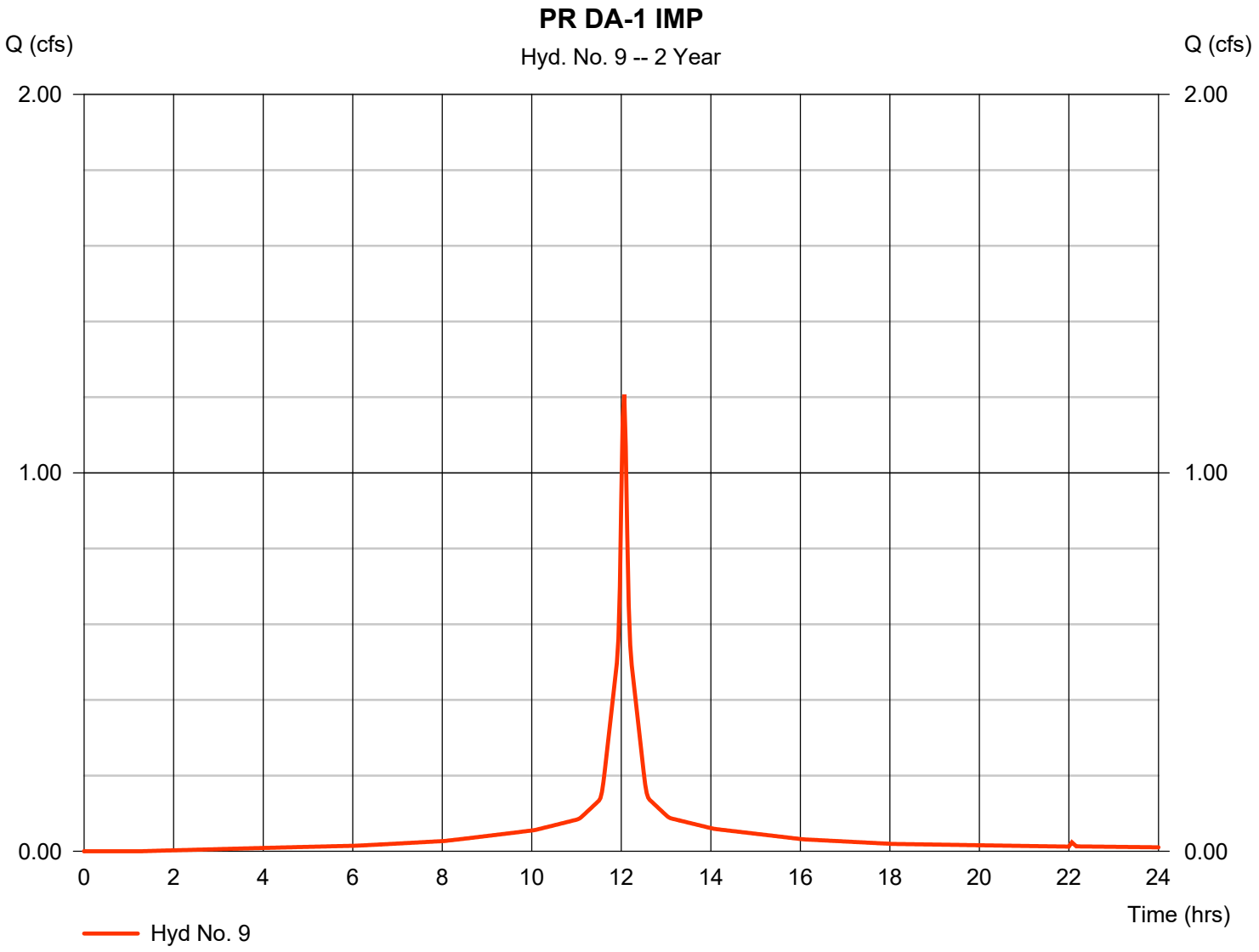


Hydrograph Report

Hyd. No. 9

PR DA-1 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.207 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	4,080 cuft
Drainage area	=	0.381 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.38 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

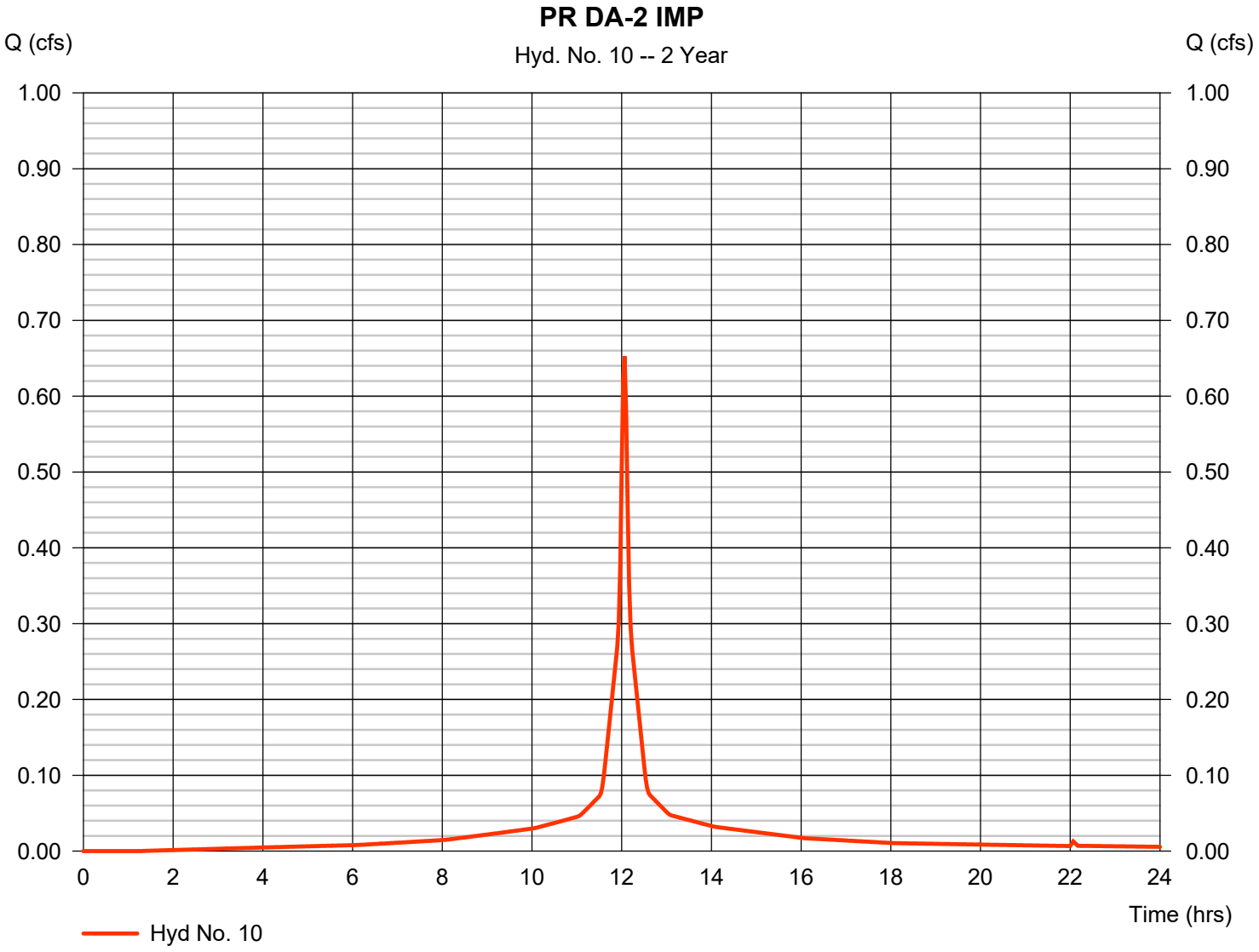


Hydrograph Report

Hyd. No. 10

PR DA-2 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.652 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	2,206 cuft
Drainage area	=	0.206 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.38 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

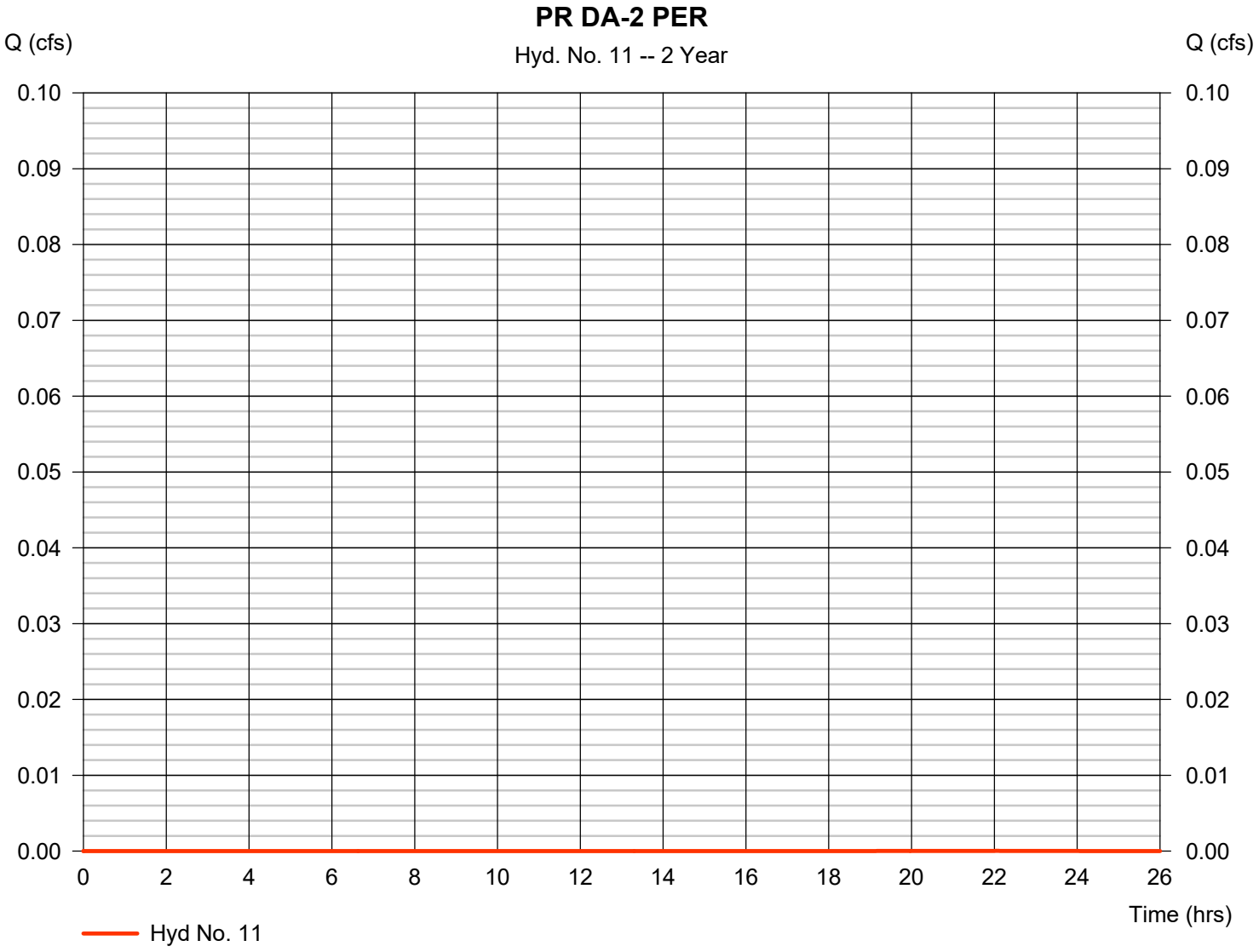


Hydrograph Report

Hyd. No. 11

PR DA-2 PER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 22.07 hrs
Time interval	= 2 min	Hyd. volume	= 0 cuft
Drainage area	= 0.026 ac	Curve number	= 39
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

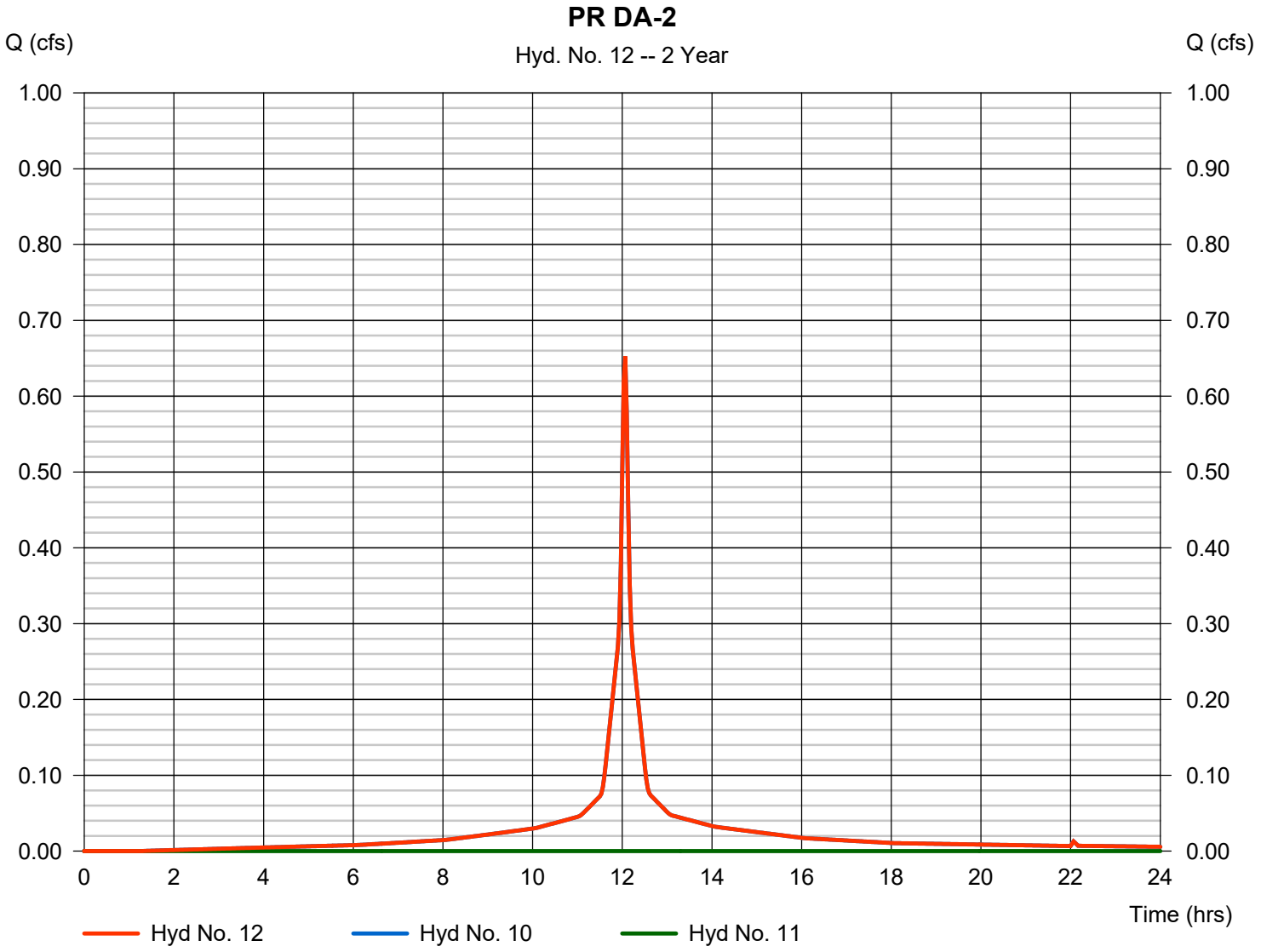


Hydrograph Report

Hyd. No. 12

PR DA-2

Hydrograph type	=	Combine	Peak discharge	=	0.652 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	2,206 cuft
Inflow hyds.	=	10, 11	Contrib. drain. area	=	0.232 ac

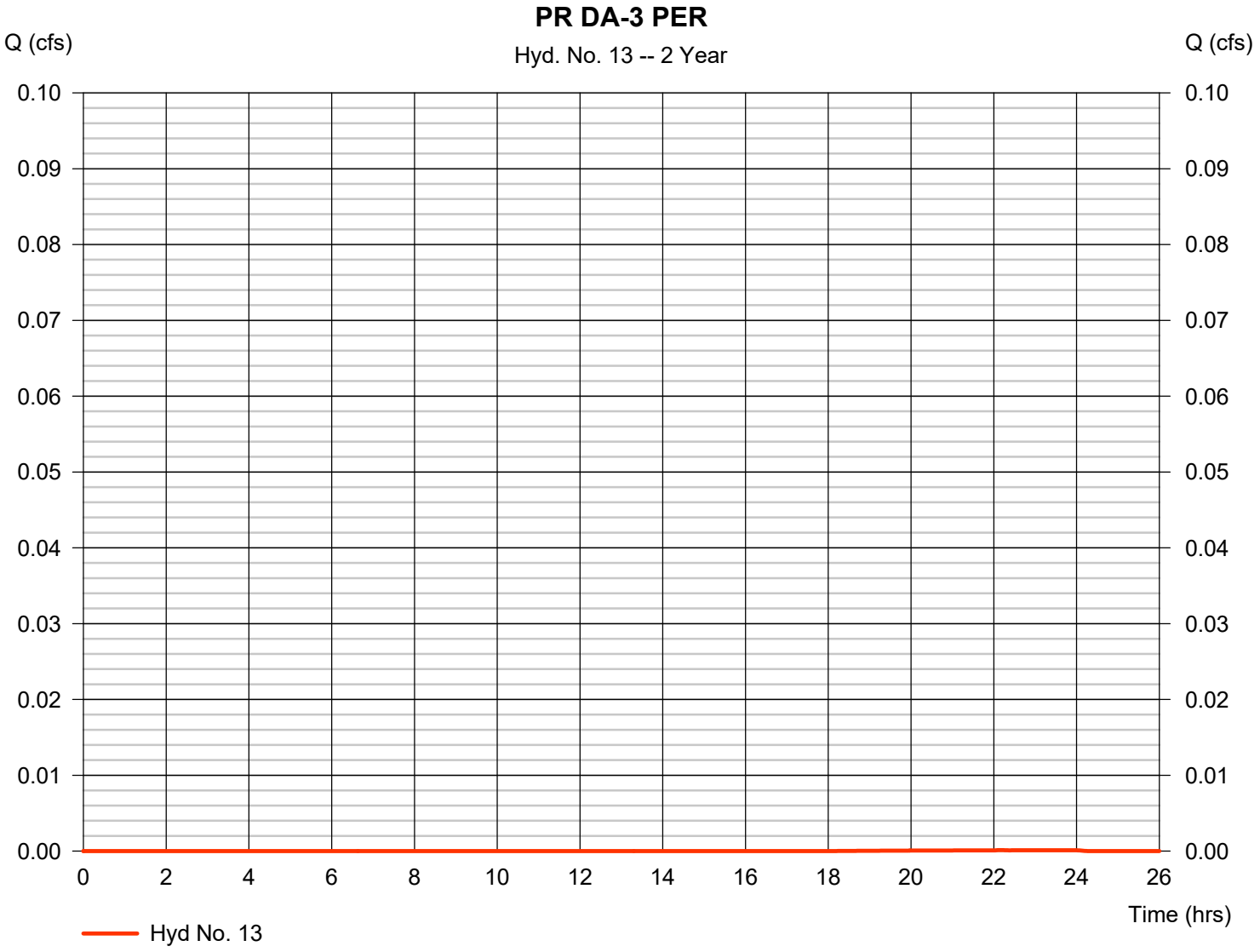


Hydrograph Report

Hyd. No. 13

PR DA-3 PER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 22.13 hrs
Time interval	= 2 min	Hyd. volume	= 2 cuft
Drainage area	= 0.110 ac	Curve number	= 39
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 3.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

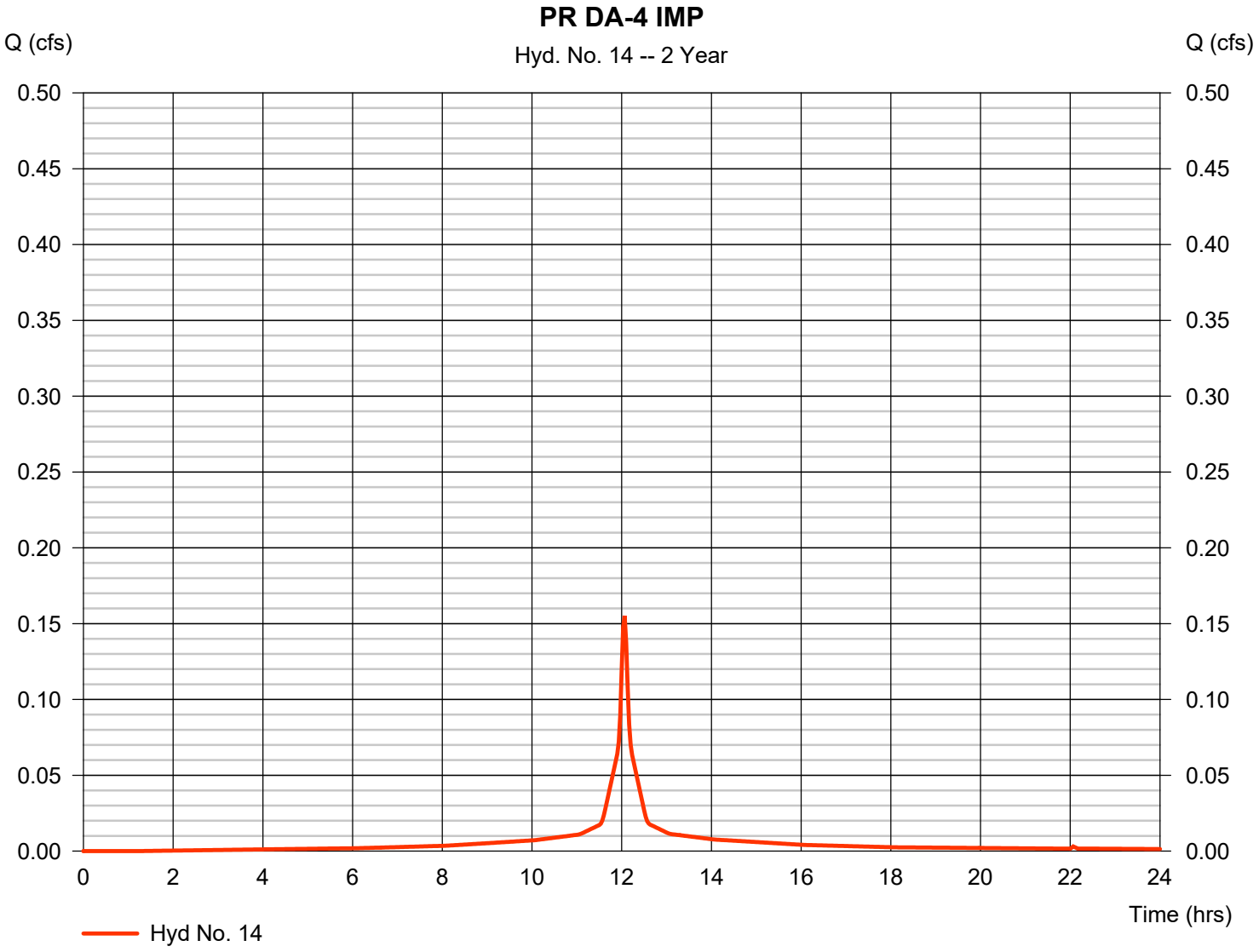


Hydrograph Report

Hyd. No. 14

PR DA-4 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.155 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	525 cuft
Drainage area	=	0.049 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.38 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

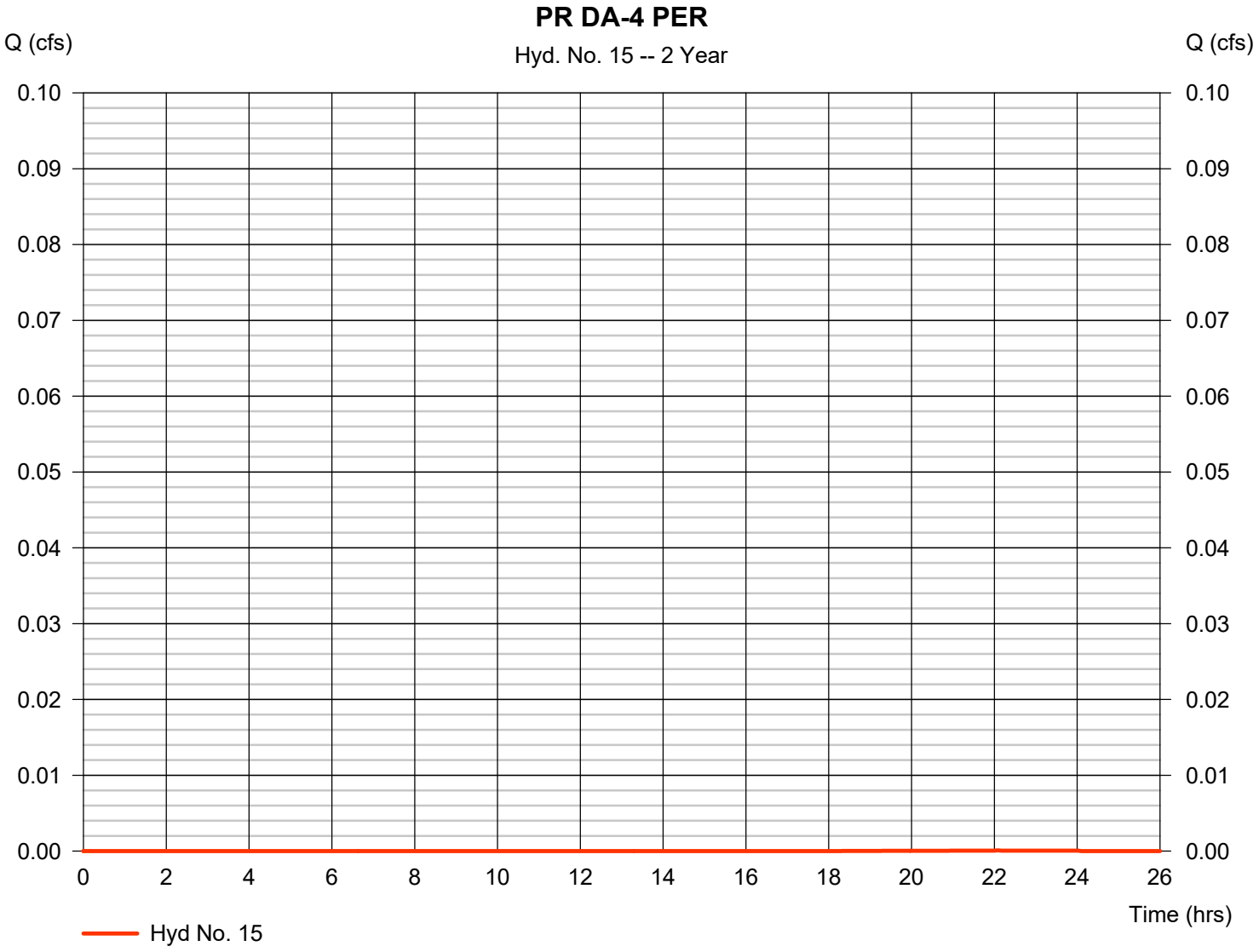


Hydrograph Report

Hyd. No. 15

PR DA-4 PER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= 22.07 hrs
Time interval	= 2 min	Hyd. volume	= 1 cuft
Drainage area	= 0.068 ac	Curve number	= 39
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 3.38 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

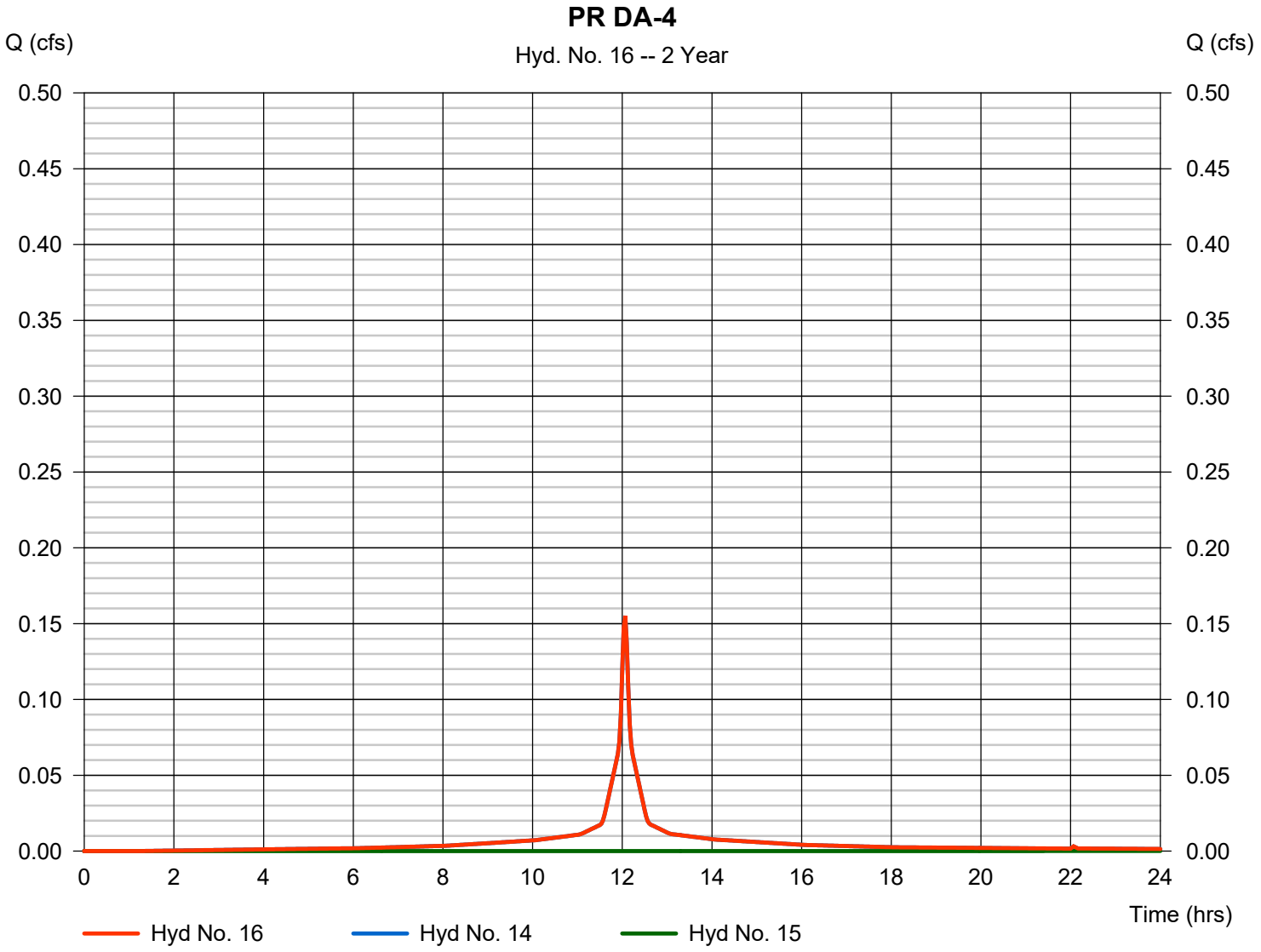


Hydrograph Report

Hyd. No. 16

PR DA-4

Hydrograph type	=	Combine	Peak discharge	=	0.155 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	526 cuft
Inflow hyds.	=	14, 15	Contrib. drain. area	=	0.117 ac

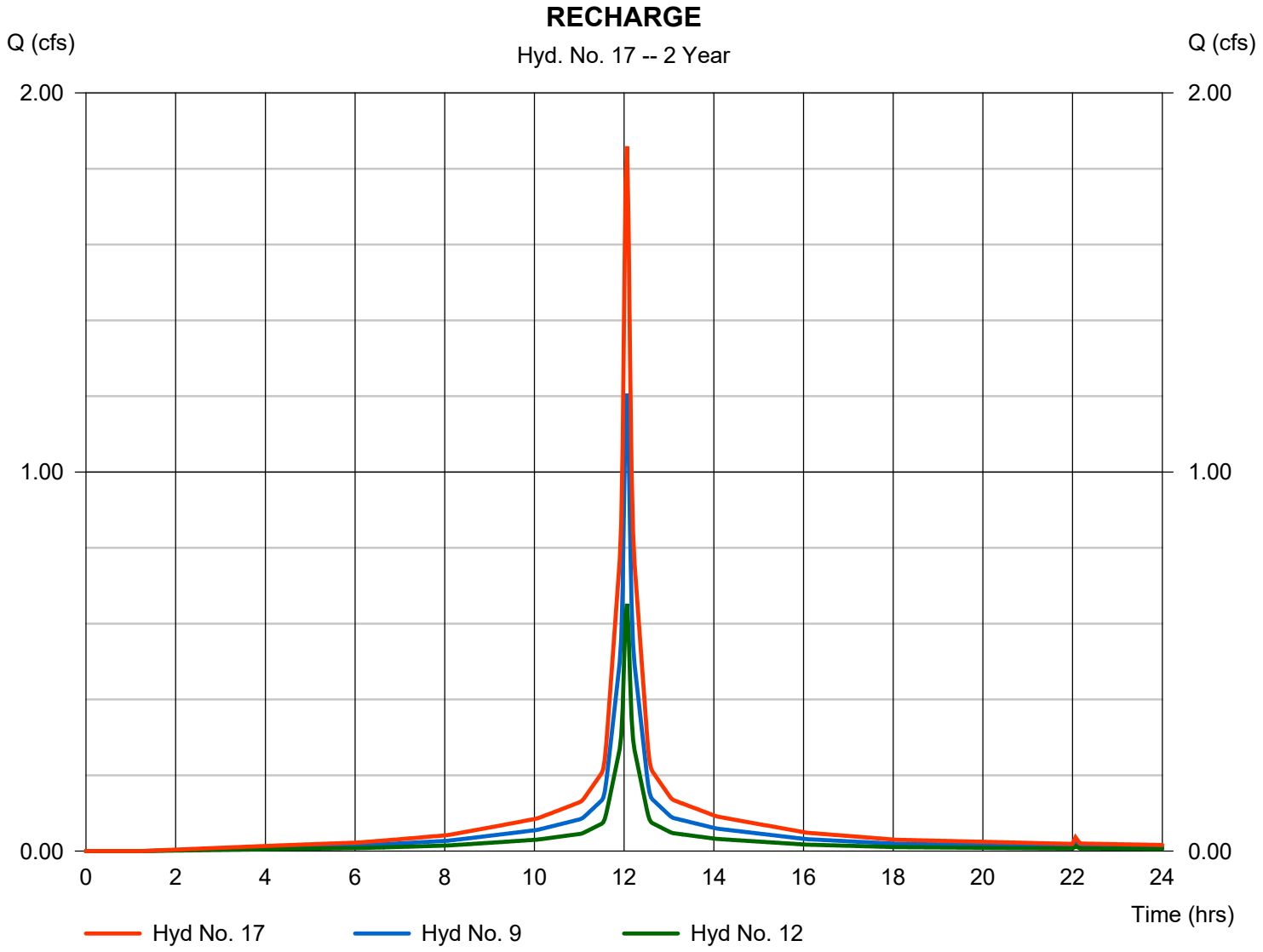


Hydrograph Report

Hyd. No. 17

RECHARGE

Hydrograph type	=	Combine	Peak discharge	=	1.859 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	6,287 cuft
Inflow hyds.	=	9, 12	Contrib. drain. area	=	0.381 ac



Hydrograph Report

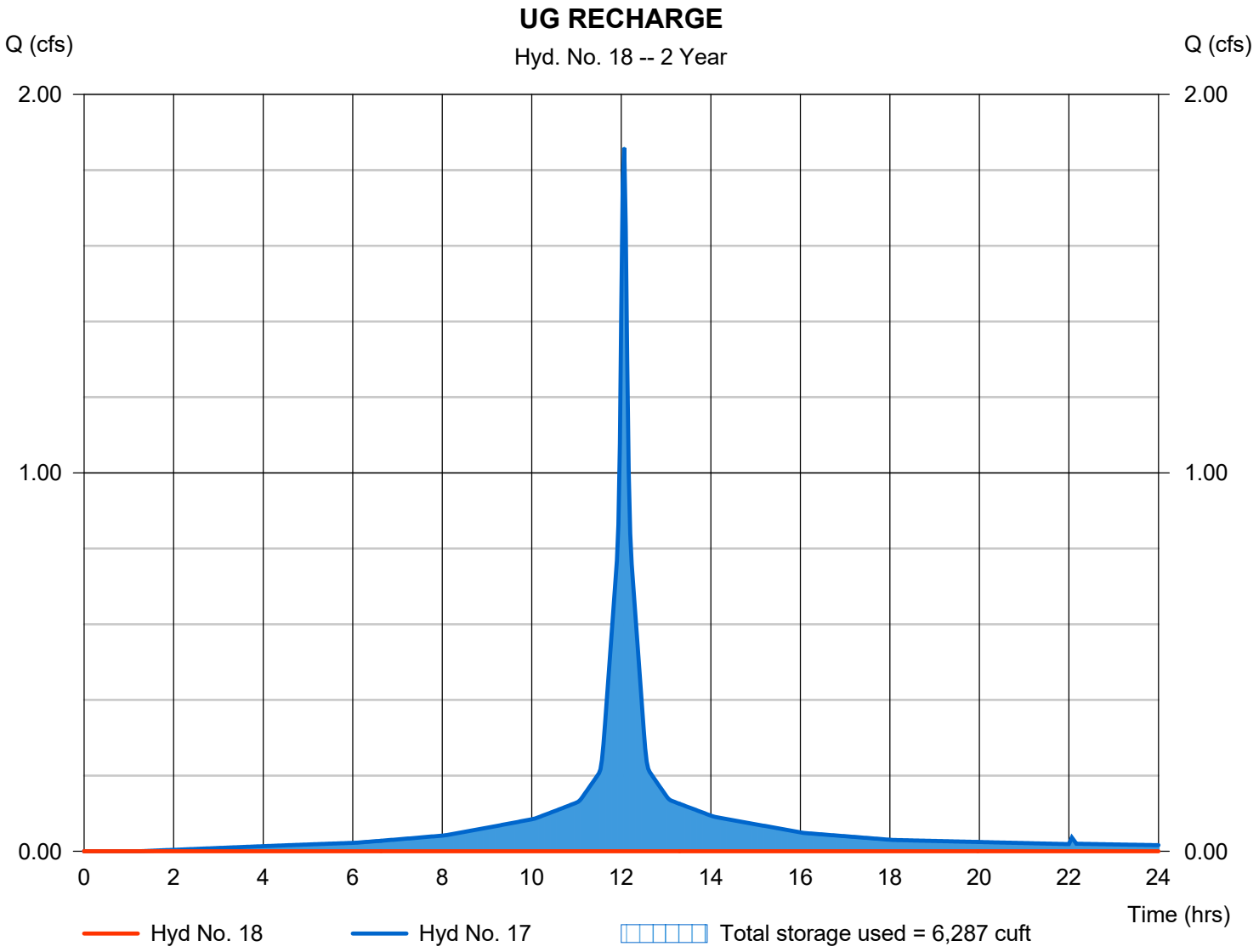
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Tuesday, 07 / 7 / 2020

Hyd. No. 18

UG RECHARGE

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	17 - RECHARGE	Max. Elevation	=	12.20 ft
Reservoir name	=	(234) SC-740	Max. Storage	=	6,287 cuft

Storage Indication method used.



Pond Report

Pond No. 12 - (234) SC-740

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	11.00	n/a	0	0
0.25	11.25	n/a	791	791
0.50	11.50	n/a	791	1,582
0.75	11.75	n/a	1,715	3,297
1.00	12.00	n/a	1,688	4,986
1.25	12.25	n/a	1,652	6,637
1.50	12.50	n/a	1,606	8,243
1.75	12.75	n/a	1,551	9,793
2.00	13.00	n/a	1,482	11,276
2.25	13.25	n/a	1,399	12,675
2.50	13.50	n/a	1,285	13,961
2.75	13.75	n/a	1,122	15,083
3.00	14.00	n/a	861	15,944
3.25	14.25	n/a	791	16,735
3.50	14.50	n/a	791	17,526
4.50	15.50	n/a	0	17,526
5.50	16.50	n/a	0	17,526

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .000	.000	.000	n/a
Orifice Coeff.	= 0.00	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

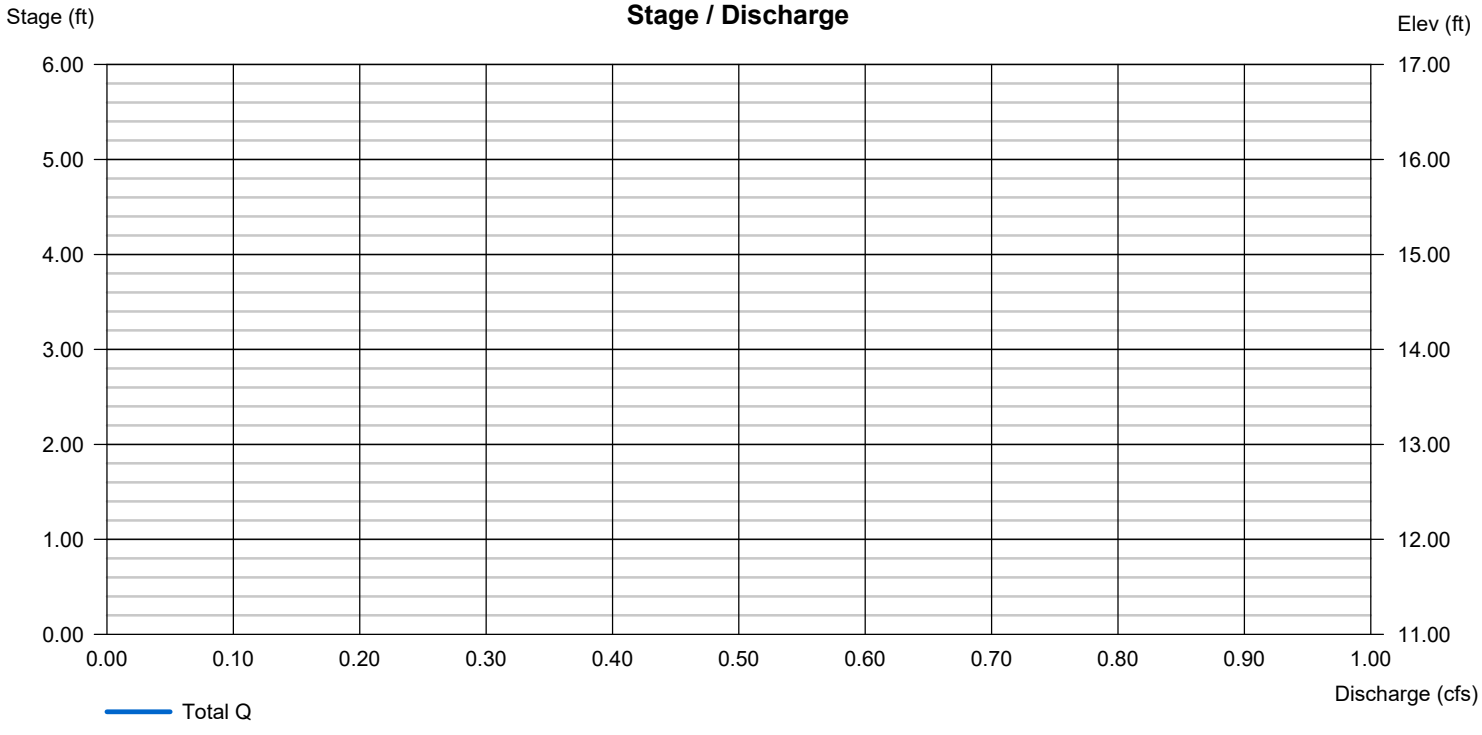
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	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).

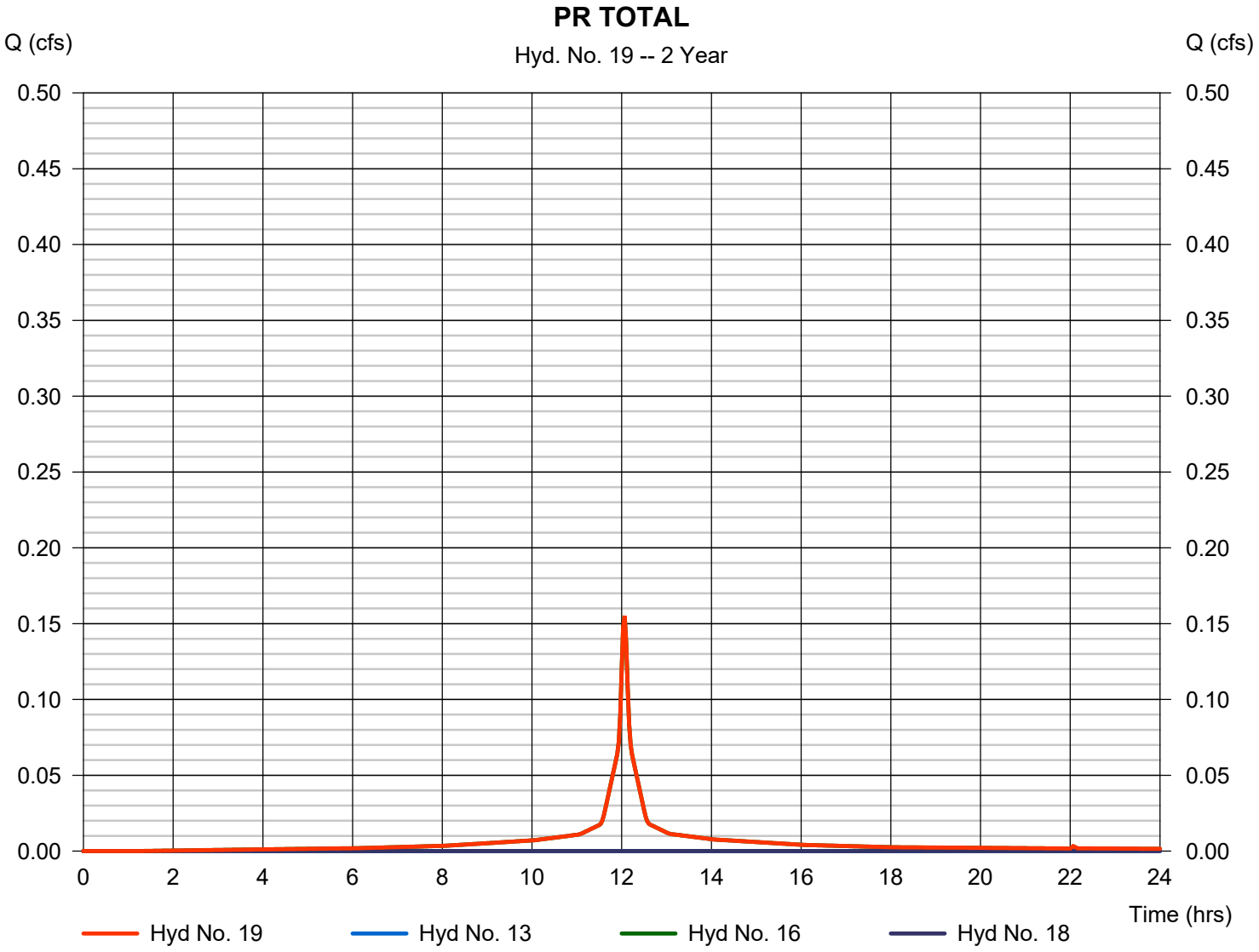


Hydrograph Report

Hyd. No. 19

PR TOTAL

Hydrograph type	= Combine	Peak discharge	= 0.155 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 527 cuft
Inflow hyds.	= 13, 16, 18	Contrib. drain. area	= 0.110 ac

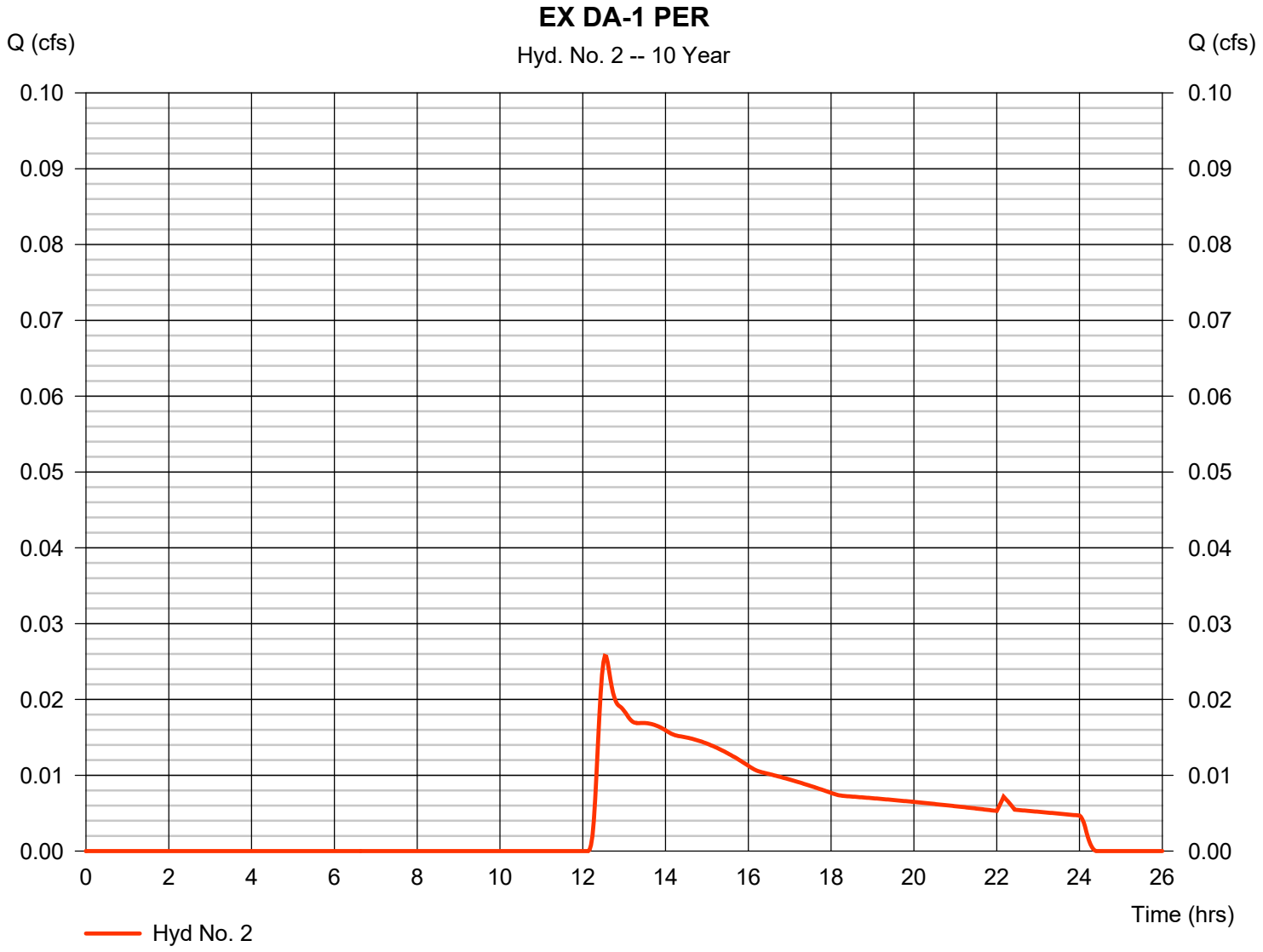


Hydrograph Report

Hyd. No. 2

EX DA-1 PER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.026 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.53 hrs
Time interval	= 2 min	Hyd. volume	= 415 cuft
Drainage area	= 0.471 ac	Curve number	= 39
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 5.23 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



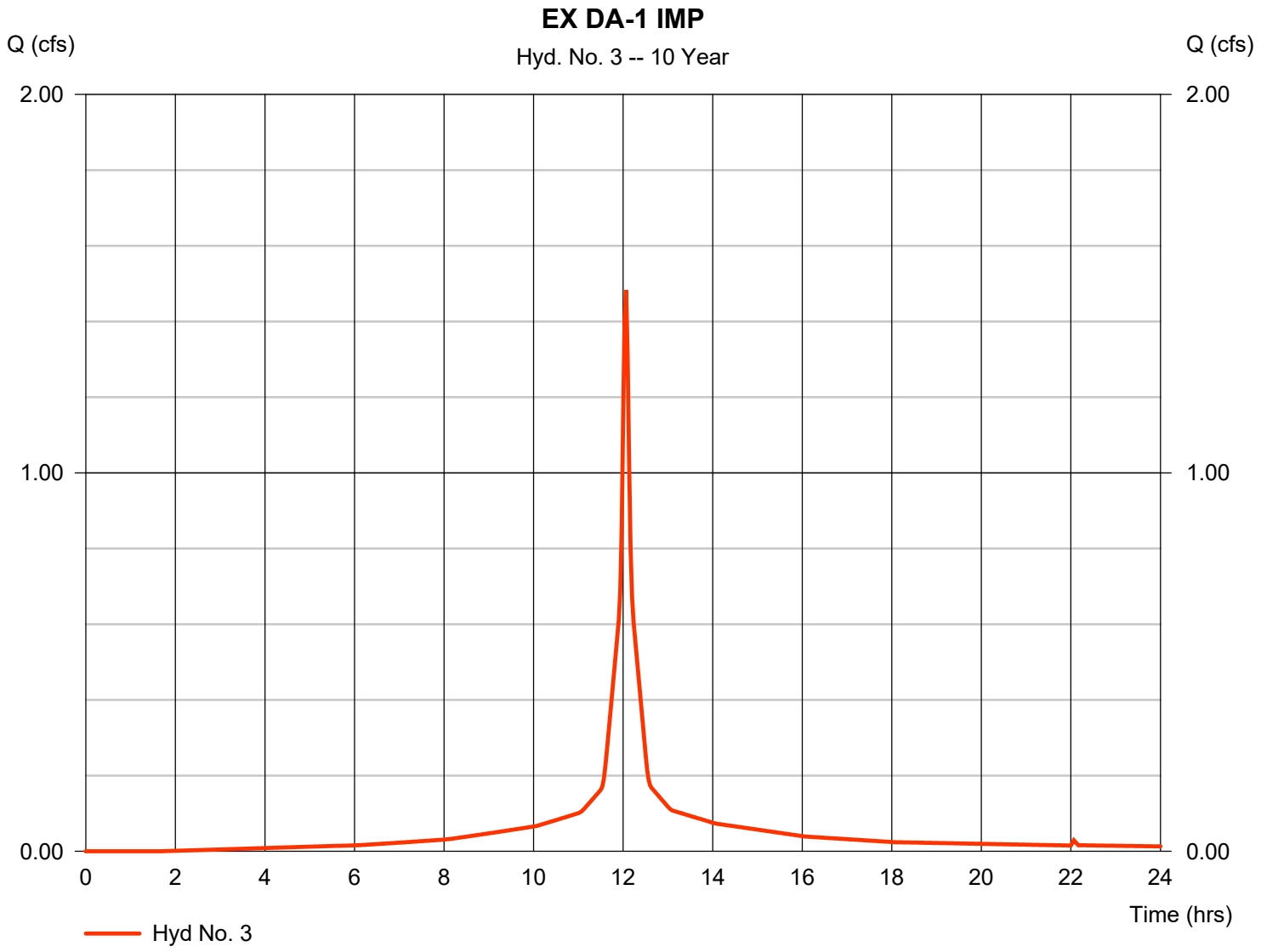
Hydrograph Report

Hyd. No. 3

EX DA-1 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.483 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	4,942 cuft
Drainage area	=	0.305 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.23 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.280 x 98) + (0.029 x 76)] / 0.305

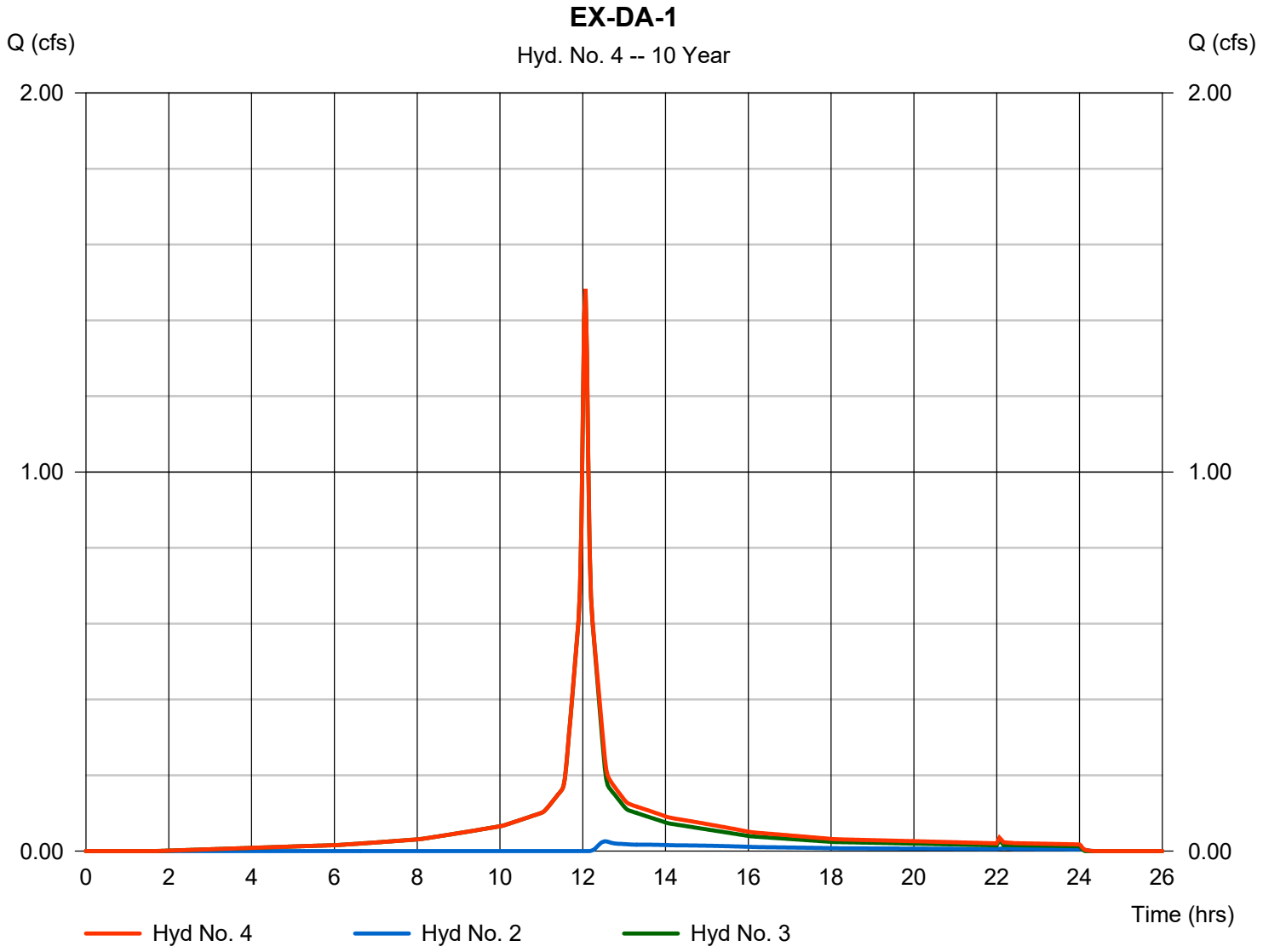


Hydrograph Report

Hyd. No. 4

EX-DA-1

Hydrograph type	=	Combine	Peak discharge	=	1.483 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	5,357 cuft
Inflow hyds.	=	2, 3	Contrib. drain. area	=	0.776 ac

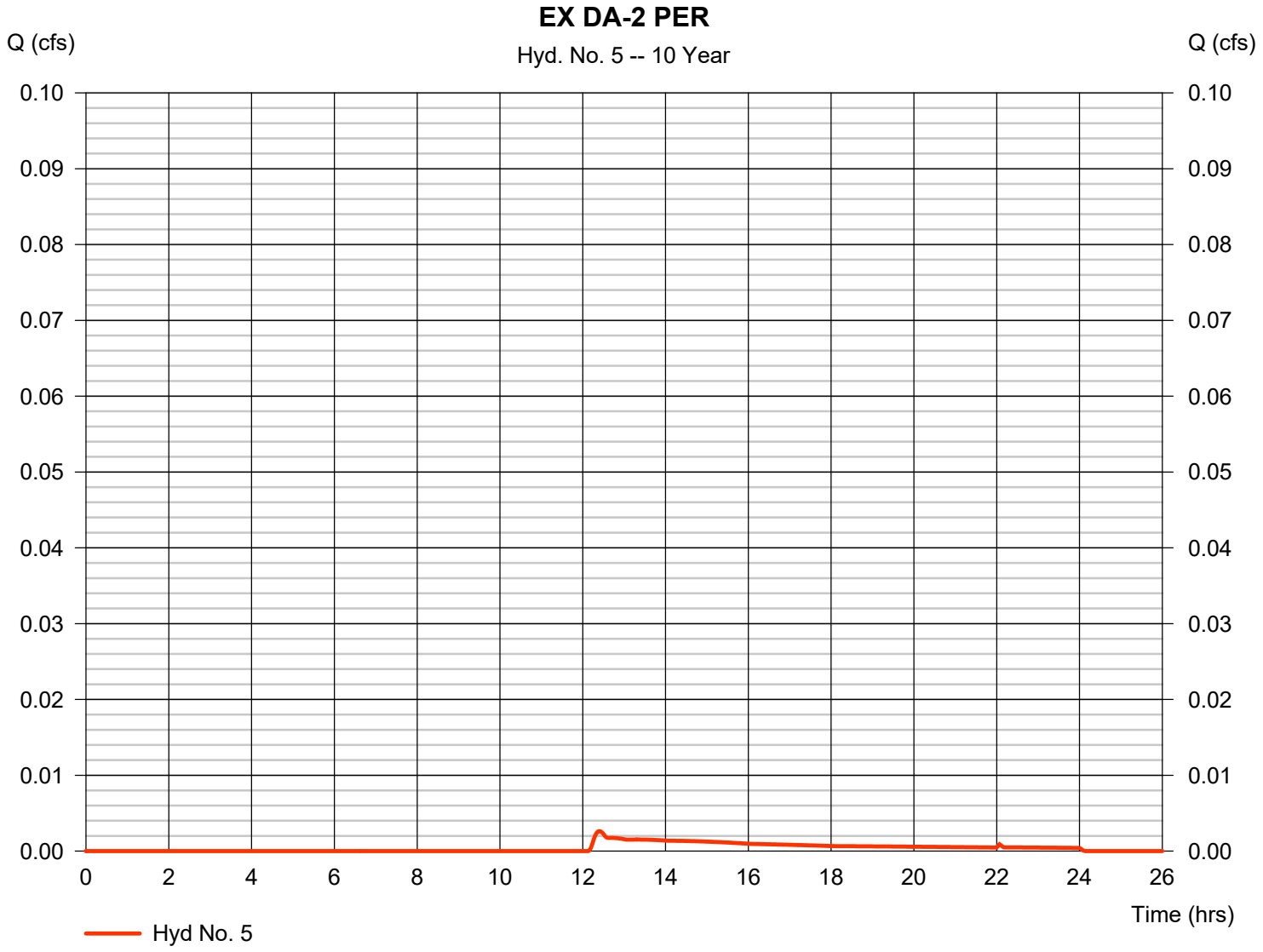


Hydrograph Report

Hyd. No. 5

EX DA-2 PER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.003 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.40 hrs
Time interval	= 2 min	Hyd. volume	= 37 cuft
Drainage area	= 0.044 ac	Curve number	= 39
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 5.23 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



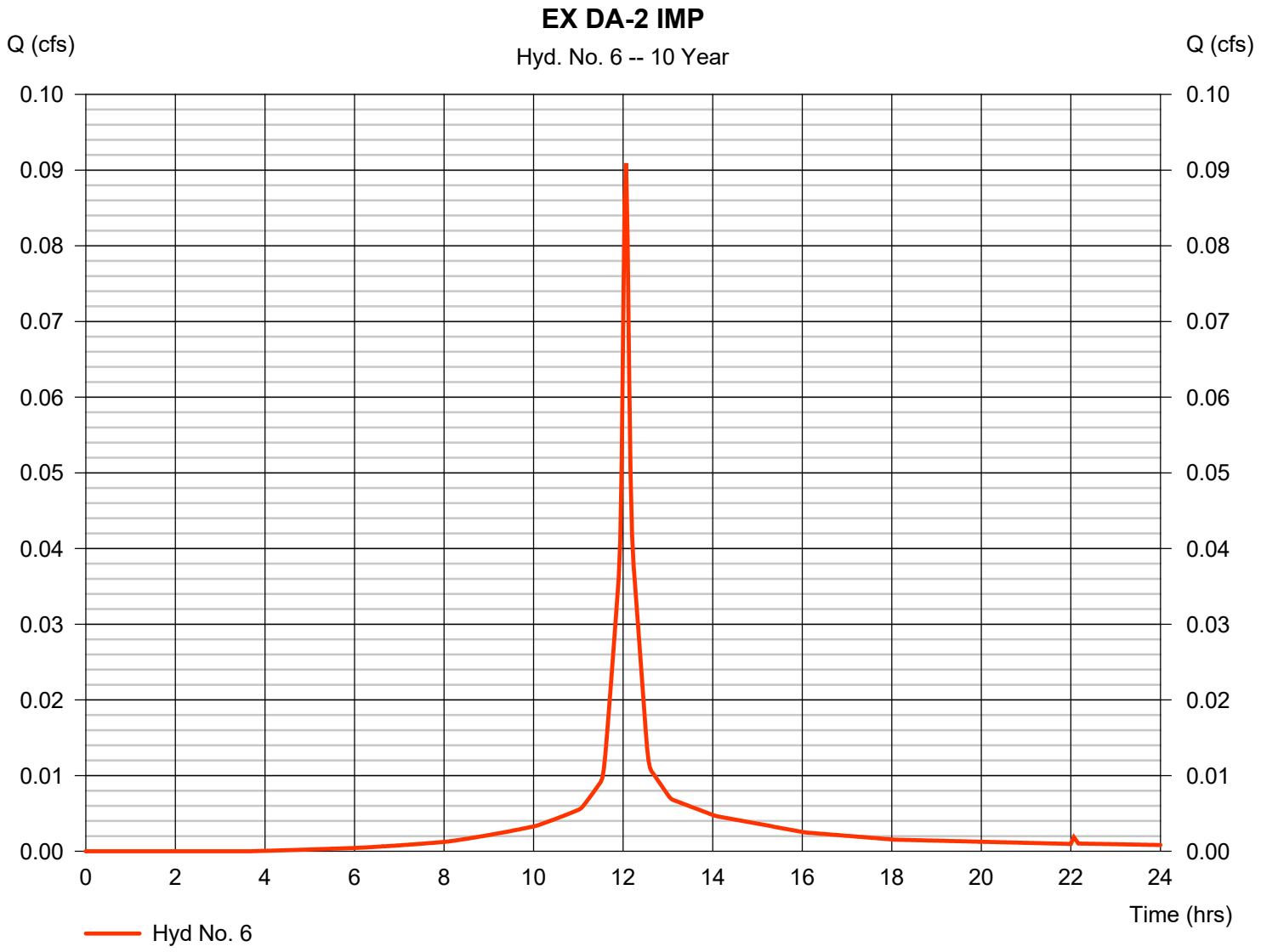
Hydrograph Report

Hyd. No. 6

EX DA-2 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.091 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	286 cuft
Drainage area	=	0.020 ac	Curve number	=	91*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.23 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.014 x 98) + (0.006 x 76)] / 0.020

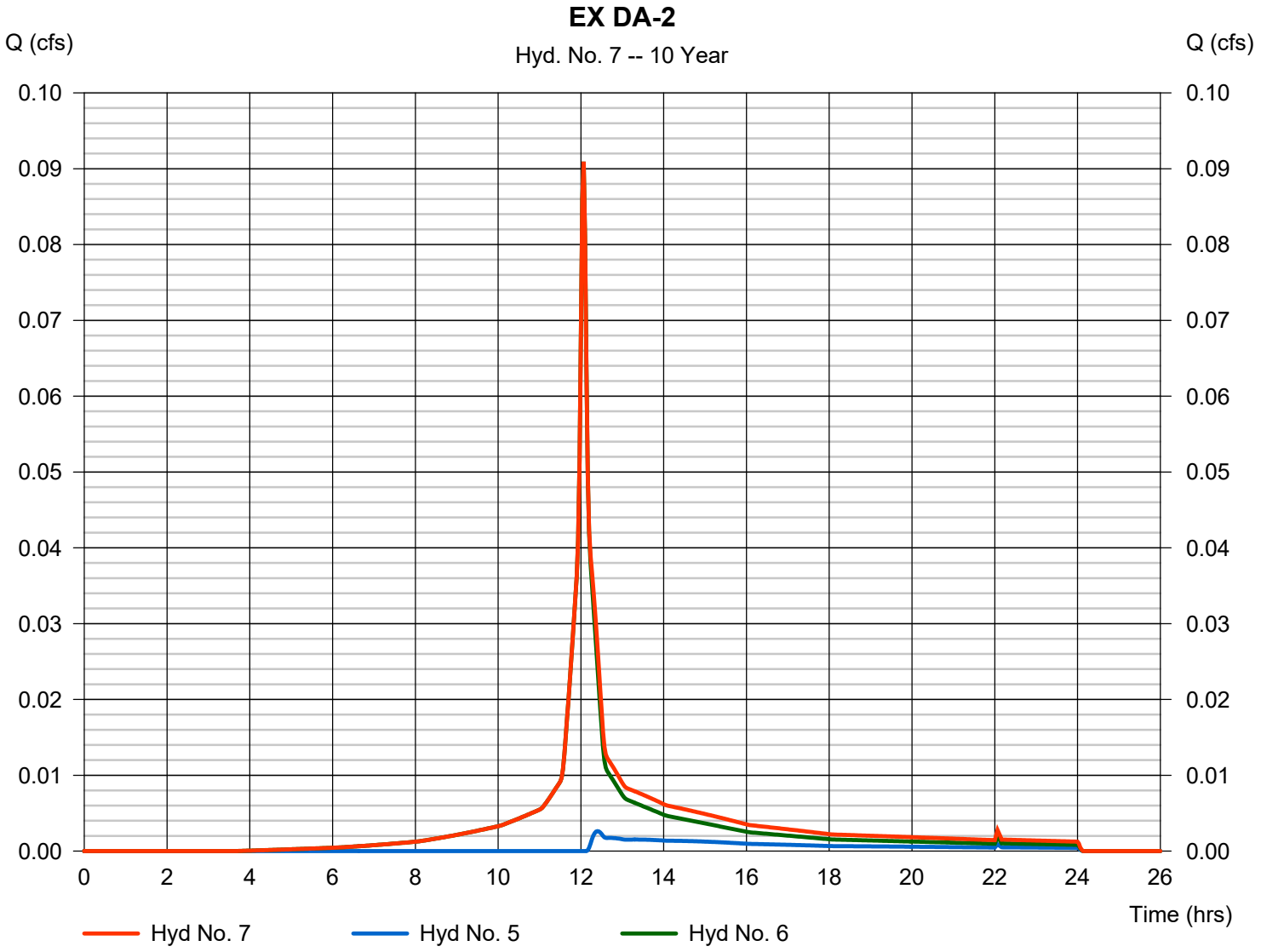


Hydrograph Report

Hyd. No. 7

EX DA-2

Hydrograph type	=	Combine	Peak discharge	=	0.091 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	324 cuft
Inflow hyds.	=	5, 6	Contrib. drain. area	=	0.064 ac

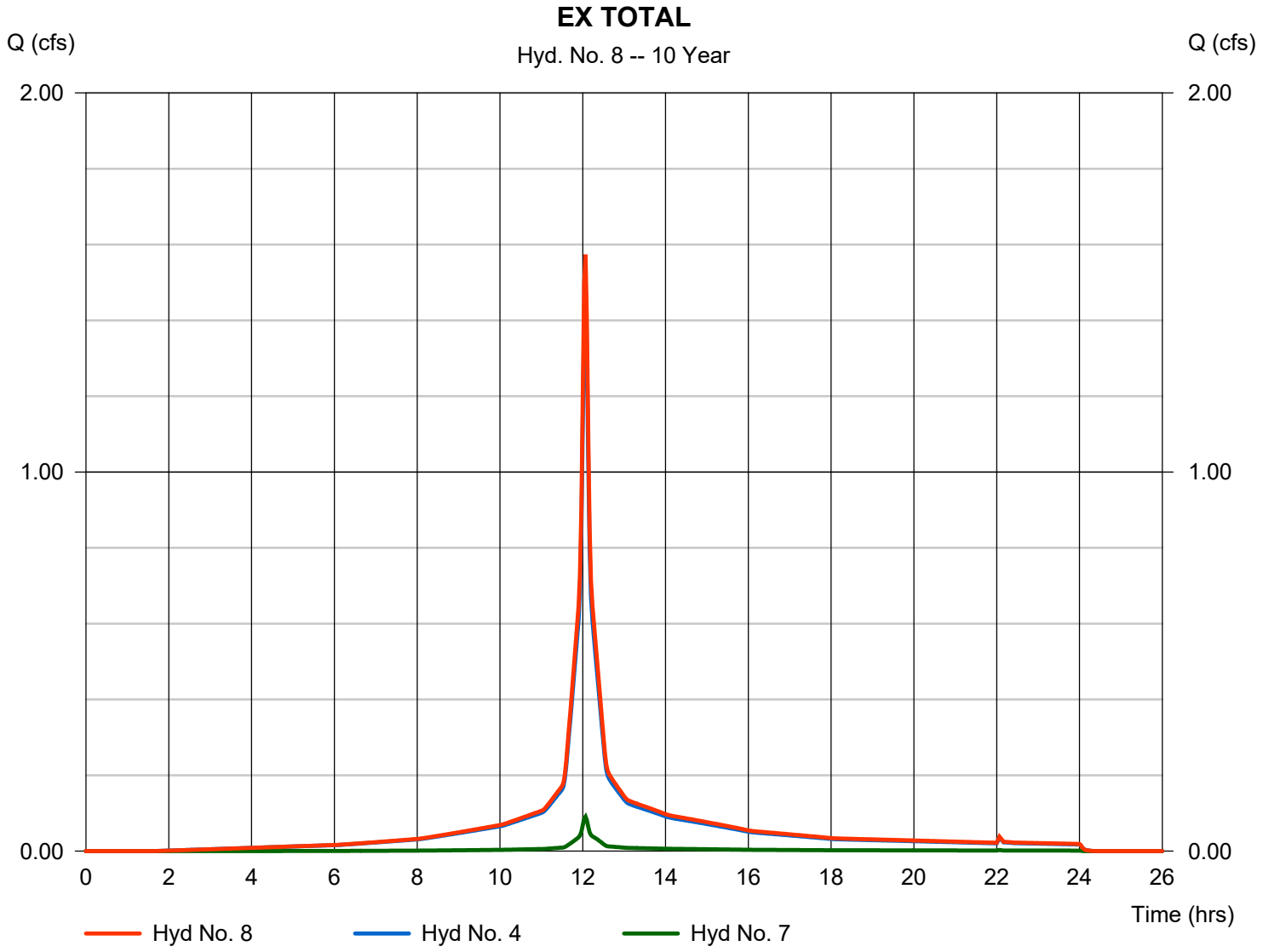


Hydrograph Report

Hyd. No. 8

EX TOTAL

Hydrograph type	= Combine	Peak discharge	= 1.574 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 5,680 cuft
Inflow hyds.	= 4, 7	Contrib. drain. area	= 0.000 ac

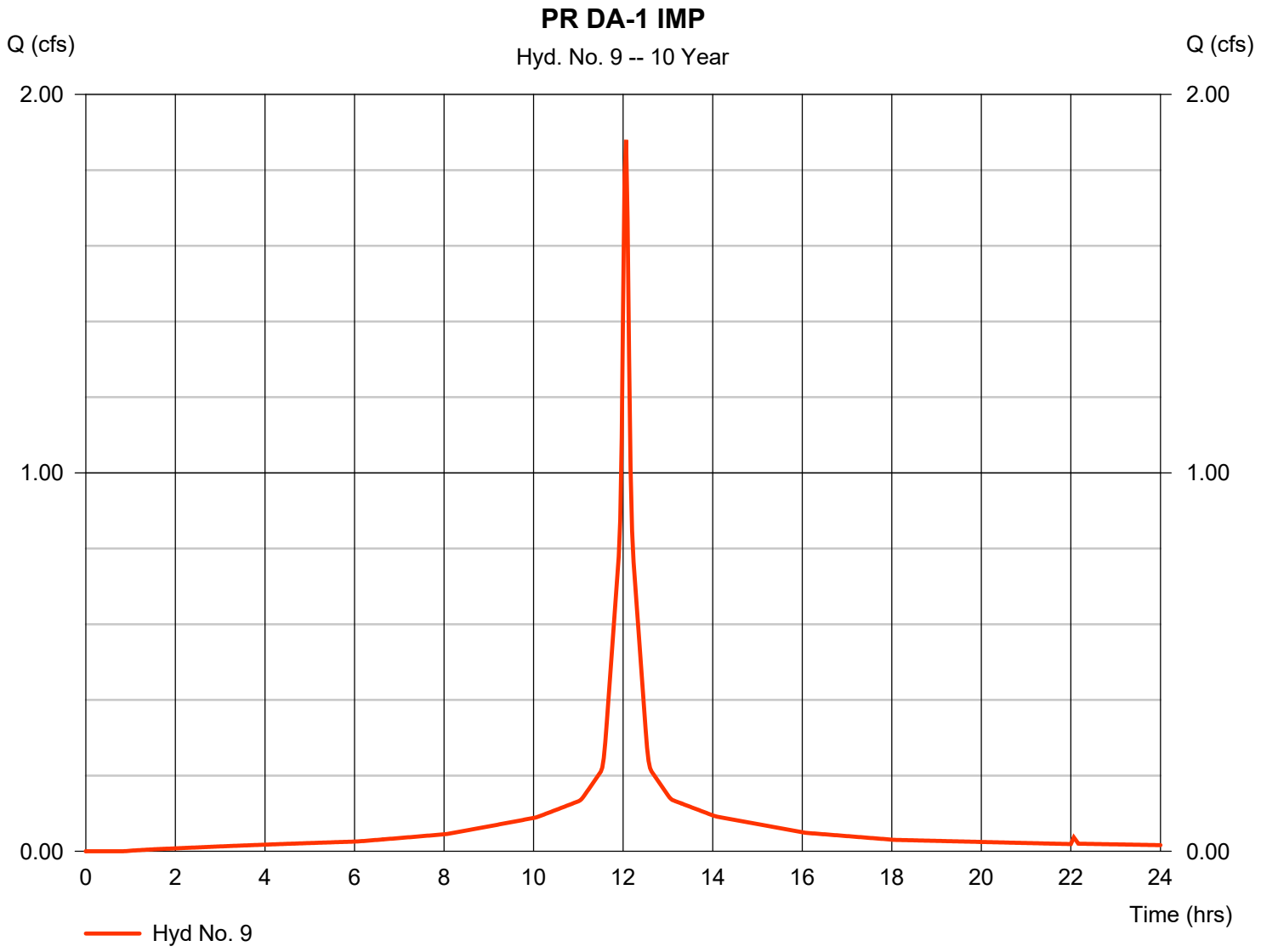


Hydrograph Report

Hyd. No. 9

PR DA-1 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.880 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	6,474 cuft
Drainage area	=	0.381 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.23 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

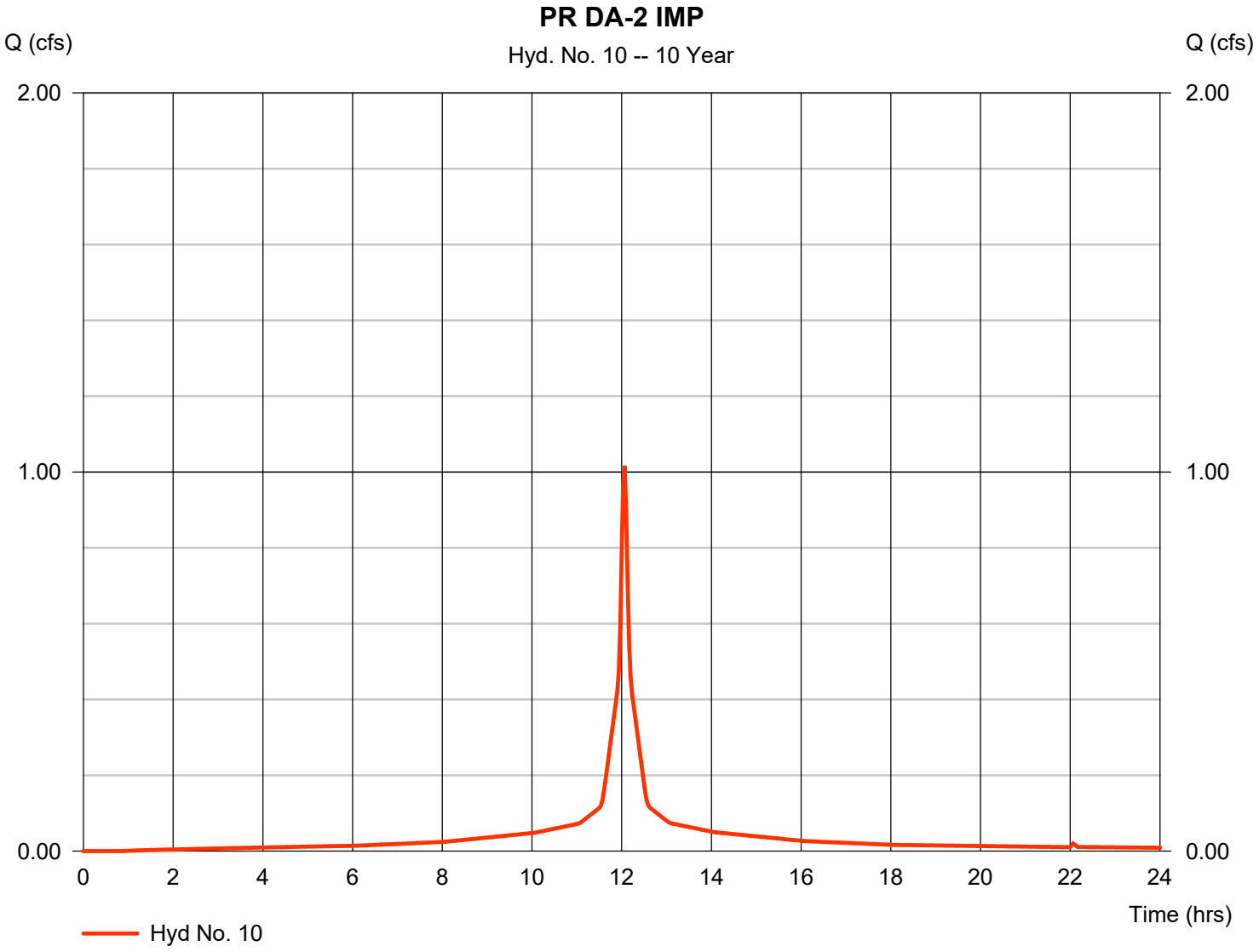


Hydrograph Report

Hyd. No. 10

PR DA-2 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.016 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,500 cuft
Drainage area	=	0.206 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.23 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

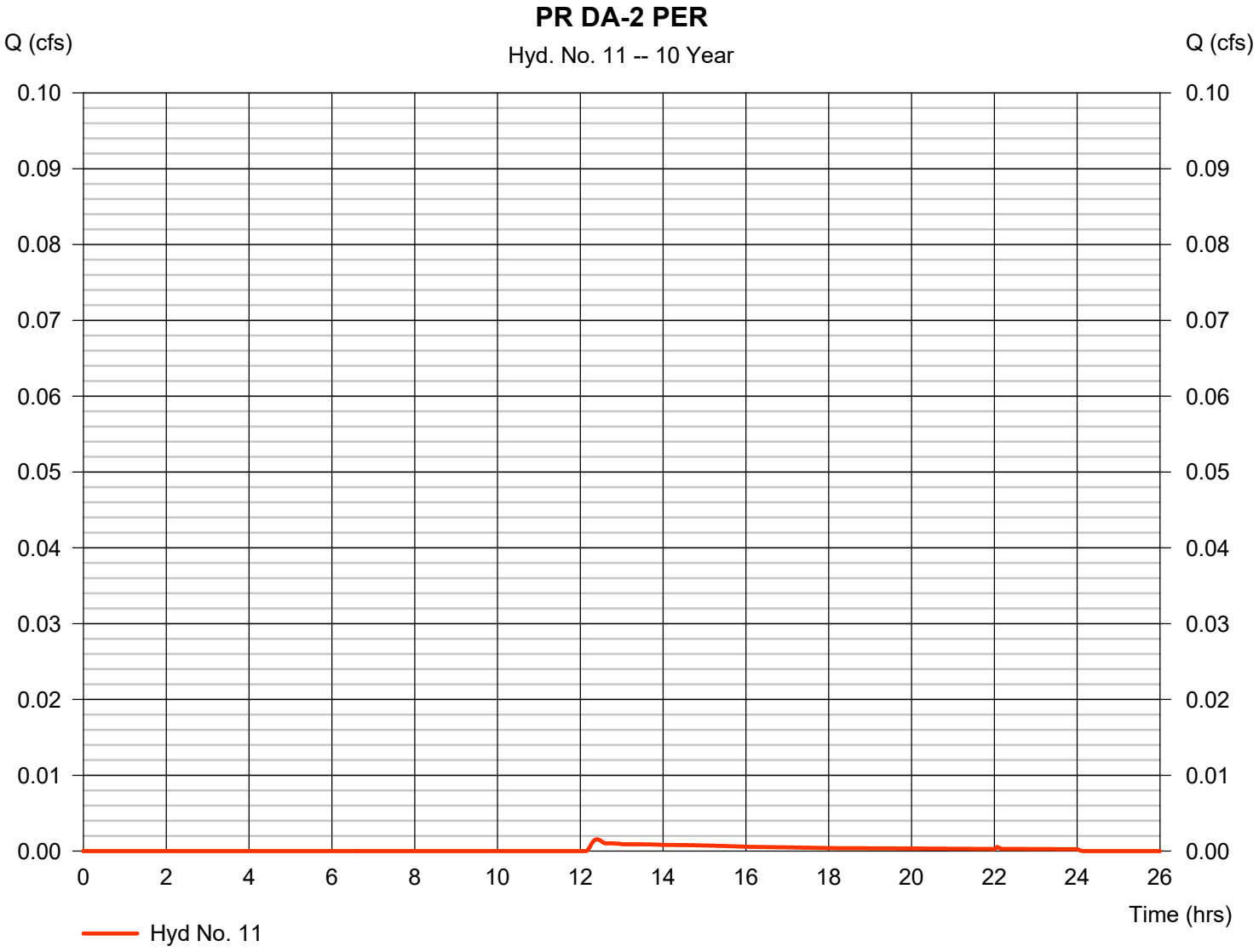


Hydrograph Report

Hyd. No. 11

PR DA-2 PER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.002 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.40 hrs
Time interval	= 2 min	Hyd. volume	= 22 cuft
Drainage area	= 0.026 ac	Curve number	= 39
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 5.23 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

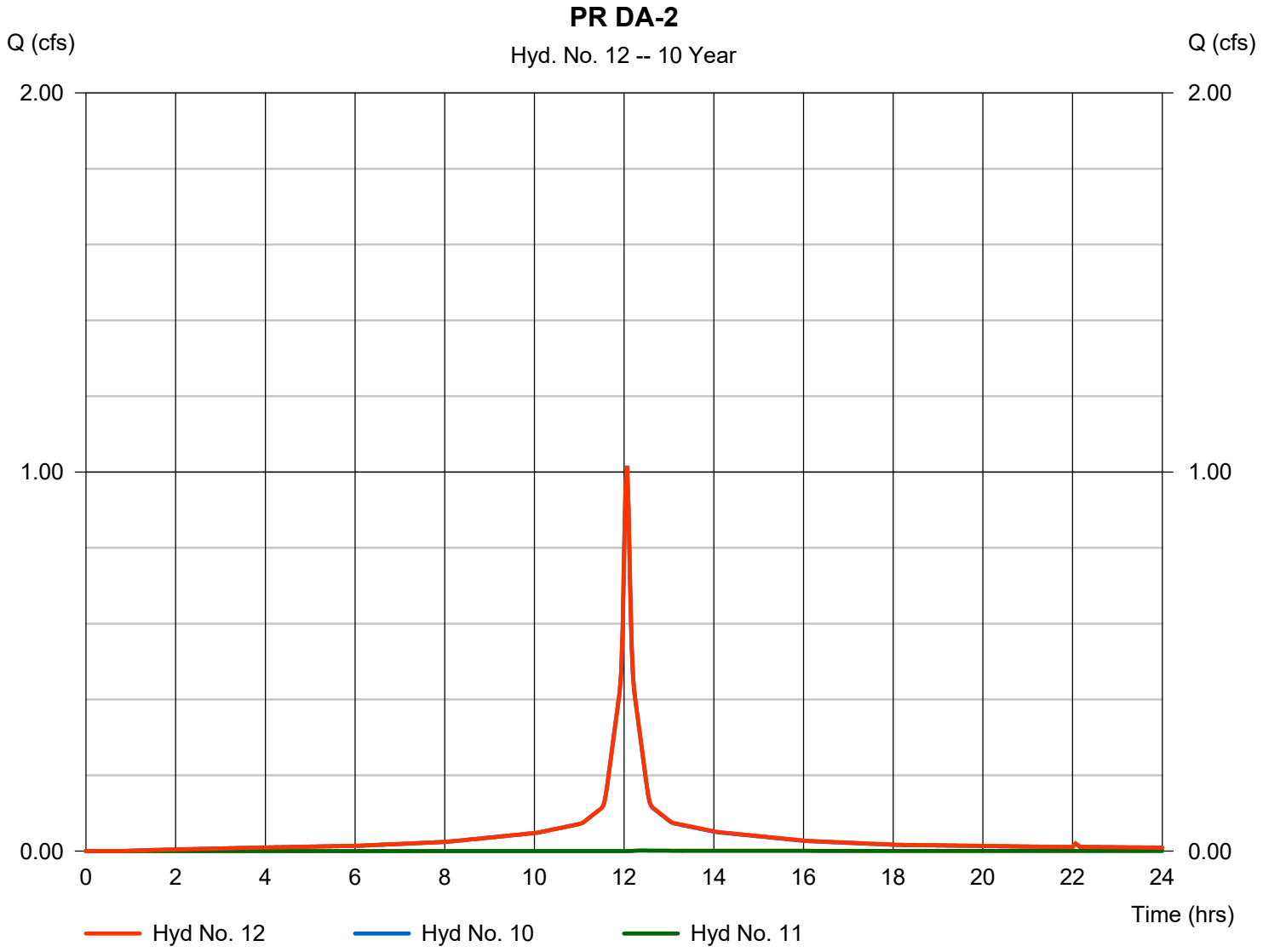


Hydrograph Report

Hyd. No. 12

PR DA-2

Hydrograph type	=	Combine	Peak discharge	=	1.016 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	3,522 cuft
Inflow hyds.	=	10, 11	Contrib. drain. area	=	0.232 ac

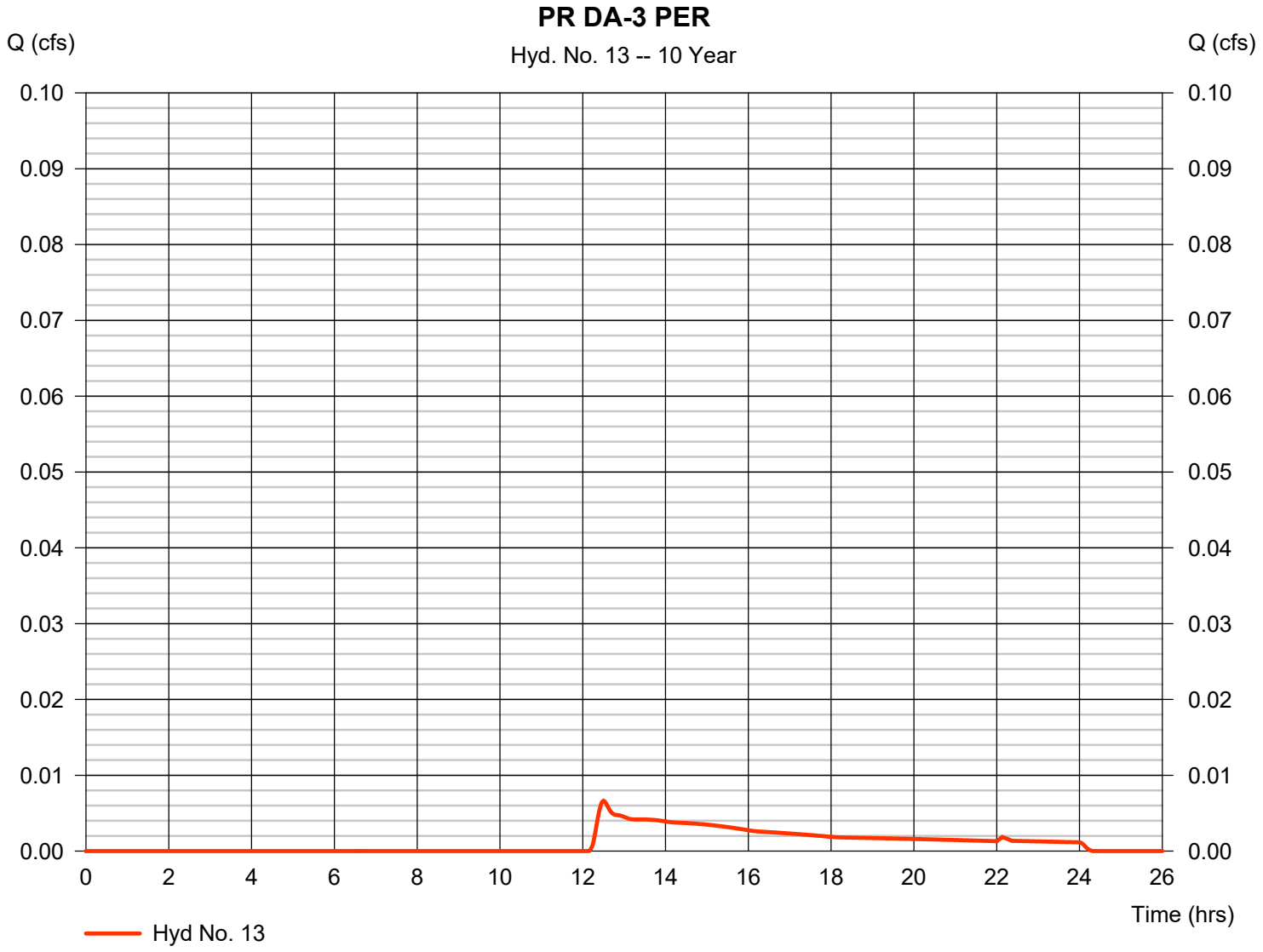


Hydrograph Report

Hyd. No. 13

PR DA-3 PER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.007 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.50 hrs
Time interval	= 2 min	Hyd. volume	= 103 cuft
Drainage area	= 0.110 ac	Curve number	= 39
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 5.23 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

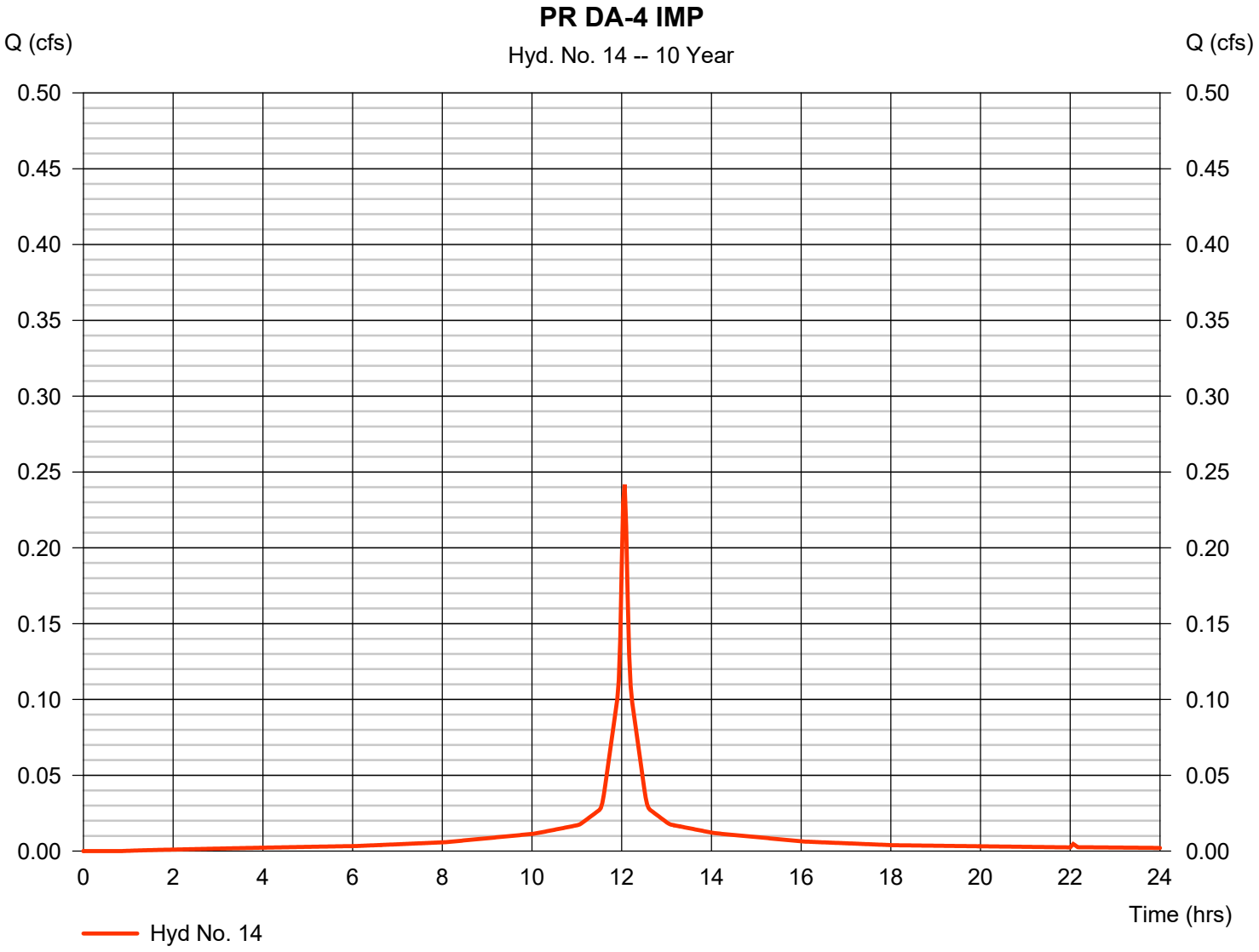


Hydrograph Report

Hyd. No. 14

PR DA-4 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.242 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	833 cuft
Drainage area	=	0.049 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.23 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

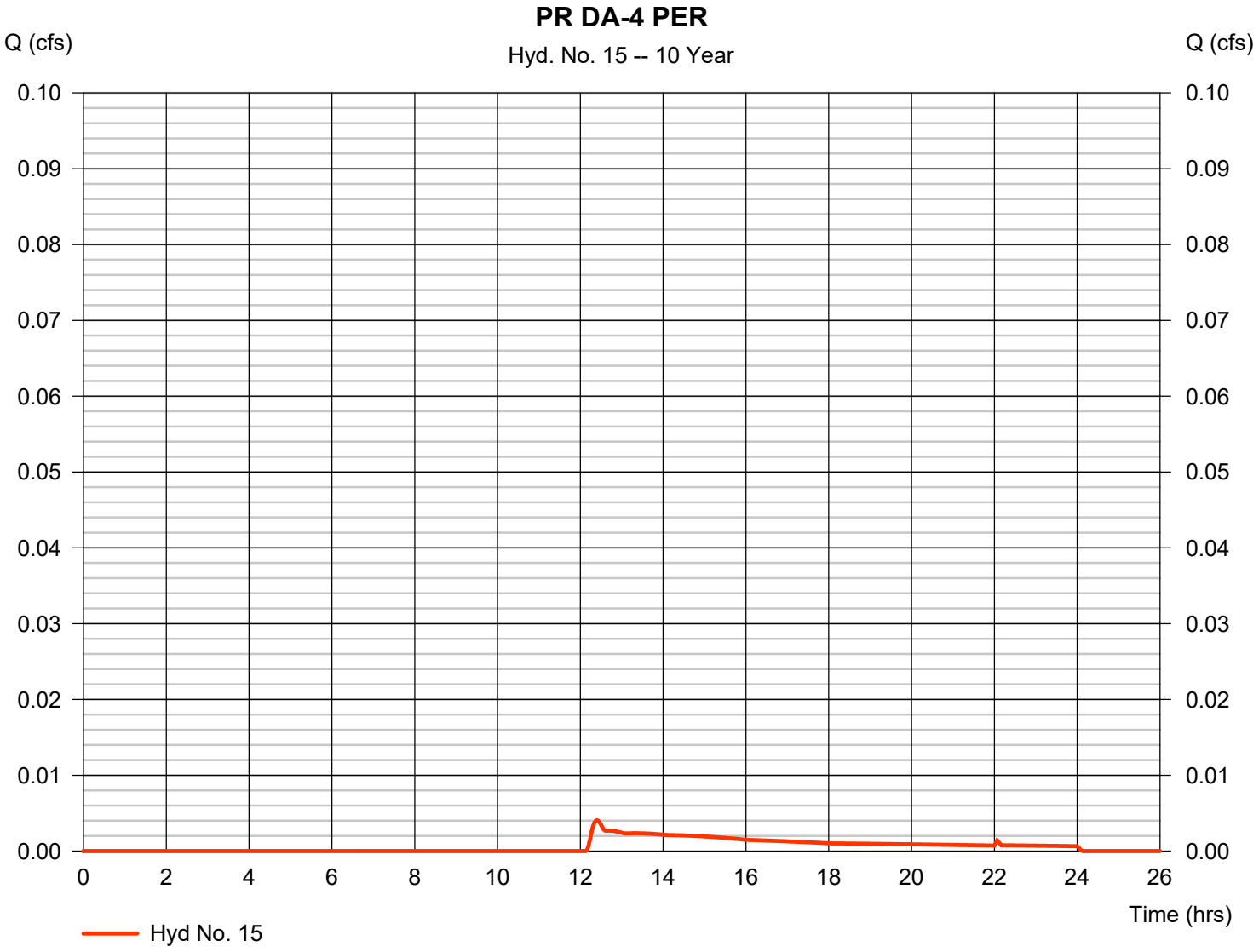


Hydrograph Report

Hyd. No. 15

PR DA-4 PER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.004 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.40 hrs
Time interval	= 2 min	Hyd. volume	= 58 cuft
Drainage area	= 0.068 ac	Curve number	= 39
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 5.23 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

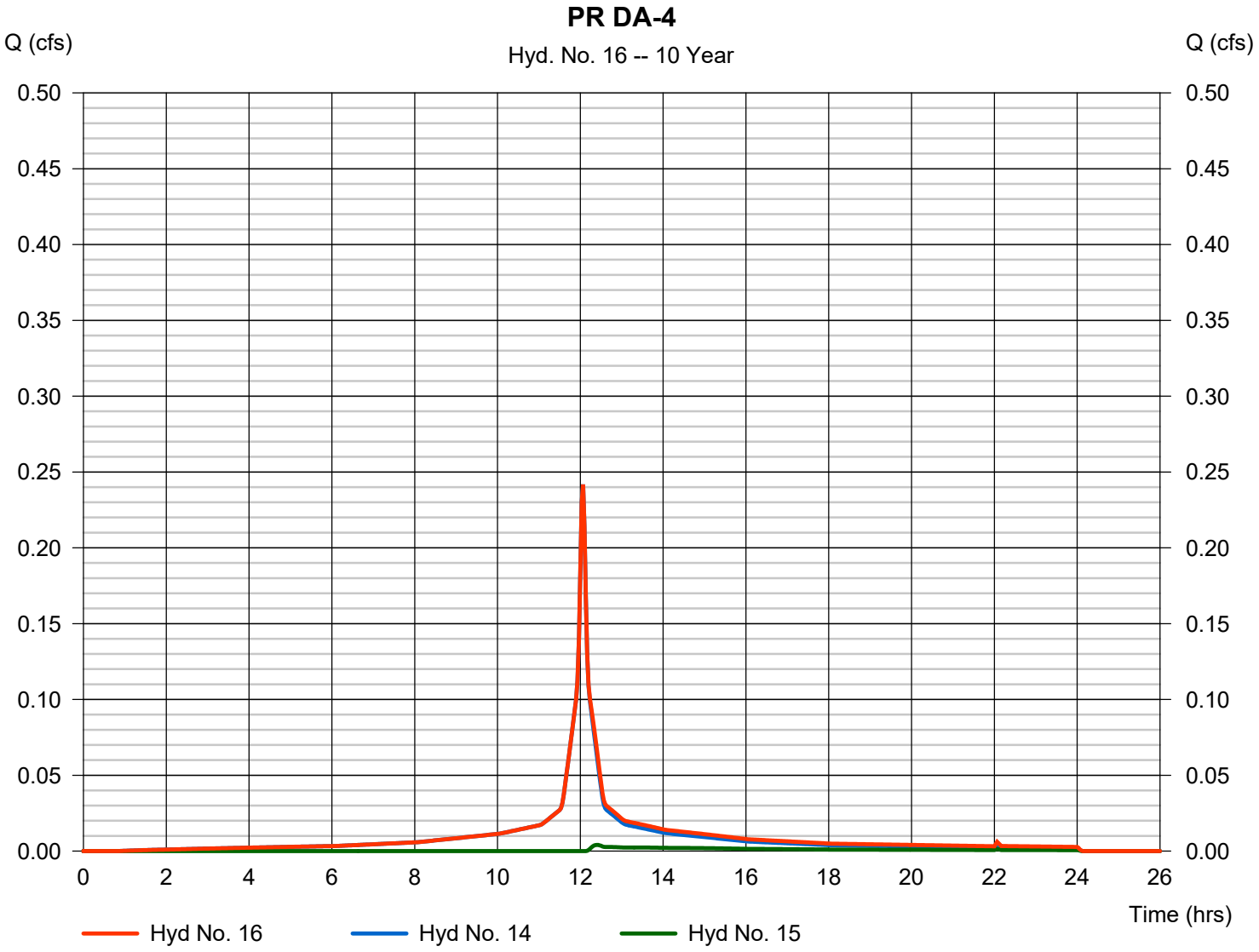


Hydrograph Report

Hyd. No. 16

PR DA-4

Hydrograph type	=	Combine	Peak discharge	=	0.242 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	890 cuft
Inflow hyds.	=	14, 15	Contrib. drain. area	=	0.117 ac

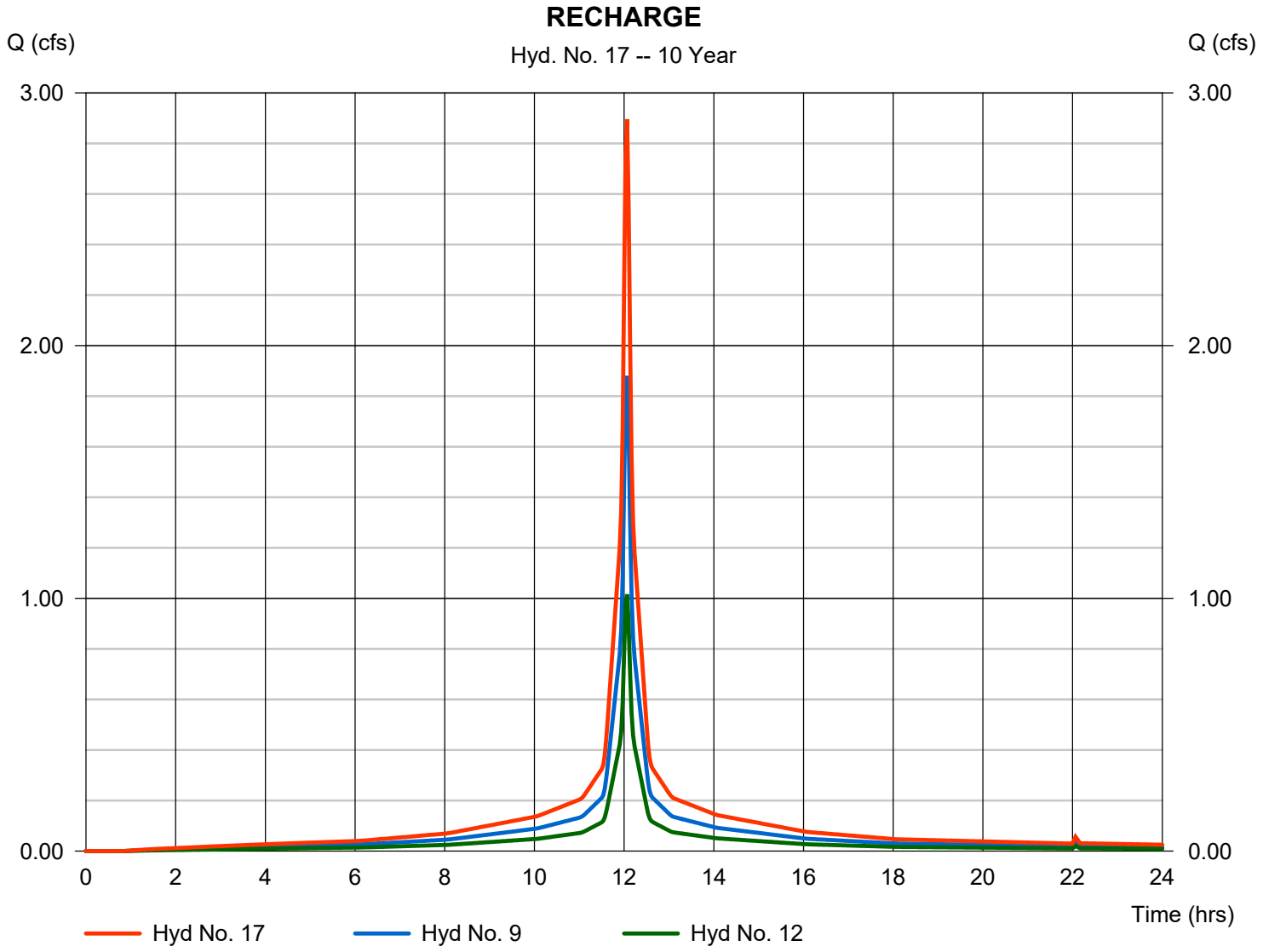


Hydrograph Report

Hyd. No. 17

RECHARGE

Hydrograph type	=	Combine	Peak discharge	=	2.896 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	9,996 cuft
Inflow hyds.	=	9, 12	Contrib. drain. area	=	0.381 ac



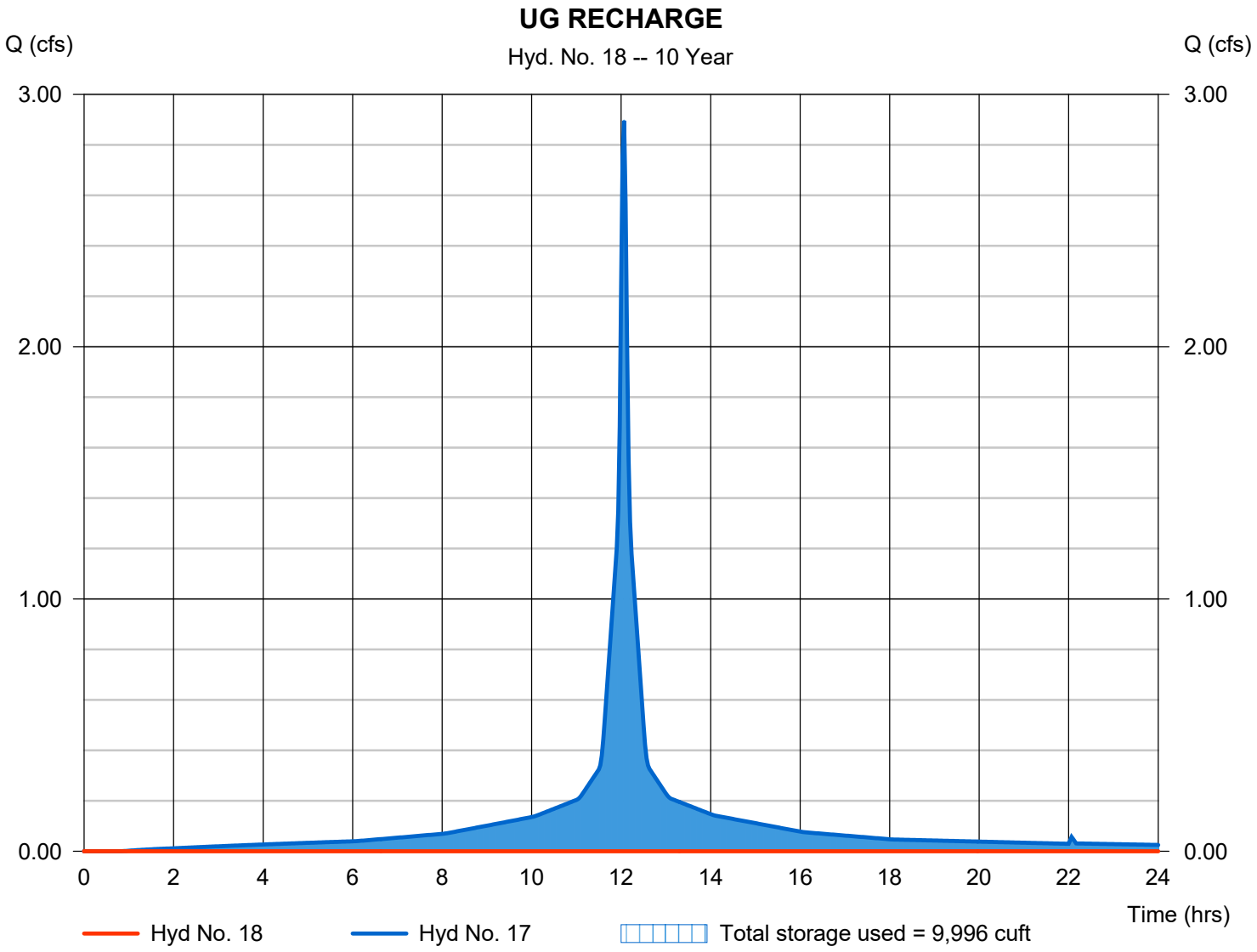
Hydrograph Report

Hyd. No. 18

UG RECHARGE

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	17 - RECHARGE	Max. Elevation	=	12.78 ft
Reservoir name	=	(234) SC-740	Max. Storage	=	9,996 cuft

Storage Indication method used.

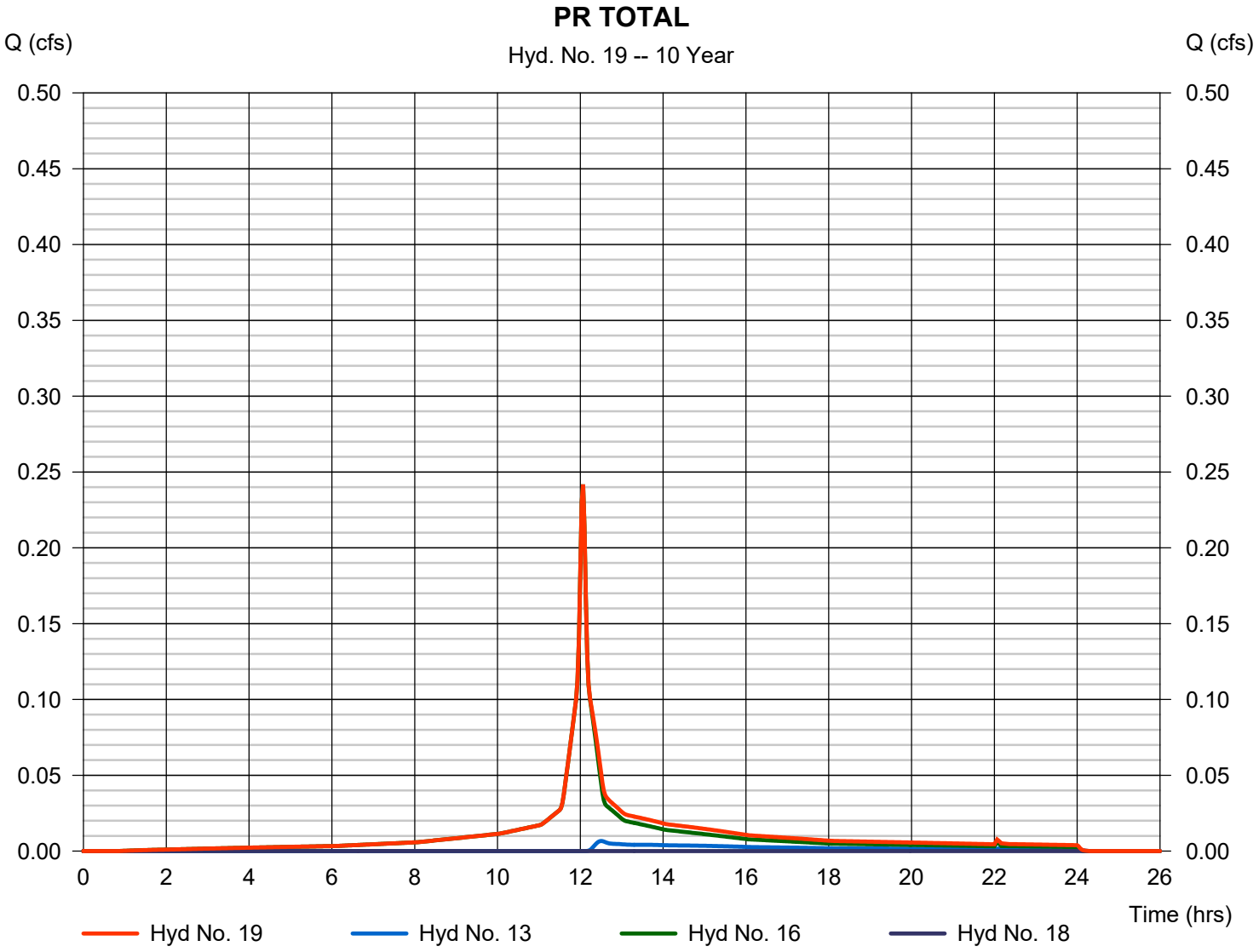


Hydrograph Report

Hyd. No. 19

PR TOTAL

Hydrograph type	=	Combine	Peak discharge	=	0.242 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	993 cuft
Inflow hyds.	=	13, 16, 18	Contrib. drain. area	=	0.110 ac

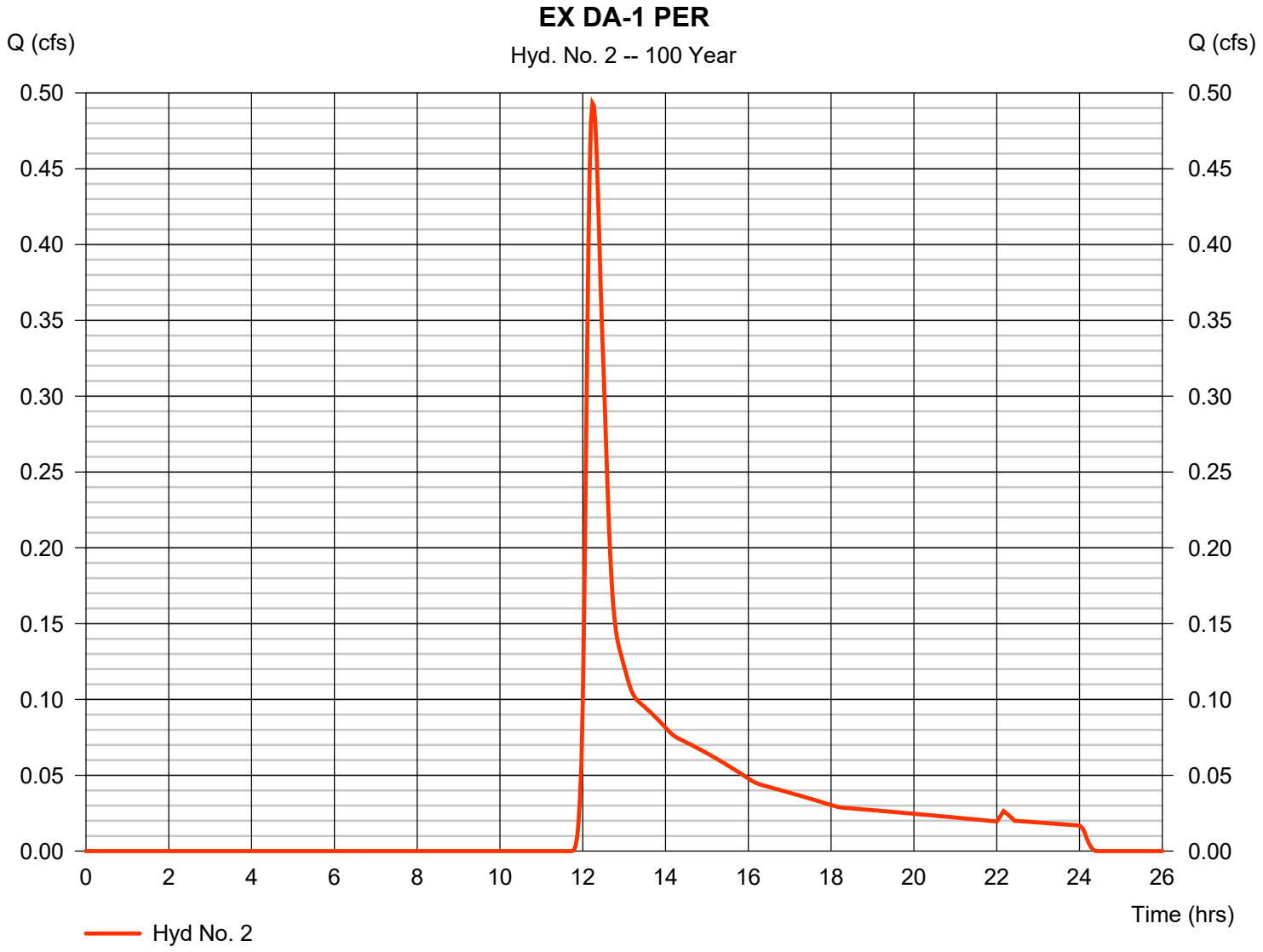


Hydrograph Report

Hyd. No. 2

EX DA-1 PER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.493 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.23 hrs
Time interval	= 2 min	Hyd. volume	= 2,625 cuft
Drainage area	= 0.471 ac	Curve number	= 39
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 16.00 min
Total precip.	= 8.94 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484



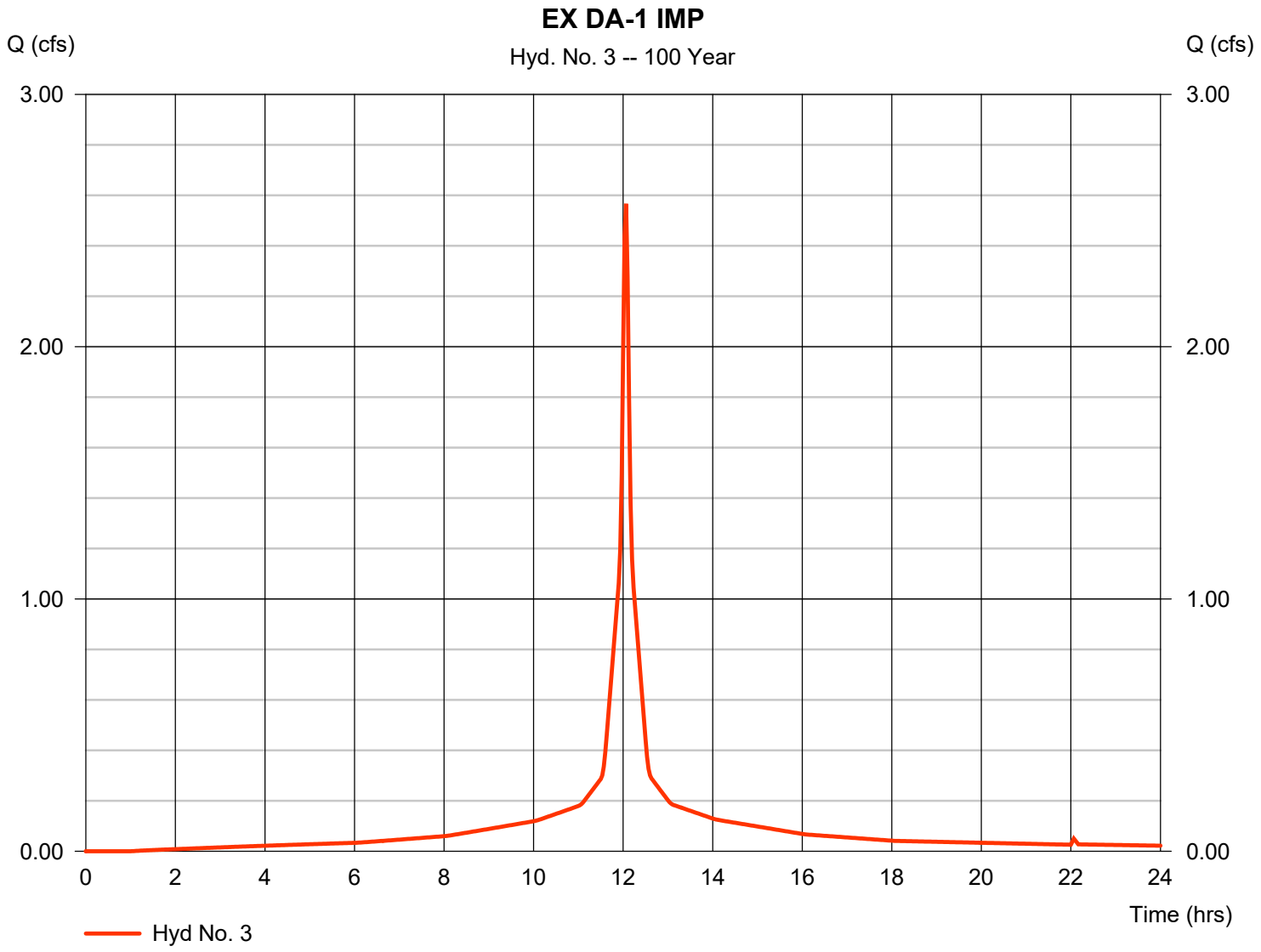
Hydrograph Report

Hyd. No. 3

EX DA-1 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.567 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	8,780 cuft
Drainage area	=	0.305 ac	Curve number	=	96*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	8.94 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.280 x 98) + (0.029 x 76)] / 0.305

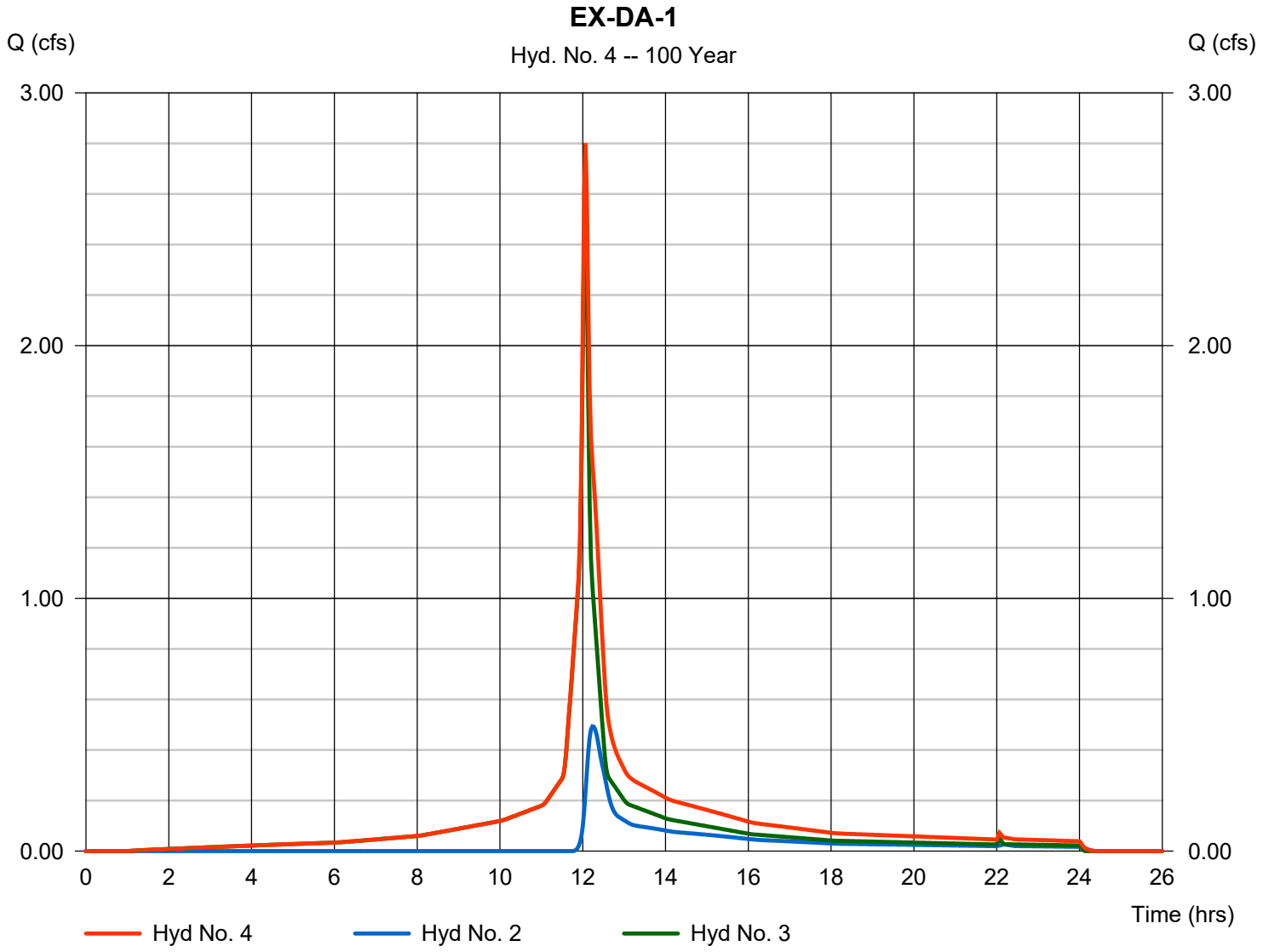


Hydrograph Report

Hyd. No. 4

EX-DA-1

Hydrograph type	=	Combine	Peak discharge	=	2.800 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	11,404 cuft
Inflow hyds.	=	2, 3	Contrib. drain. area	=	0.776 ac

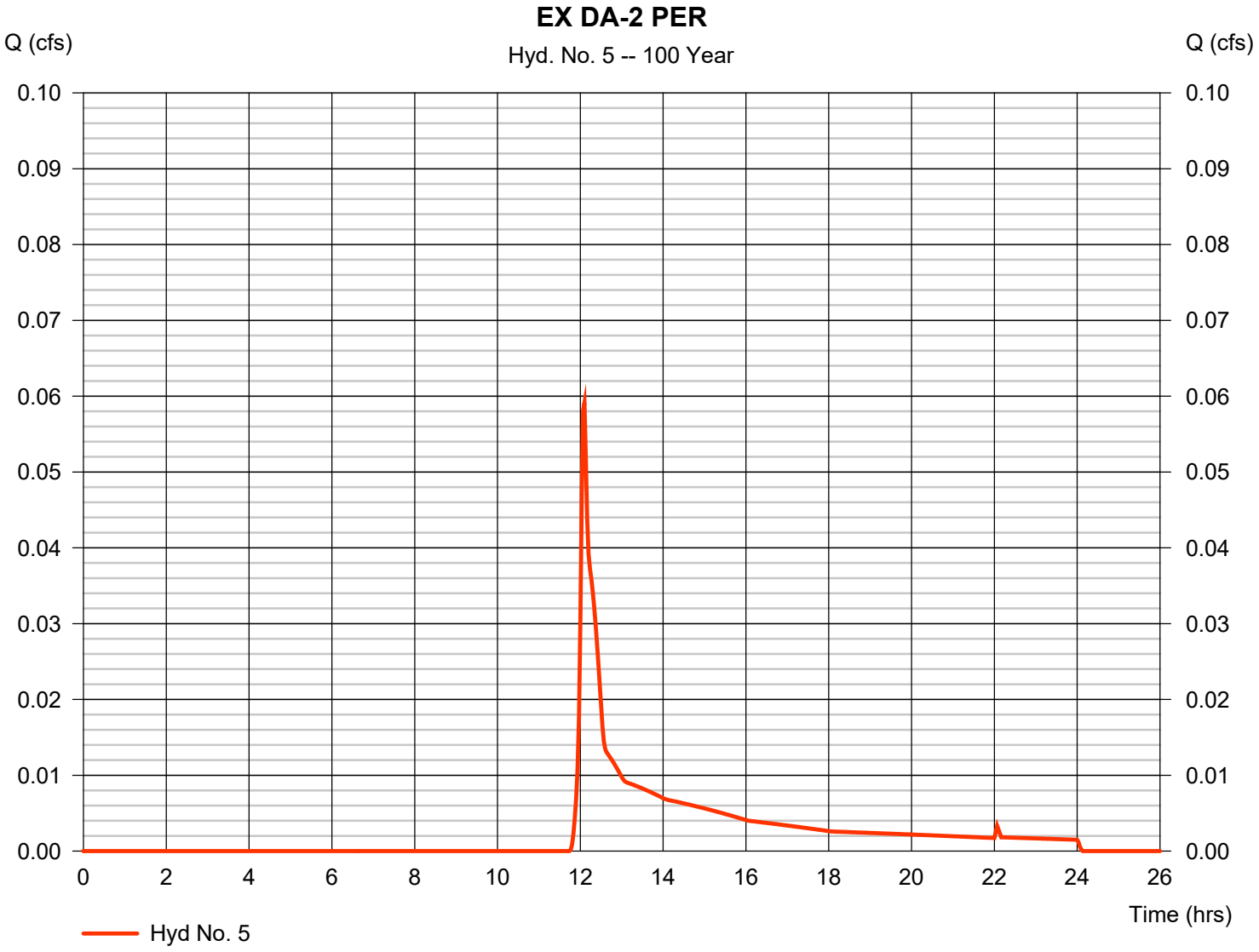


Hydrograph Report

Hyd. No. 5

EX DA-2 PER

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.059 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	236 cuft
Drainage area	=	0.044 ac	Curve number	=	39
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	8.94 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



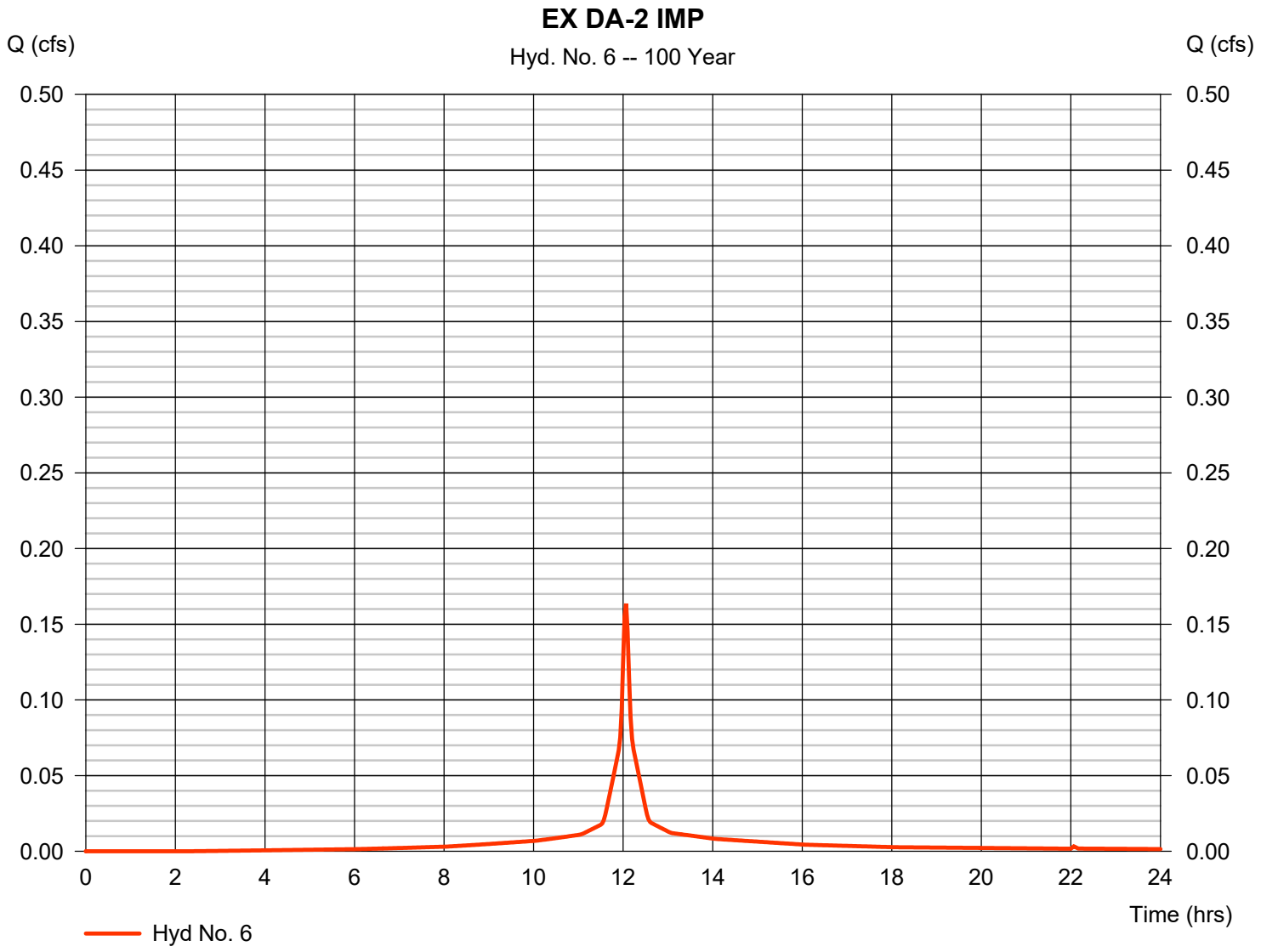
Hydrograph Report

Hyd. No. 6

EX DA-2 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.164 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	535 cuft
Drainage area	=	0.020 ac	Curve number	=	91*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	8.94 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.014 x 98) + (0.006 x 76)] / 0.020

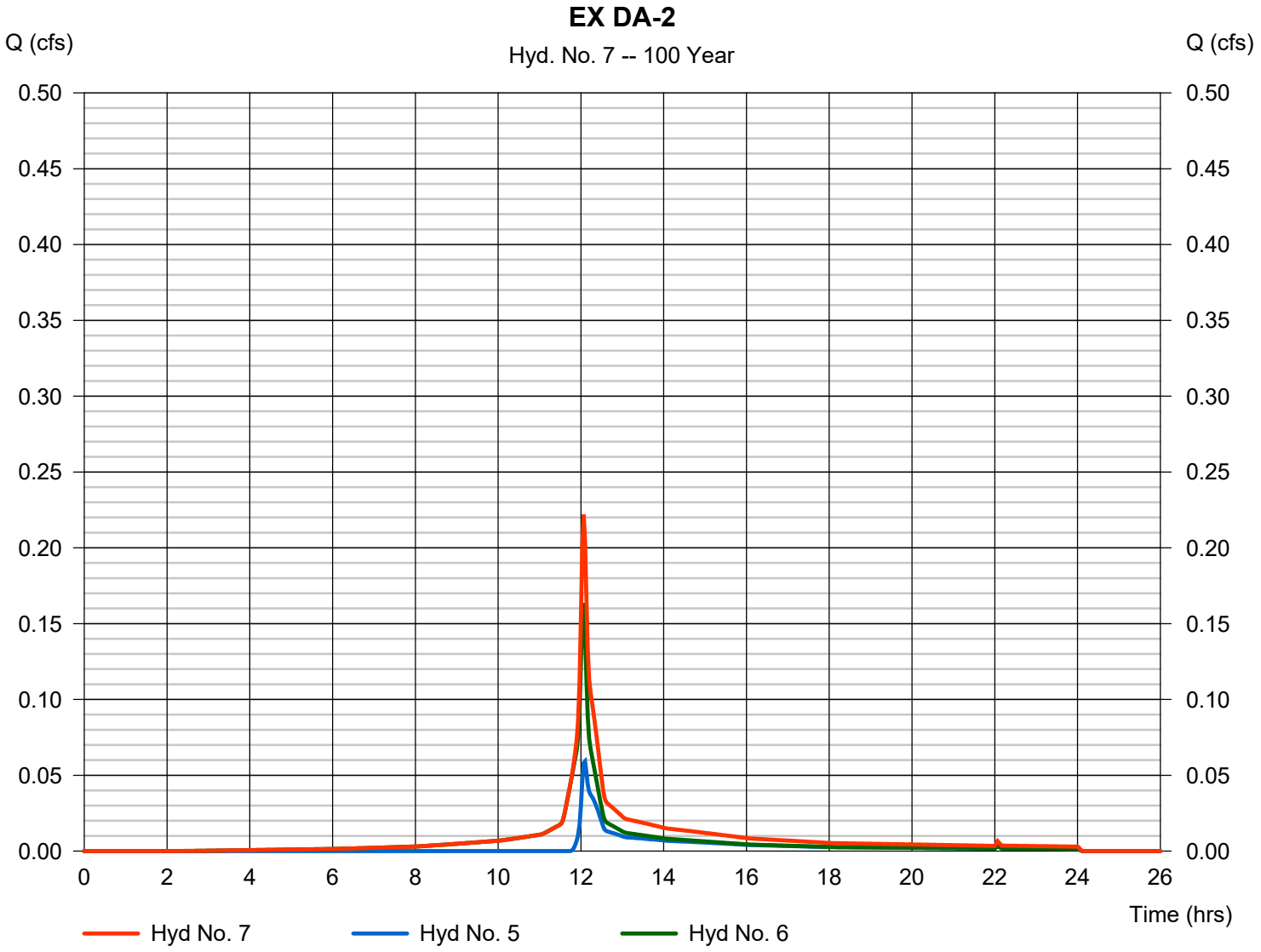


Hydrograph Report

Hyd. No. 7

EX DA-2

Hydrograph type	=	Combine	Peak discharge	=	0.222 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	770 cuft
Inflow hyds.	=	5, 6	Contrib. drain. area	=	0.064 ac

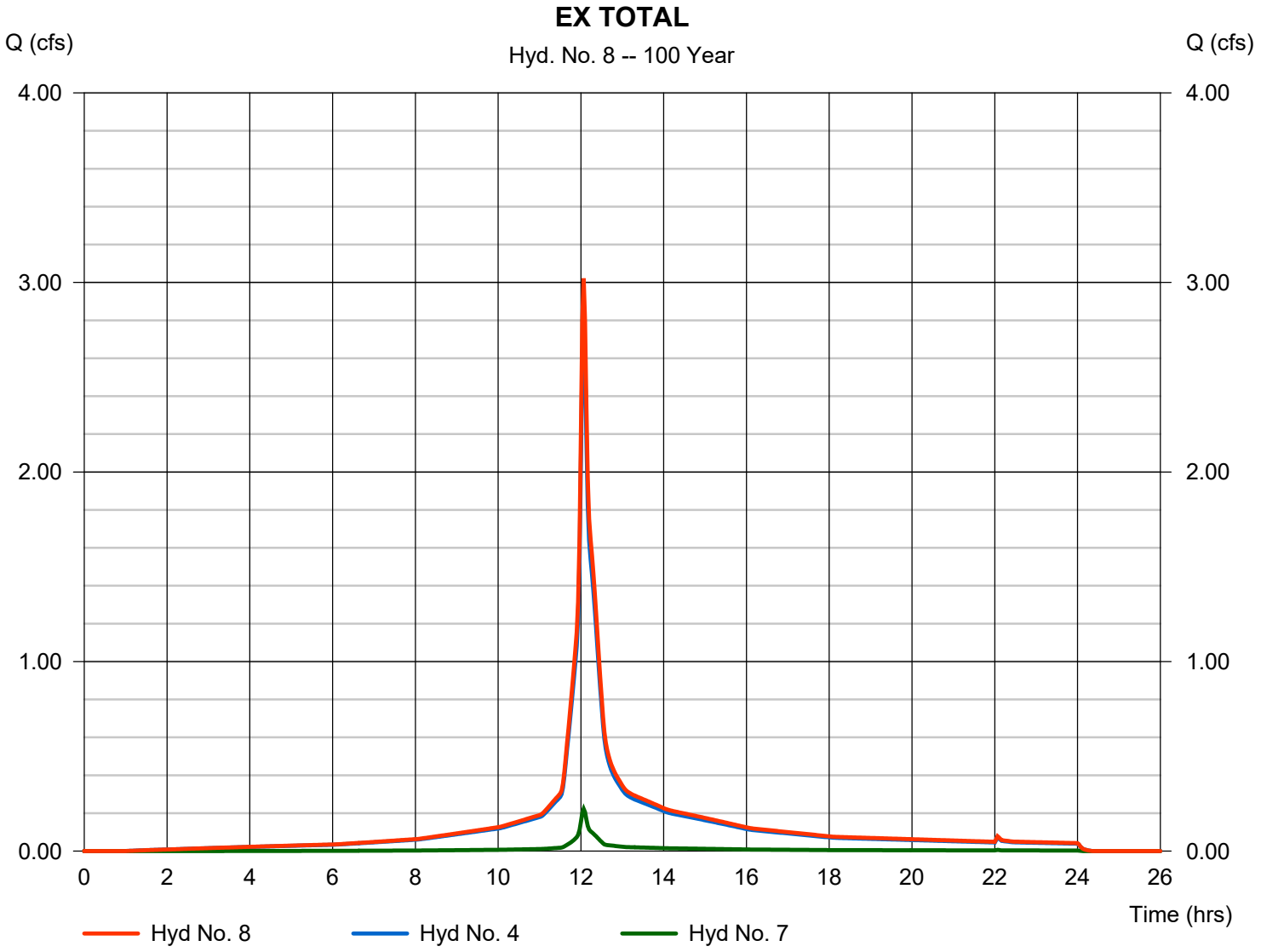


Hydrograph Report

Hyd. No. 8

EX TOTAL

Hydrograph type	= Combine	Peak discharge	= 3.022 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 2 min	Hyd. volume	= 12,175 cuft
Inflow hyds.	= 4, 7	Contrib. drain. area	= 0.000 ac

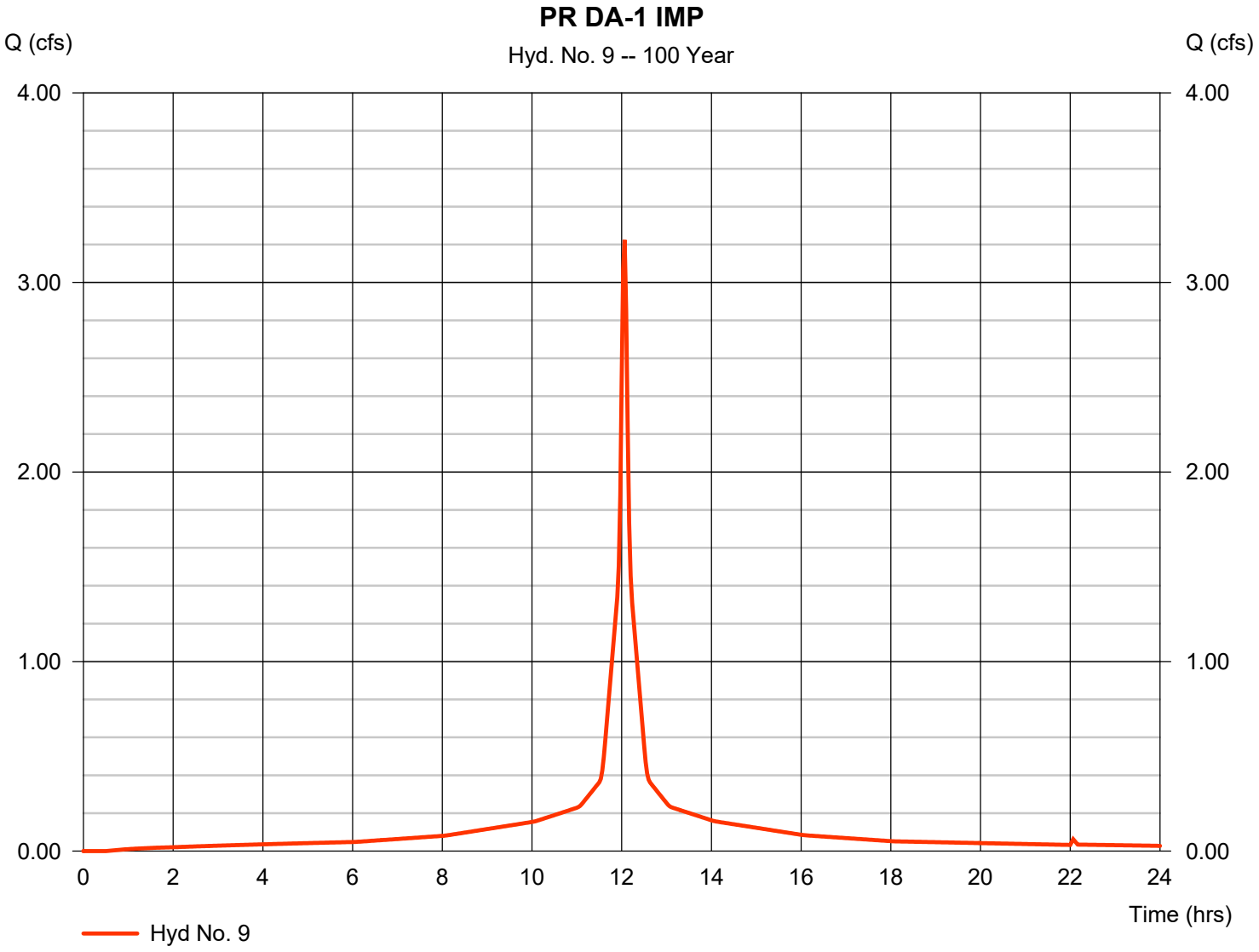


Hydrograph Report

Hyd. No. 9

PR DA-1 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.224 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	11,280 cuft
Drainage area	=	0.381 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	8.94 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

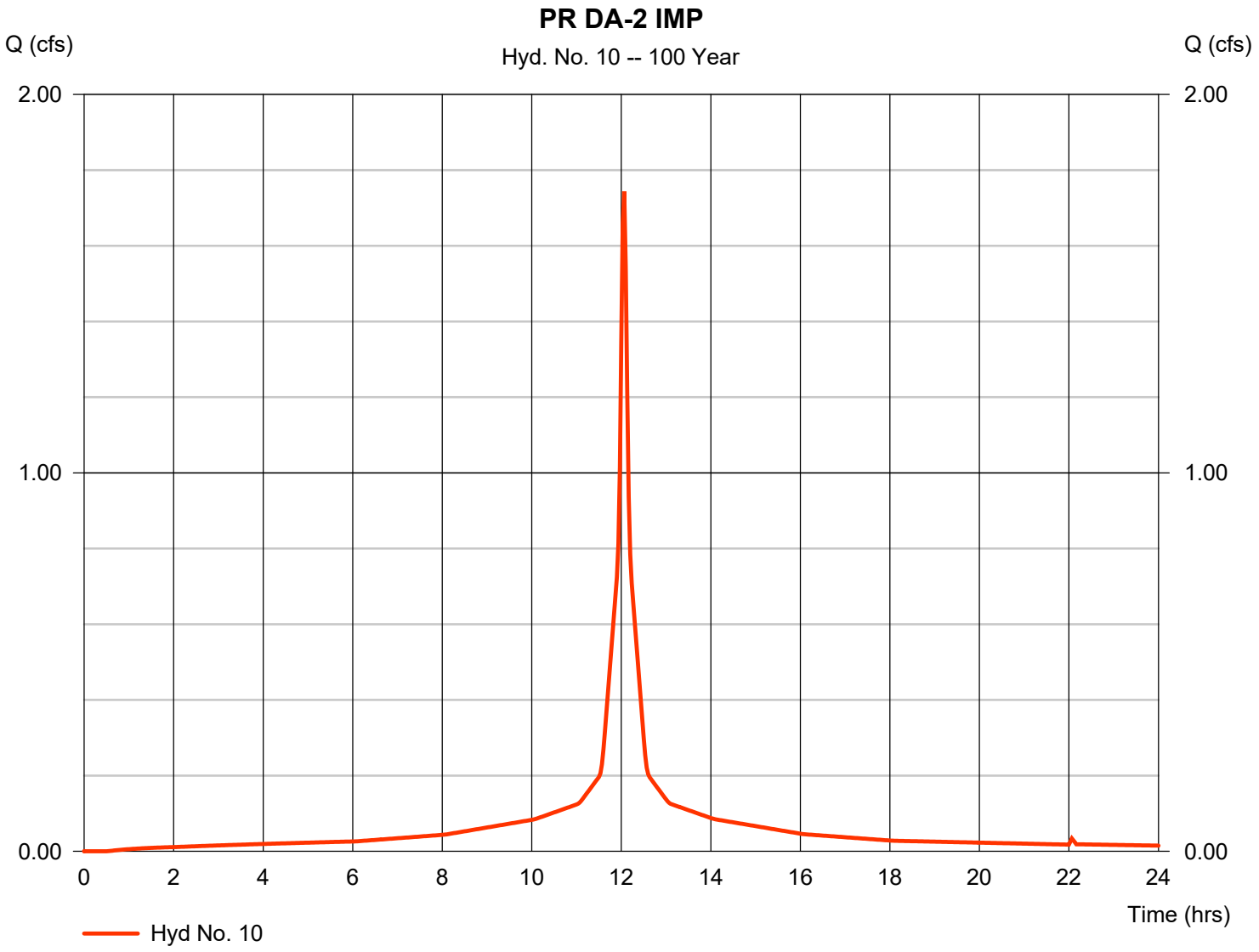


Hydrograph Report

Hyd. No. 10

PR DA-2 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.743 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	6,099 cuft
Drainage area	=	0.206 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	8.94 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

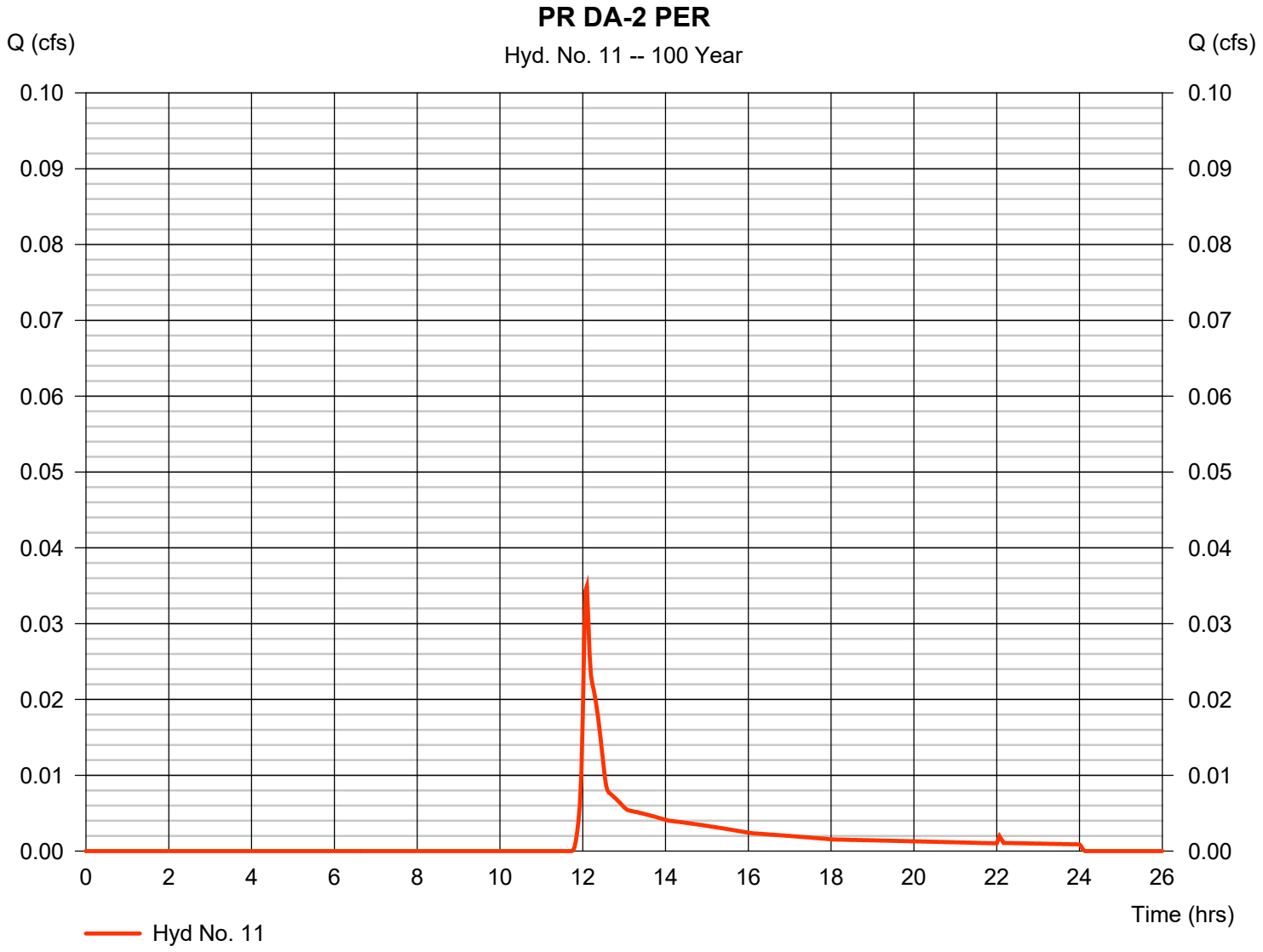


Hydrograph Report

Hyd. No. 11

PR DA-2 PER

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.035 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	2 min	Hyd. volume	=	139 cuft
Drainage area	=	0.026 ac	Curve number	=	39
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	8.94 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

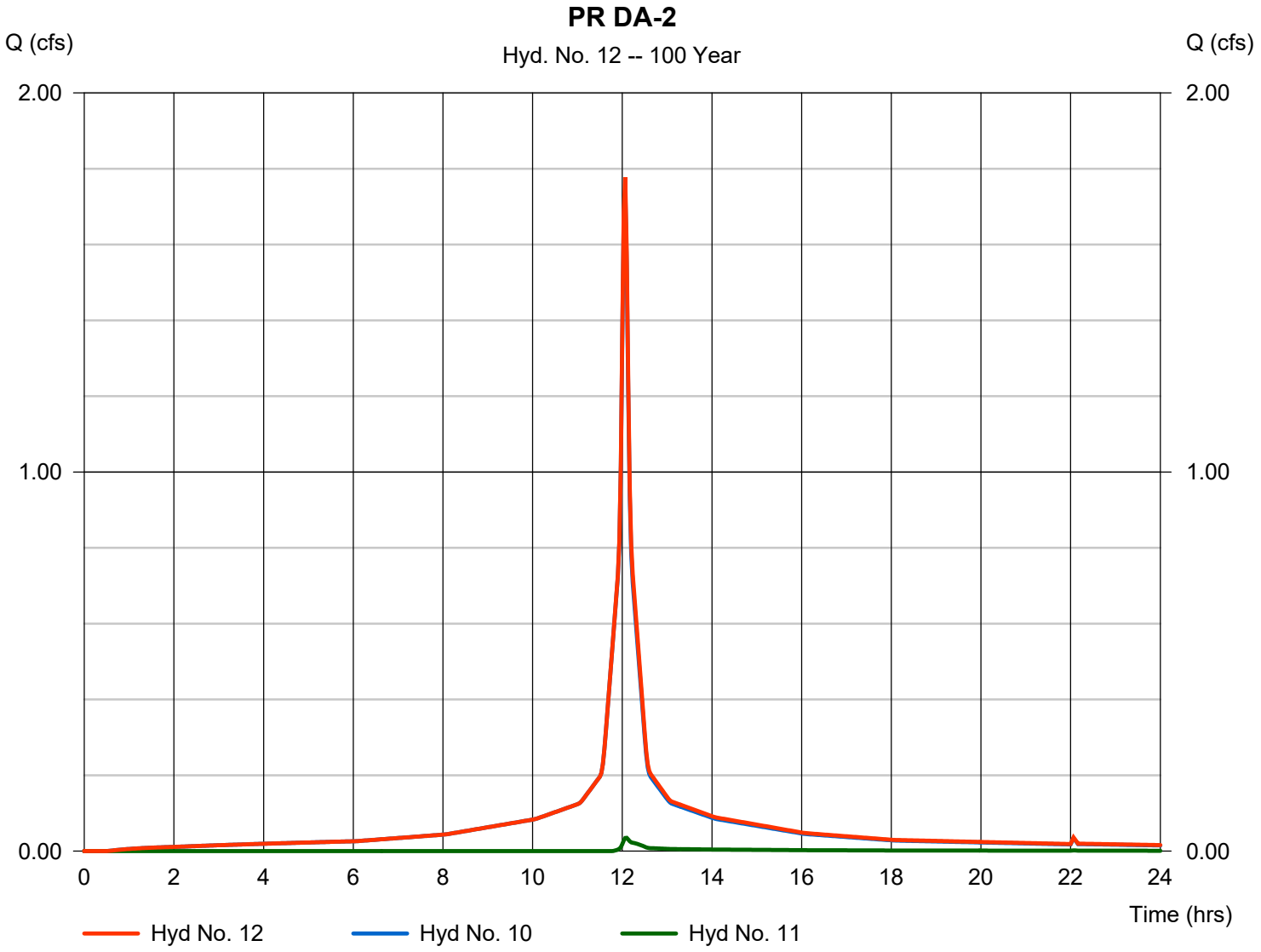


Hydrograph Report

Hyd. No. 12

PR DA-2

Hydrograph type	=	Combine	Peak discharge	=	1.778 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	6,238 cuft
Inflow hyds.	=	10, 11	Contrib. drain. area	=	0.232 ac

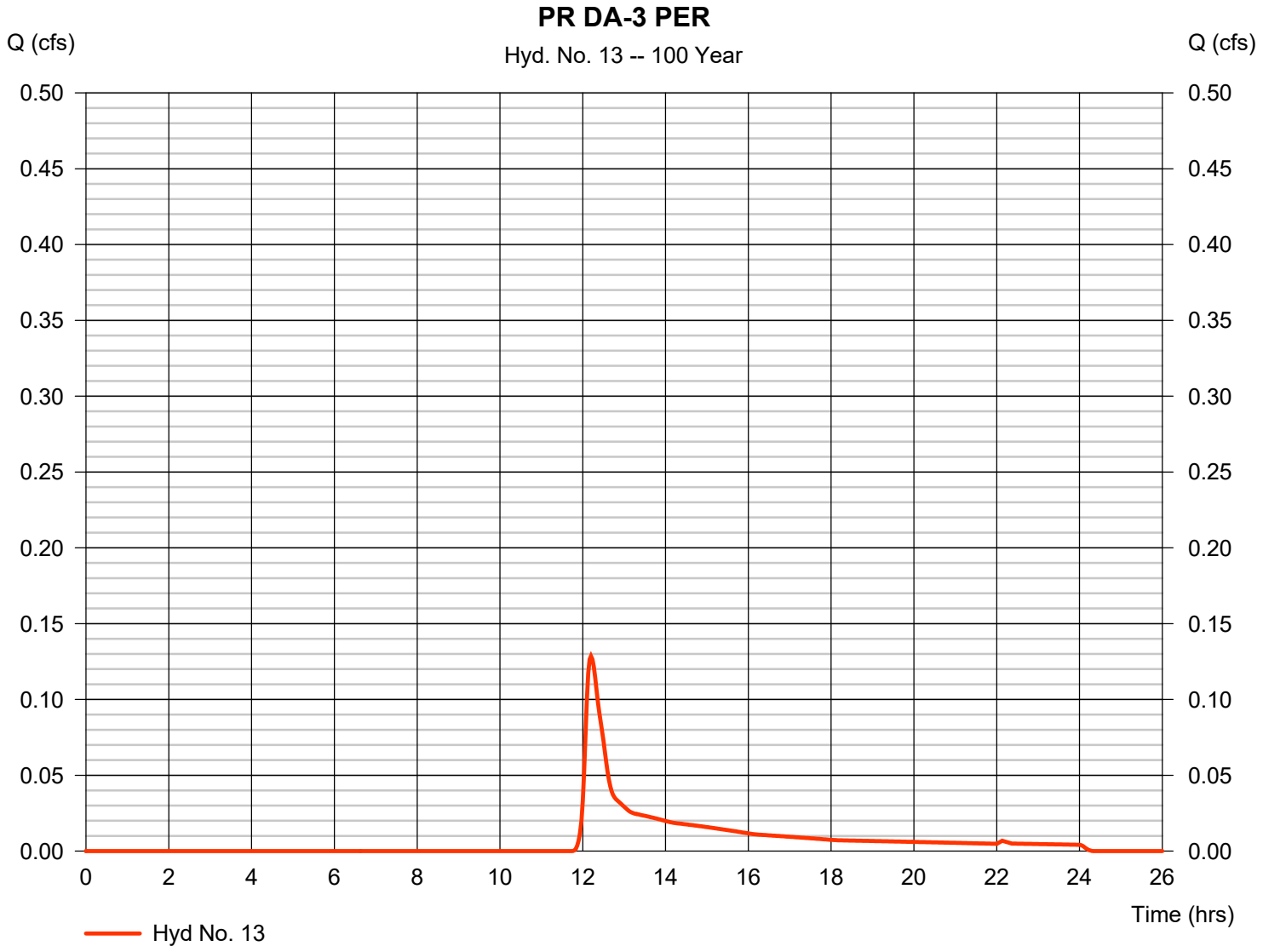


Hydrograph Report

Hyd. No. 13

PR DA-3 PER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.129 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 2 min	Hyd. volume	= 648 cuft
Drainage area	= 0.110 ac	Curve number	= 39
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 10.00 min
Total precip.	= 8.94 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

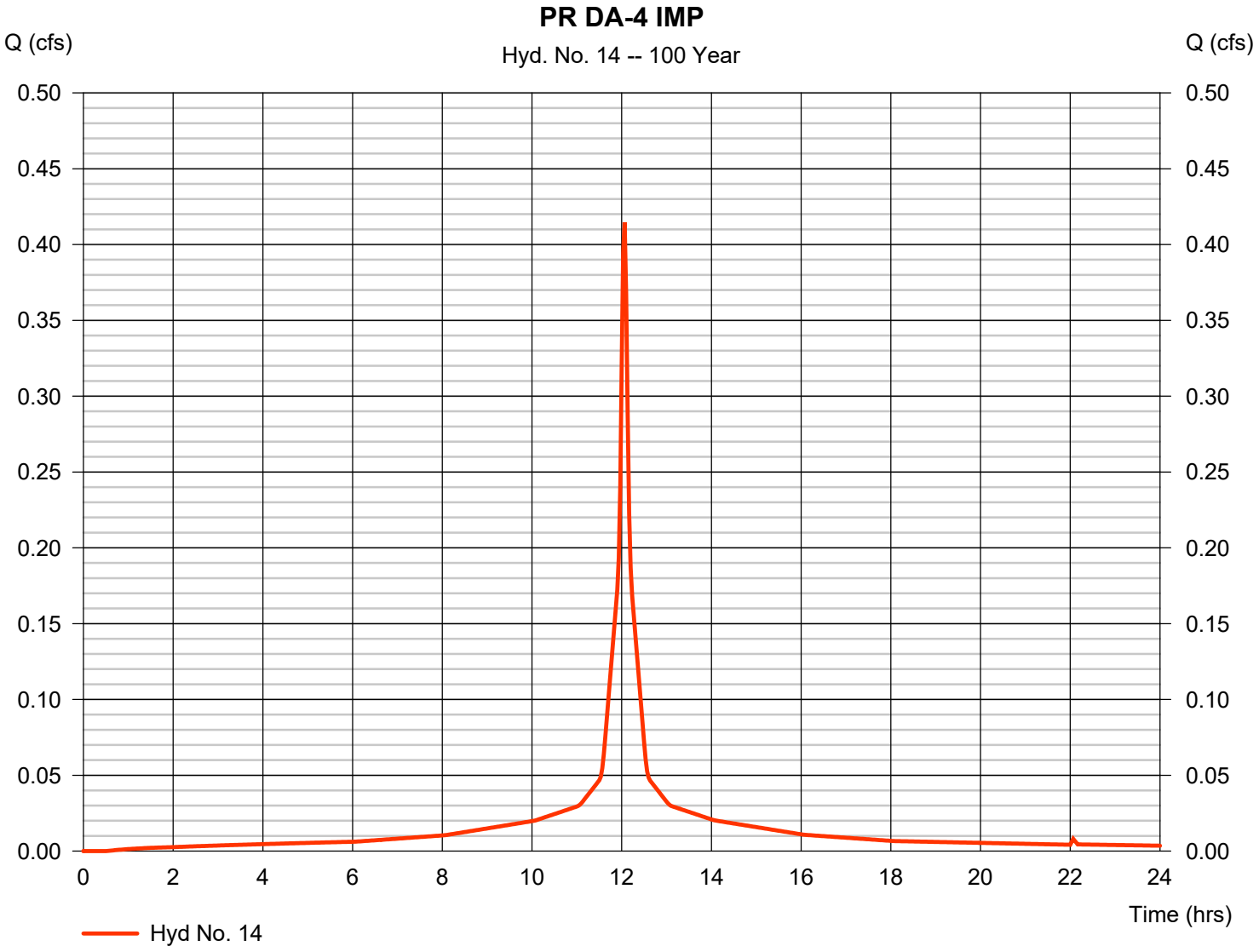


Hydrograph Report

Hyd. No. 14

PR DA-4 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.415 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,451 cuft
Drainage area	=	0.049 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	6.00 min
Total precip.	=	8.94 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

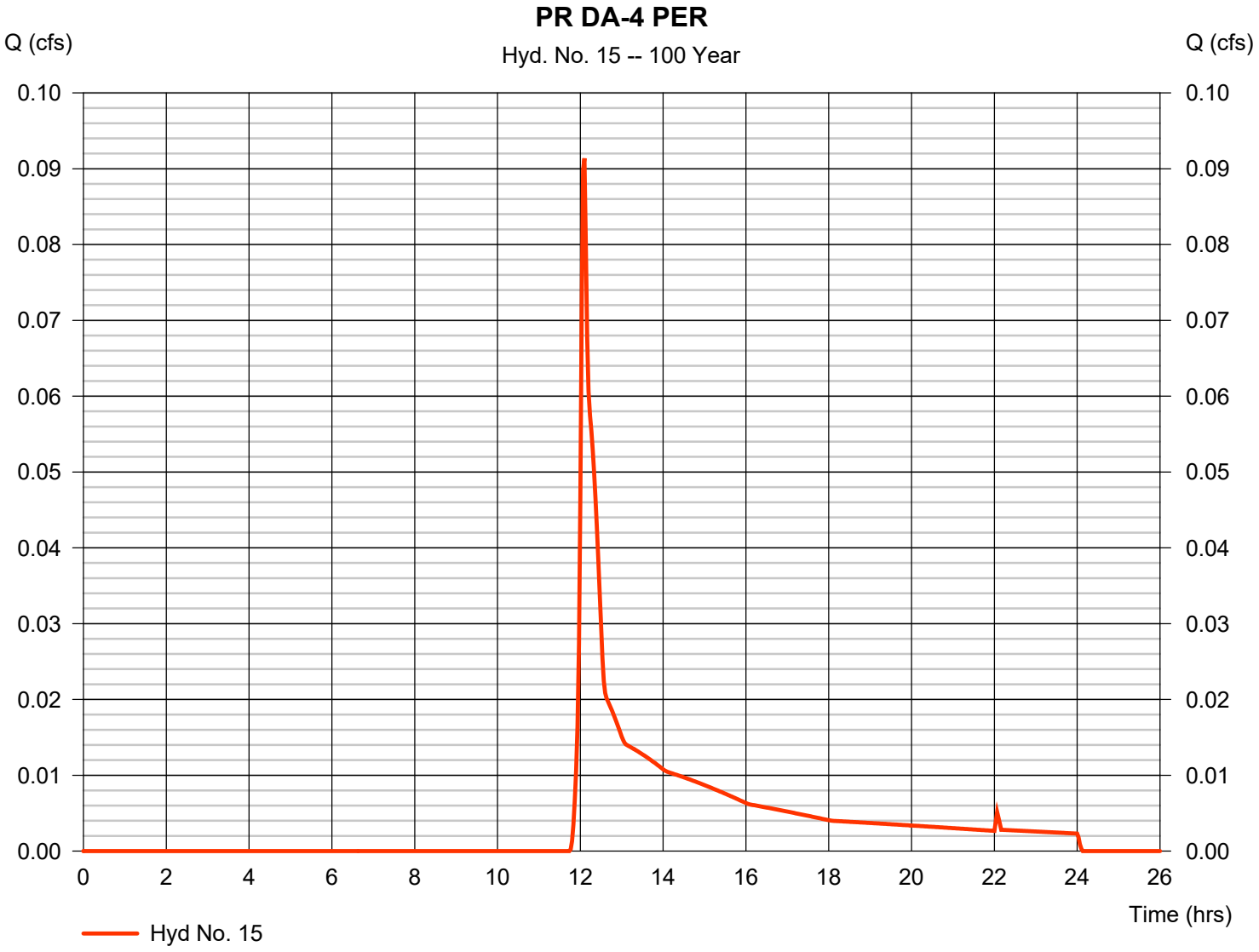


Hydrograph Report

Hyd. No. 15

PR DA-4 PER

Hydrograph type	= SCS Runoff	Peak discharge	= 0.091 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 2 min	Hyd. volume	= 364 cuft
Drainage area	= 0.068 ac	Curve number	= 39
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 6.00 min
Total precip.	= 8.94 in	Distribution	= Type III
Storm duration	= 24 hrs	Shape factor	= 484

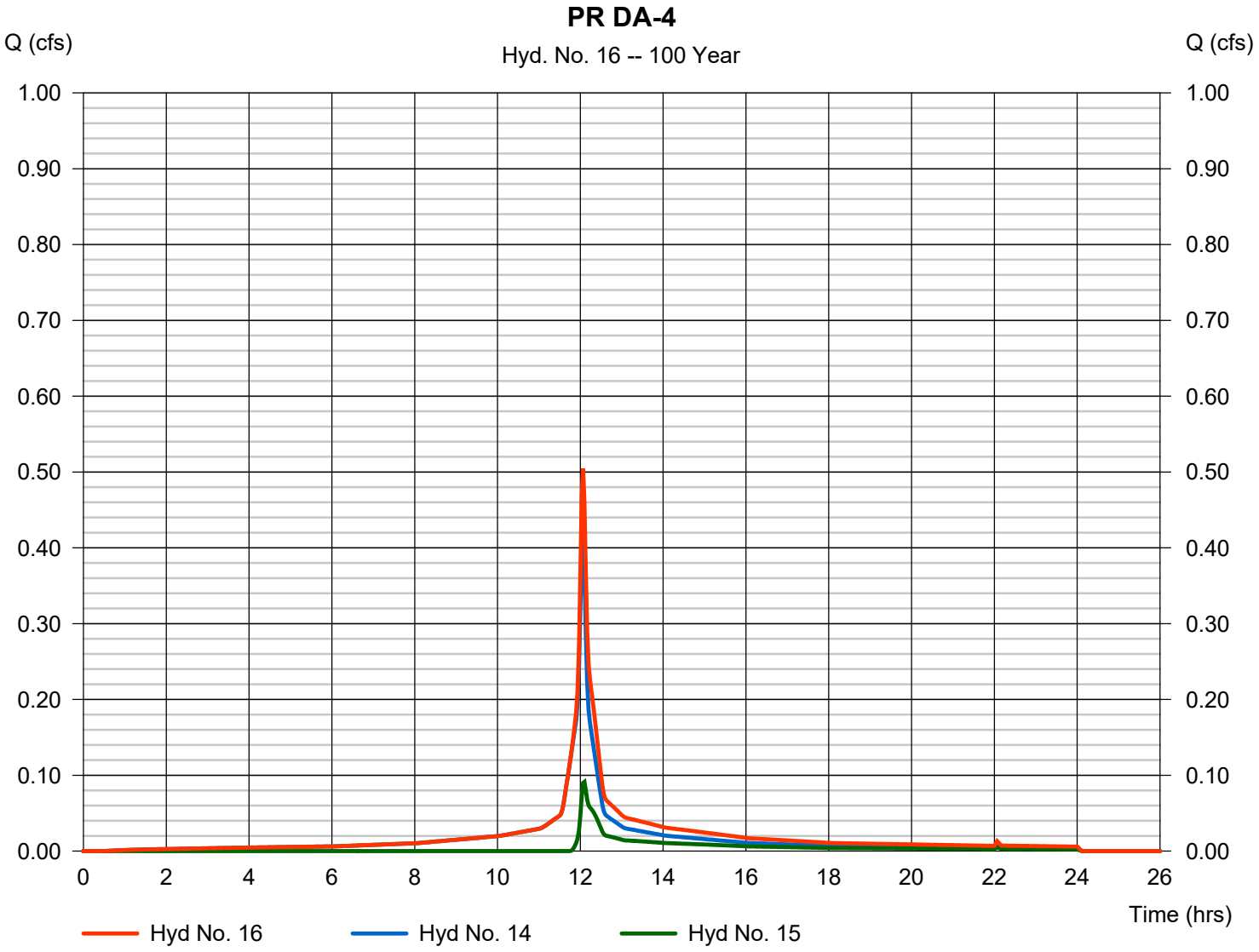


Hydrograph Report

Hyd. No. 16

PR DA-4

Hydrograph type	=	Combine	Peak discharge	=	0.505 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	1,815 cuft
Inflow hyds.	=	14, 15	Contrib. drain. area	=	0.117 ac

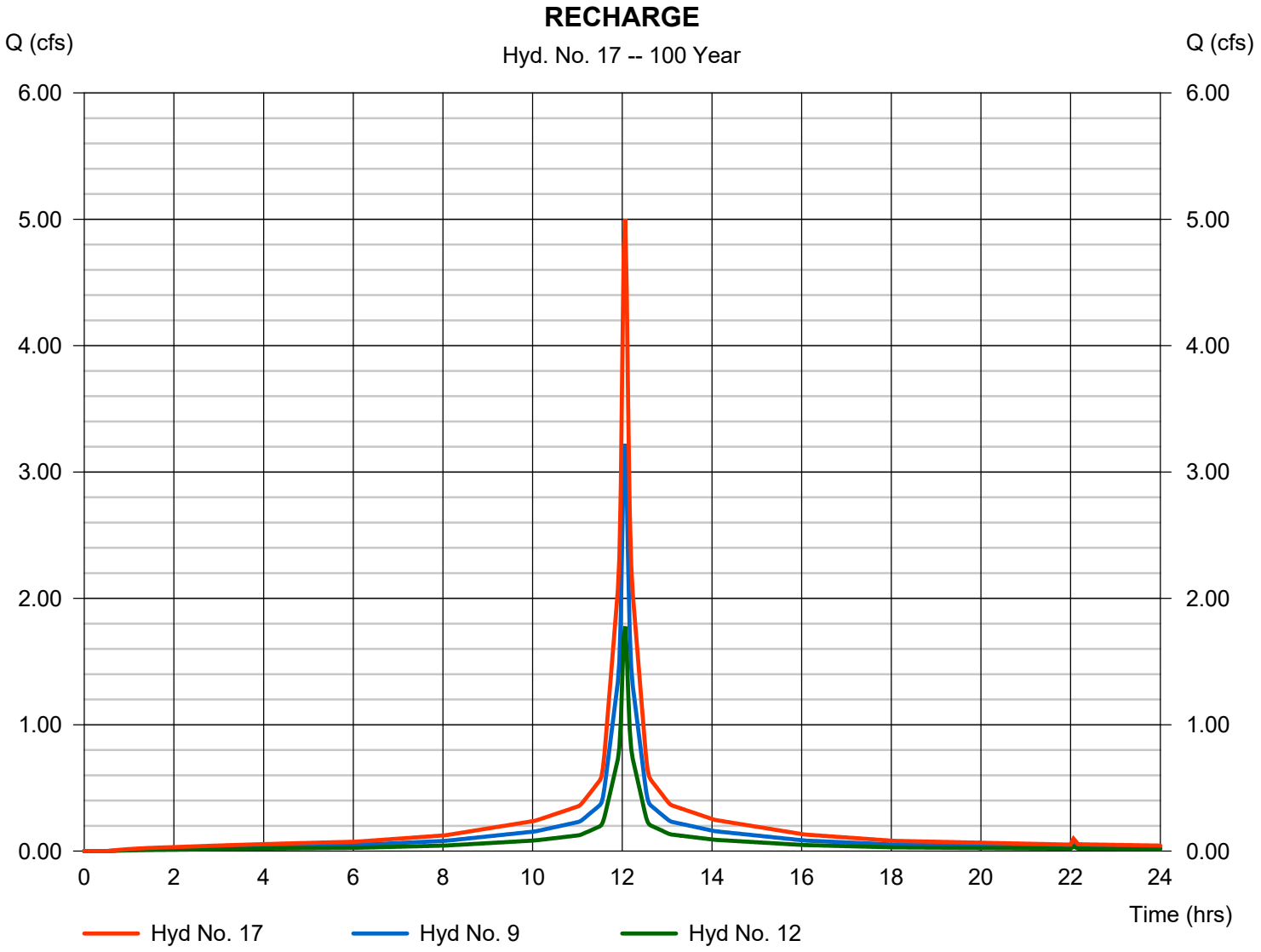


Hydrograph Report

Hyd. No. 17

RECHARGE

Hydrograph type	=	Combine	Peak discharge	=	5.002 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	17,518 cuft
Inflow hyds.	=	9, 12	Contrib. drain. area	=	0.381 ac



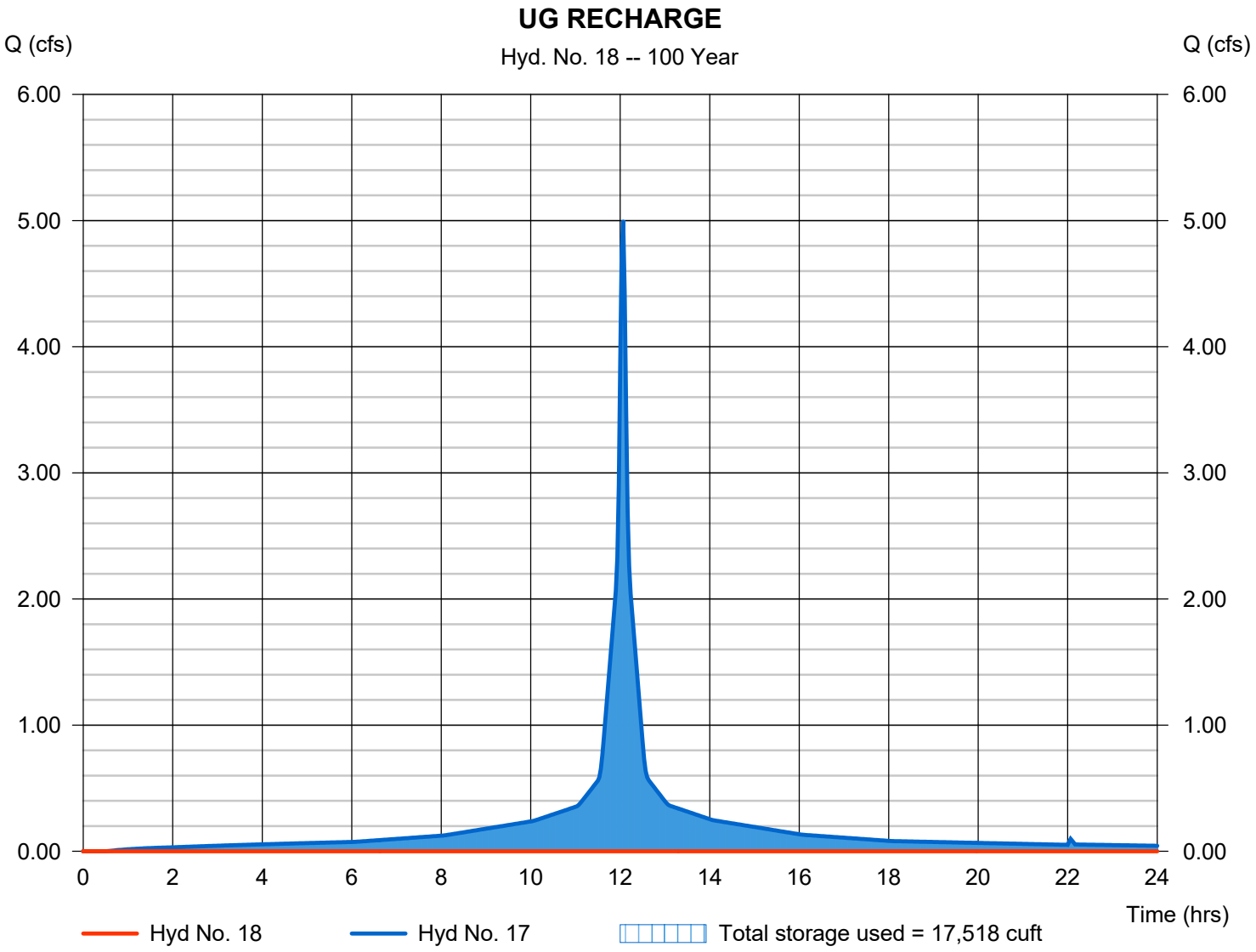
Hydrograph Report

Hyd. No. 18

UG RECHARGE

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	100 yrs	Time to peak	=	n/a
Time interval	=	2 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	17 - RECHARGE	Max. Elevation	=	14.50 ft
Reservoir name	=	(234) SC-740	Max. Storage	=	17,518 cuft

Storage Indication method used.

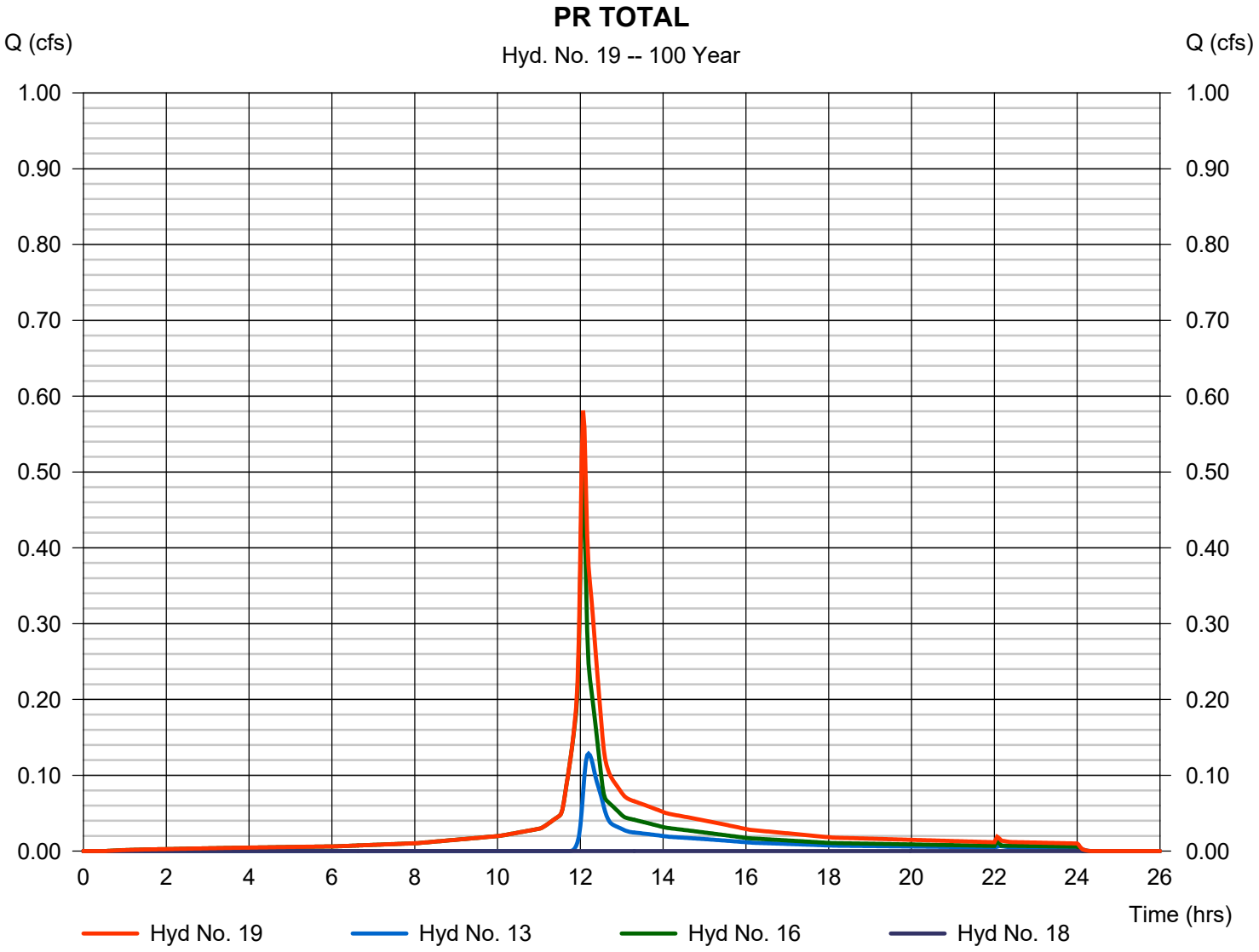


Hydrograph Report

Hyd. No. 19

PR TOTAL

Hydrograph type	=	Combine	Peak discharge	=	0.581 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.07 hrs
Time interval	=	2 min	Hyd. volume	=	2,463 cuft
Inflow hyds.	=	13, 16, 18	Contrib. drain. area	=	0.110 ac

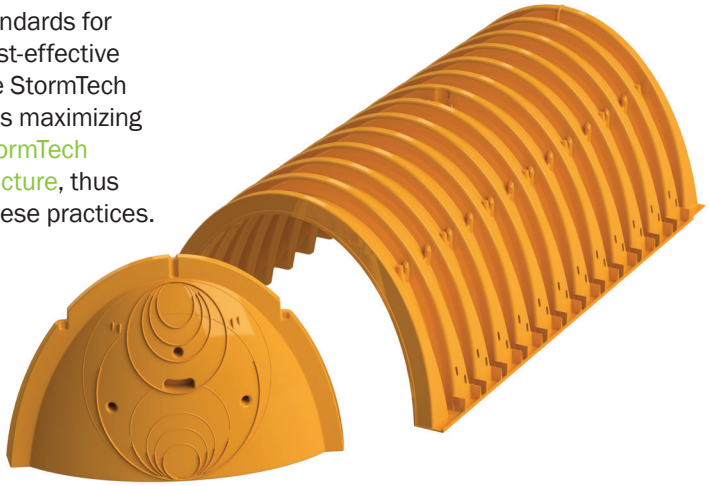


Appendix C

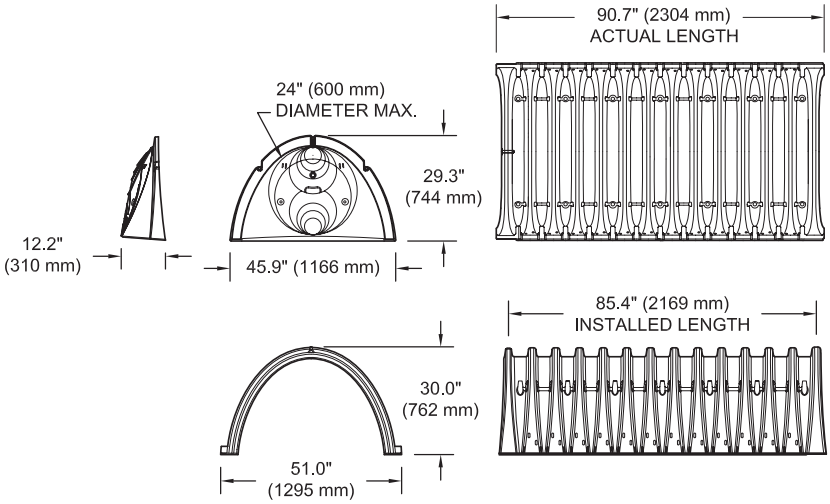
- Stormtech SC-740 Chamber Information sheet
-
- Stormtech SC-740 Volume worksheet

STORMTECH SC-740 CHAMBER

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for private (commercial) and public applications. StormTech chambers can also be used in conjunction with Green Infrastructure, thus enhancing the performance and extending the service life of these practices.



STORMTECH SC-740 CHAMBER
(not to scale)



Nominal Chamber Specifications

Size (L x W x H)
85.4" x 51" x 30"
2,170 mm x 1,295 mm x 762 mm

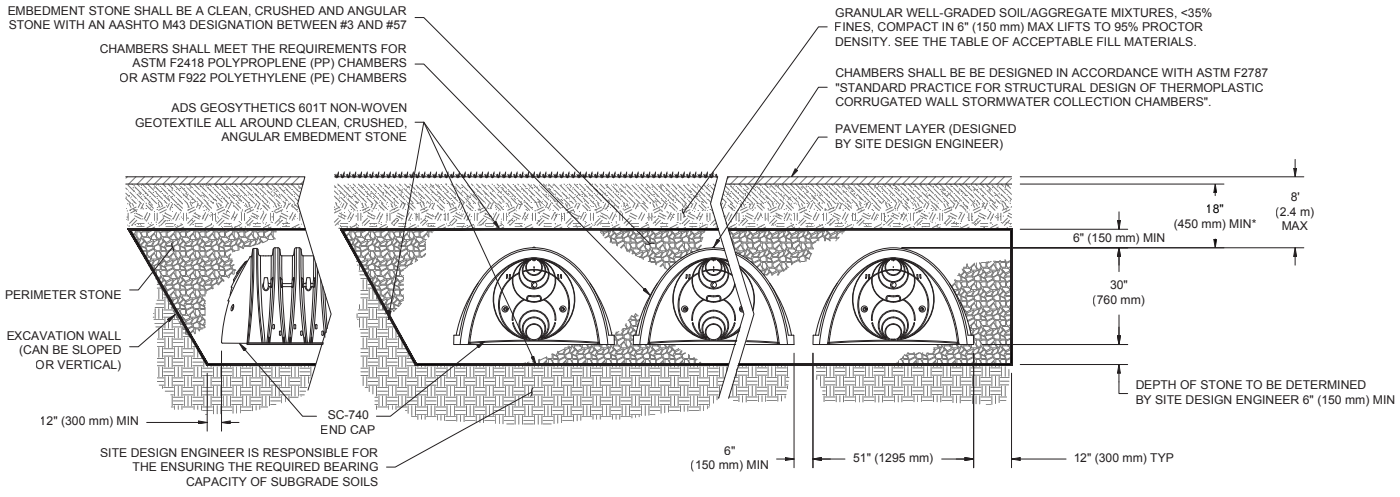
Chamber Storage
45.9 ft³ (1.30 m³)

Min. Installed Storage*
74.9 ft³ (2.12 m³)

Weight
74.0 lbs (33.6 kg)

Shipping
30 chambers/pallet
60 end caps/pallet
12 pallets/truck

*Assumes 6" (150 mm) stone above, below and between chambers and 40% stone porosity.



*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 24" (600 mm).

Project: **33-34 Broad St ; SEPE-00020**

StormTech
Detention • Retention • Water Quality
A division of ADS

Chamber Model -	SC-740	
Units -	**Imperial**	Click Here for Metric
Number of chambers -	234	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	11.00	ft
Amount of Stone Above Chambers -	6	in
Amount of Stone Below Chambers -	6	in

☐ Include Perimeter Stone in Calculations

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Total Chamber *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch & St *(cubic feet)*	Cumulative Chamber *(cubic feet)*	Elevation *(feet)*
42	0.00	0.00	263.67	263.67	17525.74	14.50
41	0.00	0.00	263.67	263.67	17262.07	14.42
40	0.00	0.00	263.67	263.67	16998.40	14.33
39	0.00	0.00	263.67	263.67	16734.73	14.25
38	0.00	0.00	263.67	263.67	16471.05	14.17
37	0.00	0.00	263.67	263.67	16207.38	14.08
36	0.05	12.87	258.52	271.39	15943.71	14.00
35	0.16	38.12	248.42	286.55	15672.31	13.92
34	0.28	65.97	237.28	303.26	15385.77	13.83
33	0.60	141.33	207.14	348.47	15082.51	13.75
32	0.80	187.60	188.63	376.23	14734.04	13.67
31	0.95	222.46	174.69	397.15	14357.81	13.58
30	1.07	251.44	163.10	414.53	13960.66	13.50
29	1.18	276.23	153.18	429.41	13546.13	13.42
28	1.27	296.16	145.21	441.37	13116.71	13.33
27	1.36	317.07	136.84	453.92	12675.34	13.25
26	1.45	340.26	127.57	467.83	12221.43	13.17
25	1.52	356.79	120.96	477.74	11753.60	13.08
24	1.58	370.26	115.57	485.83	11275.85	13.00
23	1.64	384.29	109.96	494.25	10790.02	12.92
22	1.70	397.69	104.60	502.28	10295.78	12.83
21	1.75	410.19	99.60	509.78	9793.49	12.75
20	1.80	421.86	94.93	516.79	9283.71	12.67
19	1.85	434.07	90.04	524.11	8766.92	12.58
18	1.89	442.98	86.48	529.46	8242.81	12.50
17	1.93	452.56	82.65	535.21	7713.34	12.42
16	1.97	462.15	78.81	540.96	7178.14	12.33
15	2.01	470.32	75.54	545.87	6637.17	12.25
14	2.04	478.53	72.26	550.79	6091.31	12.17
13	2.07	485.54	69.46	555.00	5540.52	12.08
12	2.10	492.55	66.65	559.20	4985.52	12.00
11	2.13	498.84	64.14	562.98	4426.32	11.92
10	2.15	504.00	62.07	566.07	3863.34	11.83
9	2.18	509.43	59.90	569.33	3297.27	11.75
8	2.20	514.42	57.91	572.32	2727.94	11.67
7	2.21	516.51	57.07	573.58	2155.62	11.58
6	0.00	0.00	263.67	263.67	1582.04	11.50
5	0.00	0.00	263.67	263.67	1318.36	11.42
4	0.00	0.00	263.67	263.67	1054.69	11.33
3	0.00	0.00	263.67	263.67	791.02	11.25
2	0.00	0.00	263.67	263.67	527.35	11.17
1	0.00	0.00	263.67	263.67	263.67	11.08

Appendix D

- Water Quality Analysis : PR DA-2 ; PR DA-4
- NJCAT Certificate - BioPod™ Biofilter with StormMix Media
- BioPod BioFilter Surface – Detail
- BioPod BioFilter Tree - Detail

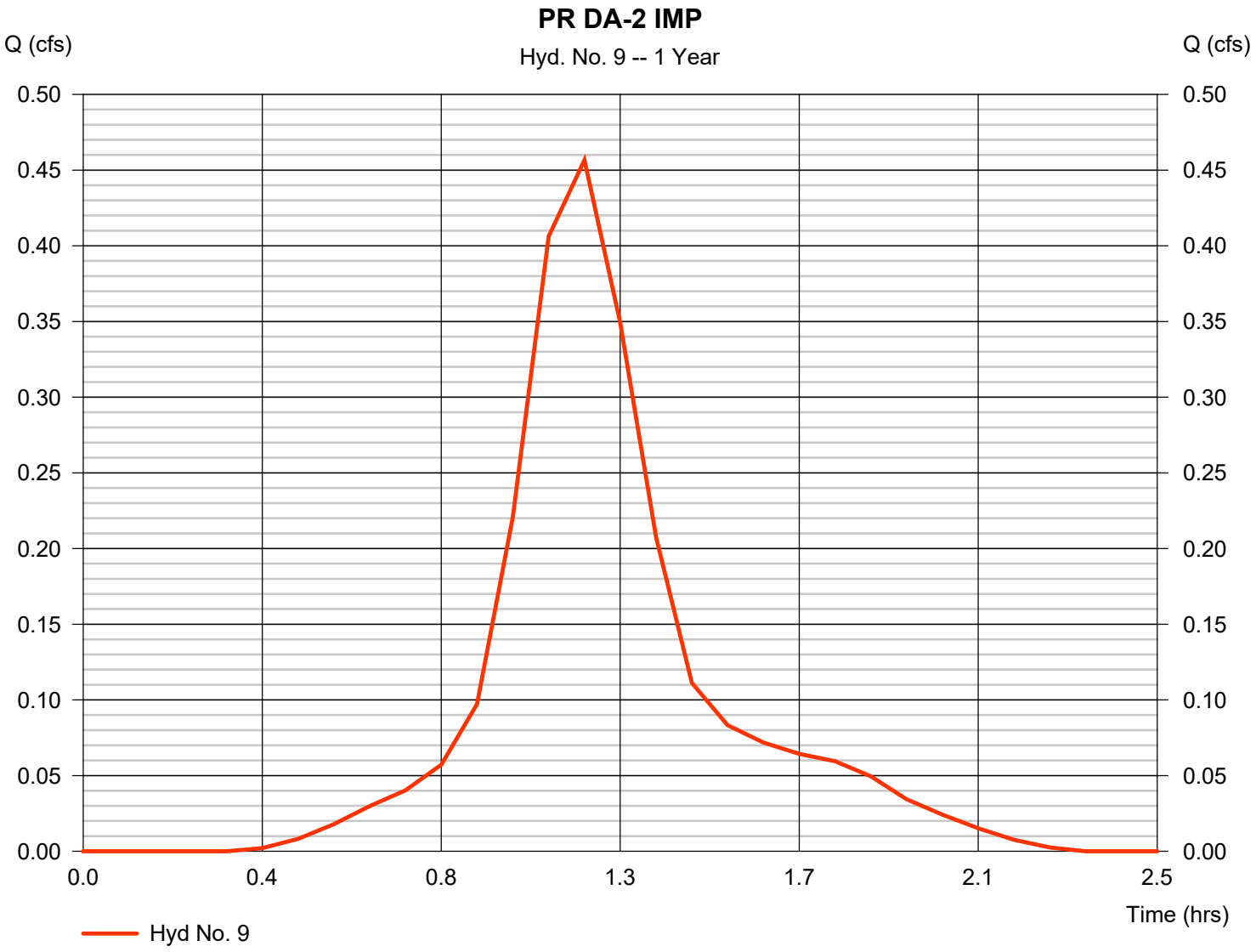
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Tuesday, 07 / 7 / 2020

Hyd. No. 9

PR DA-2 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.457 cfs
Storm frequency	=	1 yrs	Time to peak	=	1.17 hrs
Time interval	=	5 min	Hyd. volume	=	725 cuft
Drainage area	=	0.206 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	\\SERVER\Folder Redirection\Shared\Desktop\Refrences\484\WQ storm.cds			



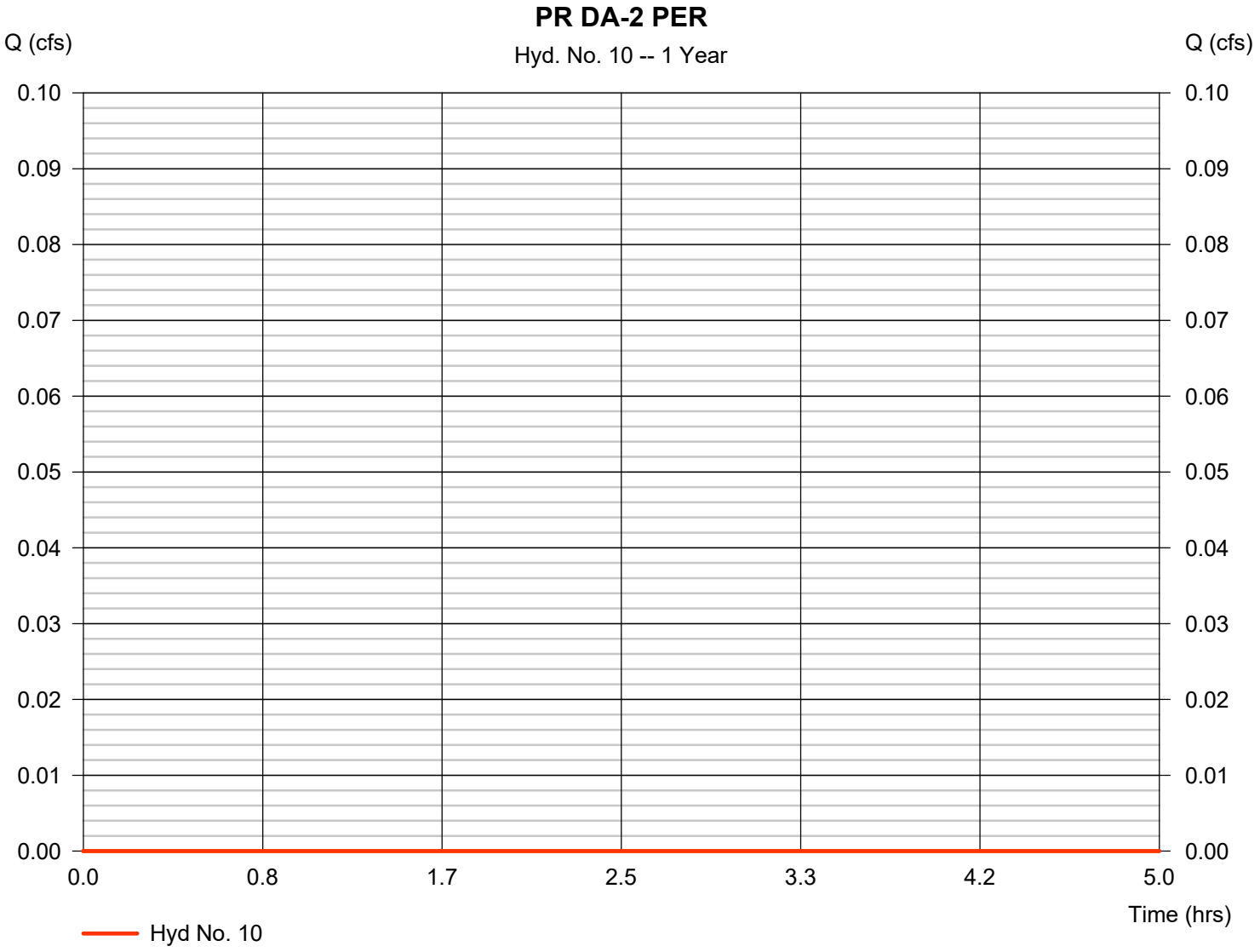
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Tuesday, 07 / 7 / 2020

Hyd. No. 10

PR DA-2 PER

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	5 min	Hyd. volume	=	0 cuft
Drainage area	=	0.026 ac	Curve number	=	39
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	\\SERVER\Folder Redirection\Shared\Desktop\References\WQ storm.cds			



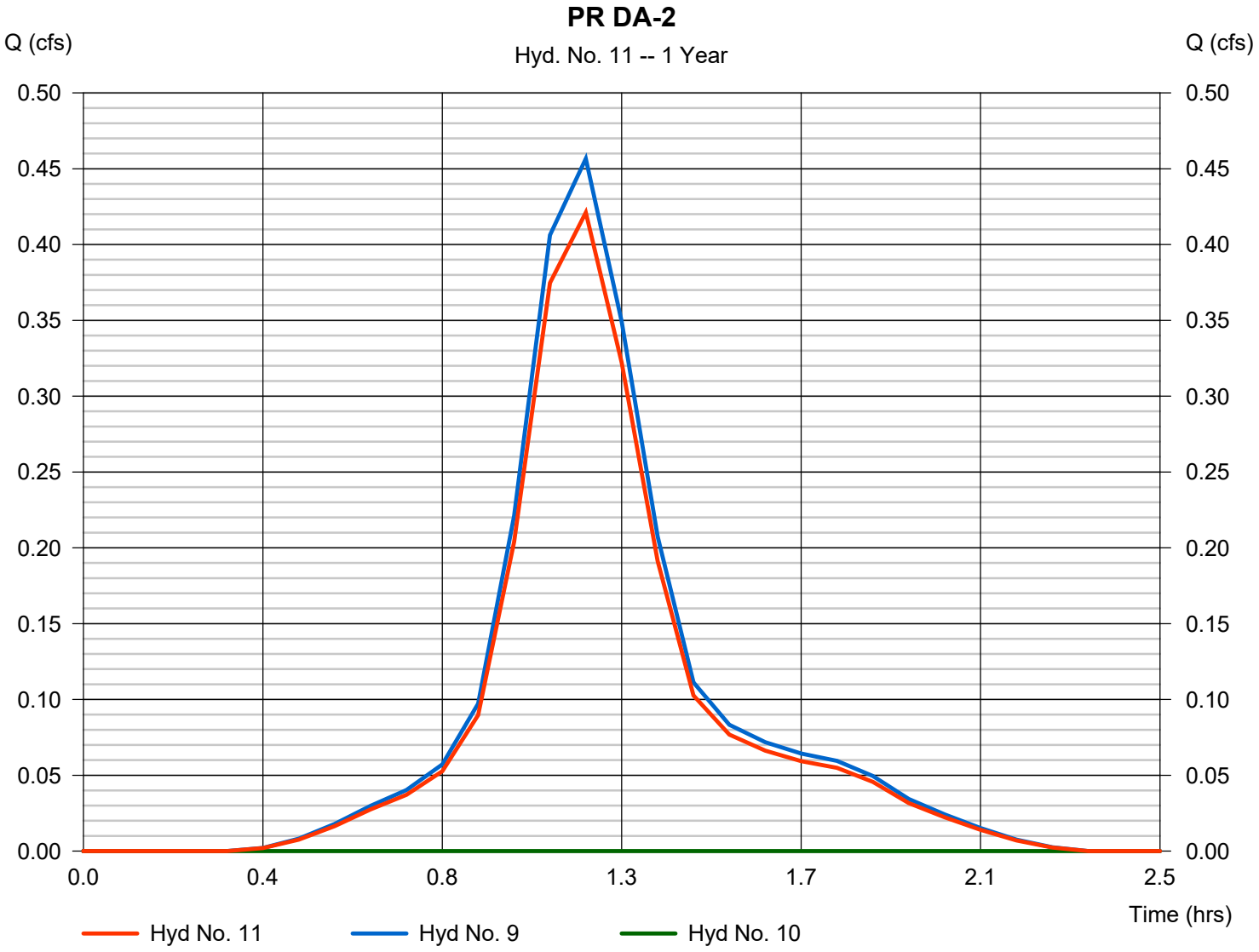
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Tuesday, 07 / 7 / 2020

Hyd. No. 11

PR DA-2

Hydrograph type	= Combine	Peak discharge	= 0.421 cfs
Storm frequency	= 1 yrs	Time to peak	= 1.17 hrs
Time interval	= 5 min	Hyd. volume	= 669 cuft
Inflow hyds.	= 9, 10	Contrib. drain. area	= 0.232 ac



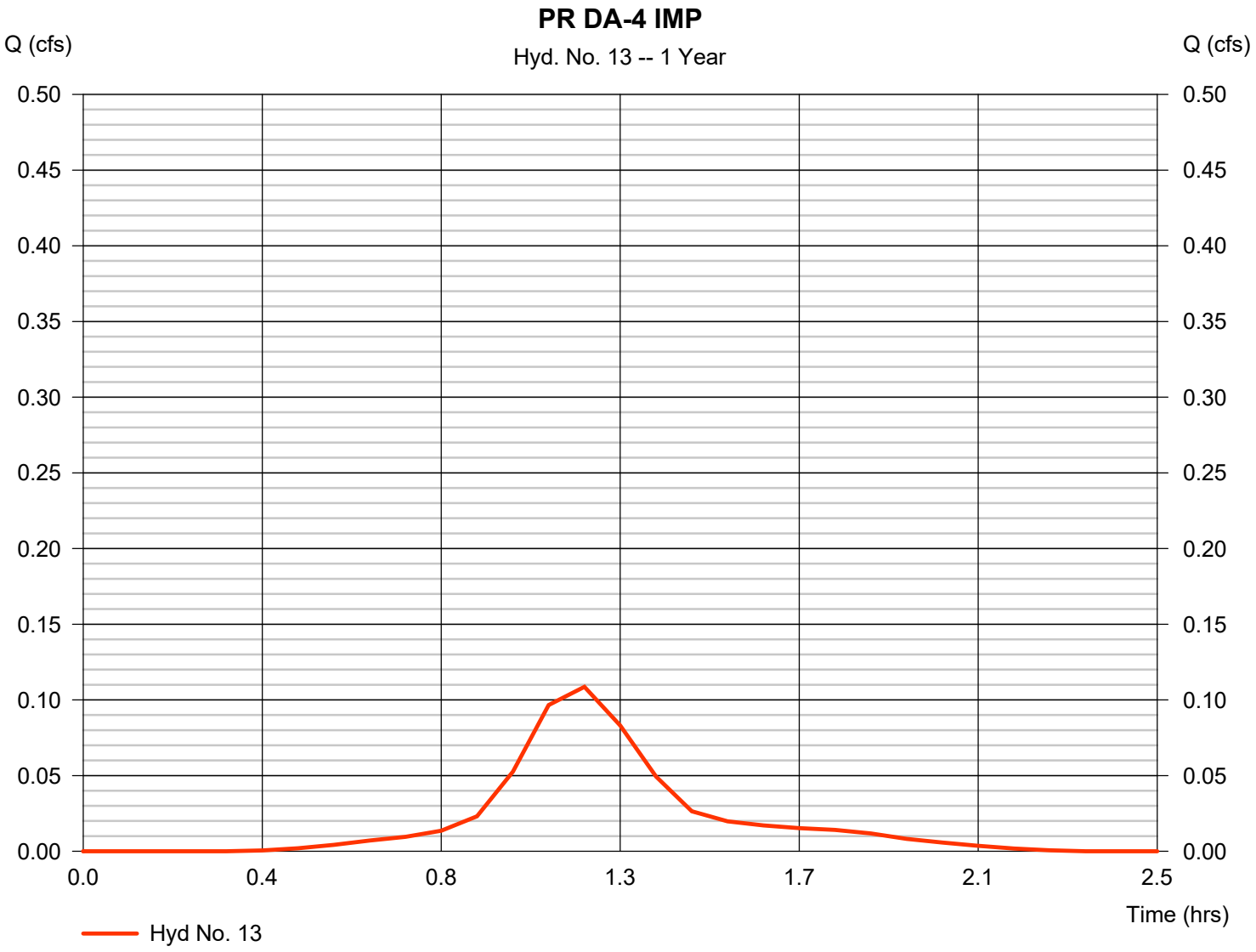
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Tuesday, 07 / 7 / 2020

Hyd. No. 13

PR DA-4 IMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.109 cfs
Storm frequency	=	1 yrs	Time to peak	=	1.17 hrs
Time interval	=	5 min	Hyd. volume	=	172 cuft
Drainage area	=	0.049 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	\\SERVER\Folder Redirection\Shared\Desktop\References\484\WQ storm.cds			



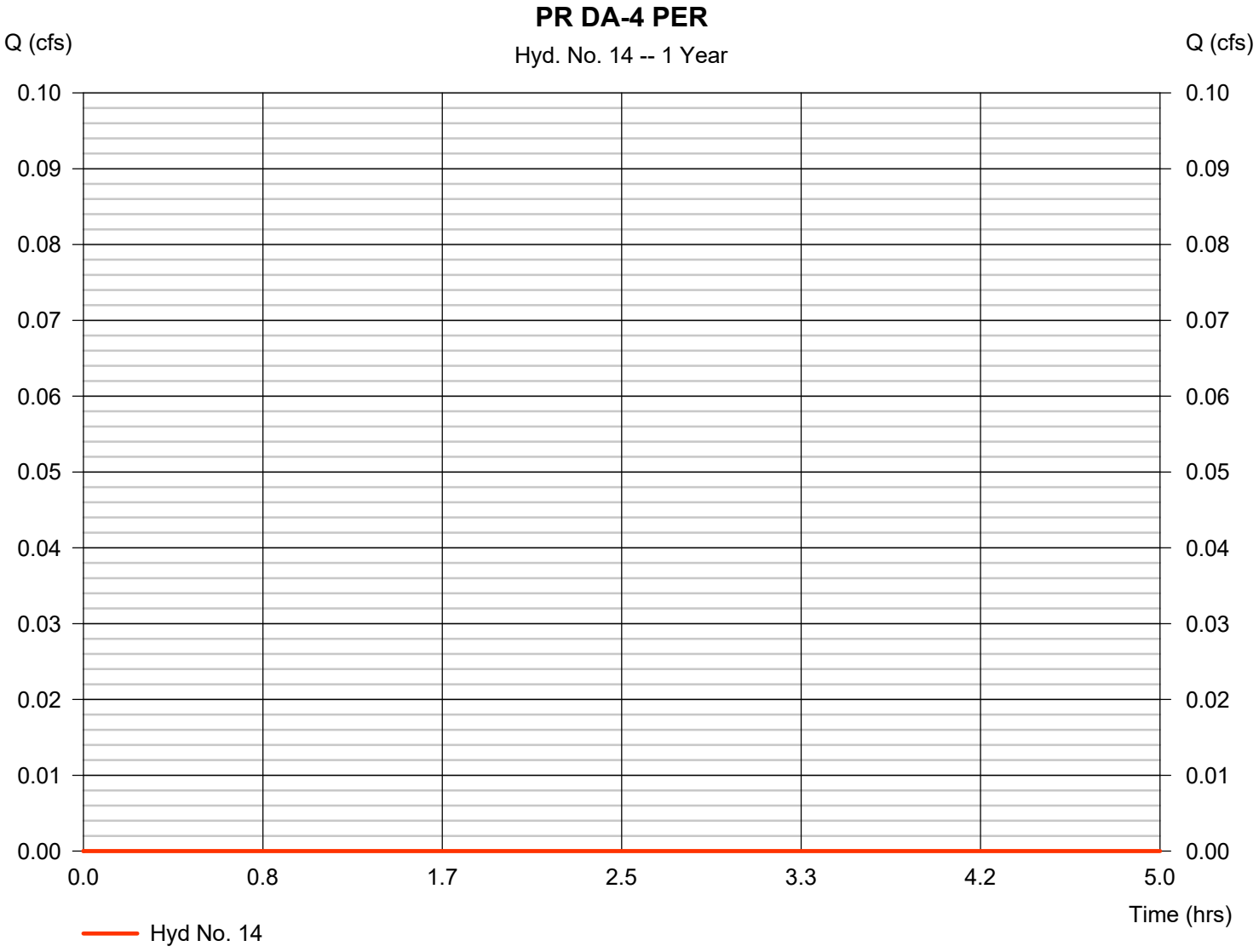
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Tuesday, 07 / 7 / 2020

Hyd. No. 14

PR DA-4 PER

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	5 min	Hyd. volume	=	0 cuft
Drainage area	=	0.068 ac	Curve number	=	39
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	10.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	\\SERVER\Folder Redirection\Shared\Desktop\References\WQ storm.cds			



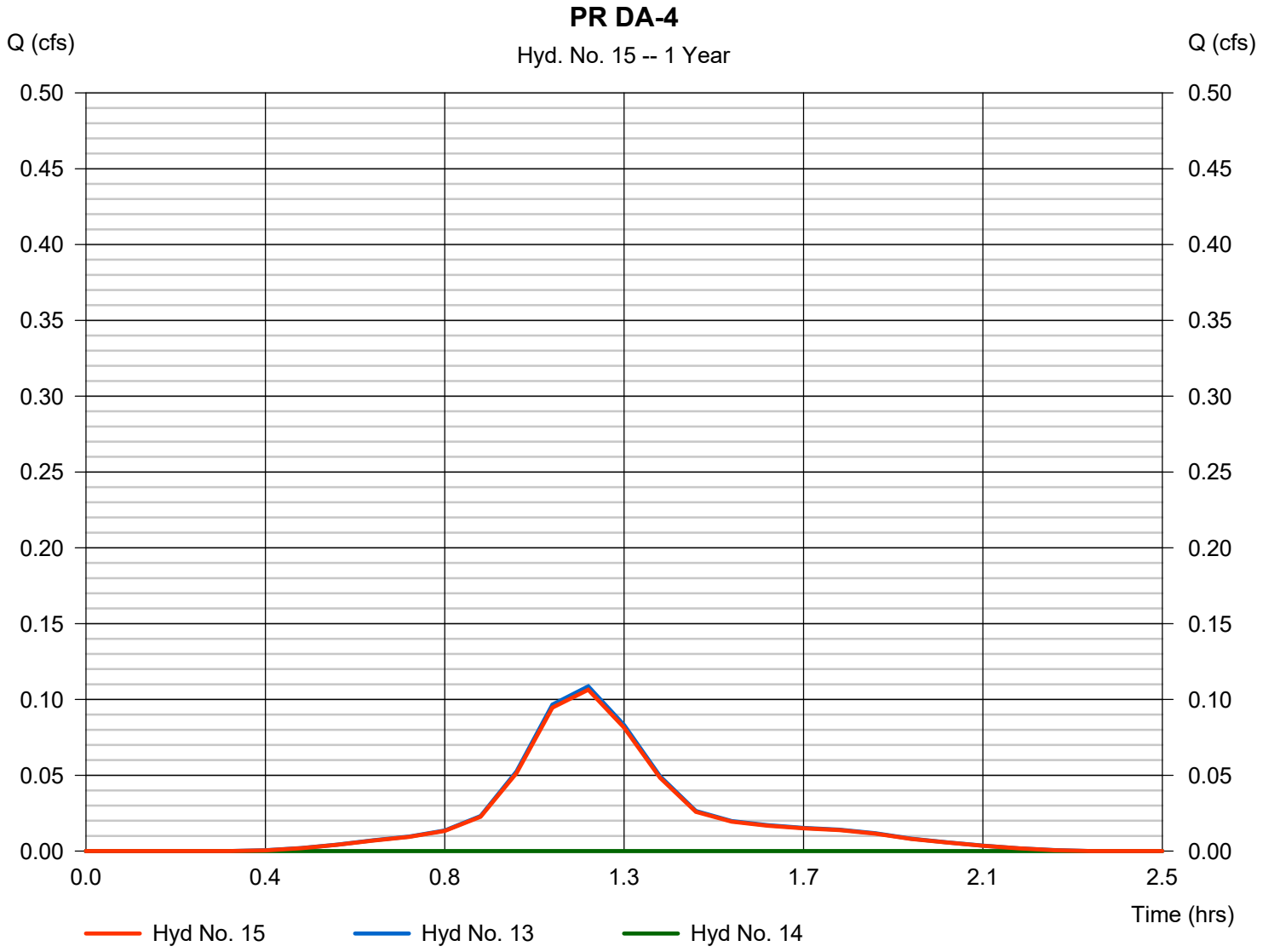
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2020 Tuesday, 07 / 7 / 2020

Hyd. No. 15

PR DA-4

Hydrograph type	= Combine	Peak discharge	= 0.106 cfs
Storm frequency	= 1 yrs	Time to peak	= 1.17 hrs
Time interval	= 5 min	Hyd. volume	= 169 cuft
Inflow hyds.	= 13, 14	Contrib. drain. area	= 0.117 ac



State of New Jersey

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Mail Code – 401-02B
Division of Water Quality
Bureau of Nonpoint Pollution Control
P.O. Box 420 – 401 E. State St.
Trenton, NJ 08625-0420
Phone: (609) 633-7021 / Fax: (609) 777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

CATHERINE R. McCABE
Commissioner

Chris Demarest
Product Development Manager
Oldcastle Precast Inc.
7921 Southpark Plaza, Suite 200
Littleton, CO 80120

December 21, 2018

Re: MTD Laboratory Certification
Biopod™ Biofilter with StormMix Media
On-line Installation

TSS Removal Rate 80%

Dear Mr. Demarest:

This revised certification letter supersedes the Department's prior certification dated May 25, 2018. This revision was completed as a result of the Biopod™ Biofilter with StormMix Media manufactured treatment device (MTD) being re-tested and verified by NJCAT for use as an on-line device. No other modifications were made to this certification.

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7(c) allow the use of MTDs for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Oldcastle Precast Inc. has requested a Laboratory Certification for the Biopod™ Biofilter with StormMix Media.

This project falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advanced Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Department of Environmental Protection Laboratory Protocol to Assess Total Suspended Solids Removal by a Filtration Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the afore mentioned protocol have been met or exceeded. The NJCAT letter also included a

recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (with the November 2018 Addendum added to the report dated May 2018) for this device is published online at http://www.njcat.org/uploads/newDocs/BioPodBiofilterReportFinal.pdf.

The NJDEP certifies the use of the Biopod™ Biofilter with StormMix Media by Oldcastle Precast Inc at a TSS removal rate of 80%, when designed, operated and maintained in accordance with the information provided in the Verification Appendix and subject to the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5. The MTFR is based on 1.8 gpm/ft^2 (0.004 cfs/ft^2) of effective filtration treatment area.

2. The Biopod™ Biofilter with StormMix Media shall be installed using the same configuration as the unit verified by NJCAT, and sized in accordance with the criteria specified in item 6 below.

3. This device cannot be used in series with another MTD or a media filter (such as a sand filter), to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.

4. Additional design criteria for MTDs can be found in Chapter 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual which can be found on-line at www.njstormwater.org.

5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the Biopod™ Biofilter with StormMix Media, which is attached to this document. However, it is recommended to review the maintenance website at https://oldcastleprecast-yut3re1sojoa.netdna-ssl.com/wp-content/uploads/OSS_BioPod_InspMaint_Jan-2018.pdf for any changes to the maintenance requirements.

6. Sizing Requirements:

   The example below demonstrates the sizing procedure for a Biopod™ Biofilter with StormMix Media.

   Example: A 0.25-acre impervious site is to be treated to 80% TSS removal using Biopod™ Biofilter with StormMix Media. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs or 354.58 gpm.

   The selection of configuration for use in the Biopod™ Biofilter with StormMix Media is based upon both the MTFR and the maximum inflow drainage area. It is necessary to

select the configuration using both methods and to rely on the method that results in the larger configuration determined by the two methods.

Inflow Drainage Area Evaluation:

The drainage area to the Biopod™ Biofilter with StormMix Media in this example is 0.25 acres. Based upon the information in Table A-1 below, any of the certified models of Biopod™ Biofilter with StormMix Media can be used to treat the impervious area without exceeding the maximum drainage area.

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was determined based on the following:

time of concentration = 10 minutes
i = 3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)
c = 0.99 (runoff coefficient for impervious)
Q = ciA=0.99x3.2x0.25 = 0.79 cfs

Based on a flow rate of 0.79 cfs and the information in Table A-1 below, multiple units will be required to use Biopod™ Biofilter with StormMix to treat the impervious area without exceeding the MTFR. Any combination would be acceptable as long as the flowrate to each unit does not exceed its MTFR, the total MTFR for all of the units equals or exceeds 0.79 cfs, and the entire 0.25 acre is treated by one of the units. Two examples are shown below:

Example 1: 9 units of the 4' x 6' model without internal by-pass.

9 units x 0.096 cfs (MTFR)=0.864 cfs

Since this exceeds 0.79 cfs, this configuration is acceptable as long as the flow to each individual unit does not exceed the MTFR of 0.096 cfs, and the entire 0.25 acre area is treated by one of the 9 units.

Example 2: 7 units of the 4' x 8' model without internal by-pass.

7 units x 0.128 cfs (MTFR)=0.896 cfs

Since this exceeds 0.79 cfs, this configuration is acceptable as long as the flow to each individual unit does not exceed the MTFR of 0.128 cfs, and the entire 0.25 acre area is treated by one of the 7 units.

The MTFR Evaluation results will be used since that method results in the larger minimum configuration determined by the two methods.

The sizing table corresponding to the available system models are noted below:

Table A-1 BioPod™ Biofilter Model Sizes and New Jersey Treatment Capacities

Configuration	Dimensions (ft)	Effective Filtration Treatment Area (ft^2)	Maximum Treatment Flow Rate[1] (cfs)	Drainage Area[2] (Acres)
BioPod	4 x 4	16	0.064	0.31
	4 x 6	24	0.096	0.47
	4 x 8	32	0.128	0.63
	4 x 12	48	0.192	0.94
	6 x 6	36	0.144	0.70
	6 x 8	48	0.192	0.94
	6 x 12	72	0.288	1.41
	8 x 16	128	0.512	2.50
BioPod with Internal Bypass	4 x 6	20.86	0.083	0.41
	4 x 8	28.86	0.115	0.56
	4 x 12	44.86	0.179	0.88
	6 x 6	32.86	0.131	0.64
	6 x 8	44.86	0.179	0.88
	6 x 10	56.86	0.227	1.11
	6 x 12	68.86	0.275	1.35
	8 x 16	124.86	0.499	2.44

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of
indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance and Retrofit of Stormwater Management Measures.

If you have any questions regarding the above information, please contact Jim Murphy of my office at (609) 633-7021.

Sincerely,

Gabriel Mahon

Gabriel Mahon, Chief
Bureau of Nonpoint Pollution Control

Attachment: Maintenance Plan

cc: Chron File
Richard Magee, NJCAT
Vince Mazzei, NJDEP - DLUR
Ravi Patraju, NJDEP - BES
Gabriel Mahon, NJDEP - BNPC
Brian Salvo NJDEP – BNPC
Nicholas X. Grotts NJDEP – BNPC

Oldcastle Precast®

BIOPOD™ BIOFILTER WITH STORMMIX™ BIOFILTRATION MEDIA

Inspection and Maintenance Guide

Stormwater

BioPod™ Biofilter with StormMix™ Biofiltration Media

Description

The BioPod™ Biofilter System (BioPod) is a stormwater biofiltration treatment system used to remove pollutants from stormwater runoff. Impervious surfaces and other urban and suburban landscapes generate a variety of contaminants that can enter stormwater and pollute downstream receiving waters unless treatment is provided. The BioPod system uses proprietary StormMix™ biofiltration media to capture and retain pollutants including total suspended solids (TSS), metals, nutrients, gross solids, trash and debris as well as petroleum hydrocarbons.

Function

The BioPod system uses engineered, high-flow rate filter media to remove stormwater pollutants, allowing for a smaller footprint than conventional bioretention systems. Contained within a compact precast concrete vault, the BioPod system consists of a biofiltration chamber and an optional integrated high-flow bypass with a contoured inlet rack to minimize scour. The biofiltration chamber is filled with horizontal layers of aggregate (which may or may not include an underdrain), biofiltration media and mulch. Stormwater passes vertically down through the mulch and biofiltration media for treatment. The mulch provides pretreatment by retaining most of the solids or sediment. The biofiltration media provides further treatment by retaining finer sediment and dissolved pollutants. The aggregate allows the media bed to drain evenly for discharge through an underdrain pipe or by infiltration.

Configuration

The BioPod system can be configured with either an internal or external bypass. The internal bypass allows both water quality and bypass flows to enter the treatment vault. The water quality flows are directed to the biofiltration chamber while the excess flows are diverted over the bypass weir without entering the biofiltration chamber. Both the treatment and bypass flows are combined in the outlet area prior to discharge from the structure. BioPod units without an internal bypass are designed such that only treatment flows enter the treatment structure. When the system has exceeded its treatment capacity, ponding will force bypass flows to continue down the gutter to the nearest standard catch basin or other external bypass structure.

The BioPod system can be configured as a tree box filter with tree and grated inlet, as a planter box filter with shrubs, grasses and an open top, or as an underground filter with access risers, doors and a subsurface inlet pipe. The optional internal bypass may be incorporated with any of these configurations. In addition, an open bottom configuration may be used to promote infiltration and groundwater recharge. The configuration and size of the BioPod system is designed to meet the requirements of a specific project.

Inspection & Maintenance Overview

State and local regulations require all stormwater management systems to be inspected on a regular basis and maintained as necessary to ensure performance and protect downstream receiving waters. Without maintenance, excessive pollutant buildup can limit system performance by reducing the operating capacity of the system and increasing the potential for scouring of pollutants during periods of high flow.

Some configurations of the BioPod may require periodic irrigation to establish and maintain vegetation. Vegetation will typically become established about two years after planting. Irrigation requirements are ultimately dependent on climate, rainfall and the type of vegetation selected.

Maintenance Frequency

Periodic inspection is essential for consistent system performance and is easily completed. Inspection is typically conducted a minimum of twice per year, but since pollutant transport and deposition varies from site to site, a site-specific maintenance frequency should be established during the first two or three years of operation.

Inspection Equipment

The following equipment is helpful when conducting BioPod inspections:

- Recording device (pen and paper form, voice recorder, iPad, etc.)
- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Manhole hook or pry bar
- Flashlight
- Tape measure

Inspection Procedures

BioPod inspections are visual and are conducted without entering the unit. To complete an inspection, safety measures including traffic control should be deployed before the access covers or tree grates are removed. Once the covers have been removed, the following items should be checked and recorded (see form provided on page 6) to determine whether maintenance is required:

- If the BioPod unit is equipped with an internal bypass, inspect the contoured inlet rack and outlet chamber and note whether there are any broken or missing parts. In the unlikely event that internal parts are broken or missing, contact Oldcastle Stormwater at (800) 579-8819 to determine appropriate corrective action.
- Note whether the curb inlet, inlet pipe, or – if the unit is equipped with an internal bypass – the inlet rack is blocked or obstructed.
- If the unit is equipped with an internal bypass, observe, quantify and record the accumulation of trash and debris in the inlet rack. The significance of accumulated trash and debris is a matter of judgment. Often, much of the trash and debris may be removed manually at the time of inspection if a separate maintenance visit is not yet warranted.
- If it has not rained within the past 24 hours, note whether standing water is observed in the biofiltration chamber.
- Finally, observe, quantify and record presence of invasive vegetation and the amount of trash and debris and sediment load in the biofiltration chamber. Erosion of the mulch and biofiltration media bed should also be recorded. Sediment load may be rated light, medium or heavy depending on the conditions. Loading characteristics may be determined as follows:
    - Light sediment load – sediment is difficult to distinguish among the mulch fibers at the top of the mulch layer; the mulch appears almost new.
    - Medium sediment load – sediment accumulation is apparent and may be concentrated in some areas; probing the mulch layer reveals lighter sediment loads under the top 1" of mulch.
    - Heavy sediment load – sediment is readily apparent across the entire top of the mulch layer; individual mulch fibers are difficult to distinguish; probing the mulch layer reveals heavy sediment load under the top 1" of mulch.

Often, much of the invasive vegetation and trash and debris may be removed manually at the time of inspection if a separate maintenance visit is not yet warranted.

Maintenance Indicators

Maintenance should be scheduled if any of the following conditions are identified during inspection:

- The concrete structure is damaged or the tree grate or access cover is damaged or missing.
- The curb inlet or inlet rack is obstructed.
- Standing water is observed in the biofiltration chamber more than 24 hours after a rainfall event (use discretion if the BioPod is located downstream of a storage system that attenuates flow).
- Trash and debris in the inlet rack cannot be easily removed at the time of inspection.
- Trash and debris, invasive vegetation or sediment load in the biofiltration chamber is heavy or excessive erosion has occurred.

Maintenance Equipment

The following equipment is helpful when conducting DVS maintenance:

- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Manhole hook or pry bar
- Flashlight
- Tape measure
- Rake, hoe, shovel and broom
- Bucket
- Pruners
- Vacuum truck (optional)

Maintenance Procedures

Maintenance should be conducted during dry weather when no flows are entering the system. All maintenance may be conducted without entering the BioPod structure. Once safety measures such as traffic control are deployed, the access covers may be removed and the following activities may be conducted to complete maintenance:

- Remove all trash and debris from the curb inlet and inlet rack manually or by using a vacuum truck as required.
- Remove all trash and debris and invasive vegetation from the biofiltration chamber manually or by using a vacuum truck as required.
- If the sediment load is medium or light but erosion of the biofiltration media bed is evident, redistribute the mulch with a rake or replace missing mulch as appropriate. If erosion persists, rocks may be placed in the eroded area to help dissipate energy and prevent recurring erosion.
- If the sediment load is heavy, remove the mulch layer using a hoe, rake, shovel and bucket, or by using a vacuum truck as required. If the sediment load is particularly heavy, inspect the surface of the biofiltration media once the mulch has been removed. If the media appears clogged with sediment, remove and replace one or two inches of biofiltration media prior to replacing the mulch layer.
- Prune vegetation as appropriate and replace damaged or dead plants as required.
- Replace the tree grate and/or access covers and sweep the area around the BioPod to leave the site clean.
- All material removed from the BioPod during maintenance must be disposed of in accordance with local environmental regulations. In most cases, the material may be handled in the same manner as disposal of material removed from sumped catch basins or manholes.

Natural, shredded hardwood mulch should be used in the BioPod. Timely replacement of the mulch layer according to the maintenance indicators described above should protect the biofiltration media below the mulch layer from clogging due to sediment accumulation. However, whenever the mulch is replaced, the BioPod should be visited 24 hours after the next major storm event to ensure that there is no standing water in the biofiltration chamber. Standing water indicates that the biofiltration media below the mulch layer is clogged and must be replaced. Please contact Oldcastle Stormwater at (800) 579-8819 to purchase proprietary StormMix biofiltration media.

BioPod Inspection & Maintenance Log

BioPod Model_____ **Inspection Date**_____

Location_____

Condition of Internal Components Notes:

☐ Good ☐ Damaged ☐ Missing

Curb Inlet or Inlet Rack Blocked Notes:

☐ Yes ☐ No

Standing Water in Biofiltration Chamber Notes:

☐ Yes ☐ No

Trash and Debris in Inlet Rack Notes:

☐ Yes ☐ No

Trash and Debris in Biofiltration Chamber Notes:

☐ Yes ☐ No

Invasive Vegetation in Biofiltration Chamber Notes:

☐ Yes ☐ No

Sediment in Biofiltration Chamber Notes:

☐ Light ☐ Medium ☐ Heavy

Erosion in Biofiltration Chamber Notes:

☐ Yes ☐ No

Maintenance Requirements

☐ **Yes - Schedule Maintenance** ☐ **No - Schedule Re-Inspection**

BIOPOD™ BIOFILTER WITH STORMMIX™ BIOFILTRATION MEDIA

OUR MARKETS

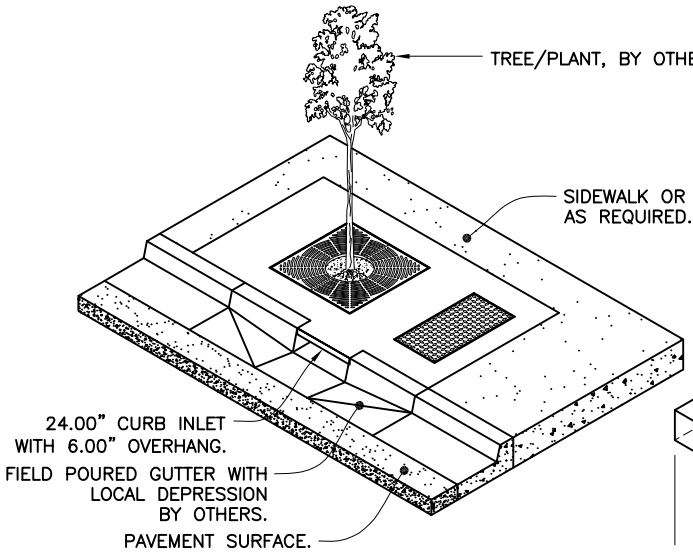
BUILDING STRUCTURES

COMMUNICATIONS

WATER

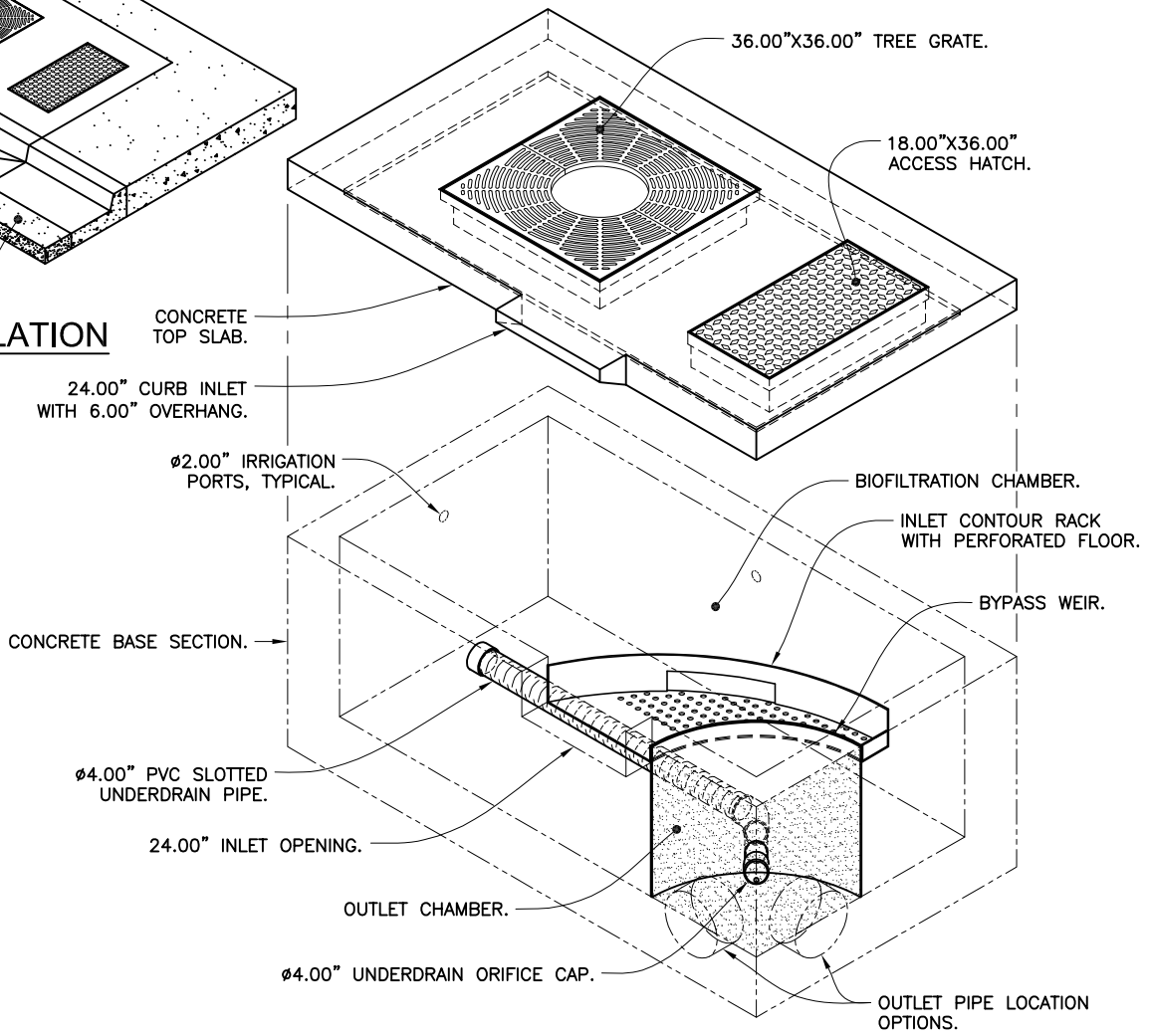
ENERGY

TRANSPORTATION



TYPICAL INSTALLATION

SCALE: 1/2



ISOMETRIC VIEW

FILTER MEDIA & DRAIN ROCK NOT SHOWN FOR CLARITY.

NOTES:

1. RIGHT CONFIGURATION SHOWN, MIRROR LEFT CONFIGURATION OF INLET RACK AND BYPASS WEIR IS AVAILABLE TO ACCOMMODATE OTHER OUTLET PIPE LOCATIONS.
2. STANDARD UNITS CAN ACCOMMODATE UP TO A 15 INCH DIAMETER RCP OUTLET PIPE.
3. SEPARATE BYPASS STRUCTURE IS REQUIRED IF PEAK FLOW RATE EXCEEDS 2.0 CFS INTERNAL BYPASS CAPACITY.
4. 18"X36" DIAMOND PLATE ACCESS HATCH STANDARD, SLIP RESISTANT OPTION AVAILABLE.
5. CONTACT OLDCASTLE® INFRASTRUCTURE FOR ENGINEERING ASSISTANCE AND DETAIL DRAWINGS.
6. CONCRETE COMPONENTS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C890 & C913.
7. VEGETATION BY OTHERS. CUSTOMER TO SPECIFY. INSTALLED AT TIME OF ACTIVATION. THE OWNER IS RESPONSIBLE FOR THE SURVIVAL OF THE VEGETATION AND MUST IRRIGATE AS NECESSARY.

US Patents Pending

Bioretention/ Biofiltration

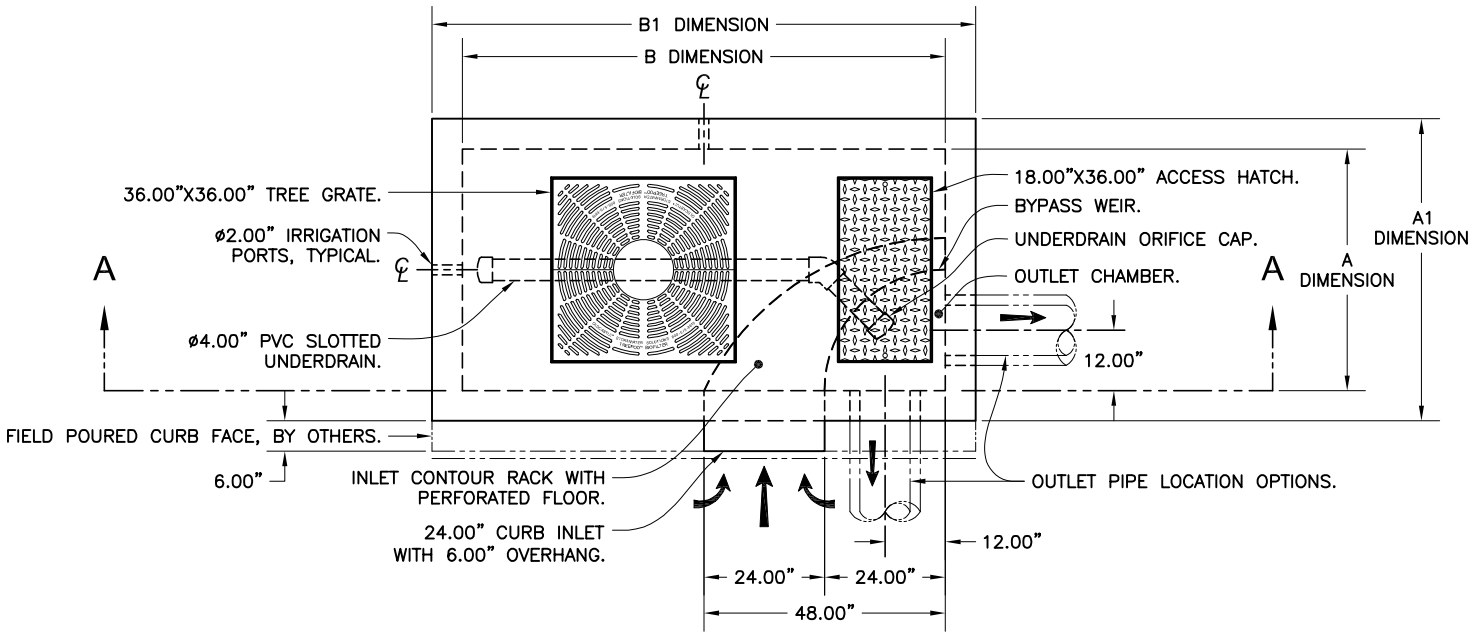
BioPod™ Biofilter Tree

Side Inlet & Internal Bypass

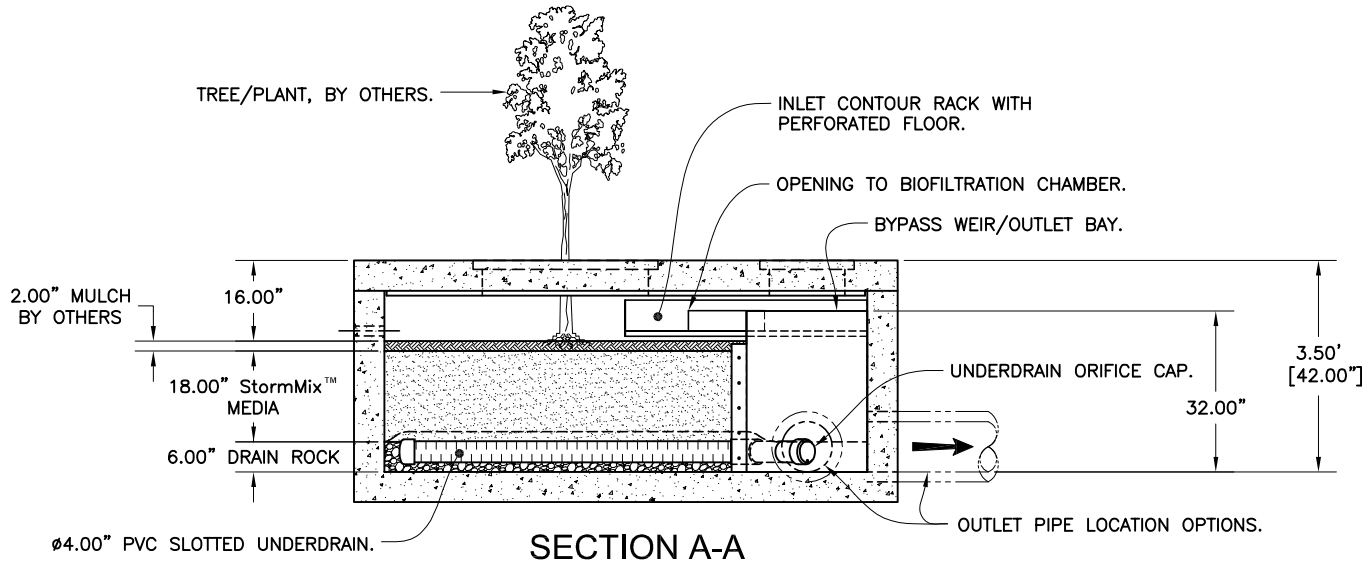
Oldcastle® INFRASTRUCTURE

Ph: 800.579.8819 | oldcastlestormwater.com

DRAWING NO.	REV	ECO	DATE	
BPT-IB-SI	A	ECO-0155 JPR 9/7/18	JPR 6/12/18	SHEET 1 OF 2



PLAN VIEW



SECTION A-A

MODEL	VAULT SIZE [1] (ID)		VAULT FOOTPRINT [1] (OD)		TREATMENT FLOW CAPACITY [2] (GPM/CFS)	TREATMENT FLOW CAPACITY [3] (GPM/CFS)
	A DIM	B DIM	A1 DIM	B1 DIM		
BPT-46IB-SI	4'	6'	5'	7'	33.4 / 0.074	37.5 / 0.084
BPT-48IB-SI	4'	8'	5'	9'	46.2 / 0.103	51.9 / 0.116
BPT-412IB-SI	4'	12'	5'	13'	71.8 / 0.160	80.7 / 0.180
BPT-66IB-SI	6'	6'	7'	7'	52.6 / 0.117	59.1 / 0.132
BPT-68IB-SI	6'	8'	7'	9'	71.8 / 0.160	80.7 / 0.180
BPT-612IB-SI	6'	12'	7'	13'	110.2 / 0.245	123.9 / 0.276
BPT-816IB-SI	8'	16'	9'	17'	199.8 / 0.445	224.7 / 0.501

[1] All Dimensions Are Nominal
[2] Based on an WA Ecology GULD Approval for Basic, Enhanced & Phosphorus. At 1.60 gpm/sf Media Surface Area.
[3] Based on an NJCAT Verification & NJ DEP Certification. At 1.80 gpm/sf Media Surface Area.

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Bioretention/ Biofiltration

BioPod™ Biofilter Tree

Side Inlet & Internal Bypass

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DRAWING NO.	REV	ECO	DATE	
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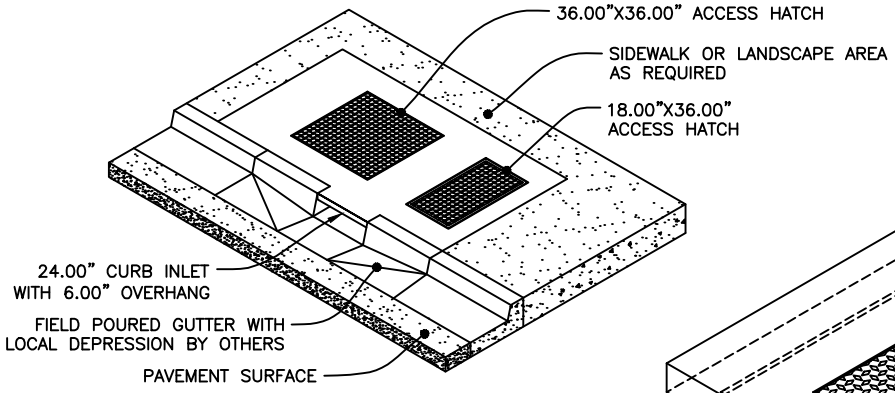
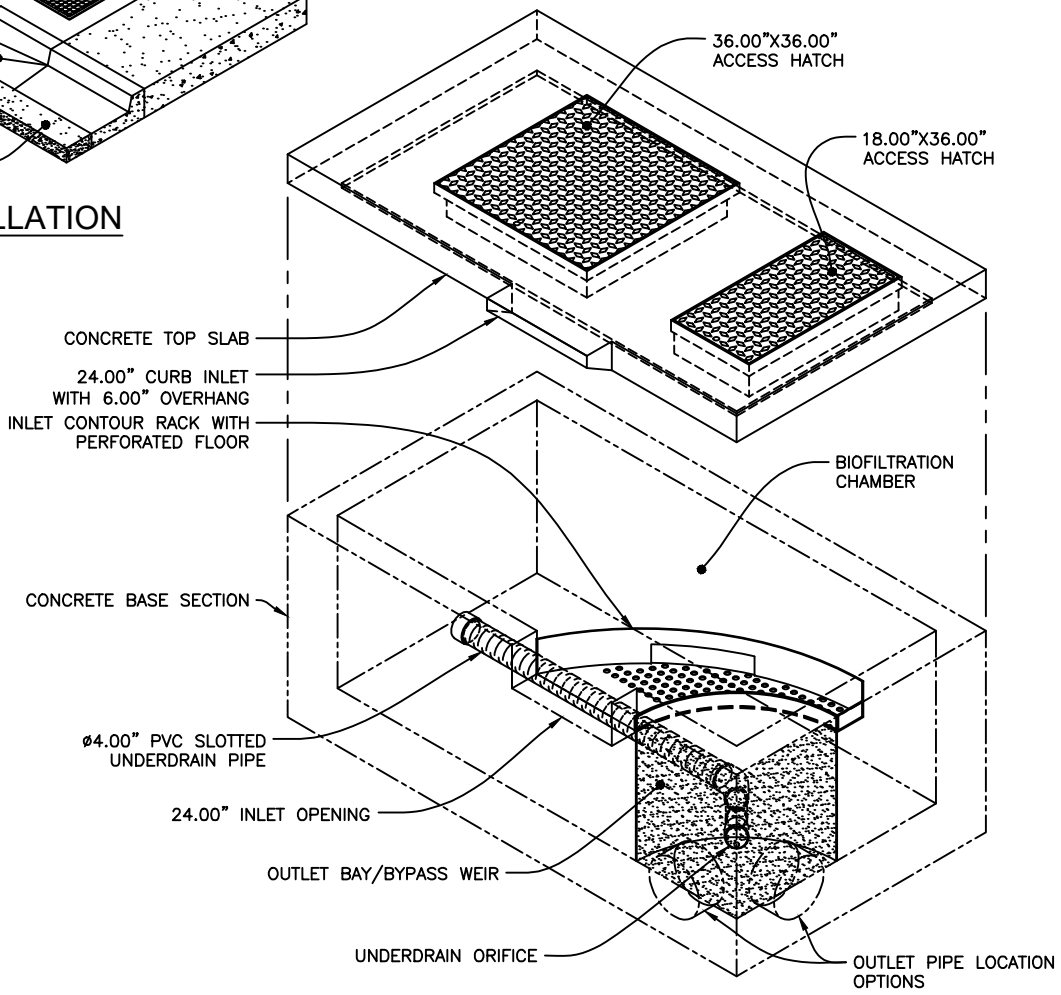


TYPICAL INSTALLATION

SCALE: 1/2



ISOMETRIC VIEW

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NOTES:

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4. DIAMOND PLATE ACCESS HATCH STANDARD, SLIP RESISTANT OPTION AVAILABLE.
5. CONTACT OLDCASTLE INFRASTRUCTURE™ FOR ENGINEERING ASSISTANCE AND DETAIL DRAWINGS.
6. CONCRETE COMPONENTS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C890 & C913.

US Patents Pending

Bioretention/ Biofiltration

BioPod™ Biofilter Surface

Side Inlet & Internal Bypass

Oldcastle Infrastructure™
A CRH COMPANY

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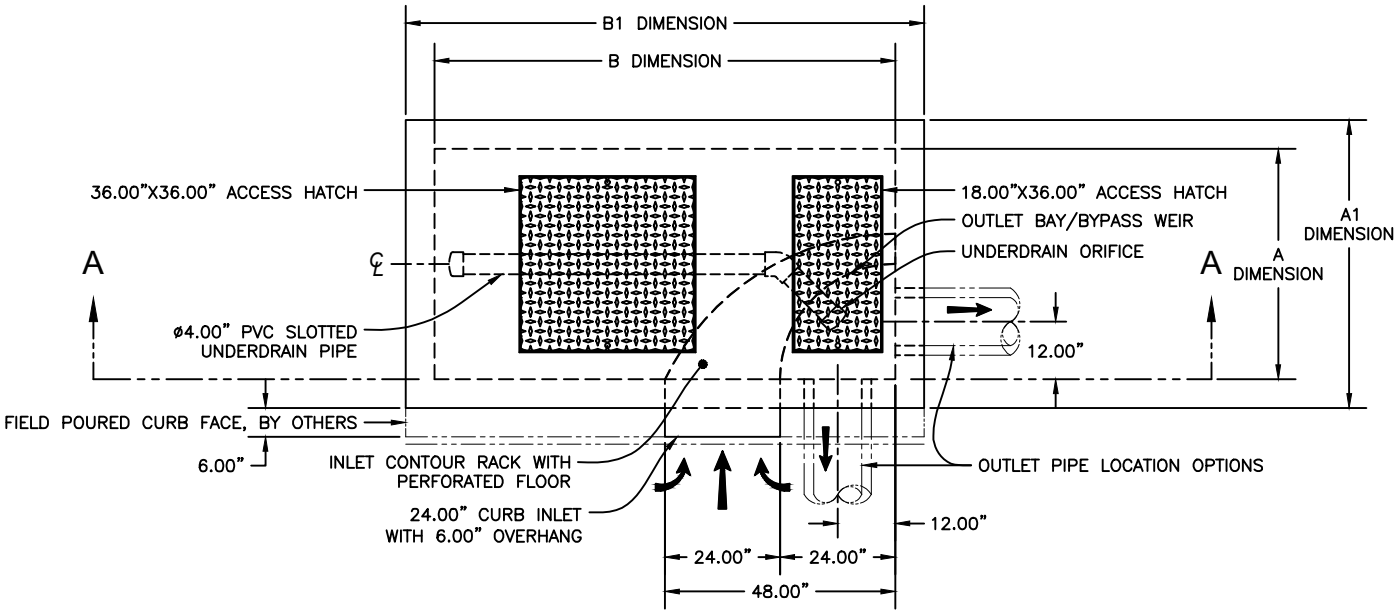
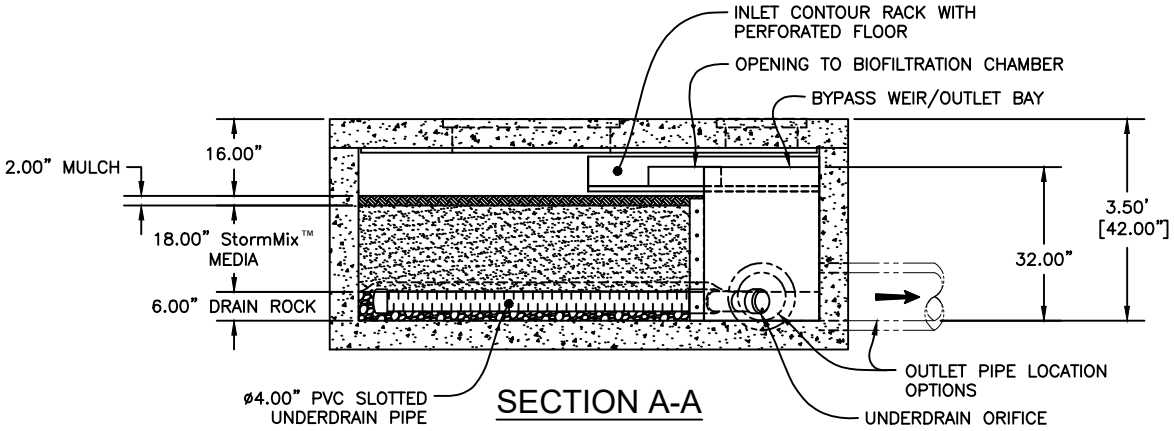


PLAN VIEW



SECTION A-A

MODEL	VAULT SIZE [1] (ID)		VAULT FOOTPRINT [1] (OD)		TREATMENT FLOW CAPACITY (GPM/CFS)	
	A DIM	B DIM	A1 DIM	B1 DIM	1.6 GPM/SF (WA GULD[2])	1.8 GPM/SF (NJCAT[3])
BPS-46IB-SI	4'	6'	5'	7'	33.4 / 0.074	37.5 / 0.084
BPS-48IB-SI	4'	8'	5'	9'	46.2 / 0.103	51.9 / 0.116
BPS-412IB-SI	4'	12'	5'	13'	71.8 / 0.160	80.7 / 0.180
BPS-66IB-SI	6'	6'	7'	7'	52.6 / 0.117	59.1 / 0.132
BPS-68IB-SI	6'	8'	7'	9'	71.8 / 0.160	80.7 / 0.180
BPS-612IB-SI	6'	12'	7'	13'	110.2 / 0.245	123.9 / 0.276
BPS-812IB-SI	8'	12'	9'	13'	148.5 / 0.331	167.0 / 0.372
BPS-816IB-SI	8'	16'	9'	17'	199.8 / 0.445	224.7 / 0.501

[1] All Dimensions are nominal, ID=Inside Dimension, OD=Outside Dimension.
[2] Treartment flow capacity at 1.6 gpm/sf media surface area based on an WA Ecology GULD Approval for Basic, Enhanced & Phosphorus.
[3] Treatment flow capacity at 1.8 gpm/sf media surface area based on an NJCAT Verification & NJ DEP Certification.

SITE SPECIFIC DATA				
Structure ID				
Model Size				
Orientation (Left or Right)				
Treatment Flow Rate (cfs)				
Peak Flow Rate (2 cfs max.)				
Rim Elevation				
Pipe Data	Pipe Location (Front or Side)	Pipe Size (15" max.)	Pipe Type	Invert Elevation*
Outlet				
* Invert Elevation is 3.5' below Rim Elevation.				
Notes:				

US Patents Pending

Bioretention/ Biofiltration

BioPod™ Biofilter Surface

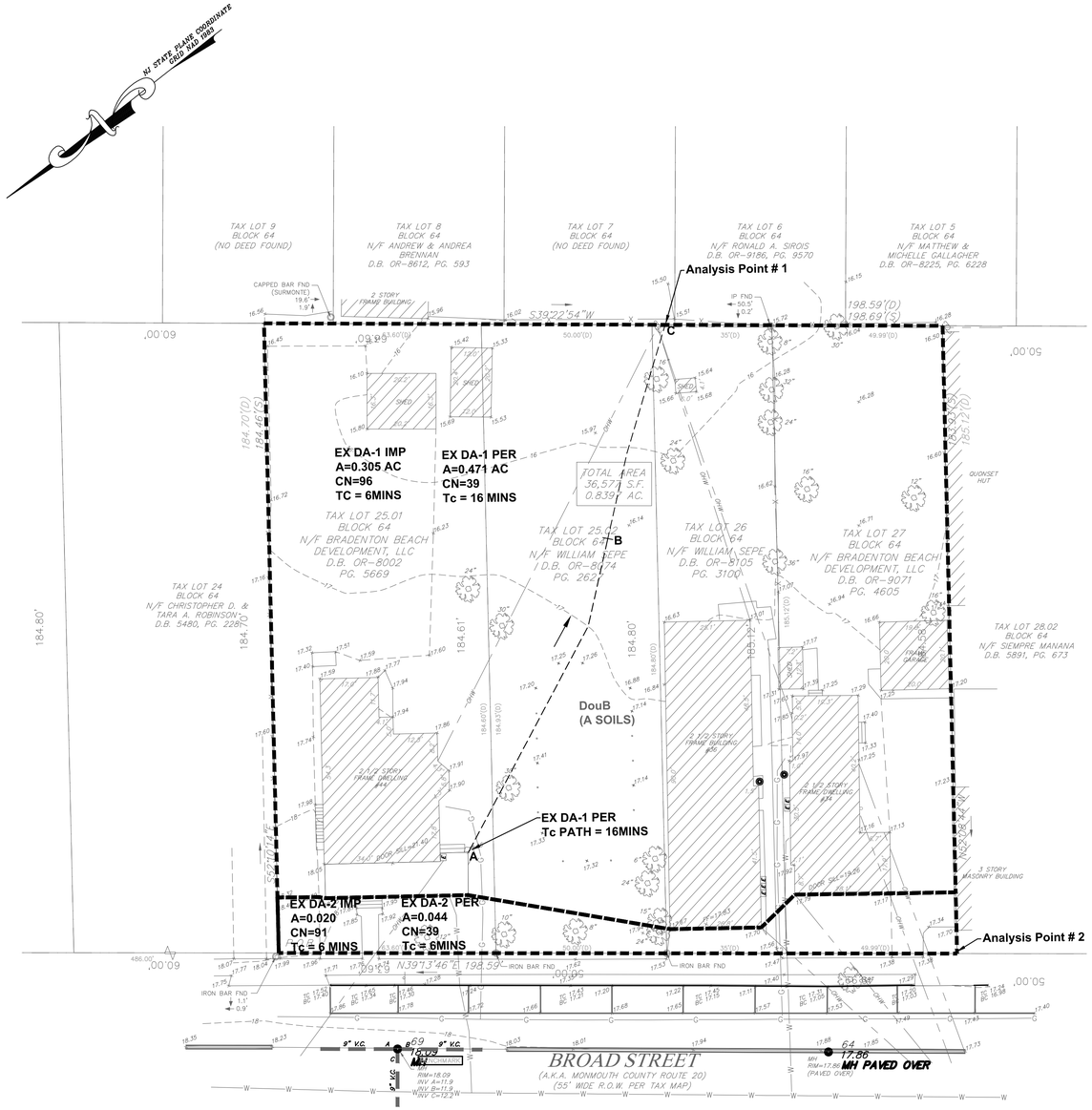
Side Inlet & Internal Bypass

Oldcastle Infrastructure™ A CRH COMPANY

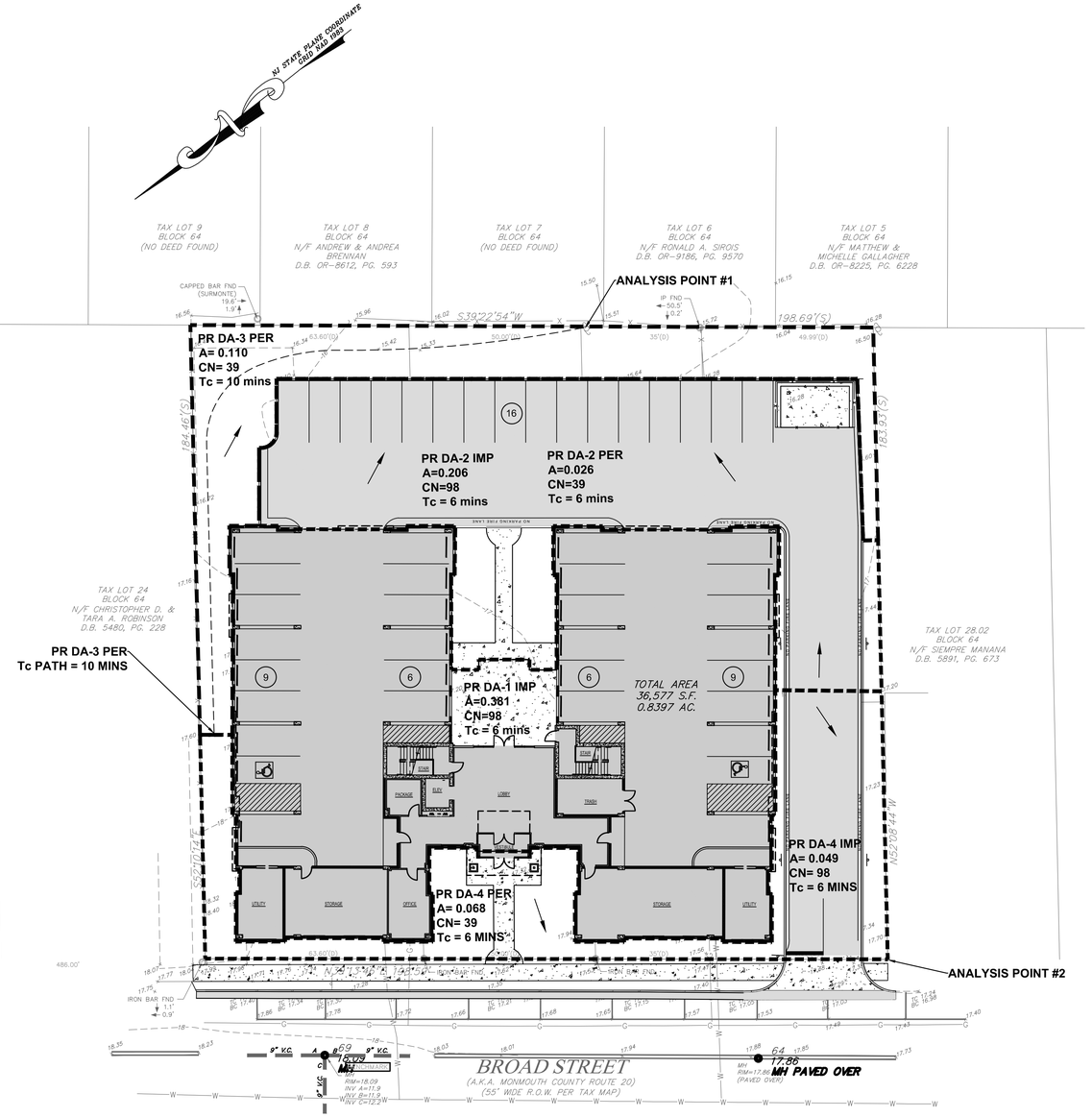
DRAWING NO.	REV	ECO	DATE	
BPS-IB-SI	D	ECO-0169 CJS 3/6/20	PPS 3/9/20	SHEET 2 OF 2

Appendix E

- Existing and Proposed Drainage Area map



EXISTING DRAINAGE MAP



PROPOSED DRAINAGE MAP

1" = 20'
10 0 20

REV. NO.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: MJB
DRAWN BY: PAS
SHEET CHK'D BY: JJF
CROSS CHK'D BY:
APPROVED BY:
DATE: JULY 6, 2020

ENGENUITY INFRASTRUCTURE

ENGENUITY INFRASTRUCTURE
12 BROAD STREET, SUITE 203
RED BANK, NJ 07701
732.741.3176
ENGENUITYNJ.COM

DRAINAGE MAP
TAX BLOCK 64
LOTS 2 & 3
BOROUGH OF MANASQUAN
MONMOUTH COUNTY, NEW JERSEY

OWNER / DEVELOPER / APPLICANT:
BROAD STREET 34, LLC
126 MAIN STREET
MANASQUAN, NJ 08736
PHONE: (732) 522-0197

JACLYN J. FLOR, P.E., P.P., C.M.E
CONSULTING ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENCE NO. 24GE045426
CERTIFICATE OF AUTHORIZATION 24GA28268000
07/06/20
DATE

PROJECT NO. SEPE-00020
DRAWING DR-1
SHEET NO. 1 OF 1

NOT FOR CONSTRUCTION

FILE NAME

STORMWATER MANAGEMENT OPERATION & MAINTENANCE MANUAL

FOR:

Broad Street 34, LLC
34 Broad Street,
Manasquan, NJ 08736

July 6, 2020

PREPARED BY:

ENGenuity
Infrastructure
2 Bridge Avenue, Suite 323
Red Bank, New Jersey 07701
(732) 741-3176

Jaclyn J. Flor, P.E., P.P., C.M.E.
State of New Jersey License No. 24GE045426

I. Introduction

This stormwater Operation and Maintenance manual has been prepared in accordance with the NJDEP Stormwater Management Rules N.J.A.C. 7:8, the NJDEP New Jersey Stormwater Best Management Practices Manual.

The project site is located within the Borough of Manasquan; Lot 25.01, 25.02, 26, and 27 in Block 64, commonly known as 34-44 Broad Street. Broad Street 34, LLC is the owner and Applicant of the subject lot. The maintenance of this facility is the responsibility of the property owner.

The scope of the development consists of the demolition of the existing structures on the subject lots and the construction of a new 3-story residential affordable housing building. In addition to the construction of the new building, additional site improvements will also include the replacement of sidewalk and curb along the property frontage, onsite landscaping, lighting, and a reinforced concrete driveway apron. The site is 0.84-acres in total of which 0.678-acres is proposed to be disturbed.

II. STORMWATER MANAGEMENT SYSTEM SUMMARY

1. Manufactured Treatment device

The parking areas are designed to drain to a manufactured treatment device to remove 80 % Total Suspended Solids (TSS). Two (2) separate model units have been selected to achieve the required treatment. The units are BioPod systems, with stormmix media, as manufactured by Oldcastle infrastructure. These treatment devices require regular maintenance and inspection for proper operation. The detailed BioPod inspection and maintenance guide included as Appendix A

One (1) 4'x8' BioPod Surface, with internal bypass is located on the south side of the entrance driveway.

One (1) 8'x16' BioPod Tree, with internal bypass is located in the center of the rear parking area.

2. Underground Stormwater Detention/Recharge

An underground stormwater chamber system is located beneath the existing parking and lawn areas. This system is designed to store and infiltrate stormwater runoff that has been collected onsite. The total system will contain two hundred thirty four (234) SC-740 Chambers, as manufactured by StormTech. Enclosed in Appendix B is the Operation and maintenance manual for the StormTech system.

III. RESPONSIBLE PARTY

William Sepe
(732) 223-6114
126 Main Street
Manasquan, NJ 08736

Appendix A

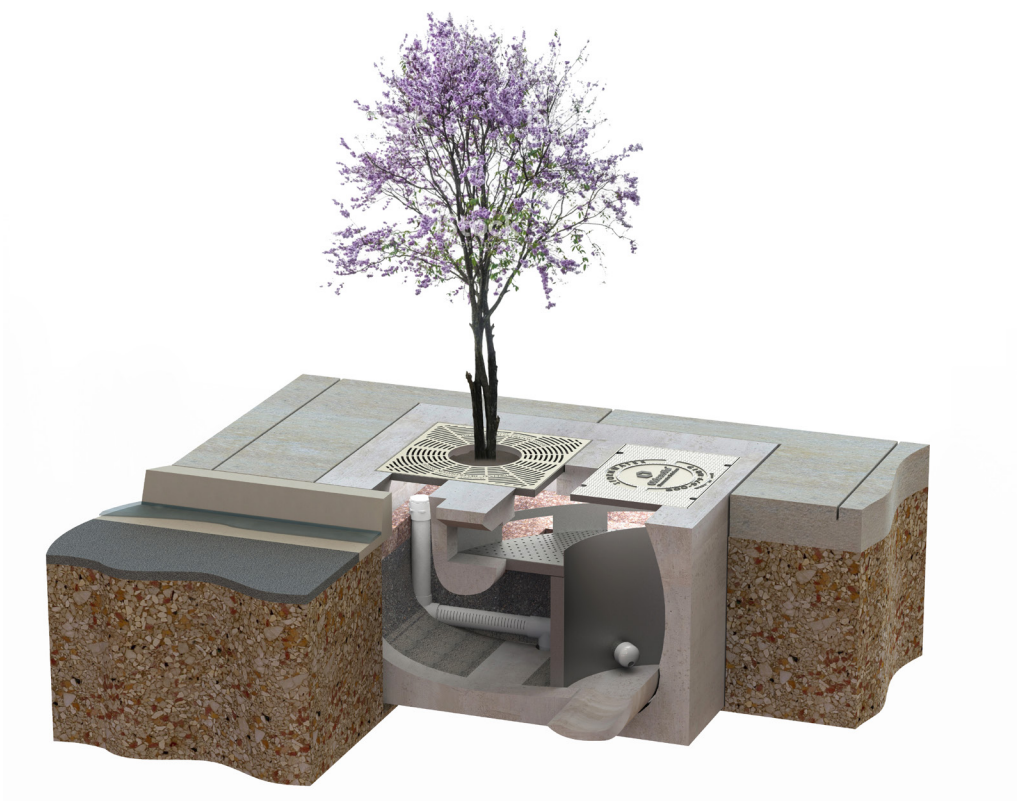
- BIOPOD SYSTEM Inspection and Maintenance Guide

Oldcastle Infrastructure™
A CRH COMPANY

BIOPOD™ SYSTEM

WITH STORMMIX™ MEDIA

Inspection and Maintenance Guide



Water

BioPod™ Biofilter with StormMix™ Biofiltration Media

Description

The BioPod™ Biofilter System (BioPod) is a stormwater biofiltration treatment system used to remove pollutants from stormwater runoff. Impervious surfaces and other urban and suburban landscapes generate a variety of contaminants that can enter stormwater and pollute downstream receiving waters unless treatment is provided. The BioPod system uses proprietary StormMix™ biofiltration media to capture and retain pollutants including total suspended solids (TSS), metals, nutrients, gross solids, trash and debris as well as petroleum hydrocarbons.

Function

The BioPod system uses engineered, high-flow rate filter media to remove stormwater pollutants, allowing for a smaller footprint than conventional bioretention systems. Contained within a compact precast concrete vault, the BioPod system consists of a biofiltration chamber and an optional integrated high-flow bypass with a contoured inlet rack to minimize scour. The biofiltration chamber is filled with horizontal layers of aggregate (which may or may not include an underdrain), biofiltration media and mulch. Stormwater passes vertically down through the mulch and biofiltration media for treatment. The mulch provides pretreatment by retaining most of the solids or sediment. The biofiltration media provides further treatment by retaining finer sediment and dissolved pollutants. The aggregate allows the media bed to drain evenly for discharge through an underdrain pipe or by infiltration.

Configuration

The BioPod system can be configured with either an internal or external bypass. The internal bypass allows both water quality and bypass flows to enter the treatment vault. The water quality flows are directed to the biofiltration chamber while the excess flows are diverted over the bypass weir without entering the biofiltration chamber. Both the treatment and bypass flows are combined in the outlet area prior to discharge from the structure. BioPod units without an internal bypass are designed such that only treatment flows enter the treatment structure. When the system has exceeded its treatment capacity, ponding will force bypass flows to continue down the gutter to the nearest standard catch basin or other external bypass structure.

The BioPod system can be configured as a tree box filter with tree and grated inlet, as a planter box filter with shrubs, grasses and an open top, or as an underground filter with access risers, doors and a subsurface inlet pipe. The optional internal bypass may be incorporated with any of these configurations. In addition, an open bottom configuration may be used to promote infiltration and groundwater recharge. The configuration and size of the BioPod system is designed to meet the requirements of a specific project.

Inspection & Maintenance Overview

State and local regulations require all stormwater management systems to be inspected on a regular basis and maintained as necessary to ensure performance and protect downstream receiving waters. Without maintenance, excessive pollutant buildup can limit system performance by reducing the operating capacity of the system and increasing the potential for scouring of pollutants during periods of high flow.

Some configurations of the BioPod may require periodic irrigation to establish and maintain vegetation. Vegetation will typically become established about two years after planting. Irrigation requirements are ultimately dependent on climate, rainfall and the type of vegetation selected.

Maintenance Frequency

Periodic inspection is essential for consistent system performance and is easily completed. Inspection is typically conducted a minimum of twice per year, but since pollutant transport and deposition varies from site to site, a site-specific maintenance frequency should be established during the first two or three years of operation.

Inspection Equipment

The following equipment is helpful when conducting BioPod inspections:

- Recording device (pen and paper form, voice recorder, iPad, etc.)
- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Manhole hook or pry bar
- Flashlight
- Tape measure

Inspection Procedures

BioPod inspections are visual and are conducted without entering the unit. To complete an inspection, safety measures including traffic control should be deployed before the access covers or tree grates are removed. Once the covers have been removed, the following items should be checked and recorded (see form provided on page 6) to determine whether maintenance is required:

- If the BioPod unit is equipped with an internal bypass, inspect the contoured inlet rack and outlet chamber and note whether there are any broken or missing parts. In the unlikely event that internal parts are broken or missing, contact Oldcastle Stormwater at (800) 579-8819 to determine appropriate corrective action.
- Note whether the curb inlet, inlet pipe, or – if the unit is equipped with an internal bypass – the inlet rack is blocked or obstructed.
- If the unit is equipped with an internal bypass, observe, quantify and record the accumulation of trash and debris in the inlet rack. The significance of accumulated trash and debris is a matter of judgment. Often, much of the trash and debris may be removed manually at the time of inspection if a separate maintenance visit is not yet warranted.
- If it has not rained within the past 24 hours, note whether standing water is observed in the biofiltration chamber.
- Finally, observe, quantify and record presence of invasive vegetation and the amount of trash and debris and sediment load in the biofiltration chamber. Erosion of the mulch and biofiltration media bed should also be recorded. Sediment load may be rated light, medium or heavy depending on the conditions. Loading characteristics may be determined as follows:
    - Light sediment load – sediment is difficult to distinguish among the mulch fibers at the top of the mulch layer; the mulch appears almost new.
    - Medium sediment load – sediment accumulation is apparent and may be concentrated in some areas; probing the mulch layer reveals lighter sediment loads under the top 1” of mulch.
    - Heavy sediment load – sediment is readily apparent across the entire top of the mulch layer; individual mulch fibers are difficult to distinguish; probing the mulch layer reveals heavy sediment load under the top 1” of mulch.

Often, much of the invasive vegetation and trash and debris may be removed manually at the time of inspection if a separate maintenance visit is not yet warranted.

Maintenance Indicators

Maintenance should be scheduled if any of the following conditions are identified during inspection:

- The concrete structure is damaged or the tree grate or access cover is damaged or missing.
- The curb inlet or inlet rack is obstructed.
- Standing water is observed in the biofiltration chamber more than 24 hours after a rainfall event (use discretion if the BioPod is located downstream of a storage system that attenuates flow).
- Trash and debris in the inlet rack cannot be easily removed at the time of inspection.
- Trash and debris, invasive vegetation or sediment load in the biofiltration chamber is heavy or excessive erosion has occurred.

Maintenance Equipment

The following equipment is helpful when conducting BioPod maintenance:

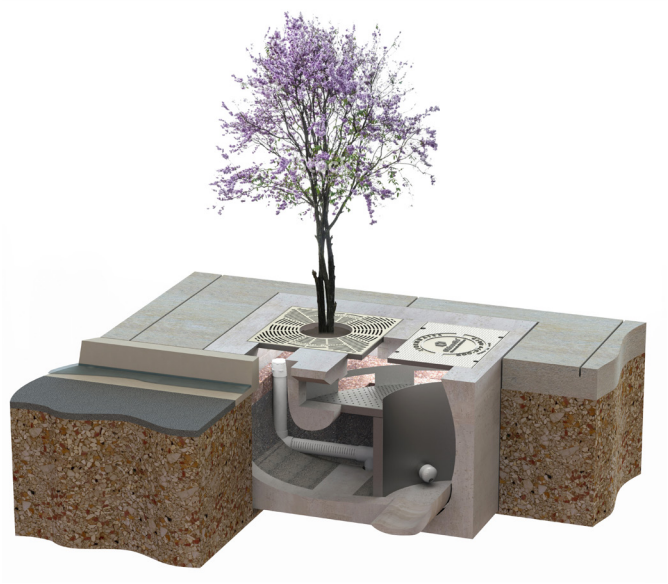
- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Manhole hook or pry bar
- Flashlight
- Tape measure
- Rake, hoe, shovel and broom
- Bucket
- Pruners
- Vacuum truck (optional)

Maintenance Procedures

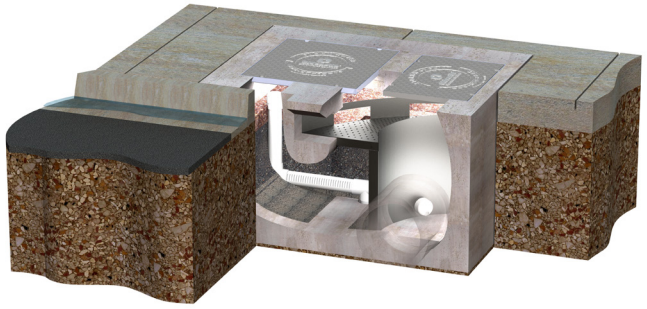
Maintenance should be conducted during dry weather when no flows are entering the system. All maintenance may be conducted without entering the BioPod structure. Once safety measures such as traffic control are deployed, the access covers may be removed and the following activities may be conducted to complete maintenance:

- Remove all trash and debris from the curb inlet and inlet rack manually or by using a vacuum truck as required.
- Remove all trash and debris and invasive vegetation from the biofiltration chamber manually or by using a vacuum truck as required.
- If the sediment load is medium or light but erosion of the biofiltration media bed is evident, redistribute the mulch with a rake or replace missing mulch as appropriate. If erosion persists, rocks may be placed in the eroded area to help dissipate energy and prevent recurring erosion.
- If the sediment load is heavy, remove the mulch layer using a hoe, rake, shovel and bucket, or by using a vacuum truck as required. If the sediment load is particularly heavy, inspect the surface of the biofiltration media once the mulch has been removed. If the media appears clogged with sediment, remove and replace one or two inches of biofiltration media prior to replacing the mulch layer.
- Prune vegetation as appropriate and replace damaged or dead plants as required.
- Replace the tree grate and/or access covers and sweep the area around the BioPod to leave the site clean.
- All material removed from the BioPod during maintenance must be disposed of in accordance with local environmental regulations. In most cases, the material may be handled in the same manner as disposal of material removed from sumped catch basins or manholes.

Natural, shredded hardwood mulch should be used in the BioPod. Timely replacement of the mulch layer according to the maintenance indicators described above should protect the biofiltration media below the mulch layer from clogging due to sediment accumulation. However, whenever the mulch is replaced, the BioPod should be visited 24 hours after the next major storm event to ensure that there is no standing water in the biofiltration chamber. Standing water indicates that the biofiltration media below the mulch layer is clogged and must be replaced. Please contact Oldcastle Infrastructure at (800) 579-8819 to purchase the proprietary StormMix™ biofiltration media.

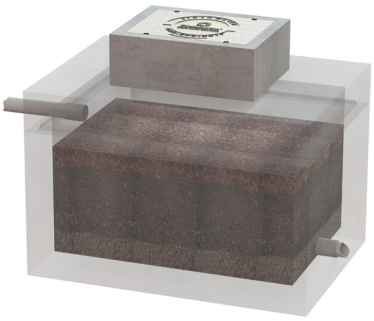


BioPod Tree Module



BioPod Media Module

BioPod Planter Module



BioPod Media Vault

BioPod Inspection & Maintenance Log

BioPod Model_____ **Inspection Date**_____

Location_____

Condition of Internal Components Notes:

☐ Good ☐ Damaged ☐ Missing

Curb Inlet or Inlet Rack Blocked Notes:

☐ Yes ☐ No

Standing Water in Biofiltration Chamber Notes:

☐ Yes ☐ No

Trash and Debris in Inlet Rack Notes:

☐ Yes ☐ No

Trash and Debris in Biofiltration Chamber Notes:

☐ Yes ☐ No

Invasive Vegetation in Biofiltration Chamber Notes:

☐ Yes ☐ No

Sediment in Biofiltration Chamber Notes:

☐ Light ☐ Medium ☐ Heavy

Erosion in Biofiltration Chamber Notes:

☐ Yes ☐ No

Maintenance Requirements

☐ **Yes - Schedule Maintenance** ☐ **No - Schedule Re-Inspection**

BIOPOD™ SYSTEM

WITH STORMMIX™ MEDIA

OUR MARKETS

BUILDING STRUCTURES

COMMUNICATIONS

WATER

ENERGY

TRANSPORTATION

Appendix B

- STORMTECH Isolatoe Row O&M Manual
- STORM TECH Isolator Row Maintenance Log

StormTech
Detention • Retention • Water Quality
An ADS company

Isolator® Row O&M Manual

THE MOST ADVANCED NAME IN WATER MANAGEMENT SOLUTIONS™

ADS®

THE ISOLATOR® ROW

INTRODUCTION

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row is a technique to inexpensively enhance Total Suspended Solids (TSS) removal and provide easy access for inspection and maintenance.

THE ISOLATOR ROW

The Isolator Row is a row of StormTech chambers, either SC-160LP, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-4500 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for settling and filtration of sediment as storm water rises in the Isolator Row and ultimately passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow storm water to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row protecting the storage areas of the adjacent stone and chambers from sediment accumulation.

Two different fabrics are used for the Isolator Row. A woven geotextile fabric is placed between the stone and the Isolator Row chambers. The tough geotextile provides a media for storm water filtration and provides a durable surface for maintenance operations. It is also designed to prevent scour of the underlying stone and remain intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the perforations in the sidewall of the chamber. The non-woven fabric is not required over the SC-160LP, DC-780, MC-3500 or MC-4500 models as these chambers do not have perforated side walls.

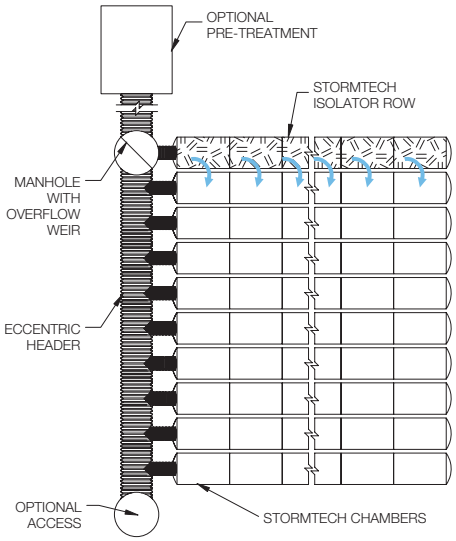
The Isolator Row is typically designed to capture the “first flush” and offers the versatility to be sized on a volume basis or flow rate basis. An upstream manhole not only provides access to the Isolator Row but typically includes a high flow weir such that storm water flowrates or volumes that exceed the capacity of the Isolator Row overtop the over flow weir and discharge through a manifold to the other chambers.

The Isolator Row may also be part of a treatment train. By treating storm water prior to entry into the chamber system, the service life can be extended and pollutants such as hydrocarbons can be captured. Pre-treatment best management practices can be as simple as deep sump catch basins, oil-water separators or can be innovative storm water treatment devices. The design of the treatment train and selection of pretreatment devices by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, the Isolator Row is recommended by StormTech as an effective means to minimize maintenance requirements and maintenance costs.

Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row.

Looking down the Isolator Row from the manhole opening, woven geotextile is shown between the chamber and stone base.

StormTech Isolator Row with Overflow Spillway (not to scale)



ISOLATOR ROW INSPECTION/MAINTENANCE

INSPECTION

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

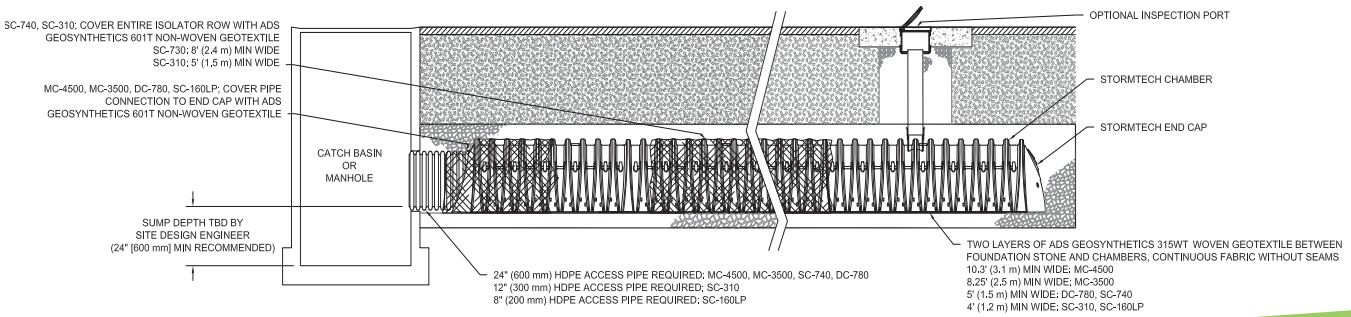
MAINTENANCE

The Isolator Row was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Most JetVac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. **The JetVac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.**

StormTech Isolator Row (not to scale)

Note: Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-4500 chamber models and is not required over the entire Isolator Row.



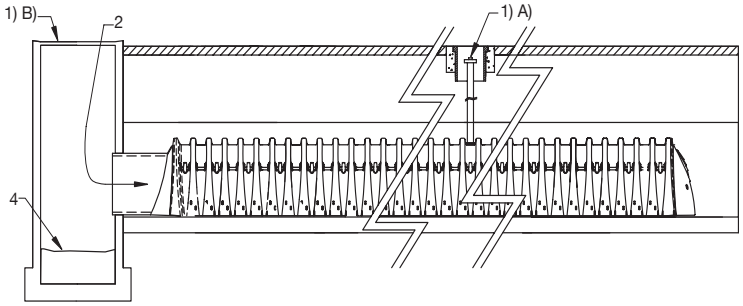
ISOLATOR ROW STEP BY STEP MAINTENANCE PROCEDURES

STEP 1
Inspect Isolator Row for sediment.
- A) Inspection ports (if present)
  - i. Remove lid from floor box frame
  - ii. Remove cap from inspection riser
  - iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
  - iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.
- B) All Isolator Rows
  - i. Remove cover from manhole at upstream end of Isolator Row
  - ii. Using a flashlight, inspect down Isolator Row through outlet pipe
    1. Mirrors on poles or cameras may be used to avoid a confined space entry
    2. Follow OSHA regulations for confined space entry if entering manhole
  - iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2. If not, proceed to Step 3.

STEP 2
Clean out Isolator Row using the JetVac process.
- A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
- B) Apply multiple passes of JetVac until backflush water is clean
- C) Vacuum manhole sump as required

STEP 3
Replace all caps, lids and covers, record observations and actions.

STEP 4
Inspect & clean catch basins and manholes upstream of the StormTech system.



SAMPLE MAINTENANCE LOG

Date	Stadia Rod Readings		Sediment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation. Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

StormTech® Detention • Retention • Water Quality
A division of ADS

Advanced Drainage Systems, Inc.
4640 Trueman Blvd., Hilliard, OH 43026
1-800-821-6710 www.ads-pipe.com

StormTech Maintenance Log

Project Name:
Location:

	Stadia Rod Readings				
Date	**Fixed point to chamber bottom (1)**	**Fixed point to top of sediment (2)**	**Sediment Depth (1) - (2)**	**Observations / Actions**	**Inspector**

KLEIN
TRAFFIC CONSULTING, LLC

156 Walker Road
West Orange, NJ 07052
973-985-3464
leekleintraffic@gmail.com

June 18, 2019
REVISED: January 22, 2020 – typo and old references

Mr. Brad Sepe
Broad Street 34, LLC
27 Colby Avenue
Manasquan, NJ 08736

VIA EMAIL: bradcp7@gmail.com

Re: Professional Traffic Engineering and Parking Evaluation
Proposed 22 Apartment Units with 45 On-Site Parking Spaces
34, 36, 40 & 44 Broad Street, Manasquan Borough, Monmouth County, NJ

Dear Mr. Sepe:

INTRODUCTION

The purpose of this Traffic Engineering Evaluation is to assess the traffic impacts associated with the development of the subject property known as Block 64, Lots 25.01, 25.02, 26 & 27 located at 34, 36, 40 & 44 Broad Street in the Borough of Manasquan, Monmouth County. The site is occupied by three homes. There is a full-movement driveway providing vehicular access to Broad Street.

It is proposed to construct three stories with 22 apartments over ground level parking of 45 parking spaces. Access to the site would continue to be provided by one full-movement driveway on Broad Street.

EXISTING CONDITIONS

The site, located at 34, 36, 40 & 44 Broad Street, is situated Broad Street with Main Street. The site is occupied by a mix of residential and commercial uses. The surrounding properties generally consist of a mix of commercial and residential uses. The adjacent roadways serving the site are described as follows:

Broad Street is an urban major collector roadway, under the jurisdiction of Monmouth County. There are sidewalks on both sides of the street and parking is permitted on both sides of the street in the vicinity of the subject site. Broad Street provides one travel lane in each direction, with an exclusive left turn lane and a right turn lane at the intersection with Main Street. The posted speed limit is 30 miles per hour (MPH).

Mass Transportation Options

The subject site is located 7-minute/0.4-mile walk from the Manasquan NJ Transit Train Station of the North Jersey Coast Line, which stops frequently throughout the AM and PM commuter hours and provides access to and from Newark Penn Station, New York Penn Station, and Hoboken. With frequent service during the AM and PM peak commuting hours, mass transportation service is an attractive alternative to commuting via automobile or owning an automobile.

Traffic Observations

We visited the site on Thursday, August 2, 2018, and on Wednesday, June 12, 2019 between 5:00 PM and 6:00 PM to observe the PM peak period traffic conditions and operations of the intersection of Broad Street with Main Street. We observed traffic to flow freely during this time period. However, traffic would queue on the southbound approach of Broad Street from the unsignalized intersection of Main Street. This occurred several times between 5:15 PM and 5:45 PM. Traffic would be considered “moderate” to “light” on Broad Street.

DEVELOPMENT PROPOSAL

The proposed development consists constructing 22 multifamily housing (low-rise) units in two floors over ground level parking with 45 parking spaces including 2 ADA parking spaces. One full-movement driveway is proposed on Broad Street.

TRIP GENERATION

According to the *Trip Generation Manual, 10th Edition* published by the Institute of Transportation Engineers, Multifamily Housing (Low-Rise) includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors). Table 1 -Trip Generation Summary, summarizes the trip generation for the proposed 22 apartment units in two floors over one level of parking. As shown in Table 1, the proposed 22-unit apartment building would generate 14 vehicle trips during the AM peak hour, and 16 vehicle trips during the PM peak hour.

Table 1 – Trip Generation Summary, attached shows the trip generation for the existing three homes as well as the proposed apartments. Based on the *Trip Generation, 10th Edition*, during the AM peak hour, the existing three homes would generate 4 trips during the AM peak hour, and 4 trips during the PM peak hour. The Trip Generation of the proposed 22 multifamily housing (low-rise) units would generate 14 trips during the AM peak hour and 16 trips during the PM peak hour. The proposed condition would not generate a significant increase in trips than the existing use on the subject site. Also, it should be noted that these trip generation values would be considered conservative. Since the site is situated so close to the Manasquan NJ Transit Rail station, many tenants may choose to live at 34, 36, 40 & 44 Broad Street to take advantage of the NJ Transit Rail service and walk to the train station rather than drive to work.

According to *Transportation Impact Analysis for Site Development*, published by the Institute of Transportation Engineers (ITE), an increase of less than 100 vehicle trips would not change the level of service of the local street network nor appreciably increase the volume-to-capacity ratio of an intersection approach. Also, NJDOT Access Management Code considers a significant increase in trips greater than 100 peak hour trips AND greater than a 10 percent increase in previously anticipated daily trips. The reopening of the existing single-family home would not generate a significant increase in trips than the proposed 22 multifamily housing (low-rise) units. Therefore, the redevelopment of the subject property into 22 multifamily housing (low-rise) units is not anticipated to significantly impact the operations of Broad Street.

SITE PLAN REVIEW

The site is proposed with approximately 9-foot wide by 18-foot long parking spaces. The drive aisle is adequate at 24-feet wide to provide access into and out of each parking space. The driveways are designed to accommodate ease of maneuvering for appropriate vehicle types. Twenty-two of the 45 parking spaces will be assigned to the tenants; therefore, each tenant will become accustomed to maneuvering into and out of their assigned parking space. The remaining 23 parking spaces will be available for those with a second vehicle or visitors.

The project is proposed with 45 parking spaces, where 44 parking spaces or 2.0 parking spaces per unit are currently permitted. The proposed site provides 45 parking spaces, or 2.05 parking spaces per apartment unit. Due to the proximity of Manasquan NJ Transit Rail station, as well as shopping, dining and entertainment options within the immediate area, it is anticipated that some of the potential residents of this proposed apartment building would not own a vehicle or at least would not own a second vehicle and take advantage of the commuting options.

Parking Generation, 5th Edition, published by ITE, provides data supporting a lower parking demand for Multifamily Housing (Low-Rise) in a General Urban/Suburban setting/location within one-half mile of rail transit service. The average peak parking demand is 1.21 parked vehicles per unit or 27 parked cars. The ITE average peak period parking demand data shows that the proposed parking supply of 2.05 parking spaces per unit would exceed the average peak parking demand for Multifamily Housing (Low-Rise). With a proposed parking supply of 2.05 parking spaces per dwelling unit, the project would exceed the average peak parking demand of a Multifamily Housing (Low-Rise) within one-half mile of rail transit in a General Urban/Suburban setting/location of 1.07 parked vehicles per dwelling unit.

The two on-site ADA parking spaces are designed to be accessible.

Adequate sight distances are provided from the existing exit driveway on Broad Street. The posted speed limit near 34, 36, 40 & 44 Broad Street is 30 MPH; therefore, the design speed of Broad Street is 35 miles per hour, thus resulting in a recommended stopping sight distance of 250 feet, in accordance with A Policy on Geometric Design of Highways and Streets (AASHTO). This required sight distance is exceeded on Broad Street.

CONCLUSIONS

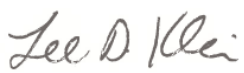
Based upon our trip generation evaluation, it is our professional opinion that the proposed 22 multifamily housing (low-rise) units would have no significant impact on traffic conditions during the AM and PM peak commuter traffic hours. It is projected that the proposed 22 multifamily housing (low-rise) units would generate less than a significant amount of traffic according to industry standards.

The design of the site will more than adequately serve the needs of the project's residents and visitors. The proposed parking supply of 45 parking spaces exceeds the permitted parking supply of 44 parking spaces. The site plan has been designed with adequate parking and circulation for the residents and visitors of the project. The proposed parking supply would be sufficient and would not have a negative impact on the surrounding neighborhood.

In conclusion, the development of this project will have a minimal impact on the traffic operations of area roadways and intersections.

The foregoing is a true representation of my findings.

Very truly yours,



Lee D. Klein, P.E., PTOE
NJPE 24GE03710400
PTOE Certification 1627
C:\LeeWork\ENGENUITY\Manasquan-Broad\KleinTraffic_TEE_BroadSt_012220.docx

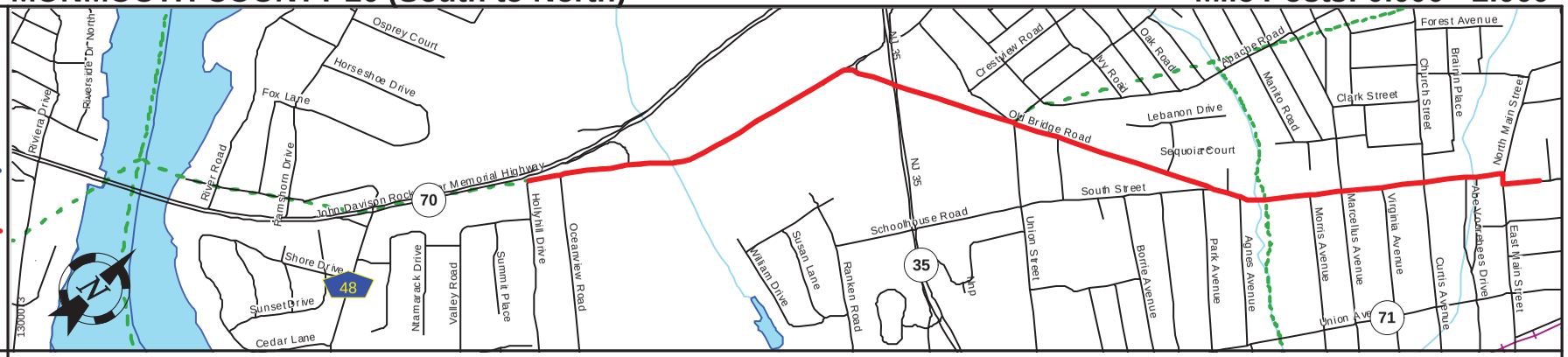
34, 36, 40 & 44 Broad Street, Manasquan, Monmouth County, NJ
Table 1 - Trip Generation Summary

			WEEKDAY						
			AM PEAK HOUR			PM PEAK HOUR			
CODE	LAND USE	AMOUNT	IN	OUT	TOTAL	IN	OUT	TOTAL	ADT
EXISTING SINGLE-FAMILY HOME TRIPS									
210	Single Family Detached Housing	3 units	2	2	4	3	2	5	41
TOTAL EXISTING SITE GENERATED TRIPS			2	2	4	3	2	5	41
PROPOSED SITE-GENERATED TRIPS									
220	**Multifamily Housing (Low-Rise)**	**22 units**	**3**	**11**	**14**	**10**	**6**	**16**	**125**
TOTAL PROPOSED CHANGE IN SITE-GENERATED TRIPS					**10**			**11**	
TOTAL PROPOSED SITE GENERATED TRIPS			**3**	**11**	**14**	**10**	**6**	**16**	**125**

Source: *Trip Generation, 10th Edition* , published by the Institute of Transportation Engineers (ITE)

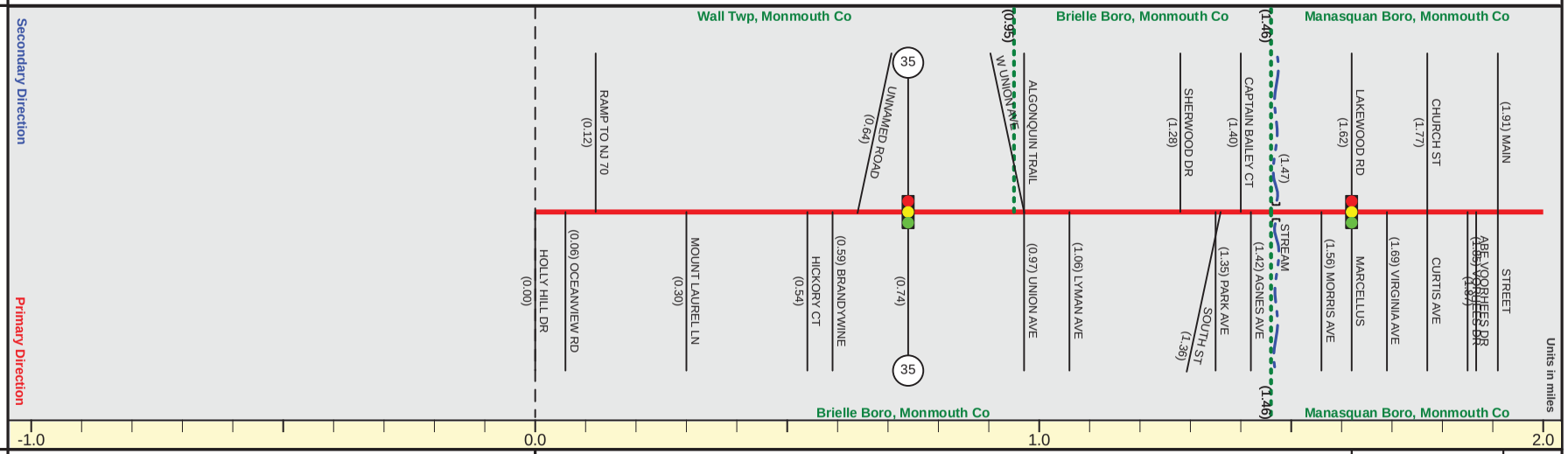
MONMOUTH COUNTY 20 (South to North)

Mile Posts: 0.000 - 2.000



Pavement	
Shoulder	
Number of Lanes	
Speed Limit	
Street Name	

Interstate Route 287
US Route 22
NJ Route 33
County Road 689
Interchange Number 2
Grade Separated Interchange
Traffic Signal
Traffic Monitoring Sites WIM AVC VOL
Road Underpass
Road Overpass



Street Name	Old Bridge Road | South Street | Broad Street
Jurisdiction	County
Functional Class	Urban Major Collector
Federal Aid - NHS Sy	STP
Control Section	
Speed Limit	40 | 30
Number of Lanes	2
Med. Type	None
Med. Width	0
Pavement	22 | 36 | 24 | 26 | 36
Shoulder	2 | 6 | 0 | 1 | 4 | 0
Traffic Volume	5,283 (2012)
Traffic Sta. ID	121349
Structure No.	
Enlarged Views	

Begin Monmouth County 20 MP=0

NO FIELD

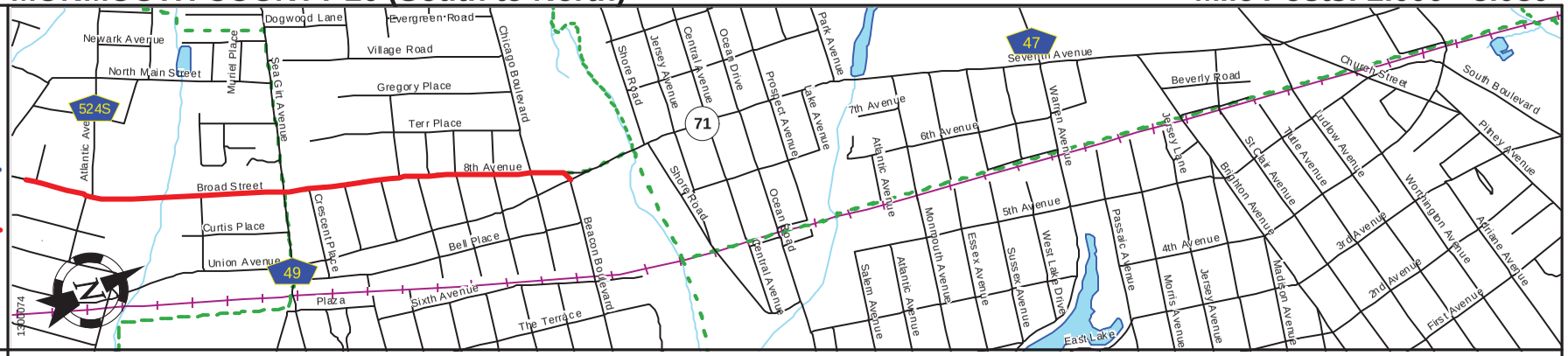
Page Created: June, 2015

SRI = 13000020__

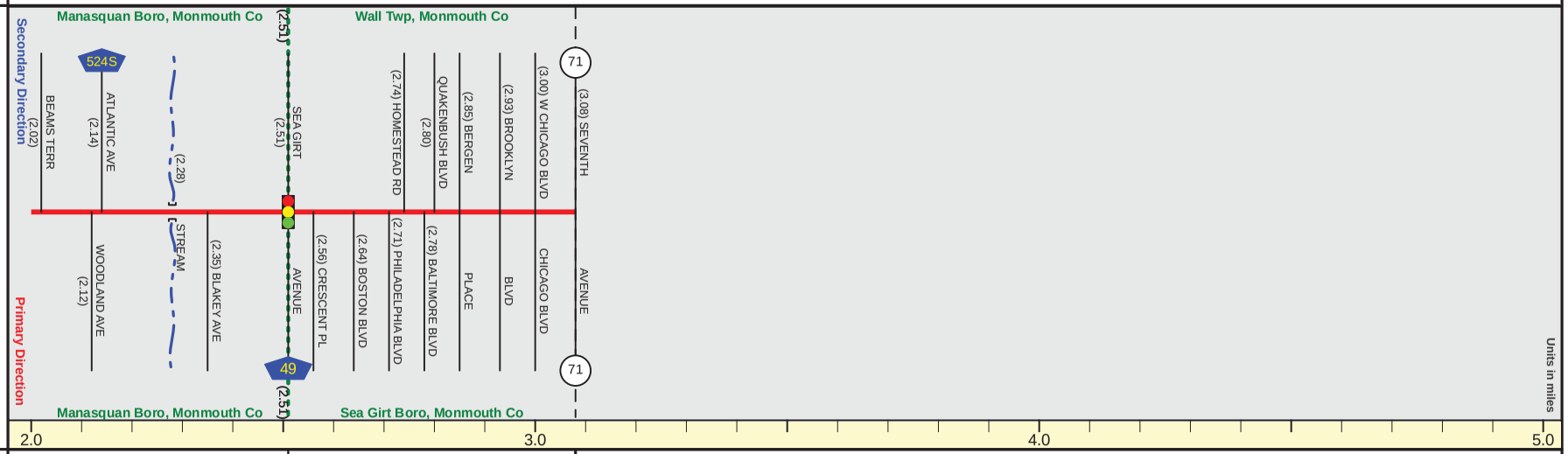
Date last inventoried: July 2011

MONMOUTH COUNTY 20 (South to North)

Mile Posts: 2.000 - 3.080



Pavement	
Shoulder	
Number of Lanes	
Speed Limit	
Street Name	



Street Name	Broad Street	8th Avenue	
Jurisdiction	County		
Functional Class	Urban Major Collector / Urban Minor Arterial	Urban Major Collector	
Federal Aid - NHS Sy	STP		
Control Section			
Speed Limit	30	35	
Number of Lanes	2		
Med. Type	None		
Med. Width	0		
Pavement	36	30	
Shoulder	0		
Traffic Volume	5,282 (2012)		
Traffic Sta. ID	121350		
Structure No.			
Enlarged Views			

End Monmouth County 20 MP=3.08

Page Created: June, 2015

SRI = 13000020__

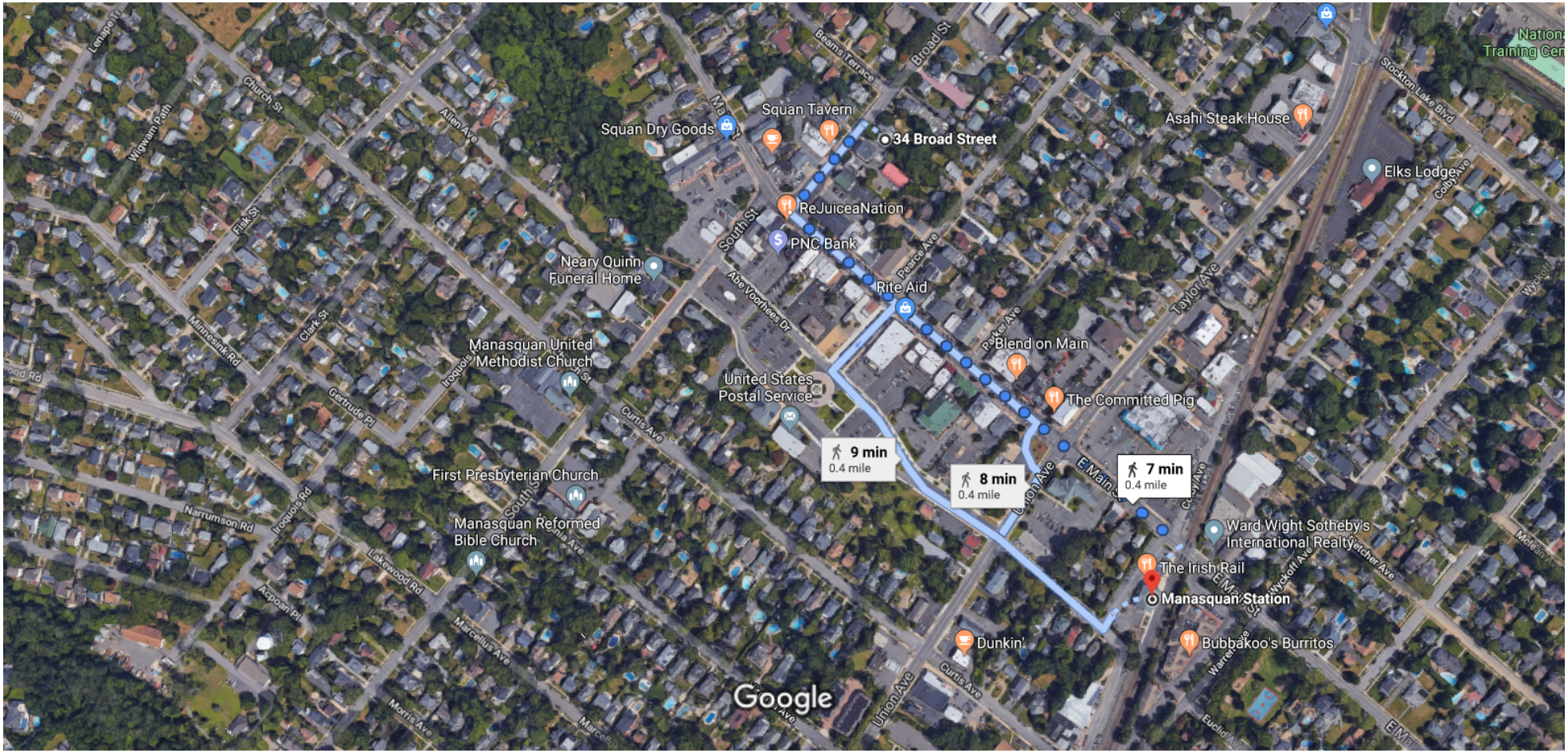
Date last inventoried: July 2011

Google Maps

34 Broad Street, Manasquan, NJ to Manasquan Station

Walking Time and Distance

Walk 0.4 mile, 7 min



Imagery ©2019 Google, Map data ©2019 Google 200 ft

via Main St	7 min	0.4 mile
via Main St and Euclid Ave	8 min	0.4 mile

via Abe Voorhees Dr 9 min

0.4 mile

All routes are mostly flat

BROAD STREET
APARTMENTS

RESIDENTIAL DEVELOPMENT

34-44 BROAD STREET
MANASQUAN, NJ

OWNER

BROAD STREET 34, LLC

ARCHITECT

APPEL DESIGN GROUP, PA
220 SOUTH ORANGE AVE.
LIVINGSTON, NJ 07039
Phone: 973-994-1776
Fax: 973-577-4455

CIVIL ENGINEER

ENGENUITY INFRASTRUCTURE TM
12 BROAD ST. SUITE 203
RED BANK, NJ 07701
Phone: 732-741-3176

DRAWING LIST

					ISSUE PLANING BOARD	SHEET NUMBER	DESCRIPTION
					06-29-20	T-01	COVER
					06-29-20	PB-1.1	GROUND FLOOR PLAN
					06-29-20	PB-1.2	SECOND FLOOR PLAN
					06-29-20	PB-1.3	THIRD FLOOR PLAN
					06-29-20	PB-1.4	ROOF PLAN
					06-29-20	PB-2.1	EXTERIOR ELEVATIONS
					06-29-20	PB-2.2	EXTERIOR ELEVATIONS

APPEL DESIGN GROUP
220 South Orange Avenue - Suite 100
Livingston, New Jersey 07039
T 973.994.1776
F 973.577.4455

Residential Development
Township of Manasquan, NJ

BUILDING MATRIX

DATED: 6/18/20

Story	Unit Area (Sq.Ft.)	Gross Bldg. (Sq.Ft.)	Qty. Units	Market Rate Units						
					1 Bed		2 Bed		3 Bedroom	
				Total	Qty.	Ratio	Qty.	Ratio	Qty.	Ratio
					900-1000 SF		*1000-1200 SF*		*1200 SF*	
3			*11*	11	0		7		4	
2			*11*	11	0		7		4	
			22	14	0	0%	14	64%	8	36%

				Total Market Units						
				100%	1 Bed		2 Bed		3 Bedroom	
				Total	Qty.	Ratio	Qty.	Ratio	Qty.	Ratio
Total Units:			*22*	*22*	*0*	*0%*	*14*	*64%*	*8*	*36%*

Note: Areas shown are approximate only and to be used for conceptual planning and design only

APPEL DESIGN GROUP
ARCHITECTS
220 SOUTH ORANGE AVE. - SUITE 100
LIVINGSTON, NJ 07039
TEL: (973) 994-1776
FAX: (973) 577-4455

RESIDENTIAL DEVELOPMENT
BROAD STREET 34, LLC

34-44 BROAD STREET
MANASQUAN, NJ

NO.	REVISION	BY	DATE
	ISSUE FOR PB	MPM	6-29-20

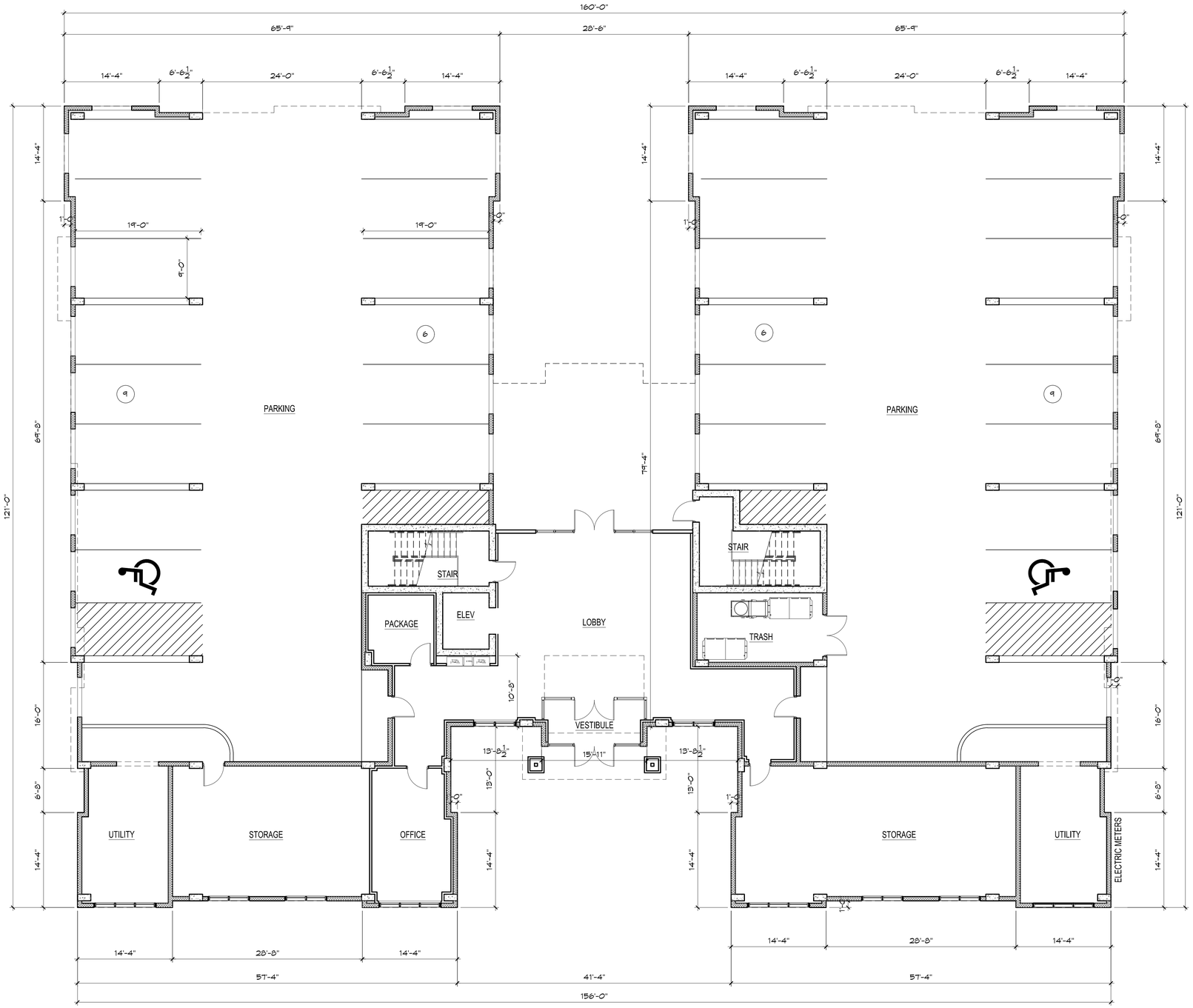
LAURANCE D. APPEL, R.A. NJ • AI-12149
NY - 025018
PA - RA-014580-B

COVER SHEET

DRAWN BY: MPM
CHECKED BY: -
CLIENT: SEPE01
DATE: 06-18-20

DRAWING:
T-01

COMM. #: N/A



1 GROUND FLOOR

Scale: 1/8" = 1'-0"

APPEL DESIGN GROUP
ARCHITECTS

220 SOUTH ORANGE AVE. - SUITE 100
LIVINGSTON, NJ 07039
TEL: (973) 994-1776
FAX: (973) 577-4455

RESIDENTIAL DEVELOPMENT
BROAD STREET 34, LLC

34-44 BROAD STREET
MANASQUAN, NJ

NO.	REVISION	BY	DATE
	ISSUE FOR PB	MPM	6-29-20

LAURANCE D. APPEL, R.A. NJ # AI-12149
NY - 025018
PA - RA-014580-B

GROUND FLOOR PLAN

DRAWN BY: MPM
CHECKED BY: -
CLIENT: SEPE01
DATE: 06-18-20

DRAWING:

PB-1.1

COMM. #: N/A

APPEL DESIGN GROUP - FILENAME: P:\CLIENT\SEPE_01 (BROAD ST)\DWG\SEPE01 PLAN_BUILDING.DWG PLOT DATE: 07/14/2020 5:45 PM BY: MPM

1 2ND FLOOR PLAN

Scale: 1/8" = 1'-0"

APPEL DESIGN GROUP
ARCHITECTS

220 SOUTH ORANGE AVE.- SUITE 100
LIVINGSTON, NJ 07039
TEL: (973) 994-1776
FAX: (973) 577-4455

RESIDENTIAL DEVELOPMENT
BROAD STREET 34, LLC

34-44 BROAD STREET
MANASQUAN, NJ

NO.	REVISION	BY	DATE
	ISSUE FOR PB	MPM	6-29-20

LAURANCE D. APPEL, R.A. NJ # AI-12149
NY - 026918
PA - RA-014560-B

SECOND FLOOR PLAN

DRAWN BY: MPM
CHECKED BY: -
CLIENT: SEPE01
DATE: 06-18-20

DRAWING:
PB-1.2

COMM. #: N/A

1 3RD FLOOR PLAN

Scale: 1/8" = 1'-0"

APPEL DESIGN GROUP
ARCHITECTS

220 SOUTH ORANGE AVE. - SUITE 100
LIVINGSTON, NJ 07039
TEL: (973) 994-1776
FAX: (973) 577-4455

RESIDENTIAL DEVELOPMENT
BROAD STREET 34, LLC

34-44 BROAD STREET
MANASQUAN, NJ

NO.	REVISION	BY	DATE
	ISSUE FOR PB	MPM	6-29-20

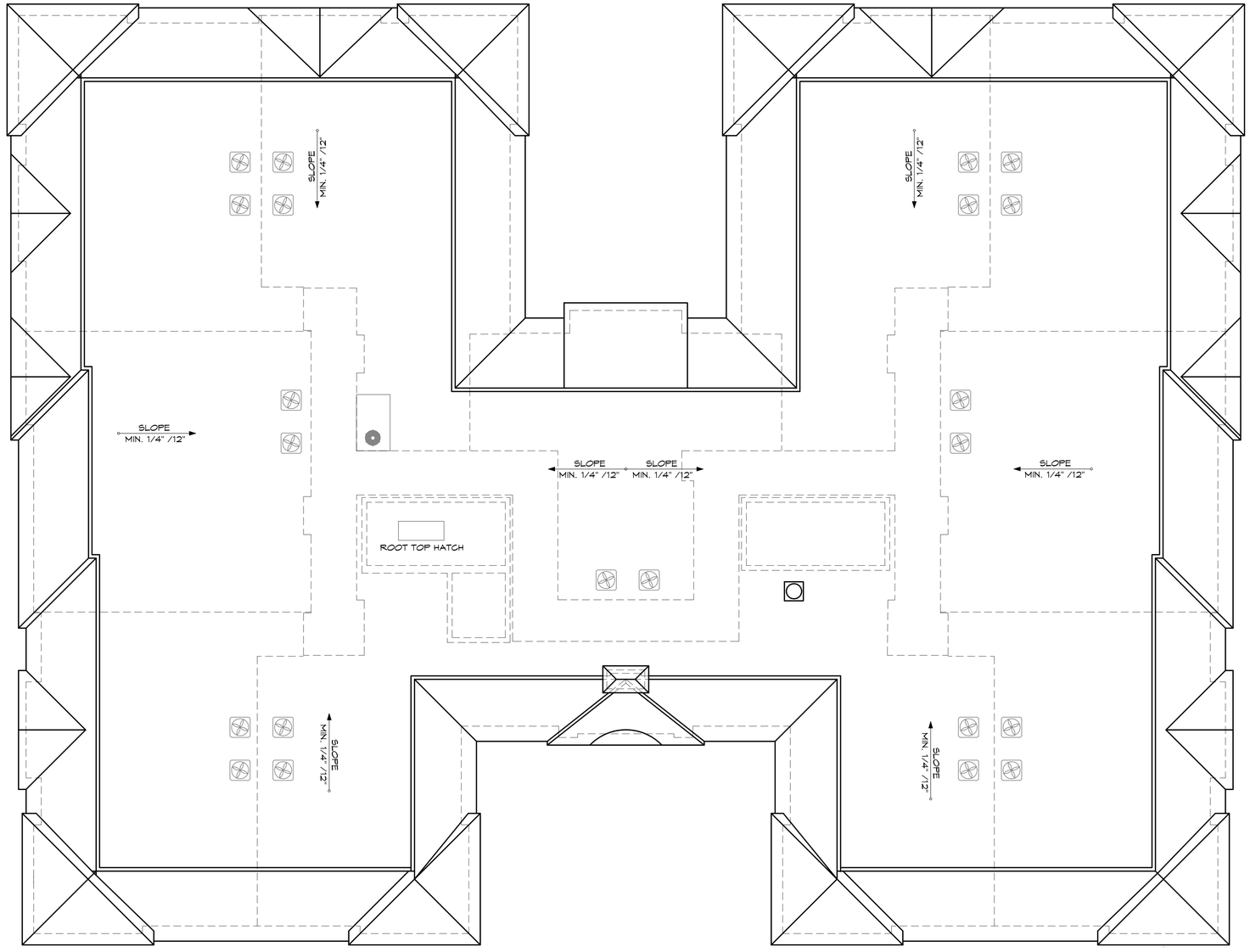
LAURANCE D. APPEL, R.A. NJ # AI-12149
NY - 026918
PA - RA-014580-B

THIRD FLOOR PLAN

DRAWN BY: MPM
CHECKED BY: -
CLIENT: SEPE01
DATE: 06-18-20

DRAWING:
PB-1.3

COMM. #: N/A



1 ROOF PLAN
Scale: 1/8" = 1'-0"

APPEL DESIGN GROUP
ARCHITECTS
220 SOUTH ORANGE AVE. - SUITE 100
LIVINGSTON, NJ 07039
TEL: (973) 994-1776
FAX: (973) 577-4455

RESIDENTIAL DEVELOPMENT
BROAD STREET 34, LLC

34-44 BROAD STREET
MANASQUAN, NJ

NO.	REVISION	BY	DATE
	ISSUE FOR PB	MPM	6-29-20

LAURANCE D. APPEL, R.A. NJ # AI-12149
NY - 026918
PA - RA-014560-B

ROOF PLAN

DRAWN BY: MPM
CHECKED BY: -
CLIENT: SEPE01
DATE: 06-18-20

DRAWING:
PB-1.4

COMM. #: N/A

ELEVATION KEY NOTES

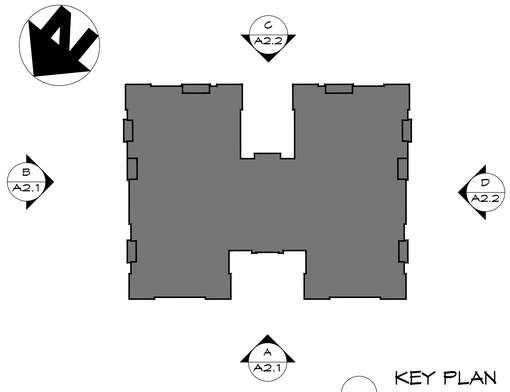
NOT ALL NOTES MAY APPLY TO THIS SHEET

TAG	DESCRIPTION
1	STONE VENEER
2	SIDING AS SELECTED
3	ARCHITECTURAL PANEL SYSTEM
4	FRIEZE BOARD TO MATCH SIDING
5	VINYL WINDOWS AS SELECTED WITH STANDARD ARCHITECTURAL GRILLES
6	ALUMINUM LEADERS AND GUTTERS
7	STANDING SEAM METAL ACCENT ROOF
8	ARCHITECTURAL DIMENSIONAL ASPHALT ROOF SHINGLES
9	PREFINISHED VENTED VINYL SOFFIT
10	DECORATIVE AWNING AS SELECTED
11	DECORATIVE PREFINISHED ARCHITECTURAL BRACKETS
12	DECORATIVE CELLULAR PVC TRIM (AZEK OR EQUAL)
13	PREFINISHED ALUMINUM POST AND GUARD RAIL AT BALCONY - STYLE AS SELECTED
14	EXTERIOR METAL DOORS
15	ARCHITECTURAL EXTERIOR FIXTURE AS SELECTED
16	DECORATIVE ARCHITECTURAL GRILLES
17	DECORATIVE CUPOLA
18	STOREFRONT SYSTEM - STYLE AS SELECTED
19	FIBERGLASS SIDE DOOR - STYLE AS SELECTED

NOTES:
1) PRODUCTS MAY VARY TO SUIT ARCHITECTURAL INTENT UTILIZING OTHER PRODUCTS OF SIMILAR APPEARANCE AND QUALITY.
2) PRODUCT MANUFACTURERS MAY VARY.
3) SEE MODULE COLOR LEGEND FOR COLOR SELECTIONS.

A — FRONT ELEVATION (NORTH WEST)

Scale: 1/8" = 1'-0"



– KEY PLAN

Scale: N.T.S.

B — LEFT SIDE ELEVATION (NORTH EAST)

Scale: 1/8" = 1'-0"

APPEL DESIGN GROUP
ARCHITECTS

220 SOUTH ORANGE AVE. - SUITE 100
LIVINGSTON, NJ 07039
TEL: (973) 994-1776
FAX: (973) 577-4455

RESIDENTIAL DEVELOPMENT
BROAD STREET 34, LLC
34-44 BROAD STREET
MANASQUAN, NJ

NO.	REVISION	BY	DATE
	ISSUE FOR PB	MPM	6-29-20

LAURANCE D. APPEL, R.A. NJ # AI-12149
NY - 026918
PA - RA-014580-B

EXTERIOR ELEVATION

DRAWN BY: CD
CHECKED BY: MPM
CLIENT: SEPE01
DATE: 06-18-20

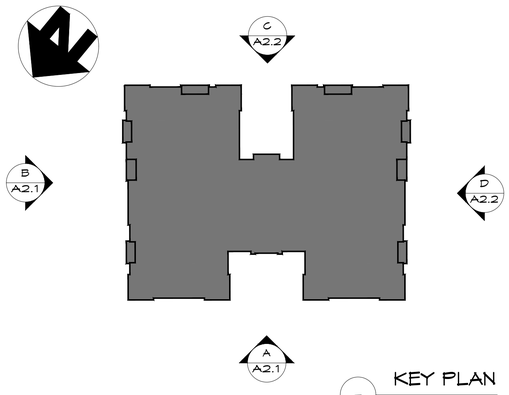
DRAWING:

PB-2.1

COMM. #: N/A

C REAR ELEVATION (SOUTH EAST)

Scale: 1/8" = 1'-0"



– KEY PLAN

Scale: N.T.S.

D RIGHT SIDE ELEVATION (SOUTH WEST)

Scale: 1/8" = 1'-0"

APPEL DESIGN GROUP
ARCHITECTS

220 SOUTH ORANGE AVE. - SUITE 100
LIVINGSTON, NJ 07039
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FAX: (973) 577-4455

RESIDENTIAL DEVELOPMENT
BROAD STREET 34, LLC

34-44 BROAD STREET
MANASQUAN, NJ

NO.	REVISION	BY	DATE
	ISSUE FOR PB	MPM	6-29-20

LAURANCE D. APPEL, RA, NJ # AI-12149
NY - 026918
PA - RA-014560-B

EXTERIOR ELEVATION

DRAWN BY: CD
CHECKED BY: MPM
CLIENT: SEPE01
DATE: 06-18-20

DRAWING:

PB-2.2

COMM. #: N/A

BROAD STREET APARTMENTS

34-44 BROAD STREET
MANASQUAN, NEW JERSEY

ARTISTIC CONCEPTUAL RENDERING ACTUAL
COLORS AND CONDITIONS MAY VARY

APPEL DESIGN GROUP
ARCHITECTS

09 .21.20

SYMBOL LEGEND

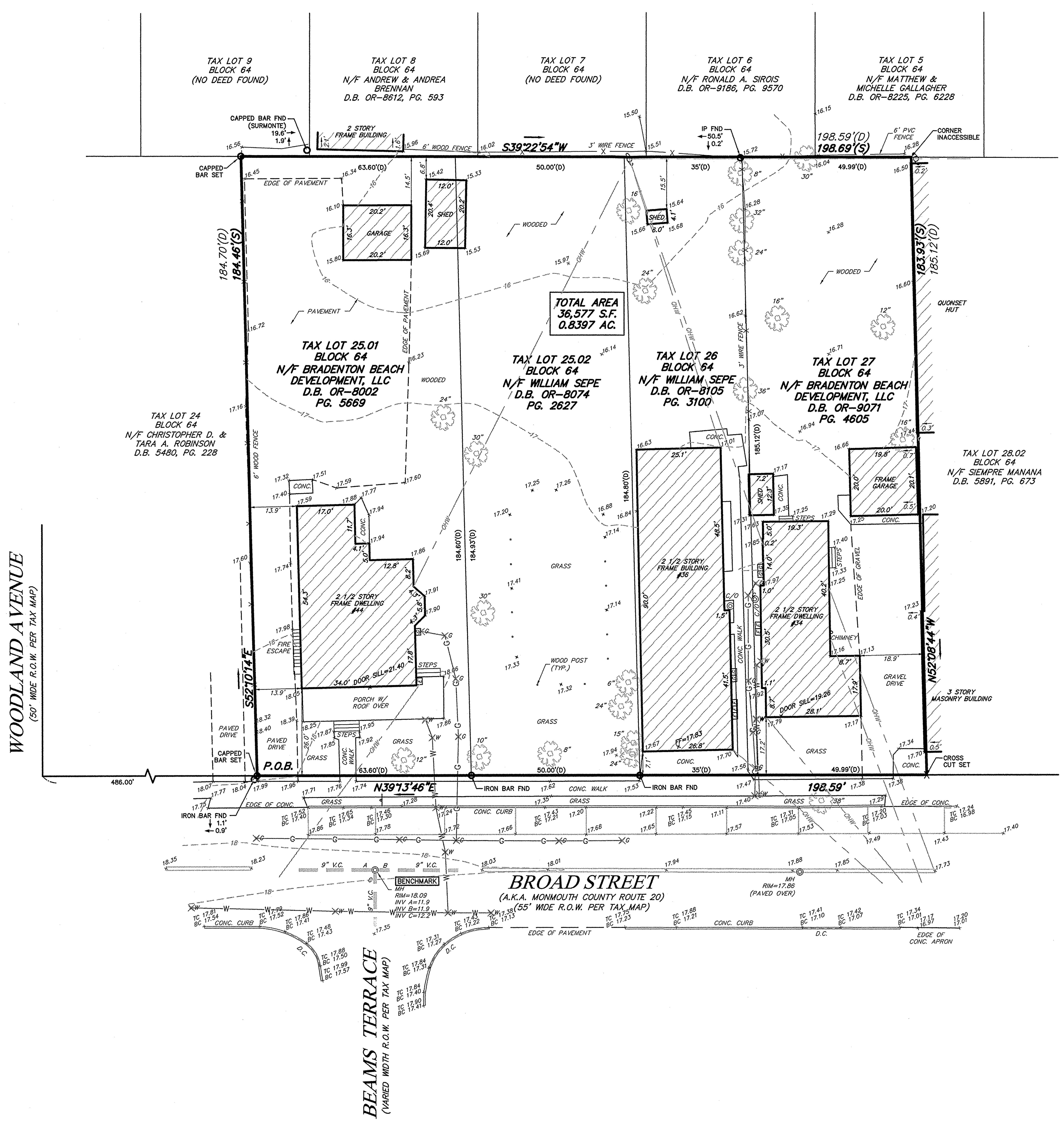
CONC. MONUMENT FND	MAIL BOX
I.P. / I.B. FND	CABLE TV BOX
TACK / STAKE FND	TELEPHONE BOX
SPOT ELEVATIONS	A/C UNIT
TRAFFIC SIGNAL POLE	TRANSFORMER
UTILITY POLE	ELECTRIC METER
GUY WIRE	GAS METER
UTILITY POLE W/LIGHT	WATER METER
LIGHT POLE	WATER VALVE
SIGN	GAS VALVE
FIRE HYDRANT	CLEAN OUT
D.W.P. DETECTABLE WARNING PAD	GAS
D.C. DEPRESSED CURB	WATER
L.S.A. LANDSCAPED AREA	ELECTRIC
WELL	TELEPHONE
MANHOLE	CABLE TV
"A"-INLET	TREE
"B"-INLET	SHRUB
"E"-INLET	BOLLARD
YARD INLET	MONITORING WELL
FLARED END SECTION	WETLAND FLAG

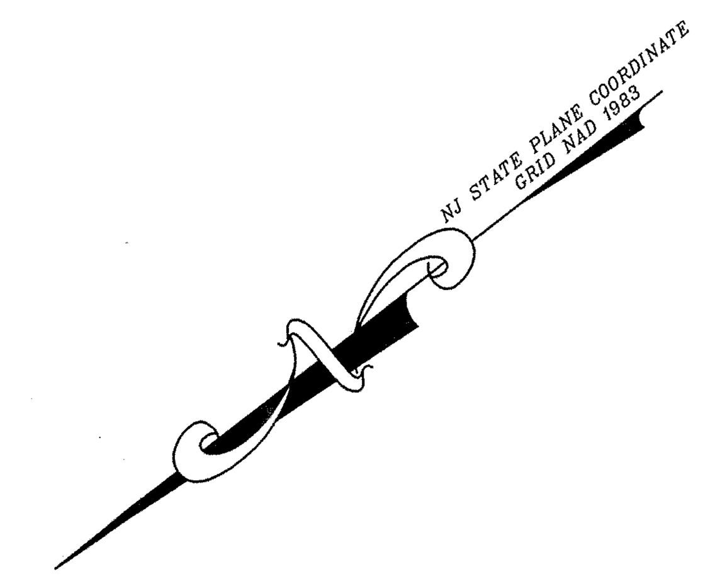
GENERAL NOTES:

1. THIS SURVEY IS PREPARED IN ACCORDANCE WITH DOCUMENTS SUPPLIED BY THE CLIENT AND THOSE OBTAINED THROUGH SUPPLEMENTAL RESEARCH BY DPK. THE DOCUMENTS UTILIZED MAY OR MAY NOT REPRESENT ALL THE TITLE DOCUMENTS RELEVANT TO THE SUBJECT PROPERTY. IT IS STRONGLY SUGGESTED THAT A COMPLETE TITLE SEARCH BE SUPPLIED TO THE SURVEYOR FOR REVIEW PRIOR TO THE PLACEMENT OF OR ALTERATION TO IMPROVEMENTS ON THE PROPERTY.
2. THIS SURVEY IS SUBJECT TO ANY EASEMENTS OF RECORD AND ANY OTHER PERTINENT FACTS THAT A COMPLETE TITLE SEARCH MIGHT DISCLOSE.
3. THIS SURVEY REPRESENTS FIELD CONDITIONS AS OF AUGUST 7, 2018.
4. THE UTILITIES SHOWN HAVE BEEN LOCATED FROM EVIDENCE OBSERVED ON THE SURFACE ONLY OR HAVE BEEN SHOWN GRAPHICALLY PER SUPPLIED MATERIALS. DPK CONSULTING MAKES NO GUARANTEES THAT THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN-SERVICE OR ABANDONED. DPK CONSULTING FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. DPK CONSULTING HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.
5. PREMISES ARE COMMONLY KNOWN AS 34-44 BROAD STREET, MANASQUAN, NEW JERSEY.
6. ALSO KNOWN AS LOTS 25.01, 25.02, 26 & 27 IN BLOCK 64 AS SHOWN ON THE OFFICIAL TAX MAPS OF THE BOROUGH OF MANASQUAN, MONMOUTH COUNTY, NEW JERSEY.
7. THE PROJECT VERTICAL DATUM IS BASED UPON NAVD 88 DERIVED USING LEICA GX1230 GPS RECEIVERS AND KEYNET.
8. BY GRAPHIC PLOTTING ONLY, THE PREMISES IS LOCATED IN FIRM ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) PER MAP NUMBER 34025C0343F, EFFECTIVE DATE SEPTEMBER 25, 2009 AND MAP NUMBER 34025C0456F, EFFECTIVE DATE SEPTEMBER 25, 2009. NO FIELD SURVEYING WAS PERFORMED TO DETERMINE THIS ZONE. AN ELEVATION CERTIFICATE MAY BE NEEDED TO VERIFY THIS DETERMINATION OR APPLY FOR VARIANCE FROM THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
9. IF THIS DOCUMENT DOES NOT CONTAIN A RAISED SEAL OF THE UNDERSIGNED PROFESSIONAL, IT IS NOT AN AUTHORIZED ORIGINAL DOCUMENT.

MAP REFERENCES:

1. MAP ENTITLED "MAP OF THE PEARCE & PARKER TRACT, SITUATE IN THE BOROUGH OF MANASQUAN, MONMOUTH COUNTY, N.J.," PREPARED BY WILLIAM SEGOINE, DATED AUGUST 1893, FILED IN THE MONMOUTH COUNTY CLERK'S OFFICE ON 1-30-1893 AS CASE NO. 63-2.
2. MAP ENTITLED "MINOR SUBDIVISION, LOT 25, BLOCK 64, BORO OF MANASQUAN, MONMOUTH COUNTY, N.J.," PREPARED BY WALTER J. PARTINGTON INC., DATED MARCH 6, 1984, FILED 8-8-1984 AS CASE NO. 194-18.





GRAPHIC SCALE

20 0 10 20

(IN FEET)
1 inch = 20 ft.

REV	DATE	DESCRIPTION	BY	CHKD

James J. Heiser
Professional Land Surveyor
N.J. Lic: 24GS04331100 N.Y. Lic: 050932-1
JHEISER@DPKCONSULTING.NET C.T. Lic: 70476
8/9/18 date

Jonathan A. Stuhl
Professional Land Surveyor
N.J. Lic: 24GS04331400 N.Y. Lic: 050879-1
JSTUHL@DPKCONSULTING.NET PA Lic: SU075538
date

In consideration of the mutual covenants between the client listed above and the undersigned, I declare that this plan is based on a field survey made under my direct supervision on the date listed above and to the best of my professional knowledge, information and belief, correctly represents the conditions found on the date of the survey, except easements, if any, below and/or above the surface of the lands and not visible. Underground utilities and/or determination of environmentally sensitive areas were not located or made by this survey. This survey is subject to conditions which an accurate title search might disclose. This plan is made to provide relevant information to the title insurer and the mortgage holder named above. This declaration is given solely to the above named parties for this transaction only and is not transferable, except as provided herein.

DRAWN BY:	SCALE:
T.J.D.	1" = 20'
CHK'D BY:	DATE:
D.S.	8/9/2018

DPK CONSULTING

DPK CONSULTING, LLC
220 OLD NEW BRUNSWICK RD-STE. 201, PISCATAWAY, NJ 08854
P:732-764-0100 F: 732-764-0990
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28042200

BOUNDARY & TOPOGRAPHIC SURVEY
TAX LOTS 25.01, 25.02, 26 & 27
BLOCK 64
34-44 BROAD STREET
BOROUGH OF MANASQUAN
MONMOUTH COUNTY NEW JERSEY

DRAWING FILE: 18-8177TP00

PROJECT NUMBER: 18-8177

SHEET 1 / 1

REV. 0

BOROUGH HALL, 201 EAST MAIN STREET
Incorporated December 30, 1887
732-223-0544
Fax 732-223-1300

GEORGE R. DEMPSEY, JR.
Mayor

BARBARA ILARIA
Municipal Clerk

JOSEPH R. DeIORIO
Municipal Administrator/
Chief Financial Officer

BOROUGH OF MANASQUAN
COUNTY OF MONMOUTH
NEW JERSEY 08736

APPLICATION TO THE PLANNING BOARD

SECTION I

Property Location: 34, 36, 40, 44 Broad Street; Lots 25.01, 25.02, 26 & 27, Block 64

Applicant: Broad Street 34, LLC
(If a Corporation, attach list of principals)

Address: 27 Colby Avenue, Manasquan, New Jersey 08736

Telephone 732-741-3900 **Cell** 732-219-5496 **Fax** 732-224-6599

Section II – Type of Application (Please check)

☐ **Variance** ☐ **Non-Permitted Use** ☐ **Conditional Use**

☐ **Subdivision – Minor** ☐ **Subdivision – Major**

☒ **Site Plan Approval**

Section III – Appeal of Zoning Officer's Decision

Date of Denial: _____

Zoning Permit Application Attached.

Section IV

Plot plan (Survey) – not older than five (5) years, clearly indicating all buildings and setbacks.

Section V – Miscellaneous

1. **Is the Applicant the Landowner?** Yes

Section V – Miscellaneous

1. **Is the Applicant the Landowner?** Yes
   (Attached authorization)

2. **Does the Applicant own any adjoining land?** No

3. **Are the property taxes paid to date?** Yes

4. **Have there been any previous applications to the Planning Board or the Board of Adjustment concerning this property?** No
   (Attach copies)

5. **Is there any deed restrictions, easements or covenants affecting the property?**
   No **(Attach copies)**

The applicant agrees to be responsible for and pay the costs entailed in the review of this application by any experts retained by the Planning Board for advice in this matter, if necessary.

(Signature of Applicant or Agent) **Date:** 12-13-19

PLANNING BOARD USE ONLY

Submitted: _____

Fees Paid: _____

Hearing Date: _____

Preliminary Approval: _____

Final Approval: _____

Denied: _____

Conditions of Approval: _____

BOROUGH HALL, 201 EAST MAIN STREET

GEORGE R. DEMPSEY, JR.
Mayor

Incorporated December 30, 1887

BOROUGH OF MANASQUAN
COUNTY OF MONMOUTH
NEW JERSEY 08736

732-223-0544
Fax 732-223-1300

BARBARA ILARIA
Municipal Clerk

JOSEPH R. DeIORIO
Municipal Administrator/
Chief Financial Officer

NOTICE TO APPLICANT FOR PLANNING BOARD HEARING

Members of the Manasquan Planning Board will individually conduct a Site visit of your property prior to the public hearing. This is necessary so they fully understand the case.

Your property will be visited during day light hours and the members will carry identification.

Please sign this notice and return it to our office along with your application.

Thank you in advance for your consent in this matter.

Broad Street 34, LLC **Applicant**

34, 36, 40, 44 Broad Street, Manasquan, NJ **Address**

October , 2019 **Date**

AGREEMENT TO RESOLVE ISSUES BETWEEN THE BOROUGH OF MANASQUAN AND FAIR SHARE HOUSING CENTER CONCERNING THE BOROUGH'S MOUNT LAUREL FAIR SHARE OBLIGATIONS AND THE MEANS BY WHICH THE BOROUGH SHALL SATISFY SAME.

In the Matter of the Borough of Manasquan, County of Monmouth, Docket No. MON-L-2508-15

THIS SETTLEMENT AGREEMENT ("Agreement") made this _____ day of _____, 2018, by and between:

BOROUGH OF MANASQUAN, a municipal corporation of the State of New Jersey, County of Monmouth, having an address at 201 East Main Street, Manasquan, New Jersey 08736 (hereinafter the "Borough" or "Manasquan");

And

FAIR SHARE HOUSING CENTER, having an address at 510 Park Boulevard, Cherry Hill, New Jersey 08002, (hereinafter "FSHC");

WHEREAS, pursuant to In re N.J.A.C. 5:96 and 5:97, 221 N.J. 1 (2015) (Mount Laurel IV), the Borough filed the above-captioned matter on July 2, 2015 seeking, among other things, a judicial declaration that its Housing Element and Fair Share Plan (hereinafter "Fair Share Plan"), as may be further amended in accordance with the terms of this settlement, satisfies its "fair share" of the regional need for low and moderate income housing pursuant to the Mount Laurel doctrine; and

WHEREAS, the Borough simultaneously sought and ultimately secured an Order protecting Manasquan from all exclusionary zoning lawsuits while it pursues approval of its Fair Share Plan; and

WHEREAS, the immunity secured by Manasquan remains in place as of the date of this Agreement; and

WHEREAS, the Trial Court appointed Michael Bolan, P.P., A.I.C.P., as the "Special Master" in this case as is customary in Mount Laurel matters; and

WHEREAS, with Mr. Bolan's assistance, Manasquan and FSHC have engaged in good faith negotiations and have reached an amicable accord on the various substantive provisions, terms and conditions delineated herein; and

WHEREAS, through that process, the Borough and FSHC agreed to settle the litigation and to present that settlement to the Trial Court, recognizing that the settlement of Mount Laurel litigation is favored because it avoids delays and the expense of trial and results more quickly in the construction of homes for lower-income households; and

WHEREAS, at this time and at this particular point in the process resulting from the Mount Laurel IV decision, when fair share obligations have yet to be definitively determined, it is appropriate for the parties to arrive at a settlement regarding a municipality's present and prospective need, instead of doing so through plenary adjudication of the present and prospective need.

NOW, THEREFORE, in consideration of the promises, the mutual obligations contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by each of the parties, the parties hereto, each binding itself, do hereby covenant and agree, each with the other, as follows:

Settlement Terms

The Borough and FSHC hereby agree to the following general terms, subject to any relevant conditions set forth in more detail below:

1. Manasquan's "Rehabilitation Obligation" is 6.

2. Manasquan's "Prior Round (1987-1999) Obligation" is 149.

3. Manasquan's "Gap (1999-2015) + Prospective Need (2015-2025) Obligation" is 382.

4. FSHC and the Borough agree that Manasquan does not accept the basis of the methodology or calculations proffered by FSHC's consultant, David N. Kinsey, PhD, P.P., F.A.I.C.P. The Parties agree to the terms in this agreement solely for purposes of settlement of this action. Although the Borough does not accept the basis of the methodology or calculations proffered by FSHC's consultant, FSHC contends, and is free to take the position before the Court, that the 382-unit obligation should be accepted by the Court because it is based on the Prior Round methodology and reflects a thirty percent (30%) reduction of Dr. Kinsey's April 2017 calculation of the Borough's Gap (1999-2015) + Prospective Need (2015-2025) fair share obligations.

5. Pursuant to N.J.A.C. 5:93-4.2, and as confirmed by Special Master Bolan, Manasquan's Realistic Development Potential (hereinafter "RDP") is 12. This leaves the Borough with a remaining combined Prior Round (1987-1999) and Gap + Prospective Need (1999-2025) "unmet need" of 519.

6. **Satisfaction of Rehabilitation Obligation**: The Borough has fully satisfied its Rehabilitation Obligation of six (6) as follows:

- The Borough has been participating in the Monmouth County Rehabilitation Program since 1995, and thirty-six (36) units have been rehabilitated in the Borough since that time.

- Of the Thirty-six (36) units rehabilitated since 1995, eight (8) have been rehabilitated after April 1, 2010, and are therefore creditworthy for the purposes of this Agreement.

- Thus, the Borough has fully satisfied its current Rehabilitation Obligation of six (6) and actually has two (2) surplus rehabilitation credits that can be applied to Round 4, should applicable law allow such credits to be counted in the future.

7. **Satisfaction of the Borough's RDP**: The Borough has a combined Prior Round (1987-1999) and Gap + Prospective Need (1999-2025) RDP of 12, which it will satisfy as follows:

- **Nine (9) family rental units from the Broad Street & Union Avenue Projects**: Developer Sepe will construct two residential projects. The two projects will produce a combined total of forty-five (45) units, which will consist of thirty-six (36) market rate units and nine (9) family rental units affordable to very-low, low- and moderate-income households. The nine (9) affordable rental units is a twenty percent (20%) set-aside of the forty-five (45) total units in the two residential projects. The first residential project will be located at 34, 36, 40 and 44 Broad Street (Block 64, Lots 25.01, 25.02, 26 and 27), and will consist of twenty-two (22) market rate units. No affordable units will be located on this site. The second site will be located on 33, 33.5 and 38 Union Avenue (Block 66.02, Lot 31.01), and will consist of twenty-three (23) total units, made up of fourteen (14) market rate units and nine (9) family rental units affordable to very-low, low- and moderate-income households. In the event that less than twenty-two (22) total units are generated on the Broad Street site and/or less than twenty-three (23) total units are generated on the Union Avenue site, Sepe will maintain a twenty percent (20%) affordable housing set-aside on the total number of units created, and the Borough will have the right to adjust its RDP downwards from 12. Certificates of occupancy shall be issued in accordance with the phasing schedule provided within N.J.A.C. 5:93-5.6(d) to ensure that the affordable units are constructed. Construction permits may be issued and closed out at either site, independently, and this requirement shall not act as a limitation on the timing of construction at either site. The nine (9) affordable units will be broken down as follows: One (1) very-low-income unit, four (4) low-income units and four (4) moderate-income units. The bedroom mix on the affordable units will be as follows: At least two (2) three-bedroom units, no more than one (1) one-bedroom unit and the remaining six (6) units will be two-bedroom units. Each affordable unit will be subject to a thirty (30) year affordable housing deed restriction in accordance with UHAC. Developer Sepe will also contract with an experienced Administrative Agent, which may or may not be the Borough's Administrative Agent, to ensure that all of the affordable units are properly affirmatively marketed.

- **Three (3) rental bonus credits**.

8. **Satisfaction of "unmet need"**: For the purposes of settlement, the Borough agrees to address its 519 combined Prior Round (1987-1999) and Gap + Prospective Need (1999-2025) "unmet need" through the following mechanisms:

- **Up To Ten (10) Accessory Apartments**: The Borough has already adopted an Accessory Apartment Ordinance that permits the development of accessory apartments in the Borough's R-1, R-2, and R-M Zones, subject to the bulk and yard requirements of the zone in which the unit is located. The Ordinance

contains provisions for the design, accessibility, affordability, marketing, and administration of the Accessory Apartment units generated as a result of the Ordinance. The Borough will amend the Ordinance to (1) allow accessory apartments to be created throughout the Borough instead of just in the R-1, R-2 and R-M zones, and (2) increase the subsidies for Accessory Apartment program from $10,000 for all units to $25,000 for a moderate-income unit, $35,000 for a low-income unit and $50,000 for a very-low income unit. The Borough will use Affordable Housing Trust Fund monies to pay for the increased subsidies.

- **Affordable Housing Overlay Over The R-M Zone**: As part of achieving Prior Round Substantive Certification, the Borough established an affordable housing overlay zone in the R-M zone to provide an opportunity to develop additional affordable housing. Any affordable units generated in the R-M Zone will be applied towards satisfying "unmet need." The R-M Zone overlay currently requires a twenty percent (20%) affordable housing set-aside, and will be modified to ensure that all sites in the R-M Zone can be developed at ten (10) units per acre.

- **Affordable Housing Overlay Over The B-1, BR-1, O and B-3 Zones**: The Borough will establish an affordable housing overlay over the B-1, BR-1, O and B-3 Zones in the Borough, as depicted in the map attached hereto as Exhibit A. The density proposed for the overlay zone will be fourteen (14) units per acre for those properties fronting on Main Street west of Route 71, and ten (10) units per acre for those properties that front on Route 71 itself. Any affordable units generated in the B-1, BR-1, O and B-3 zones will be applied towards satisfying "unmet need." The overlay zone will require a twenty percent (20%) affordable housing set-aside.

- **Mandatory Set-Aside Ordinance ("MSO")**: The Borough already has an adopted Borough-wide Mandatory Set-Aside Ordinance ("MSO") in place. The MSO currently requires a twenty percent (20%) affordable housing set-aside for residential developments comprised of five (5) or more dwelling units. The MSO will be amended to bring it up to date with currently applicable law in collaboration with the Special Master and FSHC prior to the Final Compliance Hearing in this matter. The amended MSO will not apply to the R-M, B-1, BR-1, O and B-3 Zones.

9. The Borough's RDP shall not be revisited by FSHC or any other interested party absent a substantial changed circumstance and, if such a change in circumstance occurs with the RDP, the Borough shall have the right to address the issue without negatively affecting its continuing entitlement to immunity from all Mount Laurel lawsuits through July 2, 2025.

10. The Borough agrees to require thirteen percent (13%) of all the affordable units referenced in this plan, with the exception of units constructed prior to July 1, 2008, and units subject to preliminary or final site plan approval prior to July 1, 2008, to be very-low-income units (defined as units affordable to households earning thirty percent (30%) or less of the

regional median income by household size), with half of the very-low income units being available to families.

11. Manasquan will apply "rental bonus credits" in accordance with N.J.A.C. 5:93-5.15(d).

12. At least fifty percent (50%) of the units addressing the Borough's RDP shall be affordable to a combination of very-low-income and low-income households, while the remaining affordable units shall be affordable to moderate-income households.

13. At least twenty-five percent (25%) of the Borough's RDP shall be met through rental units, including at least half in rental units available to families.

14. At least half of the units addressing the Borough's RDP in total must be available to families.

15. The Borough agrees to comply with COAH's Round 2 age-restricted cap of twenty-five percent (25%), and to not request a waiver of that requirement. This shall be understood to mean that in no circumstance may the Borough claim credit toward its fair share obligation for age-restricted units that exceed twenty-five percent (25%) of all units developed or planned to meet its Prior Round obligation and twenty-five percent (25%) of all units developed or planned to meet its combined Gap + Prospective Need obligation.

16. The Borough and/or its administrative agent shall add the following entities to the list of community and regional organizations in its affirmative marketing plan, pursuant to N.J.A.C. 5:80-26.15(f)(5): Fair Share Housing Center (510 Park Boulevard, Cherry Hill, NJ 08002); the New Jersey State Conference of the NAACP; the Latino Action Network (P.O. Box 943, Freehold, NJ 07728); STEPS, OCEAN, Inc.; the Greater Red Bank, Asbury Park/Neptune, Bayshore, Greater Freehold, Greater Long Branch, and Trenton branches of the NAACP; and the Supportive Housing Association. As part of its regional affirmative marketing strategies during implementation of its Fair Share Plan, the Borough and/or its administrative agent shall also provide notice of all available affordable housing units to the above-referenced organizations.

17. All affordable housing units created pursuant to the measures set forth in this Agreement shall comply with the Uniform Housing Affordability Controls ("UHAC"), N.J.A.C. 5:80-26.1 et. seq. or any successor regulation, with the exception that in lieu of ten percent (10%) of affordable units in rental projects being required to be affordable to households earning at or below thirty-five percent (35%) of the regional median household income by household size, thirteen percent (13%) of affordable units in such projects shall be required to be affordable to households earning at or below thirty percent (30%) of the regional median household income by household size subject to Paragraph 10 herein, and all other applicable law. All new construction units shall be adaptable in conformance with P.L.2005, c.350/N.J.S.A. 52:27D-311a and -311b and all other applicable law. The Borough, as part of the Housing Element and Fair Share Plan that will be prepared, adopted and endorsed as a result of this Agreement, shall adopt and/or update appropriate implementing ordinances in conformance with standard ordinances and guidelines developed by COAH to ensure that this provision is satisfied.

18. Upon full execution of this Agreement, Manasquan shall notify the Court so that a Fairness Hearing can be scheduled to approve the Agreement. Manasquan will place this

Agreement on file in the Borough's municipal building and file a copy with the Court 30 days prior to the Fairness Hearing, at which the Borough will seek judicial approval the terms of this Agreement pursuant to the legal standard set forth in Morris Cty. Fair Hous. Council v. Boonton Twp., 197 N.J. Super. 359, 367-69 (Law Div. 1984), aff'd o.b., 209 N.J. Super. 108 (App. Div. 1986); East/West Venture v. City of Fort Lee, 286 N.J. Super. 311, 328-29 (App. Div. 1996). Notice of the Fairness Hearing shall be published at least 30 days in advance of the Hearing. Within 120 days of the approval of this Agreement by the Court after a Fairness Hearing, Manasquan will adopt a Housing Element and Fair Share Plan, along with a Spending Plan, and will adopt all ordinances required to be adopted as part of this Agreement, and will submit same to the Court, the Court Master, and FSHC for review. The Borough, FSHC, the Court Master and the Court may agree to extend this period of time for good cause shown. The Borough will then apply to the Court for the scheduling of a "Compliance Hearing" seeking judicial approval of Manasquan's adopted Housing Element and Fair Share Plan and other required documents. Although it is expected that the Special Master will provide the majority of the required testimony at both the Fairness Hearing and the Compliance Hearing, Manasquan shall also make its consulting planner and any other relevant witnesses available for testimony at the Hearings. FSHC shall not challenge the validity of any of the documents attached hereto, or the validity of the Borough's Fair Share Plan so long as adopted in conformance with this Agreement. If the Fairness and Compliance Hearings result in approval of this Agreement and the Borough's Fair Share Plan, the parties agree that the Borough will be entitled to either a "Judgment of Compliance and Repose" ("JOR") or the "judicial equivalent of substantive certification and accompanying protection as provided under the FHA," 221 N.J. at 6, which shall be determined by the trial judge. Each party may advocate regarding whether substantive certification or repose should be provided by the Court, with each party agreeing to accept either form of relief and to not appeal an order granting either repose or substantive certification. Among other things, the entry of such an Order shall maintain Manasquan's immunity from all Mount Laurel lawsuits through July 2, 2025.

19. Subsequent to the signing of this Agreement, if a binding legal determination by the Judiciary, the Legislature, or any administrative subdivision of the Executive Branch determines that Manasquan's Gap (1999-2015) + Prospective Need (2015-2025) obligation is decreased to 306 or less, with any relevant appeal periods having passed, the Borough may file a proposed form of Order, on notice to FSHC and the Borough's Service List, seeking to reduce its Gap (1999-2015) + Prospective Need (2015-2025) obligation accordingly. Such relief shall be presumptively granted. Notwithstanding any such reduction, the Borough shall be obligated to implement the Fair Share Plan prepared, adopted and endorsed as a result of this Agreement, including by leaving in place any site specific zoning adopted or relied upon in connection with the Plan approved pursuant to this settlement agreement, maintaining all mechanisms to continue to address the Borough's "unmet need", and otherwise fulfilling fully the fair share obligations as established herein. The reduction of the Borough's obligation below what is established in this Agreement does not provide a basis for seeking leave to amend this Agreement or the Fair Share Plan adopted pursuant to this Agreement or seeking leave to amend an order or judgment pursuant to R. 4:50-1. If the Borough prevails in reducing its Gap + Prospective Need for Round 3, the Borough may carry over any resulting surplus credits to Round 4.

20. The Borough shall prepare a Spending Plan for approval by the Court during, or prior to, the duly-noticed Compliance Hearing. FSHC reserves its right to provide any comments or objections on the Spending Plan to the Court upon review. Upon approval by the Court, the Borough and FSHC agree that the expenditures of funds contemplated in the Borough's Spending Plan shall constitute the "commitment" for expenditure required pursuant to

N.J.S.A. 52:27D-329.2 and -329.3, with the four-year time period contemplated therein commencing in accordance with the provisions of In re Tp. Of Monroe, 442 N.J.Super. 565 (Law Div. 2015) (aff'd 442 N.J.Super. 563). Upon approval of its Spending Plan, the Borough shall also provide an annual Mount Laurel Trust Fund accounting report to the New Jersey Department of Community Affairs, Council on Affordable Housing, Local Government Services, or other entity designated by the State of New Jersey, with a copy provided to FSHC and posted on the municipal website, using forms developed for this purpose by the New Jersey Department of Community Affairs, Council on Affordable Housing, or Local Government Services.

21. On the first anniversary of the approval of this Agreement after a Fairness Hearing, and every anniversary thereafter through the end of this Agreement, the Borough agrees to provide annual reporting of the status of all affordable housing activity within the municipality through posting on the municipal website with a copy of such posting provided to FSHC, using forms previously developed for this purpose by the Council on Affordable Housing or any other forms endorsed by the Special Master and FSHC. In addition to the foregoing, the Borough may also post such activity on the CTM system and/or file a copy of its report with the Council on Affordable Housing or its successor agency at the State level.

22. The Fair Housing Act includes two provisions regarding actions to be taken by the Borough during the ten-year period of protection provided in this agreement. The Borough agrees to comply with those provisions as follows:

a. For the midpoint realistic opportunity review due on July 1, 2020, as required pursuant to N.J.S.A. 52:27D-313, the Borough will post on its municipal website, with a copy provided to FSHC, a status report as to its implementation of its Plan and an analysis of whether any unbuilt sites or unfulfilled mechanisms continue to present a realistic opportunity and whether the mechanisms to meet unmet need should be revised or supplemented. Such posting shall invite any interested party to submit comments to the municipality, with a copy to FSHC, regarding whether any sites no longer present a realistic opportunity and should be replaced and whether the mechanisms to meet "unmet need" should be revised or supplemented. Any interested party may by motion request a hearing before the Court regarding these issues.

b. For the review of very-low-income housing requirements required by N.J.S.A. 52:27D-329.1, within 30 days of the third anniversary of the approval of the Borough's Housing Element and Fair Share Plan at a Compliance Hearing, and every third year thereafter, the Borough will post on its municipal website, with a copy provided to FSHC, a status report as to its satisfaction of its very-low income requirements, including the family very-low-income requirements referenced herein. Such posting shall invite any interested party to submit comments to the municipality and FSHC on the issue of whether the municipality has complied with its very-low-income housing obligation under the terms of this settlement.

c. In addition to the foregoing postings, the Borough may also elect to file copies of its reports with the Council on Affordable Housing or its successor agency at the State level.

23. This Agreement may be enforced by the Borough or FSHC through a motion to enforce litigant's rights or a separate action filed in Superior Court, Monmouth County. If FSHC determines that such action is necessary, the Borough consents to the entry of an order providing FSHC party status as an intervenor solely for purposes of its motion to enforce litigant's rights.

24. All Parties shall have an obligation to fulfill the intent and purpose of this Agreement. However, if an appeal of the Court's approval or rejection of the Settlement Agreement is filed by a third party, the Parties agree to defend the Agreement on appeal, including in proceedings before the Superior Court, Appellate Division, and New Jersey Supreme Court, and to continue to implement the terms of the Settlement Agreement if the Agreement is approved by the Trial Court unless and until an appeal of the Trial Court's approval is successful, at which point the Parties reserve their right to return to the *status quo ante*. In this regard, the Borough and FSHC acknowledge that the Parties have entered into this Agreement to settle the litigation and that each is free to take such position as it deems appropriate should the matter return to the *status quo ante*.

25. The Borough agrees to pay $5,000 to FSHC, payable within 10 days of judicial approval of this Agreement pursuant to a duly-noticed Fairness Hearing.

26. Unless otherwise specified, it is intended that the provisions of this Agreement are to be severable. The validity of any article, section, clause or provision of this Agreement shall not affect the validity of the remaining articles, sections, clauses or provisions hereof. If any section of this Agreement shall be adjudged by a court to be invalid, illegal, or unenforceable in any respect, such determination shall not affect the remaining sections.

27. This Agreement shall be governed by and construed by the laws of the State of New Jersey.

28. This Agreement may not be modified, amended or altered in any way except by a writing signed by both the Borough and FSHC.

29. This Agreement may be executed in any number of counterparts, each of which shall be an original and all of which together shall constitute but one and the same Agreement.

30. The Borough and FSHC acknowledge that each has entered into this Agreement on its own volition without coercion or duress after consulting with its counsel, that each person to sign this Agreement is the proper person and possesses the authority to sign the Agreement, that this Agreement contains the entire understanding of the Borough and FSHC and that there are no representations, warranties, covenants or undertakings other than those expressly set forth herein.

31. The Borough and FSHC acknowledge that this Agreement was not drafted by the Borough and FSHC, but was drafted, negotiated and reviewed by representatives of the Borough and FSHC and, therefore, the presumption of resolving ambiguities against the drafter shall not apply. The Borough and FSHC expressly represent that: (a) it has been represented by counsel in connection with negotiating the terms of this Agreement; and (b) it has conferred due authority for execution of this Agreement upon the persons executing it.

32. Any and all Exhibits and Schedules annexed to this Agreement are hereby made a part of this Agreement by this reference thereto. Any and all Exhibits and Schedules now

and/or in the future are hereby made or will be made a part of this Agreement with prior written approval of both the Borough and FSHC.

33. This Agreement constitutes the entire Agreement between the Borough and FSHC hereto and supersedes all prior oral and written agreements between the Borough and FSHC with respect to the subject matter hereof except as otherwise provided herein.

34. Anything herein contained to the contrary notwithstanding, the effective date of this Agreement shall be the date upon which representatives of the Borough and FSHC have executed and delivered this Agreement.

35. All notices required under this Agreement ("Notice[s]") shall be written and shall be served upon the Borough and FSHC by certified mail, return receipt requested, or by a recognized overnight or by a personal carrier. In addition, where feasible (for example, transmittals of less than fifty pages) shall be served by facsimile or e-mail. All Notices shall be deemed received upon the date of delivery. Delivery shall be affected as follows, subject to change as to the person(s) to be notified and/or their respective addresses upon ten (10) days' notice as provided herein:

TO FSHC:

Adam M. Gordon, Esq.
Fair Share Housing Center
510 Park Boulevard
Cherry Hill, NJ 08002
Phone: (856) 665-5444
Telecopier: (856) 663-8182
Email: adamgordon@fairsharehousing.org

TO THE BOROUGH:

Erik C. Nolan, Esq.
Jeffrey R. Surenian & Associates, LLC
707 Union Avenue, Suite 301
Brielle, NJ 08730
Phone: (732) 612-3100
Telecopier: (732) 612-3101
Email: EN@Surenian.com

Mark G. Kitrick, Esq.
King, Kitrick, Jackson and McWeeney, LLC
2329 Highway 34, Suite 104
Manasquan, NJ 08736
Phone: (732) 630-0405
Telecopier: (732) 477-1304
Email: mkitrick@kkjlawfirm.com

WITH A COPY TO THE BOROUGH ADMINISTRATOR:

Thomas Flarity, Administrator
Borough of Manasquan
201 East Main Street
Manasquan, NJ 08736
Phone: (732) 223-0544

Telecopier: (732) 223-1300
Email: tflarity@manasquan-nj.gov

WITH A COPY TO THE SPECIAL MASTER:

Michael Bolan, PP/AICP
104 Howard Way
PO Box 295
Pennington, NJ 08534
Phone: (609) 466-4259
Telecopier: (609) 466-1588
Email: michaelbolan@verizon.net

In the event any of the individuals identified above has a successor, the individual identified shall name the successor and notify all others identified of their successor.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be properly executed, their corporate seals affixed and attested and this Agreement to be effective as of the Effective Date.

Witness/Attest:

FAIR SHARE HOUSING CENTER:

By: _____
Adam M. Gordon, Esq.
On Behalf of Fair Share Housing Center

Dated: June 22, 2018

Witness/Attest:

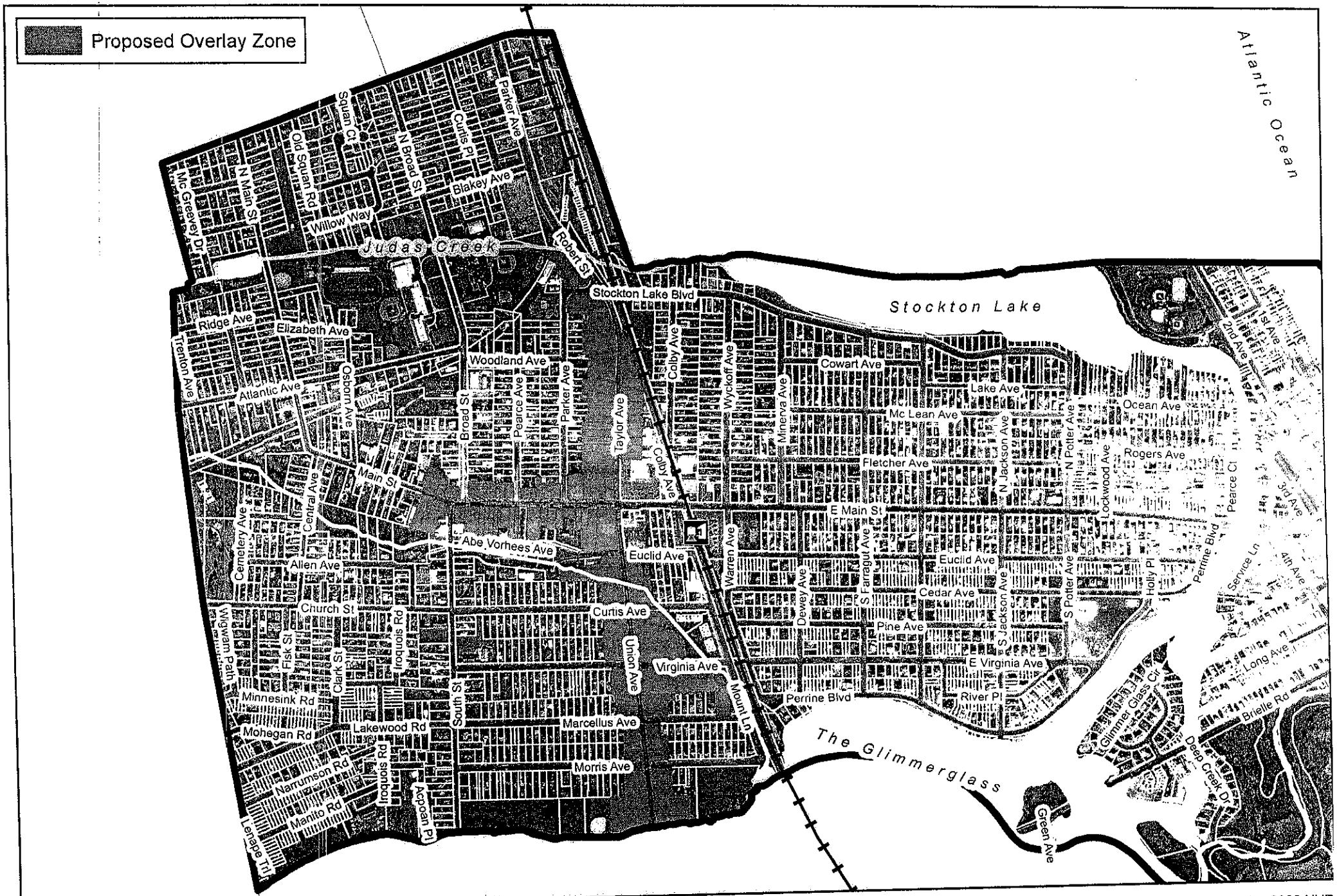
BOROUGH OF MANASQUAN:

By: _____
Edward Donovan, Mayor
On Behalf of the Borough of Manasquan

Dated: July 3, 2018

EXHIBIT A

Overlay Zone Map



LEON S. AVAKIAN, Inc.
Consulting Engineers

Created Mar-19-2018

Proposed Affordable Housing Overlay Zone

Borough of Manasquan
Monmouth County, New Jersey

Source: parcels NJGIN, Waterbodies 2002 NHD

0 0.1 0.2 0.4 Miles

NORTH

SETTLEMENT AGREEMENT

THIS SETTLEMENT AGREEMENT ("Agreement") made this 19th day of March 2019, by and between:

BOROUGH OF MANASQUAN, a municipal corporation of the State of New Jersey, County of Monmouth, having an address at 201 East Main Street, Manasquan, New Jersey 08736 (hereinafter the "Borough" or "Manasquan");

And

BROAD STREET 34 LLC, a New Jersey limited liability company with a business address of 126 Main Street, Manasquan, New Jersey 08736.

And

UNION AVENUE 33 LLC, a New Jersey limited liability company with a business address of 126 Main Street, Manasquan, New Jersey 08736.

BROAD STREET 34 LLC and UNION AVENUE 33 LLC are hereinafter referred to as "Developer." Collectively, the Borough and Developer shall be referred to as the "Parties."

WHEREAS, in compliance with the New Jersey Supreme Court's decision in In re Adoption of N.J.A.C. 5:96 and 5:97 by N.J. Council on Affordable Housing, 221 N.J. 1 (2015), July of 2015, the Borough filed an action with the Superior Court of New Jersey ("Court"), entitled In the Matter of the Application of the Borough of Manasquan, County of Monmouth, Docket No. MON-L-2508-15 seeking a Judgment of Compliance and Repose approving its Housing Element and Fair Share Plan (hereinafter "Affordable Housing Plan"), in addition to related reliefs (the "Compliance Action") and simultaneously filed a motion for temporary immunity, which was subsequently granted by the Court and is still in full force and effect; and

WHEREAS, the members of Developer filed a motion to intervene in the Borough's Compliance Action, which was denied, but is still an "interested party" in the case; and

WHEREAS, the Developer attended several mediations with Borough representatives, Borough professionals, the Court appointed Special Master, and a Settlement Conference with the Honorable Dennis E. O'Brien on June 11, 2018; and

WHEREAS, the sole member of BROAD STREET 34 LLC owns or controls the entity owning property identified on the Borough's tax map as Block 64, Lots 25.01, 25.02, 26 and 27 (the "Broad Street Site");

WHEREAS, UNION AVENUE 33 LLC is the owner or controls the entity owning property identified on the Borough's tax map as Block 66.02, Lot 31.01 (the "Union Avenue Site"); and

WHEREAS, in evaluating properties appropriate for inclusionary developments, the Borough has determined that the Broad Street Site and the Union Avenue Site present an available, approvable, developable, and suitable opportunity for such development N.J.A.C. 5:93-1.3; and

WHEREAS, subject to the adoption of ordinances with terms specified herein and subject further to Court approval of this agreement, the Borough has determined to incorporate the Broad Street Site and the Union Avenue Site identified in this Agreement into its Affordable Housing Plan; and

WHEREAS, the Affordable Housing Plan will include the Broad Street Site, which will be developed with up to twenty-two (22) market rate units (hereinafter the "Broad Street Project"), and the Union Avenue Site, which will be developed with up to twenty-three (23) units, of which nine (9) will be affordable to very low, low and moderate income households (hereinafter the "Union Avenue Project"), which represents a twenty percent (20%) affordable housing set-aside across the two projects (the Broad Street Project and the Union Avenue Project collectively referred to as the "Inclusionary Development"); and

WHEREAS, to ensure that the Broad Street Project and the Union Avenue Project generate affordable housing credits to be applied to the Borough's affordable housing obligations, as per N.J.A.C. 5:93-5.6(d), the certificates of occupancy for the two projects will be phased together and issued as if they were one project; and

WHEREAS, the affordable units within the Union Avenue Project shall comply with the Round 2 regulations of the New Jersey Council on Affordable Housing ("COAH"), the Uniform Housing Affordability Controls, N.J.A.C. 5:80-26.1 et seq. ("UHAC"), and all other applicable law, including a requirement that thirteen percent (13%) of all affordable units are available to very low income households, and said Inclusionary Developments shall be deed restricted for a period of at least 30 years; and

WHEREAS, all of the affordable units will be family rental units entitling the Borough to rental bonus credits up to the applicable rental bonus caps; and

WHEREAS, the Parties wish to enter into this Agreement, setting forth the terms, conditions, responsibilities and obligations of the Parties, and seek the Court's approval of this Agreement at a Fairness Hearing; and

NOW, THEREFORE, in consideration of the promises, the mutual obligations contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged by each of the Parties, the Parties hereto, each binding itself, its successors and assigns, do hereby covenant and agree, each with the other, as follows:

ARTICLE I – PURPOSE

1.1 The purpose of this Agreement is (a) to create a realistic opportunity for up to nine (9) affordable family rental units and up to forty-five (45) total units on the Broad Street Site and the Union Avenue Site; (b) to control the development of the Broad Street Project for no more than twenty-two (22) total units with no affordable units on the site and the Union Avenue Project for no more than twenty-three (23) total units with a twenty percent (20%) affordable housing set-aside of nine (9) units on the site if the total number of units produced is forty-five (45) as set forth herein. Nothing in this Agreement shall be construed to limit Developer's right to construct all forty-five (45) units. In the event that less than twenty-two (22) total units are generated on the Broad Street Site and/or less that twenty-three (23) total units are generated on the Union Avenue Site, the Developer will maintain a twenty percent (20%) affordable housing set-aside on the total number of units created, and the Borough's Realistic Development Potential ("RDP") will be adjusted downwards accordingly. The market rate units in both the Broad Street and the Union Avenue Projects may be rental or for-sale units.

1.2 The Broad Street Project shall be substantially consistent with the concept site plan, and rendering attached hereto and made a part hereof as **Exhibit A**, which has been reviewed and approved by the Borough and the Borough's professionals.

1.3 The Union Avenue Project shall be substantially consistent with the concept site plan, and rendering attached hereto and made a part hereof as **Exhibit B**, which has been reviewed and approved by the Borough and the Borough's professionals.

1.4 The Borough will also introduce and consider for a hearing an ordinance rezoning the Broad Street Site, which is attached hereto as **Exhibit C**.

1.5 The Borough will also introduce and consider for a hearing an ordinance rezoning the Union Street Site, which is attached hereto as **Exhibit D**.

1.6 The Broad Street Project and Union Avenue Project shall utilize materials provided on the materials list, which is attached hereto and made part hereof as **Exhibit E**, which has been reviewed and approved by the Borough and the Borough's professionals.

ARTICLE II - BASIC TERMS AND CONDITIONS

2.1 This Agreement is subject to Court approval following a duly noticed "Fairness Hearing".

2.2 In the event of any legal challenges to the Court's approval of this Agreement or the Required Approvals (defined in section 4.6), including a challenge by any third party, the Parties must diligently defend any such challenge and shall cooperate with each other regarding said defense. In addition, if any such challenge results in a modification of this Agreement or the Broad Street Project or the Union Avenue Project, the Parties must negotiate in good faith with

the intent to draft a mutually-acceptable amended Agreement, provided that no such modification requires an increase or decrease in density than that provided herein.

2.3 This Agreement does not purport to resolve all of the issues before the Court raised in the Compliance Action. In the event the Borough adopts the Ordinances rezoning the Broad Street Site and the Union Avenue Site and the Court approves this Settlement Agreement, but the Borough is unable to reach a settlement with Fair Share Housing Center ("FSHC") or any other person or entity, all of the Parties hereto are obligated to comply with their obligations under this Agreement including but not limited to the obligation to defend this Agreement.

ARTICLE III – DEVELOPER OBLIGATIONS

3.1 Obligation To File Development Applications In Accordance With Rezoning Ordinances, Concept Plans. Developer shall file development applications in accordance with the Ordinances rezoning the Broad Street Site and the Union Avenue Site. All such applications shall be substantially consistent with the concept plans, and renderings, attached hereto as **Exhibits A** and **B**, and the Zoning Ordinances attached hereto as **Exhibits C** and **D**, and will also incorporate the materials list attached hereto as **Exhibit E**. The Borough shall ensure that development applications are timely processed and heard by the Planning Board.

3.2 Obligation To Maintain 20 Percent Affordable Housing Set-Aside And To Comply With All Affordable Housing Laws. Developer, its successors and/or assigns shall have an obligation to deed-restrict twenty percent (20%) of the combined total residential units produced in the Broad Street Project and the Union Avenue Project. If the projects deliver the agreed upon forty-five (45) total units, then nine (9) family rental units will be affordable to very low, low and moderate income families. Developer shall not be subject to any payment in-lieu, or an affordable housing development fee.

3.3 Obligation To Phase The Affordable Units: Certificates of occupancy for both projects shall be issued in accordance with the phasing schedule provided within N.J.A.C. 5:93-5.6(d) to ensure that the affordable units are constructed. Final certificates of occupancy shall not be issued for units in the Broad Street Project until overall affordable unit/market unit phasing requirements are complied with for the Broad Street Project and the Union Avenue Project. Construction permits may be issued and closed out at either site, independently, and this requirement shall not act as a limitation on the timing of construction at either site.

3.4 Additional Affordable Housing Requirements: All of the affordable units in the Union Avenue Project shall comply with UHAC, the Borough's Affordable Housing Plan, the Borough's Affordable Housing Ordinance, any applicable order of the Court (including the Borough's eventual Judgment of Compliance and Repose Order or "JOR Order"), and other applicable laws. The Developer will also comply with the following provisions regarding the affordable units in the Union Avenue Project, which provisions shall prevail in the case of conflict with UHAC:

3.4.1 Deed Restriction Period: The Developer shall have an obligation to deed restrict the affordable units in the proposed project as very low, low or moderate income affordable units for a period of at least thirty (30) years

from the date of the initial occupancy of each affordable unit (the "Deed-Restriction Period"), until the Borough takes action to release the controls on affordability, so that the Borough may count each affordable unit against its obligation to provide affordable housing. The Parties agree that the affordability controls shall not expire until such time, after thirty (30) years from the date of initial occupancy that the Borough takes action to release the controls on affordability, and that, thereafter, the affordability controls shall continue in effect until the date on which the individual affordable rental unit shall become vacant, provided that the occupant household continues to earn a gross annual income of less than 80 percent of the applicable median income. See N.J.A.C. 5:80-26.11(b). If, at any time after the release of the affordability controls by the Borough, a rental household's income is found to exceed 80 percent of the regional median income, the rental rate restriction shall expire at the later of either the next scheduled lease renewal or sixty (60) days. See Ibid.

3.4.2 **Deed Restriction**: The Developer shall execute and record a Deed Restriction for the affordable units in a form acceptable to both Parties before the first Certificate of Occupancy is issued for the Inclusionary Development. The Deed Restriction will be recorded in the Monmouth County Clerk's office. The Borough shall take all actions necessary to release and discharge the Deed Restriction with respect to each affordable unit upon the expiration of the Deed Restriction Period with respect to such unit, subject to the terms of 3.4.1 hereof.

3.4.3 **Income Distribution Requirements**: Thirteen percent (13%) of the total number of the affordable family rental units in the Union Avenue Project must be very low income units, thirty-seven (37%) of the total number of affordable rental units must be low income units, and the remaining fifty percent (50%) must be moderate income rental units. If the Union Avenue Project delivers 9 total affordable units, one (1) will be a very low income unit, four (4) will be low income units, and four (4) will be moderate income units.

3.4.4 **Bedroom Mix**: At least twenty percent (20%) of the affordable units will be three bedroom units, and no more than twenty percent (20%) of the affordable units will be one bedroom units. The remainder of the affordable units will be two bedroom units. If the Union Avenue Project delivers nine (9) total affordable units, at least two (2) of the units will be three bedroom units, no more than one (1) of the units will be a one bedroom unit and the remaining six (6) units will be two bedroom units.

3.4.5 **Other Affordable Housing Unit Requirements**: The Developer will also comply with all of the other requirements of UHAC and the Borough's Affordable Housing Ordinance, including, but not limited to, (1) affirmative marketing requirements, (2) candidate qualification and screening

requirements, (3) phasing requirements, and (4) integrating the affordable units amongst the market rate units in the Union Avenue Project.

3.4.6 **Administrative Agent**: The Developer shall contract with a qualified and experienced third party administrative agent, which may be the Borough's administrative agent (the "administrative agent") for the administration of the affordable units and shall have the obligation to pay all costs associated with properly deed restricting the affordable units in accordance with this Agreement for the Deed-Restriction Period. The Developer and its administrative agent shall work with the Borough and the Borough's administrative agent, should the Developer's and the Borough's administrative agent not be one and the same, regarding any affordable housing monitoring requirements imposed by COAH or the Court. The Developer shall provide, within thirty (30) days after written notice, detailed information reasonably requested by the Borough or the Borough's administrative agent, should the Developer's and the Borough's administrative agent not be one and the same, concerning the Developer's compliance with UHAC, the Borough's Affordable Housing Ordinance, the Borough's Amended Affordable Housing Plan, all applicable Court orders (including the Borough's JOR), and other applicable laws.

3.4.7 **Inclusion Of Affordable Units In The Borough's Affordable Housing Plan**: The Parties agree that all of the affordable units in the Union Avenue Project will be included in the Borough's Affordable Housing Plan, which will be approved by the Court at a Compliance Hearing, and will be memorialized in a JOR Order, and that the affordable housing credits generated by the Union Avenue Project will be applied against the Borough's Realistic Development Potential ("RDP").

3.4.8 **UHAC**. Notwithstanding anything to the contrary contained herein, to the extent there is any discrepancy between UHAC and the Borough's Affordable Housing Ordinance and/or UHAC and this Agreement, the terms of the Borough's Affordable Housing Ordinance and/or this Agreement, not UHAC, shall control.

3.5 **Obligation to post Escrows**. Developer shall post escrows to cover the costs of the Borough's and Planning Board's professionals in conjunction with their review of Developer's development applications, which costs shall include, by way of example, the cost to review submissions of the applicant and other relevant documents and to testify about the reports reviewed. All such escrows shall be governed by the requirements of the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq. ("MLUL").

3.6 **Obligation To Comply With Reasonable Conditions of Approval**. Developer acknowledges that as a condition of preliminary and/or final site plan and/or subdivision approval, Planning Board may require on-site and off-site improvements only as permitted by N.J.S.A. 40:55D-42. Developer shall comply with all such reasonable conditions and shall confine any challenge to any condition of approval to an attempt to rectify the contested condition.

3.7 Developer shall perform, at its expense, any studies the Planning Board or other Borough Board, commission or other entity with jurisdiction may reasonably, and lawfully, require with respect to any infrastructure improvements necessitated by the Broad Street and Union Avenue projects.

3.8 Developer accepts and will comply with the requirement that any development approval granted by Planning Board for the Broad Street Site or the Union Avenue Site, shall incorporate by reference this Agreement, shall be consistent with all terms and provisions of this Agreement, and shall include an express condition requiring compliance by the Parties with all obligations under this Agreement.

3.9 Obligation Not To Oppose Borough's Application for Approval of its Affordable Housing Plan. Developer will cooperate with and support the Borough's subsequent request for entry of a Judgment of Compliance and Repose provided that the Borough's Affordable Housing Plan includes the inclusion of the Broad Street Site and the Union Avenue Site consistent with this Agreement, and will support the settled upon fair share and will not otherwise challenge the validity of the Borough's Affordable Housing Plan.

3.10 Obligation to Cooperate. Developer and Borough shall each have the obligation to cooperate and advance the intent and purposes of this Agreement.

ARTICLE IV - OBLIGATIONS OF THE BOROUGH

4.1 The Rezoning Ordinance. Within sixty (60) days of the approval of this Agreement by Court Order after a properly noticed Fairness or Compliance Hearing is held, the Borough shall introduce the zoning ordinances attached hereto as **Exhibits C** and **D** (hereinafter the "Rezoning Ordinances") that will permit the development of the Broad Street Site and the Union Avenue Site consistent with the Rezoning Ordinances, and reasonably consistent with the attached concept site plans, and renderings (collectively attached as **Exhibits A** and **B)** that allows for the development of the Broad Street Site for the construction of 22 market rate residential units, and the Union Avenue Site for the construction of 23 residential units, of which nine (9) units will be set-aside as affordable family rental units. The Rezoning Ordinances will require a twenty percent (20%) set-aside across both of the proposed projects and will require all affordable units to be constructed in accordance with all applicable UHAC and COAH regulations, including all required phasing requirements.

4.2 Upon introduction of the Rezoning Ordinances, the Borough shall refer the Rezoning Ordinances to the Planning Board for review and recommendation at the Planning Board's next regularly scheduled meeting.

4.3 At the next regularly scheduled Borough Council meeting after a recommendation has been made by the Planning Board regarding the Rezoning Ordinances, the Borough will vote on the approval of the Rezoning Ordinances.

4.4 In the event that the Rezoning Ordinances shall not be adopted as aforesaid, then the Parties to this Agreement shall be restored, *status quo ante*, to their respective positions prior to the execution of this Agreement, and no party shall be entitled to use this Agreement to the

disadvantage of the other in any future litigation.

4.5 Obligation To Include Project Into Borough's Affordable Housing Plan. The Borough shall incorporate this Inclusionary Development, this Agreement and the Rezoning Ordinances into the Affordable Housing Plan for which it seeks the Court's approval. The Borough agrees that, absent written consent of Developer, or its successors in title, the Rezoning Ordinances shall remain applicable to the Property until, at minimum, the conclusion of the Third Round compliance period (July 2, 2025), and may only be removed from the Affordable Housing Plan with the approval of the Court on Notice to Developer and its successors.

4.6 Obligation To Cooperate. The Borough acknowledges that in order for Developer to construct the Broad Street and Union Avenue Projects, the Developer will be required to obtain any and all approvals and permits from (1) entities, boards or agencies which are under the jurisdiction of the Parties to this Agreement, and from (2) all relevant public entities and utilities; such as, by way of example only, the Borough, the Planning Board, the County of Monmouth, the Monmouth County Planning Board, the New Jersey Department of Environmental Protection, and the New Jersey Department of Transportation (collectively, "Required Approvals"). The Borough agrees to use all reasonable efforts to assist Developer in its undertakings to obtain the Required Approvals on an expedited basis provided that the taxes on the subject property are current. The Developer shall be responsible for the Borough's costs incurred in conjunction with providing cooperation to the extent permitted by ordinance, New Jersey statute or regulation. The Borough further acknowledges that the Broad Street and Union Avenue Projects as depicted on the concept site plans and renderings attached hereto may require modification to comply with the Required Approvals and the conditions imposed by the Required Approvals, and that deviations and reasonable variances and waivers from the Ordinances may be required to comply with the Required Approvals and effectuate the intent and purpose of this Agreement. This Settlement Agreement in no way obligates the Planning Board to approve any relief requested.

4.7 Obligation to Maintain Proposed Re-Zoning of Property. The Borough agrees that if a decision of a court of competent jurisdiction in Monmouth County, or a determination by an administrative agency responsible for implementing the Fair Housing Act, or an action by the New Jersey Legislature, would result in a calculation of an affordable housing obligation for the Borough for the period 1987-2025 that would lower the Borough's affordable housing obligation beyond that established by COAH for the period 1987-1999 and/or this Court for the period 1999-2025, the Borough shall nonetheless implement the Rezoning Ordinances contemplated by this Agreement, and take all steps necessary to support the development of the Broad Street Project and the Union Avenue Project as they are contemplated by this Agreement.

4.8 Obligation to Provide Developer Relief from Cost-Generative Features and/or Requirements. The Borough recognizes that as inclusionary developments, within the meaning of the Mount Laurel doctrine, the Broad Street Project and the Union Avenue Projects are entitled to certain relief from cost-generative features as defined by relevant law.

ARTICLE V – MUTUAL OBLIGATIONS

5.1 Obligations Regarding Costs. Except as set forth herein, each Party shall be responsible for its own costs and expenses associated with seeking Court approval for and implementing this Agreement. The foregoing provision shall not be construed to preclude joint representation of Borough and Planning Board in any litigation or other proceeding.

5.2 Obligation To Comply with State Regulations. The Parties shall comply with any and all Federal, State, County and local laws, rules, regulations, statutes, ordinances, permits, resolutions, judgments, orders, decrees, directives, interpretations, standards, licenses, approvals, and similarly binding authority, applicable to the Inclusionary Development or the performance by the Parties of their respective obligations or the exercise by the Parties of their respective rights in connection with this Agreement.

5.3 Mutual Good Faith, Cooperation and Assistance. The Parties shall exercise good faith, cooperate, and assist each other in fulfilling the intent and purpose of this Agreement, including, but not limited to, the approval of this Agreement by the Court, the Approvals, the development of the Property consistent with the terms hereof, and the defense of any challenge with regard to any of the foregoing.

5.4 Defense of Agreement. Each Party exclusively shall be responsible for all costs which they may incur in obtaining Court approval of this Agreement and any appeal therefrom, or obtaining the Required Approvals or the approval of the Affordable Housing Plan or any part thereof. The Parties shall diligently defend any such challenge.

5.5 Notices. Any notice or transmittal of any document required, permitted or appropriate hereunder and/or any transmittal between the Parties relating to the Property (herein "Notice[s]") shall be written and shall be served upon the respective Parties by facsimile or by certified mail, return receipt requested, or recognized overnight or personal carrier such as, for example, Federal Express, with certified proof of receipt, and, where feasible (for example, any transmittal of less than fifty (50) pages), and in addition thereto, a facsimile delivery shall be provided. All Notices shall be deemed received upon the date of delivery set forth in such certified proof, and all times for performance based upon notice shall be from the date set forth therein. Delivery shall be affected as follows, subject to change as to the person(s) to be notified and/or their respective addresses upon ten (10) days' notice as provided herein:

TO DEVELOPER:

BROAD STREET 34 LLC
Attention: William Sepe
126 Main Street
Manasquan, NJ 08736

UNION AVENUE 33 LLC
Attention: William Sepe
126 Main Street
Manasquan, NJ 08736

WITH COPIES TO: **Giordano, Halleran & Ciesla**
Attention: John A. Sarto, Esq.
125 Half Mile Road, Suite 300
Red Bank, NJ 07701-6777
jsarto@ghclaw.com

TO THE BOROUGH OF MANASQUAN:

Borough Of Manasquan
Attention: Thomas Flarity, Borough Administrator
201 East Main Street
Manasquan, NJ 08736

WITH COPIES TO: **King, Kitrick, Jackson and McWeeney, LLC**
Attention: Mark G. Kitrick, Esq.
2329 Highway 34, Suite 104.
Manasquan, NJ 08736

AND TO: **Jeffrey R. Surenian and Associates, LLC**
Attention: Erik C. Nolan, Esq.
707 Union Avenue, Suite 301
Brielle, NJ 08730

In the event any of the individuals identified above has a successor, the individual identified shall name the successor and notify all others identified of their successor. Notice by counsel for a party shall be effective for all purposes.

ARTICLE VI - MISCELLANEOUS

6.1 Severability. Unless otherwise specified, it is intended that the provisions of this Agreement are to be severable. The validity of any article, section, clause or provisions of this Agreement shall not affect the validity of the remaining articles, sections, clauses or provisions hereof. If any section of this Agreement shall be adjudged by a court to be invalid, illegal, or unenforceable in any respect, such determination shall not affect the remaining sections.

6.2 Successors Bound. The provisions of this Agreement shall run with the land, and the obligations and benefits hereunder shall be binding upon and inure to the benefit of the Parties, their successors and assigns, including any person, corporation, partnership or other legal entity which at any particular time may have a fee title interest in the Property which is the subject of this Agreement. This Agreement may be enforced by any of the Parties, and their successors and assigns, as herein set forth.

6.3 Governing Law. This Agreement shall be governed by and construed by the laws of the State of New Jersey.

6.4 No Modification. This Agreement may not be modified, amended or altered in any way except by a writing signed by each of the Parties. A change to the concept site plans or

renderings to comply with the Required Approvals, as referenced in Section 4.6, shall not constitute a modification, amendment or alteration.

6.5 Effect of Counterparts. This Agreement may be executed simultaneously in one (1) or more facsimile or e-mail counterparts, each of which shall be deemed an original. Any facsimile or e-mail counterpart forthwith shall be supplemented by the delivery of an original counterpart pursuant to the terms for notice set forth herein.

6.6 Voluntary Agreement. The Parties acknowledge that each has entered into this Agreement on its own volition without coercion or duress after consulting with its counsel, that each party is the proper person and possess the authority to sign the Agreement, that this Agreement contains the entire understanding of the Parties and that there are no representations, warranties, covenants or undertakings other than those expressly set forth herein.

6.7 Interpretation. Each of the Parties hereto acknowledges that this Agreement was not drafted by any one of the Parties, but was drafted, negotiated and reviewed by all Parties, and, therefore, the presumption of resolving ambiguities against the drafter shall not apply. Each of the Parties expressly represents to the other Parties that: (a) it has been represented by counsel in connection with negotiating the terms of this Agreement; and (b) it has conferred due authority for execution of this Agreement upon the person(s) executing it.

6.8 Necessity of Required Approvals. The Parties recognize that the site plans required to implement the Inclusionary Development provided in this Agreement, and such other actions as may be required of the Planning Board or Borough under this Agreement, cannot be approved except on the basis of the independent reasonable judgment by the Planning Board and the Borough Council, as appropriate, and in accordance with the procedures established by law. Nothing in this Agreement is intended to constrain that judgment or to authorize any action not taken in accordance with procedures established by law, however, in accordance with procedures established by law, the Planning Board's judgment must not be arbitrary, capricious, or unreasonable in its consideration of the application. Similarly, nothing herein is intended to preclude Developer from appealing any denials of or conditions imposed by the Planning Board in accordance with the MLUL or taking any other action permitted by law.

6.9 Schedules. Any and all Exhibits and Schedules annexed to this Agreement are hereby made a part of this Agreement by this reference thereto. Any and all Exhibits and Schedules now and/or in the future are hereby made or will be made a part of this Agreement with prior written approval of both Parties.

6.10 Entire Agreement. This Agreement constitutes the entire agreement between the parties hereto and supersedes all prior oral and written agreements between the parties with respect to the subject matter hereof except as otherwise provided herein.

6.11 Conflict of Interest. No member, official or employee of the Borough or the Planning Board shall have any direct or indirect interest in this Agreement, nor participate in any decision relating to the Agreement which is prohibited by law, absent the need to invoke the rule of necessity.

6.12 Effective Date. Anything herein contained to the contrary notwithstanding, the effective date ("Effective Date") of this Agreement shall be the date upon which the last of the Parties to execute this Agreement has executed and delivered this Agreement.

6.13 Waiver. The Parties agree that this Agreement is enforceable. Each of the Parties waives all rights to challenge the validity or the ability to enforce this Agreement. Failure to enforce any of the provisions of this Agreement by any of the Parties shall not be construed as a waiver of these or other provisions.

6.14 Captions. The captions and titles to this Agreement and the several sections and subsections are inserted for purposes of convenience of reference only and are in no way to be construed as limiting or modifying the scope and intent of the various provisions of this Agreement.

6.15 Default. In the event that any of the Parties shall fail to perform any material obligation on its part to be performed pursuant to the terms and conditions of this Agreement, unless such obligation is waived by all of the other Parties for whose benefit such obligation is intended, or by the Court, such failure to perform shall constitute a default of this Agreement. Upon the occurrence of any default, the non-defaulting Party shall provide notice of the default and the defaulting Party shall have a reasonable opportunity to cure the default within forty-five (45) days. In the event the defaulting Party fails to cure within forty-five (45) days, or such reasonable period of time as may be appropriate to take actions to cure the default in compliance with the laws of New Jersey, the Party(ies) for whose benefit such obligation is intended shall be entitled to exercise any and all rights and remedies that may be available in equity or under the laws of the State of New Jersey, including the right of specific performance to the extent available. Further, the Parties may apply to the Court for relief, by way of a motion for enforcement of litigant's rights.

6.16 Notice of Actions. The Parties and their respective counsel agree immediately to provide each other with notice of any lawsuits, actions or governmental declarations threatened or pending by third parties of which they are actually aware which may affect the provisions of this Agreement.

6.17 Construction, Resolution of Disputes. This Agreement has been entered into and shall be construed, governed and enforced in accordance with the laws of the State of New Jersey without giving effect to provisions relating to the conflicts of law. Jurisdiction of any litigation ensuing with regard to this Agreement exclusively shall be in the Superior Court of New Jersey, with venue in Monmouth County. Service of any complaint may be effected consistent with the terms hereof for the delivery of "Notices," hereinafter defined. The Parties waive formal service of process. The Parties expressly waive trial by jury in any such litigation.

6.18 Conflicts. The Parties acknowledge that this Agreement cannot be affected by the Compliance Action or any amendments to the Borough's Affordable Housing Plan or Land Use and Development Ordinances and this Agreement shall control with respect to those matters as applied to the Property. Upon the entry of a Judgment of Compliance and Repose in the Borough's Compliance Action, and after the Compliance Action is concluded, the Court shall retain jurisdiction to ensure compliance with the terms and conditions of this Agreement. As to any inconsistencies between the Approvals and this Agreement, the Approvals shall control. Any

expenses of the Court appointed Special Master to resolve conflicts that may arise subsequent to the entry of this Agreement shall be split evenly between the Borough and Developer.

6.19 Recitals. The recitals of this Agreement are incorporated herein and made a part hereof.

THE REMAINDER OF THIS PAGE IS PURPOSEFULLY BLANK

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be properly executed, their corporate seals affixed and attested and this Agreement to be effective as of the Effective Date.

Attest:

Sally J Cavallers

Print Name: Sally J Cavallers

BROAD STREET 34 LLC

By: [signature]

Print Name: William Sepe

Date: March 13, 2019

Attest:

Sally J Cavallers

Print Name: Sally J Cavallers

UNION AVENUE 33 LLC

By: [signature]

Print Name: William Sepe

Date: March 13, 2019

Attest:

Barbara Ilaria

Print Name: Barbara Ilaria

BOROUGH OF MANASQUAN,
A Municipal Corporation of the
State of New Jersey

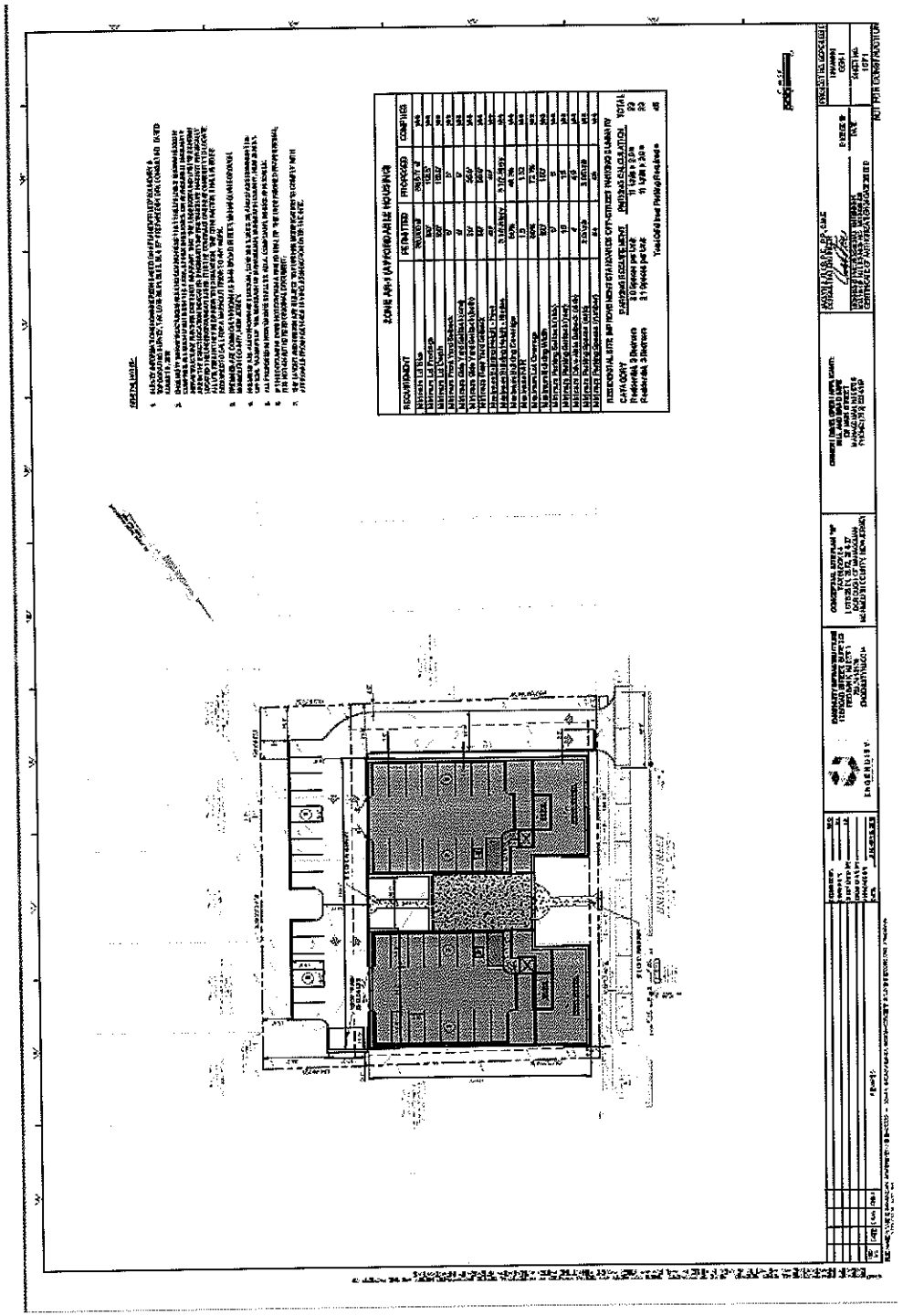
By: Edward G Donovan

Print Name: Edward G. Donovan

Date: March 19, 2019

EXHIBIT A

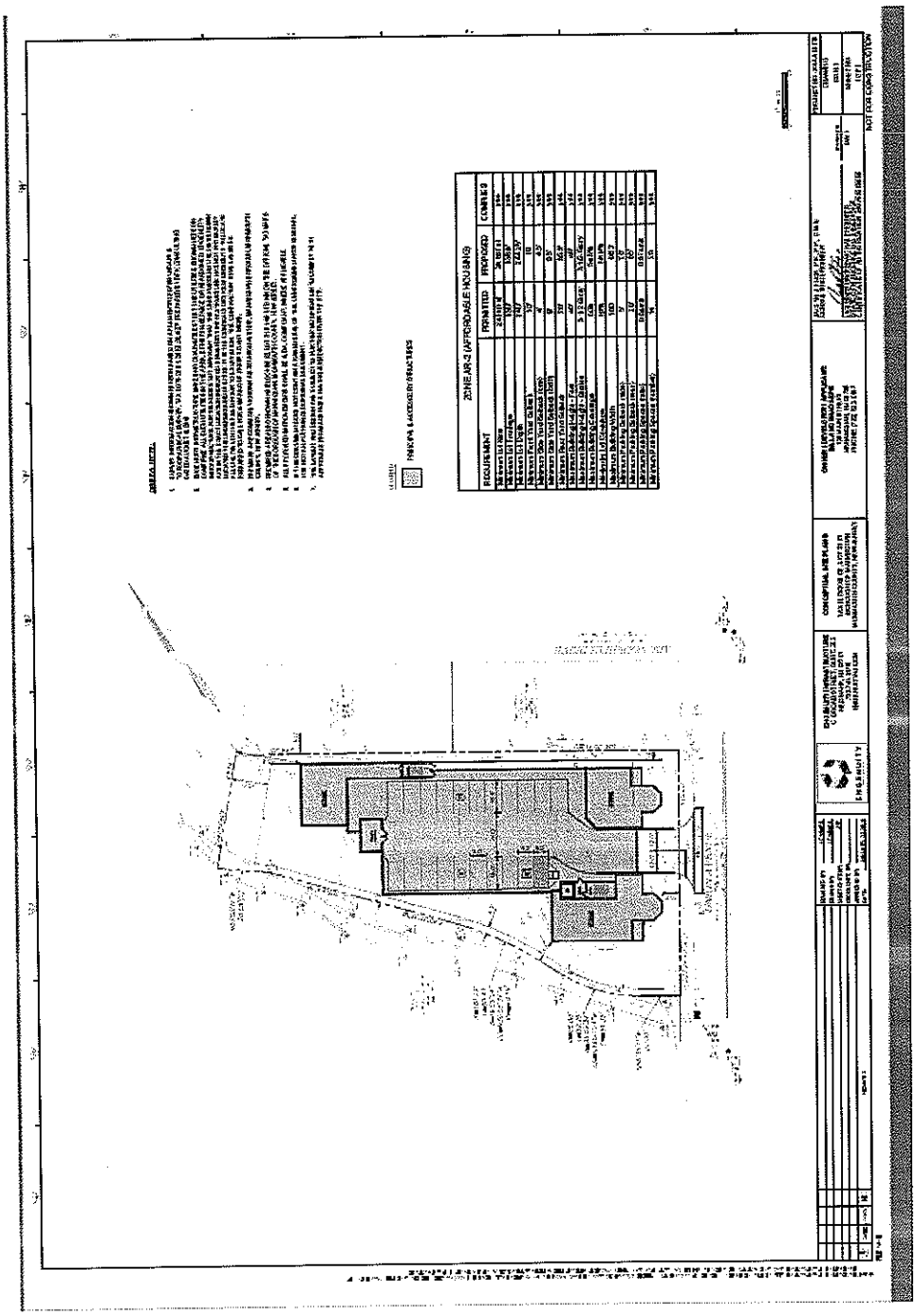
CONCEPT SITE PLAN AND RENDERING FOR THE BROAD STREET PROJECT



MICHAEL JAMES MONROE
·ARCHITECT·

EXHIBIT B

CONCEPT SITE PLAN AND RENDERING FOR THE UNION AVENUE PROJECT



MICHAEL JAMES MONROE
·ARCHITECT·

EXHIBIT C

ZONING ORDINANCE FOR THE BROAD STREET PROJECT

Affordable Housing AR-1 Zone

The purpose of the Affordable Housing AR-1 Zone ("AR-1 Zone") is to provide for the development of a multi-family inclusionary development designed to assist the Borough in satisfying its combined Prior Round and Round 3 (1999-2025) Realistic Development Potential ("RDP") affordable housing obligation through construction of affordable units set aside for low and moderate income households. The AR-1 Zone shall comprise the following tax lots: Lots 25.01, 25.02, 26 & 27, Block 64. This Ordinance is adopted in furtherance of the Settlement Agreement entered into between the Borough and Fair Share Housing Center ("FSHC") on July 2, 2018 (hereinafter the "FSHC Settlement Agreement"), the Settlement Agreement entered into between the Borough and Broad Street 44, LLC and Union Avenue 33, LLC (hereinafter the "Sepe Settlement Agreement"), and in connection with the Borough's Mount Laurel litigation captioned at MON-L-2508-15.

(1) Permitted principal uses. Residential within a single multi-family building. A maximum of twenty-two (22) units are permitted, and all units shall be market rate. The affordable housing obligation generated by this development shall be provided off-site pursuant to the terms of the Sepe Settlement Agreement, which provides that COs shall not be issued for units in this zone until overall affordable unit/market unit phasing requirements are complied with for the Broad Street site and the Union Avenue site.

(2) Permitted accessory uses.

(a) Off-street parking facilities.

(b) Other uses that are customarily incidental to a permitted principal use. No sheds are permitted on the property.

(c) Common facilities and amenities serving the residents of the multi-family developments including swimming pools and other on-site recreational areas and facilities, common walkways, sitting areas and gardens, and other similar uses.

(d) Fences and walls erected, maintained or planted no greater than six (6) feet above ground level within a side or rear yard, and no greater than four (4) feet within a front yard, and otherwise in accordance with the standards of Section 35-7.5.

(e) Bike racks.

(f) Solid waste and recycling area, setback at least five (5) feet from any rear yard or side yard. No setback from the parking area is required. The area shall be screened from view from a public right-of-way by a combination of block and chain link fence, and shall have gated access.

(g) Site lighting. The arrangement of exterior lighting shall adequately illuminate parking areas, and prevent glare to adjoining residential areas.

(3) Prohibited uses.

(a) Parking or storage of boats, boat trailers, motor homes, taxi cabs, limousines, construction equipment, commercial vehicles and recreational vehicles.

(4) Bulk, area and building requirements.

(a) Minimum lot size 36,000 square feet

(b) Minimum lot frontage	190 feet
(c) Minimum lot depth	180 feet
(d) Minimum front yard setback	5 feet
(e) Minimum one side yard setback	6 feet
(f) Minimum both side yard setback	20 feet
(g) Minimum rear yard setback	50 feet
(h) Maximum building height	40 feet / 3.5 stories[1]
(i) Maximum building coverage	50%
(j) Maximum floor area ratio	1.5
(k) Maximum lot coverage	80%
(l) Maximum Building Width	160 feet
(m) Minimum parking setback from side lot line	5 feet
(n) Minimum parking setback rear from lot line	15 feet
(o) Minimum drive aisle setback from a side lot line	4 feet

(5) Site access, off-street parking, and loading requirements.

(a) One site access driveway shall be provided with a minimum width of 22 ft.

(b) Number of spaces, and parking space dimensions, as required by New Jersey Residential Site Improvement Standards at N.J.A.C. 5:21-1.1 et seq. shall apply, notwithstanding any standards to the contrary in the zoning ordinance.

(c) Parking shall be in the rear yard, and may also be provided beneath the principal building, without setback from a principal or accessory building.

(d) No Loading space is required.

(6) Landscape Buffer. Adjacent to a residential zone a fifteen (15) foot buffer, a 5 foot portion of which must be planted, landscaped and provides irrigation. Landscaping along the public right-of-way is not required.

(7) Identification Sign. One (1) wall mounted, non-illuminated address sign is permitted with a maximum sign area of five (5) square feet

(8) Design Standards. A multi-family building should have a unified theme, displayed through the application of common building materials consistent with the rendering attached to the Sepe Settlement Agreement as Exhibit A, and materials list as Exhibit E, or as may be modified as permitted by the Settlement Agreement. If the rendering conflicts with design standards or regulations within the zoning ordinance the rendering shall control.

(9) Miscellaneous. The standards of Section 35-7.9 b and e shall not apply.

[1] Chimneys and cupolas are not counted towards building height.

EXHIBIT D

ZONING ORDINANCE FOR THE UNION AVENUE PROJECT

Affordable Housing AR-2 Zone

The purpose of the Affordable Housing AR-2 Zone ("AR-2 Zone") is to provide for the development of a multi-family inclusionary development designed to assist the Borough in satisfying its combined Prior Round and Round 3 (1999-2025) Realistic Development Potential ("RDP") affordable housing obligation through construction of affordable units set aside for low and moderate income households. The AR-2 Zone shall comprise the following tax lots: Lot 31.01, Block 66.02. This Ordinance is adopted in furtherance of the Settlement Agreement entered into between the Borough and Fair Share Housing Center ("FSHC") on July 2, 2018 (hereinafter "FSHC Settlement Agreement"), the Settlement Agreement entered into between the Borough and Broad Street 33, LLC and Union Avenue 33, LLC (hereinafter the "Sepe Settlement Agreement"), and in connection with the Borough's Mount Laurel litigation captioned at MON-L-2508-15.

(1) Permitted principal uses. Market rate and affordable residential housing within a multi-family building. A maximum of twenty-three (23) units are permitted, with an on-site affordable housing set-aside provided. The required affordable housing set-aside shall be twenty percent (20%) of the total number of units developed at this site (Lot 31.01, Block 66.02), and the site known as Lots 25.01, 25.02, 26 & 27, Block 64 (the "Broad Street Site"). For example, it is anticipated that a total of 45 residential units will be developed at both sites, which will require a twenty percent (20%) affordable housing set-aside of nine (9) total affordable family rental housing units to be developed on the Union Avenue site. In addition, the affordable housing phasing requirement in the Sepe Settlement Agreement will apply to both the Broad Street Site and the Union Avenue Site.

(2) Permitted accessory uses.

(a) Off-street parking facilities

(b) Other uses that are customarily incidental to a permitted principal use.

(c) Common facilities and amenities serving the residents of the multi-family developments including swimming pools and other on-site recreational areas and facilities, common walkways, sitting areas and gardens, and other similar uses.

(d) Fences and walls erected, maintained or planted no greater than six (6) feet above ground level within a side or rear yard, and no greater than four (4) feet within a front yard, and otherwise in accordance with the standards of Section 35-7.5.

(e) Bike racks.

(f) Solid waste and recycling area, setback at least five (5) ft. from any rear or side yard. No setback from the parking area is required. The area shall be screened from view from a public right-of-way by either an enclosed by a combination of block and chain link fence, and shall have gated access.

(g) Site lighting. The arrangement of exterior lighting shall adequately illuminate parking areas, and prevent glare to adjoining residential areas.

(3) Prohibited uses.

(a) Parking or storage of boats, boat trailers, motor homes, taxi cabs, limousines, construction equipment, commercial vehicles and recreational vehicles.

(4) Bulk, area and building requirements.

(a) Minimum lot size	24,000 square feet
(b) Minimum lot frontage	130 feet
(c) Minimum lot depth	240 feet
(d) Minimum front yard setback	10 feet
(e) Minimum one side yard setback	4 feet
(f) Minimum both side yard setback	9feet
(g) Minimum rear yard setback	20 feet
(h) Maximum building height	40 feet/ 3.5 stories[2]
(i) Maximum building coverage	60%
(j) Maximum lot coverage	60%
(k) Maximum Building Width	100 feet
(l) Maximum Building Length	200 feet
(m) Minimum parking setback from side lot line	5 feet
(n) Minimum parking setback rear from lot line	20 feet

(5) Site access, off-street parking, and loading requirements.

(a) One site access driveway shall be provided with a minimum width of 24 ft.

(b) Number of parking spaces = .6/ unit[3]

(c) Parking shall be in the rear yard, and may also be provided beneath the principal building, without setback from a principal or accessory building.

(d) No Loading space is required.

(6) Identification Sign. One (1) wall mounted, non-illuminated address sign is permitted with a maximum sign area of five (5) square feet.

(7) Design Standards. A multi-family building should have a unified theme, displayed through the application of common building materials consistent with the rendering attached to the Sepe Settlement Agreement as Exhibit B, and the material list as Exhibit E, or as may be modified as permitted by the Settlement Agreement. If the rendering conflicts with design standards or regulations within the zoning ordinance the rendering shall control.

(8) Miscellaneous. The standards of Section 35-7.9 b and e shall not apply.

---

[1] Chimneys and cupolas are not counted towards building height.

[2] The off-street parking requirement can be met through use of available on-street parking. Shared parking arrangements with properties within ½ mile of the site shall also be permitted.

EXHIBIT E

MATERIALS LIST

The Developer or its successor may utilize any combination of the materials listed.

Cladding:

- Wood-like synthetic material
- Fiber-cement
- Stucco
- Vinyl

Roofing:

- Asphalt shingle
- Slate and synthetic slate
- Metal

Base of building:

- Stone and cultured stone
- Brick and brick veneer

Trim:

- Cellular PVC, solid urethane, fiber-cement board, and vinyl.

Windows:

- Vinyl, fiberglass, aluminum clad.

Soffits:

- Solid urethane, wood composite, vinyl.

Gutters and Downspouts:

- Metal or aluminum.

Exterior Columns:

- Wood composite, fiberglass.

Railings:

- Wood composite, metal, and aluminum.

Cupolas:

- Cellular PVC, solid urethane, fiber-cement board, vinyl, asphalt shingle, slate, synthetic slate, and metal.

Chimneys:

- Brick, brick veneer, cultured stone, or cladding material.

ENGENUITY
INFRASTRUCTURE

ENGenuity Infrastructure™
2 Bridge Avenue, Suite 323, Red Bank, NJ 07701
732.741.3176 | engenuitynj.com

SEPE-00020 July 16, 2020

Attn: Mary Salerno, Secretary
Manasquan Borough Planning Board
201 East Main Street
Manasquan, New Jersey 08736

Re: Boro File No. MSPB-R1160 Site Plan – Broad Street 34, LLC
Block 64, Lots 25.01, 25.02, 26 & 27
34, 36, 40 & 44 Broad Street AR-1 Affordable Housing
Borough of Manasquan, Monmouth County, NJ

Dear Ms. Salerno:

Please accept this letter in response to the Board Engineer's letter dated February 13, 2020 and the Fire Marshal review letter dated January 24, 2020. We offer the following responses for the Board's consideration; the Board Engineer's comments are in *italics* and our comments are in **bold**:

Project Description

As per your request, I have reviewed the above-referenced application in accordance with the provisions of the Borough Land Development Ordinance. The documents reviewed in conjunction with this application include:

1. *Preliminary and Final Major Site Plan prepared by Jaclyn Flor, PE, PP, of Engenuity Infrastructure, LLC, dated October 25, 2019.* **Updated plans last revised July 7, 2020 submitted herewith.**

2. *Architectural Layout and Elevations prepared by Michael Monroe, RA, dated July 30,2019.* **Updated plans prepared by Appel Design Group, dated June 18, 2020 submitted herewith.**

3. *Stormwater Management Report prepared by Jaclyn Flor, PE, PP, of Engenuity Infrastructure, LLC, dated October 23, 2019.* **Updated report dated July 6, 2020 submitted herewith.**

4. *Boundary & Topographic Survey prepared by James Heiser, PLS, of DPK Consulting, dated August 9, 2018.*

5. *Traffic and Parking Evaluation prepared by Lee Klein, PE, PTOE, of Klein Traffic Consulting, LLC, dated June 18, 2019, last revised January 22, 2020.*

6. ***Stormwater Management Operation & Maintenance Manual prepared by Jaclyn Flor, PE, PP, of Engenuity Infrastructure, LLC, dated July 6, 2020. Submitted herewith.***

Attn: Mary Salerno, Secretary
Manasquan Borough Planning Board
Re: Boro File No. MSPB-R1160 Site Plan – Broad Street 34, LLC
Block 64, Lots 25.01, 25.02, 26 & 27
34, 36, 40 & 44 Broad Street AR-1 Affordable Housing
Borough of Manasquan, Monmouth County, NJ

The property is located in the AR-1 Affordable Housing Zone with frontage on Broad Street. With this application, the applicant is proposing to construct an approximately 16,630 square foot, three story, apartment building, with fourteen (14) two bedroom units, and eight (8) three bedroom units between the second and third floors. Associated parking and site improvements are also proposed. The application is deemed complete as of February 13, 2020. **Informational.**

The following are our comments and recommendations regarding this application:

Zoning

1. *The property is located in the AR-1 Affordable Housing Zone. The proposed multi- unit residential use of is permitted in the zone.* **Informational.**

2. *The AR-1 Zone was created for this project as part of a settlement agreement with the borough and zoning standards which reflect the layout are included as part of the agreement. The following items were shown as proposed on the settlement exhibits. These standards are normally requirements for this type of multi-unit project, but are not met with this application:*

   a. *A minimum parking space size of 9'x19' is required, whereas 9'x18' spaces are proposed.* **Section 5(b) of the AR-1 zoning Ordinance indicates "Number of spaces, and parking space dimensions, as required by New Jersey Residential Site Improvement Standards at N.J.A.C. 5:21-1.1 et seq. shall apply, notwithstanding any standards to the contrary in the zoning ordinance." Whereas 9'X18' parking stall dimensions are permitted under N.J.A.C 5:21-4.15.**

   b. *A minimum 80 square feet of exterior deck porch or patio is required for each unit, whereas exterior decks are proposed for two of the units.* **Section 9 of the AR-1 zoning ordinance provides that section 35-7.9(b) and 35-7.9(e) shall not apply.**

   c. *A minimum of 80 square feet of storage space is required for each apartment, whereas no dedicated storage space appears to be provided. Common storage space is proposed on the first floor but the applicant should explain how this space will be utilized and divided between the units.* **Testimony shall be provided demonstrating compliance with the ordinance.**

Attn: Mary Salerno, Secretary
Manasquan Borough Planning Board
Re: Boro File No. MSPB-R1160 Site Plan – Broad Street 34, LLC
Block 64, Lots 25.01, 25.02, 26 & 27
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Borough of Manasquan, Monmouth County, NJ

3. *The settlement agreement outlines allowable exterior material for the proposed building. The architectural plans should be detailed to demonstrate conformance with this requirement.* **The plans have been revised to include same.**

4. *The architectural floorplan/parking layout differs from the engineer's site plan. The correct layout must be clarified.* **The plans have been revised to address the discrepancy.**

5. *The building height is measured from the top of curb per the borough ordinance. The applicant's engineer should confirm that this was the basis utilized for the building height measurement.* **This has been confirmed, the building height was measured from the top of the curb. Height 40'-0" measured from top of curb to our highest parapet.**

Drainage/Utilities:

6. *The drainage calculations must be revised to show pre and post development flows and the applicable reductions since this is considered a 'major' project by the NJDEP stormwater regulations since it creates a new ¼ acre impervious coverage. The calculations must also demonstrate that the system will drain within 72 hours.* **As the project meets the criteria for a Major Development the applicable standards for quantity reduction, groundwater recharge and water quality are demonstrated within the revised stormwater report. A summary of the pre-development vs post development peak runoff rate reduction is provided on page 8 of the included report. Additionally, a computation demonstrating that the underground recharge system will fully drain within 72 hours has been included in the stormwater report.**

7. *Infiltration cannot be utilized for the sizing of the proposed recharge system.* **The infiltration for the proposed underground recharge has been excluded from the runoff hydrographs. Therefore, the volume of the underground recharge does not consider infiltration for sizing.**

8. *The rainfall intensity for the 100 year storm should be 8.94 in/hr per the Monmouth County Rainfall Frequency Data.* **The Monmouth County 24 hour rainfall frequency data has been used for the computation of the runoff hydrographs in the revised stormwater report. Precipitation values for the storm events include: 2-year 3.38 in, 10-year 5.23 in, and 100-year 8.94 in.**

Attn: Mary Salerno, Secretary
Manasquan Borough Planning Board
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Borough of Manasquan, Monmouth County, NJ

9. *A two foot separation from the bottom of the recharge system to the seasonal high water table should be shown.* **Based upon the mottling observed in the soil borings the seasonal high water table (SHWT) is less than elevation 9.0. The bottom of the stone in the underground recharge system is provided at elevation 11.0, therefore exceeding the minimum 2 ft separation requirement for infiltration. A detail of the separation has also been provided on the construction detail for the underground recharge system.**

10. *The applicant should justify the 0.8 Cn utilized for the proposed pavers.* **The runoff curve numbers (CN) have been revised and updated. A detailed section of the stormwater report includes a description of the land cover and CN value for the site. All impervious areas have been assigned a CN value of 98.**

11. *The applicant's engineer should clarify if the covered parking areas will be flat (GFE 17.00) or graded as indicated by the spot shot elevations on the site plans.* **The covered parking areas will be graded.**

12. *Sumps may wish to be considered in the proposed inlets to collect any silt or contaminants prior to them infiltrating in the recharge system.* **Complies the typical B inlet detail has been revised to provide a 1 ft deep sump.**

13. *Roof drain overflows at grade with slotted covers should be provided and a detail provided.* **Emergency roof leader overflows will be provided for each downspout location. A detail showing a wye connection with a grade has been provided on the construction plans.**

14. *"Eco" headpieces should be provided for the Type 'B' inlets in the parking area.* **The plan has been revised to include Eco curb piece to inlets.**

15. *A stormwater maintenance manual for the perpetual maintenance of the entire stormwater system should be provided for review.* **A separate Operations and Maintenance Manual for the stormwater system has been has been provided to comply with the requirement of NJAC 7:8-5.8.**

16. *The proposed sanitary sewer connection point should be clarified as it appears to terminate in the proposed courtyard.* **The proposed sanitary sewer connection point has been revised to show a connection to the proposed building. Additionally, a cleanout, with a brass cap has also been provided within the public right-of-way between the curb and sidewalk.**

Attn: Mary Salerno, Secretary
Manasquan Borough Planning Board
Re: Boro File No. MSPB-R1160 Site Plan – Broad Street 34, LLC
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Borough of Manasquan, Monmouth County, NJ

Traffic:

17. *The location of the proposed dumpster enclosure may make it difficult for a garbage collection vehicle to navigate the site. I suggest the trash enclosure may be better suited to directly across from the main access aisle for the site.* **The location of the proposed trash enclosure has been relocated as specified. A turning template exhibit has been provided using a refuse vehicle for the new location.**

18. *Applicable sight triangles should be shown on the plan.* **An exhibit has been provided showing same.**

19. *Fire lanes and marking should be provided per the borough fire inspector.* **The plan has been revised to include Fire lane and markings.**

20. *The applicant's traffic engineer should be prepared to discuss the proposed traffic functioning of the site and the site's impact on the surrounding roadways during the summer months.* **The Applicant's Traffic Engineer, Lee Klein, PE, PTOE, shall provide testimony.**

Landscaping/Lighting:

21. *The applicant's engineer should comment on the proposed October Glory Maple's locations at the rear of the site and their potential long term effects on the drainage recharge system.* **Two of the previous three October Glory Maple have been removed from the landscape plan and the underground recharge system has been relocated underneath the parking area to provide additional separation from the location of the remaining October Glory Maple.**

22. *The Crepe Myrtles at the front of the site will provide a good focal point for the landscape layout, however they may be better located outside the lawn panels in a landscaping bed for ease of maintenance.* **Addressed. See the tree planting detail on the revised plan sheet 7. A mulch bed will be provided surrounding trees and shrubs.**

23. *A detail for the proposed freestanding light bases should be provided.* **A freestanding light base detail has been added to the construction detail plan (sheet CD-2).**

24. *The light spillage onto the adjacent lot to the north must be addressed. The lighting plan should be revised accordingly.* **The Lighting plan has been revised.**

Attn: Mary Salerno, Secretary
Manasquan Borough Planning Board
Re: Boro File No. MSPB-R1160 Site Plan – Broad Street 34, LLC
Block 64, Lots 25.01, 25.02, 26 & 27
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Borough of Manasquan, Monmouth County, NJ

25. *Details for the trash enclosure and gate must be provided.* **A trash enclosure detail has been added to construction detail plan (sheet CD-2).**

26. *The location of the proposed privacy fence shown in the details must be shown and labeled on the plan.* **The plan has been revised to show proposed privacy fence around the trash enclosure (sheet CD-1).**

Miscellaneous:

27. *Proposed spot elevations should be provided for the proposed handicap ramps to demonstrate compliance with ADA requirements.* **The plans have been revised to provide spot elevations for all ADA accessible spaces.**

28. *All new utilities are proposed to be located underground.* **Confirmed. A note has been added to the construction plan.**

29. *Any trees which will be removed as part of the application should be shown on the plan.* **The plans have been revised to show a tree removal plan (sheet LS-1).**

30. *Any curb and sidewalk must be replaced as necessary on Broad Street.* **The plans have been revised to show curb and sidewalk replacement on Broad Street (sheet CD-1).**

31. *All necessary outside agency approvals must be obtained for this project. These may include, but not be limited to the following:*

Monmouth County Planning Board
Freehold Soil Conservation District.
All required approvals will be provided to the Board.

Fire Marshals Review letter dated 1/24/20

1. *We would like to ensure that the proposed structure is fully suppressed, including any exterior porch, balcony, or covered area.* **The building will be fully suppressed including any exterior porch, balcony, or any covered area. A dedicated 4" diameter ductile iron fire service will be provided to service the buildings fire suppression system.**

2. *We would also like to ensure that the water mains in the area are capable of supplying an adequate flow for fire suppression operations in a building of that size.* **Testimony will be provided that a hydrant flow test will be conducted on a nearby hydrant that is**

Attn: Mary Salerno, Secretary
Manasquan Borough Planning Board
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Block 64, Lots 25.01, 25.02, 26 & 27
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Borough of Manasquan, Monmouth County, NJ

connected to the Broad street water main. This flow test will be coordinated with the Manasquan Fire Department.

3. *We would like to ensure driveway leading to the rear of the structure can accommodate weight of the fire apparatus used by the Manasquan F.D., and provide enough room for the apparatus to access the rear of the structure.* **The plans have been revised to provide an 8" thick reinforced concrete driveway apron to support the additional weight of the fire apparatus. Additionally, the on-site driveway and parking lot pavement thickness are designed to local road specifications and will provide adequate support for a fire truck. A vehicle turning template exhibit has been provided, that shows a fire truck can access the rear of the building.**

Should you have any questions or require any additional information, please do not hesitate to contact this office.

Sincerely,

Jaclyn J. Flor, PE, PP, CME
President & CEO

cc:

34, 36, 40 & 44 Broad Street, Manasquan, Monmouth County, NJ
Table 1 - Trip Generation Summary

			WEEKDAY						
			AM PEAK HOUR			PM PEAK HOUR			
CODE	LAND USE	AMOUNT	IN	OUT	TOTAL	IN	OUT	TOTAL	ADT
EXISTING SINGLE-FAMILY HOME TRIPS									
220	Multifamily Housing (Low-Rise)	14 units	2	7	9	7	4	11	65
712	Small Office Building	3,500 SF	6	1	7	3	6	9	57
TOTAL EXISTING SITE GENERATED TRIPS			7	8	16	10	10	19	122
PROPOSED SITE-GENERATED TRIPS									
220	**Multifamily Housing (Low-Rise)**	**22 units**	**3**	**11**	**14**	**10**	**6**	**16**	**125**
TOTAL PROPOSED CHANGE IN SITE-GENERATED TRIPS					**(2)**			**(3)**	**4**
TOTAL PROPOSED SITE GENERATED TRIPS			**3**	**11**	**14**	**10**	**6**	**16**	**125**

Source: *Trip Generation, 10th Edition* , published by the Institute of Transportation Engineers (ITE)

BORO ENGINEERING

August 26, 2020

Mary Salerno, Secretary
Manasquan Borough Planning Board
201 East Main Street
Manasquan, NJ 08736

Re: Boro File No. MSPB-R1160
Site Plan – Broad Street 34, LLC
Block 64, Lots 25.01, 25.02, 26 & 27
34, 36, 40 & 44 Broad Street
AR-1 Affordable Housing
Borough of Manasquan, Monmouth County, NJ

Dear Ms. Salerno:

As per your request, I have reviewed the above-referenced application in accordance with the provisions of the Borough Land Development Ordinance. The revised documents reviewed in conjunction with this application include:

1. Preliminary and Final Major Site Plan prepared by Jaclyn Flor, PE, PP, of Engenuity Infrastructure, LLC, dated October 25, 2019, last revised July 7, 2020.

2. Architectural Layout and Elevations prepared by Laurence Appel, RA, of the Appel Design Group dated June 29, 2020.

3. Stormwater Management Report prepared by Jaclyn Flor, PE, PP, of Engenuity Infrastructure, LLC, dated July 6, 2020.

4. Stormwater Management Operation & Maintenance Manual prepared by Jaclyn Flor, PE, PP, of Engenuity Infrastructure, LLC, dated July 6, 2020.

5. Boundary & Topographic Survey prepared by James Heiser, PLS, of DPK Consulting, dated August 9, 2018.

6. Traffic and Parking Evaluation prepared by Lee Klein, PE, PTOE, of Klein Traffic Consulting, LLC, dated June 18, 2019, last revised January 22, 2020.

7. Site Triangle and Turning Template Exhibits prepared by Jaclyn Flor, PE, PP, of Engenuity Infrastructure, LLC, dated March 17, 2020.

The property is located in the AR-1 Affordable Housing Zone with frontage on Broad Street. With this application, the applicant is proposing to construct an approximately 16,630 square foot, three story, apartment building, with fourteen (14) two bedroom units, and eight (8) three bedroom units between the second and third floors. Associated parking and site improvements are also proposed. The application was previously deemed complete on February 13, 2020.

The following are our comments and recommendations regarding this application:

Zoning

1. The property is located in the AR-1 Affordable Housing Zone. The proposed multi-unit residential use of is permitted in the zone.

2. The AR-1 Zone was created for this project as part of a settlement agreement with the borough which included a site plan layout. Zoning standards which reflect the site plan layout were also included as part of the settlement agreement. The following items were addressed in the settlement agreement and in the AR-1 zoning ordinance. These standards are normally requirements for this type of multi-unit project, but are not required with this application:

   a. A minimum parking space size of 9'x19' is required, whereas 9'x18' spaces are proposed.

   b. A minimum 80 square feet of exterior deck porch or patio is required for each unit, whereas exterior decks are proposed for two of the units.

3. A minimum of 80 square feet of storage space is required for each apartment, whereas no dedicated storage space appears to be provided. However common storage space is proposed on the first floor. Thus, the applicant should explain how this space will be utilized and divided between the units.

4. Addressed. The submitted architectural plans detail the exterior building materials which are in substantial conformance with the settlement agreement. Prior to building permits being issued for exterior finishes, the applicant will need to submit shop drawings which indicate compliance with the settlement agreement.

5. Addressed. The architectural plans have been revised to conform to the site plan layout.

6. The site plan should be revised with a note to indicate that the building height measurement is based on the top of curb elevation.

Drainage/Utilities

7. A stormwater management system which conforms to the NJDEP stormwater regulations and provides the necessary stormwater quality and quantity requirements is proposed through a subsurface recharge system under the proposed parking lot and entrance drive.

8. Addressed. The applicant's engineer has revised the submitted drainage calculations to route the entire site through the underground recharge system. The calculations demonstrate that the recharge system will not overflow into the parking lot for the 100 year design storm.

9. The applicant's engineer should indicate the capacity of the bypass for the proposed treatment devices as it appears that the bypass will be utilized in the 10 and 100 year storms.

10. The applicant's engineer has provided an operations and maintenance manual for the proposed drainage system as required. The manual should be revised to include specific details on when certain maintenance operations will be performed (i.e. inspected quarterly, system vacuumed every 6 months, etc.).

11. The roof drain overflows should be fitted with slotted covers to prevent debris from entering the recharge system.

Traffic

12. Addressed. The location of the proposed dumpster enclosure has been relocated and turning templates provided which demonstrate a garbage truck can navigate and service the site.

13. Sight triangles have been shown on the plans. Easements and descriptions for these areas should be submitted for review by the Board Attorney and Engineer.

14. The applicant's traffic engineer should be prepared to discuss the proposed traffic functioning of the site and the site's impact on the surrounding roadways during the summer months.

Landscaping/Lighting

15. Addressed - All previous comments have been addressed.

Miscellaneous

16. Addressed. All new utilities are proposed to be located underground.

17. Addressed. All trees which will be removed as part of the application have been shown on the plans.

18. Addressed. All curb and sidewalk on Broad Street are shown as to be replaced.

19. All necessary outside agency approvals must be obtained for this project. These may include, but not be limited to the following:

    a. Monmouth County Planning Board
    b. Freehold Soil Conservation District

Should you have any questions or desire any additional information, please do not hesitate to contact me.

Very truly yours,

ALBERT D. YODAKIS, P.E., P.P.
PLANNING BOARD ENGINEER
BOROUGH OF MANASQUAN

ADY:jy

cc: George McGill, esq., Planning Board Attorney
John Sarto, esq.
Giordano, Halleran & Ciesla, 125 Half Mile Road, Suite 300, Red Bank, NJ 07701-6777
Jaclyn Flor, PE, PP
Engenuity Infrastructure, 12 Broad Street, Suite 203, Red Bank, NJ 07701
Broad Street 34, LLC
126 Main Street, Manasquan, NJ 08736

Office: (732) 223-1599
Fax: (732) 223-8802

Board Members:
Chairman John White
Secretary Carmen Triggiano
1st Vice Chairman Drew Coder
2nd Vice Chairman Brian Wick
Treasurer Jack Herbert

Manasquan Fire District #1
Office of the Board of Fire Commissioners
38 Taylor Ave
Manasquan, NJ 08736
Member of the New Jersey State
Fire District Association

Hook & Ladder Co. #1
Volunteer Engine Co. #2

Chief Paul Samuel
Deputy Chief Tom Schofield
Fire Director Chris Barkalow

To: Mary C. Salerno, Planning Board Secretary

From: Christopher Barkalow, Fire Marshal

Date: January 24, 2020

Re: Plan Review – 34-44 Broad St. (Block: 64 – Lots: 25.01, 25.02, 26, and 27)

As you requested, I have reviewed the planning board application package for 34-44 Broad St. (Block: 64 – Lots: 25.01, 25.02, 26, and 27) and the site plan prepared by James Michael Monroe, dated 7/30/19. The Manasquan Fire Bureau would like to make the following requests;

1. We would like to ensure that the proposed structure is fully suppressed, including any exterior porch, balcony, or covered area.
2. We would also like to ensure that the water mains in the area are capable of supplying an adequate flow for fire suppression operations in a building of that size.
3. We would like to ensure driveway leading to the rear of the structure can accommodate weight of the fire apparatus used by the Manasquan F.D., and provide enough room for the apparatus to access the rear of the structure.

If you have any questions or comments, please feel free to contact me.

Sincerely,

Christopher Barkalow
Fire Marshal

34, 36, 40 & 44 Broad Street, Manasquan, Monmouth County, NJ
Table 1 - Trip Generation Summary

			WEEKDAY						
			AM PEAK HOUR			PM PEAK HOUR			
CODE	LAND USE	AMOUNT	IN	OUT	TOTAL	IN	OUT	TOTAL	ADT
EXISTING SINGLE-FAMILY HOME TRIPS									
220	Multifamily Housing (Low-Rise)	14 units	2	7	9	7	4	11	65
712	Small Office Building	3,500 SF	6	1	7	3	6	9	57
TOTAL EXISTING SITE GENERATED TRIPS			7	8	16	10	10	19	122
PROPOSED SITE-GENERATED TRIPS									
220	**Multifamily Housing (Low-Rise)**	**22 units**	**3**	**11**	**14**	**10**	**6**	**16**	**125**
TOTAL PROPOSED CHANGE IN SITE-GENERATED TRIPS					**(2)**			**(3)**	**4**
TOTAL PROPOSED SITE GENERATED TRIPS			**3**	**11**	**14**	**10**	**6**	**16**	**125**

Source: *Trip Generation, 10th Edition* , published by the Institute of Transportation Engineers (ITE)

DRAINAGE REPORT

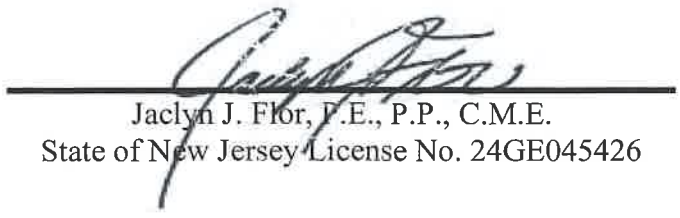
Broad Street 34, LLC
34 Broad Street,
Manasquan, NJ 08736
October 23, 2019

PREPARED FOR:

Manasquan Planning Board
201 East Main Street Manasquan,
New Jersey 08736

PREPARED BY:

Engenuity Infrastructure
12 Broad Street, Suite 203
Red Bank, New Jersey 07701
(732) 741-3176



Jaclyn J. Flor, P.E., P.P., C.M.E.
State of New Jersey License No. 24GE045426

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APPENDICES

Appendix A

- NRCS SURGO Custom Soil Resource Report for Monmouth County, NJ
- NOAA Point Precipitation Frequency Estimates for Manasquan, NJ, USA
- Soils and Foundation Investigation (Melick- Tully Assocaites)

Appendix B

- Existing Drainage Area Plan
- Proposed Drainage Area Plan

I. PROJECT DESCRIPTION

Broad Street 34, LLC is located on 34 Broad Street, Manasquan, NJ. The scope of the project consists of the construction of a 3-story affordable housing building. In addition to the construction of the new building, the site improvements will also include the replacement of sidewalk and curb surrounding the property, new landscaping, and a driveway apron. The site is 0.84-acres in total of which 0.678-acres is proposed to be disturbed.

The site is presently occupied by three (3) 2-1/2 story dwellings, three (3) sheds and a garage with associated sidewalk, driveways, and accessory structures and amenities. The property is bounded by the improved right-of-way of Broad street to the east. The site generally drains in the easterly direction, except for the road frontage which drains towards the respective street.

The existing ground cover changes are indicated on the Existing and Proposed Drainage Areas Maps in Appendix B and are tabulated below. The improvements associated with the project (new roofing, driveway, and sidewalk) require approximately 0.281-acres of net new impervious surface within the watershed area. Hence the project will result in a net increase in impervious surface of more than 0.25-acres. The proposed project improvements result in approximately 0.678-acres of disturbance, which does not exceed the 1.0-acre threshold limit. As such, the project is not considered a Major Development and does not require compliance under the Stormwater Management Rules (N.J.A.C.7:8).

There are no wetlands in the project vicinity and no wetlands impacts or transition area impacts are proposed. The project is not located within a floodplain or flood hazard area and no permits from the NJ Department of Environmental Protections (NJDEP) are required.

II. SOILS

The NRCS SURGO Custom Soil Resource Report for Monmouth County, New Jersey for the site identifies the in-situ soils as DouB, 0 to 5 percent slopes. This soil type is characterized by loamy fluviomarine deposits and/or gravelly fluviomarine deposits, and is found to be a member of Hydrologic Soil Group A. A copy of the cited report is included in Appendix A.

III. RUNOFF COEFFICIENTS

The project site includes four (4) categories of groundcover for both the existing and proposed conditions, as follows:

- Open space, good condition ground cover
- Gravel
- Roof
- Impervious cover (sidewalks, parking areas, roof, & sheds, etc.)

Table 7.1, "Typical Runoff Coefficients for 100 Year Frequency Storm" from the N.J.A.C. 5:21, Residential Site Improvement Standards is included in Appendix A for reference. Based on Hydrologic Soil Group A, the following 'C' values were derived:

- Roof Area 'C' = 0.99

- Gravels 'C' = 0.88
- Open space, good condition groundcover 'C' = 0.45
- Paved parking lots, driveways, etc 'C' = 0.99

IV. TIME OF CONCENTRATION

The maximum length of travel across the existing/proposed watershed is approximately 125-feet. Using Figure 7.1, "Time of Concentration" from the N.J.A.C. 5:21, Residential Site Improvement Standards, a time of concentration of 10-minutes is appropriate for the watershed.

V. DRAINAGE CALCULATIONS

Existing Condition Total Area = 0.84 acres

Average Runoff Coefficient 'C' Calculation

Groundcover	Area (Ac.)	Runoff Coefficient 'C'	A x C
Roof Area	0.179	0.99	0.177
Pavement	0.113	0.99	0.112
Gravel	0.031	0.88	0.027
Open space/Grass	0.517	0.45	0.233

Average Runoff Coefficient 'C' = 0.549/0.84 = 0.65 for existing conditions

Runoff Calculations for 2 Yr., 25 Yr., and 100 Year Storm Frequencies

Storm Frequency	'C' Avg.	I (in./hr.)*	Area (ac.)	Q (cfs)
2 Year, Existing	0.65	0.653	0.84	0.356
25 Year, Existing	0.65	0.972	0.84	0.530
100 Year, Existing	0.65	1.13	0.84	0.616

* For Rainfall Intensity 'I' see NOAA Point Precipitation Frequency Estimates for Manasquan, New Jersey included in Appendix A

Proposed Condition Total Area = 0.84 acres

Average Runoff Coefficient 'C' Calculation

Groundcover	Area (Ac.)	Runoff Coefficient 'C'	A x C
Roof Area	0.392	0.99	0.388
Open Space	0.236	0.45	0.106
Pavement	0.212	0.99	0.210

Average Runoff Coefficient 'C' = 0.704/0.84 = 0.84 for proposed conditions

Runoff Calculations for 2 Yr., 25 Yr., and 100 Year Storm Frequencies

Storm Frequency	'C' Avg.	I (in./hr.)*	Area (ac.)	Q (cfs)
2 Year, Existing	0.84	0.653	0.84	0.460
25 Year, Existing	0.84	0.972	0.84	0.685
100 Year, Existing	0.84	1.13	0.84	0.797

* For Rainfall Intensity 'I' see NOAA Point Precipitation Frequency Estimates for Manasquan, New Jersey included in Appendix A

As can be seen from the calculations, the total runoff Q (cfs) is increased from the proposed site development due to the additional impervious surface. The increase, however, will still result in a net reduction in flow due to the lack of a stormwater management system at the existing site. The proposed storm sewer system has been designed to handle the entire volume and flow up to the 100 year storm whereas the existing site runoff flowed over land.

VI. STORMWATER MANAGEMENT

The watershed area(s) associated with the existing site discharged to a grassed area or to the street. No increase in post developed flows are proposed.

The proposed system will comprise of three (3) Dry well Structures, each, 10' in diameter and 5' in depth. The system will provide sufficient storage so that flows are attenuated in the structure and released at a rate such that there is no increase in pre-development (existing) flows directed to the existing grass area.

VII. DRY WELL DESIGN

The purpose of the proposed Dry well Structures are to store the additional stormwater runoff generated by the proposed improvements and provide stormwater management for the project. The Dry Well Structure Analysis was performed using New Jersey Stormwater Best Management Practice Manual, Chapter 9.3 to determine the runoff rates and volumes.

Flows from the proposed impervious surfaces will be conveyed through the system to provide flow reductions sufficient to compensate for minor increases in runoff associated with proposed watershed. The proposed dry wells will result in a net reduction of flows from the pre-development conditions.

Dry Well Calculations

	Job specific values (inputted by designer)
	Known values (given)
	Calculated

1a. Determine the Pre and Post-development Runoff Coefficient (C)

Pre-development Runoff Coefficient

Total Site Area: 0.8397 Ac.

Land Cover	Area "A" (Ac.)	Hydrologic Soil Type	Runoff Coefficient	A x C
Grass	0.5167	A	0.45	0.233
Pavement	0.113	A	0.99	0.112
Roof Area	0.179	A	0.99	0.177
Packed Gravel	0.031	A	0.88	0.027
Total:	0.8397			0.549

Weighted Runoff Coefficient $C = \sum AxC/\text{Total Site Area}$

C-pre= 0.65

Post-development Runoff Coefficient;

Total Site Area: 0.8397 Ac.

Land Cover	Area "A" (Ac.)	Hydrologic Soil Type	Runoff Coefficient	A x C
Grass	0.2357	A	0.45	0.106
Pavement	0.212	A	0.99	0.210
Roof Area	0.392	A	0.99	0.388
Pavers	0	A	0.8	0.000
Total:	0.8397			0.704

Weighted Runoff Coefficient $C = \sum AxC/\text{Total Site Area}$

C-post= 0.84

1b. Determine the Time of Concentration (T_c) and Intensity (I)

Use Tc = 10 minutes

I_2 =	4.4
I_{10} =	5.8
I_{25} =	6.6
I_{100} =	8.0

1c. Calculate the site runoff (Q)

Q_{pre} = CIA

$Q_{2\text{-pre}}$ =	2.42	cfs
$Q_{10\text{-pre}}$ =	3.18	cfs
$Q_{25\text{-pre}}$ =	3.62	cfs
$Q_{100\text{-pre}}$ =	4.39	cfs

Q_{post} = CIA

$Q_{2\text{-post}}$ =	3.10	cfs
$Q_{10\text{-post}}$ =	4.08	cfs
$Q_{25\text{-post}}$ =	4.65	cfs
$Q_{100\text{-post}}$ =	5.63	cfs

2a. Determine the required storage volume (v)

$\Delta Q_{2yr} = Q_{2\text{-post}} - Q_{2\text{-pre}}$ =	0.68	cfs
$\Delta Q_{10yr} = Q_{10\text{-post}} - Q_{10\text{-pre}}$ =	0.90	cfs
$\Delta Q_{25yr} = Q_{25\text{-post}} - Q_{25\text{-pre}}$ =	1.02	cfs
$\Delta Q_{100yr} = Q_{100\text{-post}} - Q_{100\text{-pre}}$ =	1.24	cfs

Maximum increase in runoff;

ΔQ =	1.24	cfs

2b. Calculate Required Dry Well Storage Volume

$V = (\Delta Q)(T_c)(60)$

V = 744.72 cubic feet

$V = 0.40\ (L)(W)(H)$

3. Dry well Dimensions

The height of the dry well should not exceed 5 feet. Input the width to obtain the required length to meet the above volume. Due to possible site constraints or space limitations the width and length could vary to meet the volume requirement. Also, more than one dry well can be used.

Use three dry wells with the following dimensions;

R=	4.8	ft
D=	10.0	ft
H=	5.0	ft

4. Connecting HDPE Pipe Volume

60 LF HDPE Pipe 24" =	188.5	cubic feet
90 LF HDPE Pipe 24" =	282.7	cubic feet

5. Total Drainage System Volume

V = 942.5 cubic feet

*see dry well volume calculations and total volume calculation on next page.

Dry Well Volume Calculations:

1 Dry well Storage Volume @ 5' Radius with 5' height = $0.40 \times \pi \times 5^2 \times 5$
= 157.07 CF
3 Dry well Storage Volume @ 5' Radius with 5' height = 157.07×3
= 471.23 CF
Total Remaining Volume = 744.72 – 471.23 = 273.48

60 LF Connecting HDPE Pipe Volume @ 24" = $\pi \times 1^2 \times 60$
= 188.49 CF
90 LF Connecting HDPE Pipe Volume @ 24" = $\pi \times 1^2 \times 90$
= 282.74 CF

Total Drainage System Volume = 471.23 CF + 188.49 CF + 282.74 CF
= 942.46 CF

The proposed drainage system will consist of three (3) 10' diameter dry wells connected in series by a 24" perforated HDPE pipe to convey the peak 100-year emergency overflow. The entire system was designed at a depth to allow for landscaping above the pipes but also to ensure that the system is at a minimum of two (2') feet above the seasonal high groundwater table (depth of 8.5') which corresponds to an elevation of 7.09. These recommendations were provided in the Soil Report prepared by Melick & Tulley (See Appendix A).

VIII. PERMIT REQUIREMENTS

There are no floodplains in the immediate project area and the improvements will not impact any wetlands or documented T&E habitats. The project is not located in a Historic District. No permits are required from the NJ Department of Environmental Protection (NJDEP). The total area of disturbance for the project exceeds 5,000-square feet, therefore Soil Erosion and Sediment Control Certification from the Freehold Soil Conservation District will be required for the project.

IX. DRAINAGE DESIGN

Runoff calculations for the contributing on-site areas and pipe design calculations for the proposed storm sewer collection and conveyance system are included on the Proposed Drainage Plan and Details.

X. SUMMARY OF RESULTS

The construction of the proposed Building and associated site improvements will result in no detrimental impacts to the surrounding community. There are no environmentally sensitive areas located within the project limits and no impacts are proposed to any wetlands, floodplains or streams. The project will ultimately result in a net reduction in peak runoff for the proposed site. The existing site contained no storm sewer management system and all runoff flowed directly overland. Although the peak flows for the proposed site result in a net increase in runoff, the entire volume up to the design 100-year storm will be contained within the proposed Dry Well Structures.

Appendix A

- NRCS SURGO Custom Soil Resource Report for Monmouth County, NJ
- NOAA Point Precipitation Frequency Estimates for Manasquan, NJ, USA
- Soils and Foundation Investigation (Melick- Tully Assocaites)

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Monmouth County, New Jersey

Broad Street 34, LLC

May 16, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Map Scale: 1:632 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 30 60 120 180

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Monmouth County, New Jersey
Survey Area Data: Version 12, Sep 15, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 8, 2014—Sep 2, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DouB	Downer-Urban land complex, 0 to 5 percent slopes	0.8	100.0%
Totals for Area of Interest		**0.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Monmouth County, New Jersey

DouB—Downer-Urban land complex, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 4j72
Elevation: 0 to 170 feet
Mean annual precipitation: 28 to 59 inches
Mean annual air temperature: 46 to 79 degrees F
Frost-free period: 161 to 231 days
Farmland classification: Not prime farmland

Map Unit Composition

Downer and similar soils: 60 percent
Urban land: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Downer

Setting

Landform: Knolls, low hills
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Loamy fluviomarine deposits and/or gravelly fluviomarine deposits

Typical profile

Ap - 0 to 10 inches: sandy loam
Bt1 - 10 to 16 inches: sandy loam
Bt2 - 16 to 36 inches: sandy loam
C1 - 36 to 48 inches: loamy sand
C2 - 48 to 80 inches: stratified sand to sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Urban Land

Setting

Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: Unranked

Minor Components

Woodstown

Percent of map unit: 5 percent
Landform: Drainageways, flats
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave, linear
Hydric soil rating: No

Sassafras

Percent of map unit: 5 percent
Landform: Low hills, knolls
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

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NOAA Atlas 14, Volume 2, Version 3
Location name: Manasquan, New Jersey, USA*
Latitude: 40.1251°, Longitude: -74.0456°
Elevation: 13.83 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.342 (0.309-0.379)	0.408 (0.370-0.453)	0.484 (0.437-0.537)	0.540 (0.487-0.598)	0.610 (0.547-0.675)	0.660 (0.588-0.730)	0.711 (0.630-0.789)	0.758 (0.667-0.843)	0.818 (0.712-0.915)	0.864 (0.746-0.972)
10-min	0.546 (0.494-0.605)	0.653 (0.591-0.724)	0.776 (0.700-0.860)	0.864 (0.779-0.957)	0.972 (0.871-1.08)	1.05 (0.937-1.16)	1.13 (1.00-1.25)	1.20 (1.06-1.34)	1.29 (1.13-1.45)	1.36 (1.17-1.53)
15-min	0.683 (0.617-0.756)	0.821 (0.743-0.910)	0.981 (0.886-1.09)	1.09 (0.985-1.21)	1.23 (1.10-1.36)	1.33 (1.19-1.47)	1.43 (1.26-1.58)	1.52 (1.34-1.69)	1.63 (1.42-1.82)	1.71 (1.47-1.92)
30-min	0.936 (0.846-1.04)	1.13 (1.03-1.26)	1.39 (1.26-1.55)	1.58 (1.43-1.75)	1.83 (1.64-2.02)	2.00 (1.79-2.22)	2.19 (1.94-2.43)	2.36 (2.08-2.63)	2.59 (2.26-2.90)	2.77 (2.39-3.11)
60-min	1.17 (1.06-1.29)	1.42 (1.29-1.58)	1.79 (1.61-1.98)	2.06 (1.86-2.28)	2.43 (2.18-2.69)	2.72 (2.42-3.01)	3.01 (2.67-3.34)	3.31 (2.91-3.68)	3.72 (3.24-4.16)	4.04 (3.48-4.54)
2-hr	1.44 (1.30-1.61)	1.76 (1.59-1.96)	2.24 (2.01-2.48)	2.60 (2.33-2.88)	3.10 (2.76-3.43)	3.50 (3.11-3.89)	3.93 (3.46-4.37)	4.37 (3.82-4.86)	4.98 (4.30-5.58)	5.48 (4.69-6.17)
3-hr	1.60 (1.44-1.78)	1.95 (1.76-2.17)	2.48 (2.23-2.76)	2.89 (2.59-3.21)	3.46 (3.08-3.85)	3.93 (3.48-4.37)	4.42 (3.88-4.92)	4.94 (4.30-5.51)	5.67 (4.86-6.36)	6.27 (5.31-7.06)
6-hr	2.03 (1.82-2.27)	2.47 (2.22-2.76)	3.12 (2.79-3.48)	3.65 (3.25-4.06)	4.41 (3.90-4.90)	5.05 (4.43-5.61)	5.73 (4.98-6.37)	6.46 (5.56-7.21)	7.52 (6.37-8.44)	8.41 (7.03-9.47)
12-hr	2.46 (2.21-2.76)	2.99 (2.69-3.35)	3.81 (3.40-4.26)	4.49 (4.00-5.01)	5.51 (4.86-6.13)	6.38 (5.59-7.10)	7.34 (6.35-8.18)	8.40 (7.16-9.38)	9.98 (8.35-11.2)	11.3 (9.32-12.8)
24-hr	2.87 (2.62-3.16)	3.49 (3.19-3.85)	4.52 (4.13-4.98)	5.41 (4.92-5.95)	6.77 (6.10-7.40)	7.95 (7.12-8.68)	9.29 (8.24-10.1)	10.8 (9.48-11.7)	13.1 (11.3-14.2)	15.1 (12.9-16.4)
2-day	3.35 (3.06-3.70)	4.07 (3.72-4.50)	5.26 (4.79-5.80)	6.27 (5.69-6.90)	7.79 (7.02-8.57)	9.11 (8.15-10.0)	10.6 (9.39-11.6)	12.2 (10.7-13.4)	14.7 (12.7-16.2)	16.9 (14.4-18.6)
3-day	3.53 (3.25-3.87)	4.29 (3.95-4.70)	5.52 (5.06-6.04)	6.55 (6.00-7.16)	8.10 (7.36-8.84)	9.43 (8.52-10.3)	10.9 (9.77-11.9)	12.5 (11.1-13.7)	15.0 (13.1-16.4)	17.1 (14.8-18.8)
4-day	3.72 (3.44-4.04)	4.51 (4.18-4.91)	5.77 (5.34-6.28)	6.84 (6.30-7.42)	8.41 (7.71-9.12)	9.76 (8.89-10.6)	11.2 (10.2-12.2)	12.9 (11.5-14.0)	15.3 (13.5-16.6)	17.4 (15.2-18.9)
7-day	4.30 (4.00-4.64)	5.18 (4.82-5.59)	6.51 (6.05-7.04)	7.64 (7.08-8.24)	9.28 (8.55-10.0)	10.7 (9.78-11.5)	12.2 (11.1-13.1)	13.9 (12.5-14.9)	16.3 (14.5-17.6)	18.4 (16.1-19.9)
10-day	4.84 (4.53-5.19)	5.80 (5.43-6.23)	7.19 (6.72-7.72)	8.33 (7.77-8.93)	9.98 (9.26-10.7)	11.3 (10.5-12.1)	12.8 (11.7-13.7)	14.4 (13.1-15.4)	16.7 (15.1-18.0)	18.7 (16.7-20.2)
20-day	6.54 (6.18-6.95)	7.78 (7.34-8.26)	9.37 (8.83-9.94)	10.6 (10.0-11.3)	12.4 (11.6-13.1)	13.8 (12.9-14.6)	15.2 (14.2-16.1)	16.7 (15.5-17.7)	18.7 (17.2-19.9)	20.3 (18.5-21.7)
30-day	8.10 (7.70-8.54)	9.59 (9.11-10.1)	11.3 (10.8-11.9)	12.7 (12.1-13.4)	14.6 (13.8-15.3)	16.0 (15.1-16.8)	17.4 (16.4-18.4)	18.9 (17.7-19.9)	20.8 (19.3-22.0)	22.3 (20.6-23.6)
45-day	10.3 (9.82-10.8)	12.2 (11.6-12.8)	14.2 (13.5-14.9)	15.7 (14.9-16.5)	17.7 (16.8-18.5)	19.2 (18.2-20.1)	20.7 (19.5-21.7)	22.1 (20.8-23.2)	23.9 (22.4-25.2)	25.3 (23.6-26.7)
60-day	12.3 (11.7-12.9)	14.5 (13.8-15.1)	16.6 (15.9-17.4)	18.3 (17.4-19.1)	20.3 (19.4-21.3)	21.9 (20.8-22.9)	23.3 (22.1-24.4)	24.7 (23.3-25.9)	26.4 (24.8-27.7)	27.6 (25.9-29.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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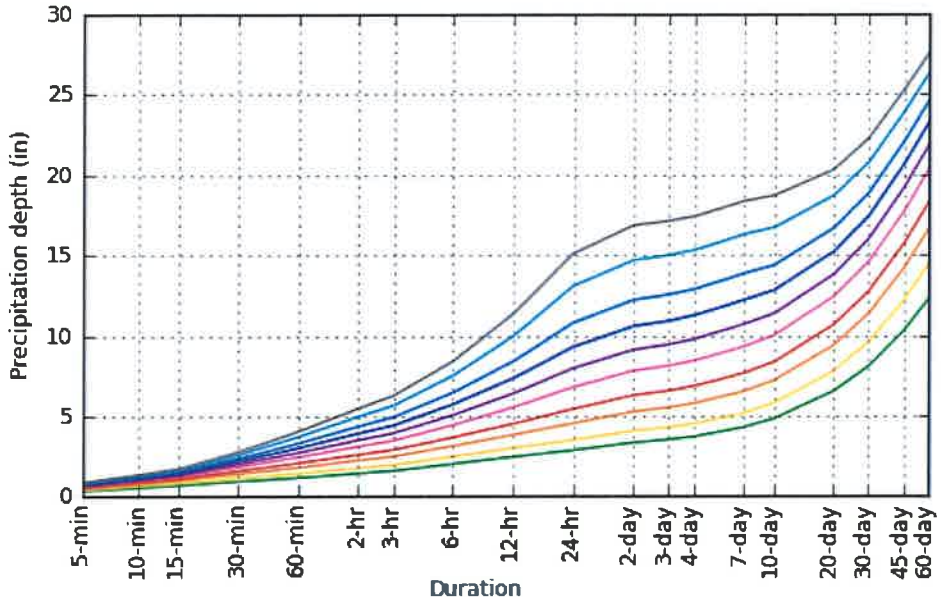
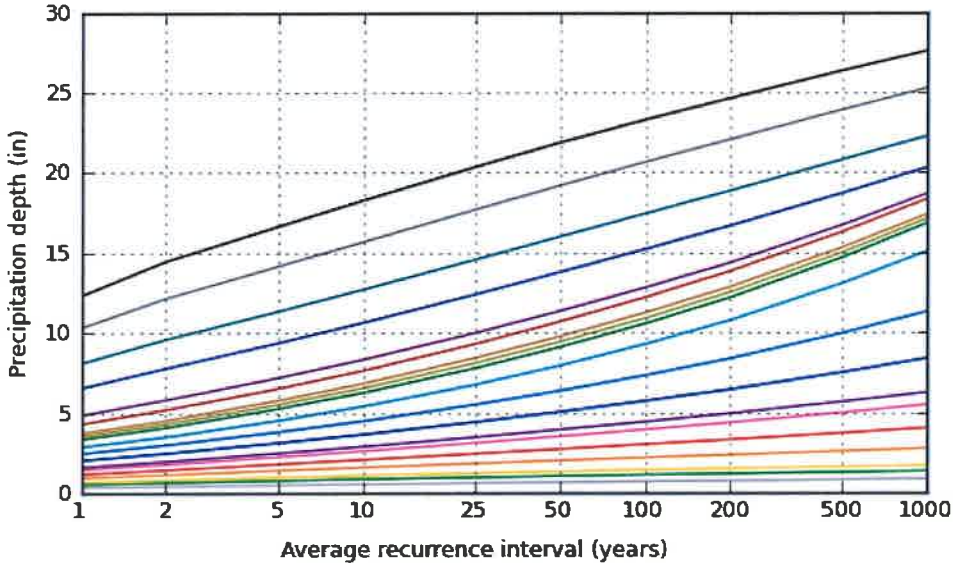
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 40.1251°, Longitude: -74.0456°





NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Thu May 16 15:24:53 2019

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Maps & aerials

Small scale terrain

Large scale terrain

Large scale map

Large scale aerial

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Melick-Tully
& Associates

A Division of GZA

SUBSURFACE INVESTIGATION

PROPOSED BUILDING and DRYWELLS
MR. BRAD SEPE
MANASQUAN, MONMOUTH COUNTY, NEW JERSEY

August 22, 2019
File No. 26.0091827.00

PREPARED FOR:
Mr. Brad Sepe
126 Main Street
Manasquan, New Jersey

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August 22, 2019
File No. 26.0091827.00

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126 Main Street
Manasquan, New Jersey 08736

Attention: Mr. Brad Sepe

Report
Subsurface Investigation
Proposed Building and Drywells
Manasquan, Monmouth County, New Jersey

Introduction

This report summarizes the results of the subsurface investigation performed by Melick-Tully and Associates, a Division of GZA GeoEnvironmental, Inc. (MTA) to assist in design of proposed dry wells which may be required for the proposed structure to be constructed on Block 64, Lots 25.01, 25.02, 26 and 27 in Manasquan, Monmouth County, New Jersey. The subject property is located at 34-44 Broad Street. The approximate location of the site is shown on the Site Location Map, Plate 1.

Proposed Construction

Information provided to us indicates that the proposed construction would consist of a proposed three-story slab-on-grade multi-family residential building with parking to the east (rear) of the proposed building. An archway would be constructed in the center of the building that will allow access to the pavement areas from Broad Street. Dry wells may be required as part of the proposed construction. Plans indicate the dry wells would consist of a cast in-place structure or a bottom-less manhole, with the

invert(s) established at about 9 feet below the existing ground surface and surrounded by 12 inches of 2-1/2-inch stone.

Purpose and Scope of Work

The purpose of our services was to:

1) explore the subsurface soil and groundwater conditions within the proposed drywell areas;

2) obtain relatively undisturbed tube samples for laboratory permeability testing;

3) provide an allowable foundation design bearing capacity for the nearby proposed structure; and

4) summarize our findings in a brief written report.

To accomplish these purposes, a subsurface exploration program consisting of four supervised test pits was completed within accessible portions of the site. The test pits were advanced using a rubber-tire backhoe and extended to depths ranging from 11 to 14 feet below the existing ground surface. The approximate locations of the test pits performed for this study are shown on the Plot Plan, Plate 2.

All field work was completed under the direct technical supervision of a geologist from MTA. Our representative located the test pits in the field by tape measurement from existing features shown on the plans provided to us, maintained continuous logs of the test pits as the work proceeded and obtained representative bulk samples of the soils for identification purposes. In addition, relatively undisturbed tube samples were obtained from the test pits and subjected to laboratory tube permeameter permeability testing.

Detailed descriptions of the encountered subsurface conditions are presented on the Logs of Test Pits, Plates 3A through 3D. The soils were visually classified in general accordance with the USDA Textural Triangle shown on Plate 4.

The following discussion of our findings are subject to the limitations attached as an Appendix to this report.

Findings

The site consists of four contiguous lots containing one, two and one-half story multi-family dwelling; open space; a mixed-use two-story building; and a two-story dwelling. The northern and southern dwellings contain driveways that extend to the rear of each structure. The remaining areas consist of lawn, brush, or hardscaping. Utilities serviced the existing buildings.

Topsoil ranging from 9 to 14 inches was encountered at the surface of Test Pits 1, 2, and 4. Fill materials consisting of silt loams were encountered at the surface in Test Pit 3 and below the topsoil in Test Pit 1 and extended to depths of 1.5 and 2.5 feet below the existing ground surface, respectively. Natural clay loams extending to depths of 3 to 5 feet below the existing ground surface were encountered below the fill and surface materials.

The clay loams were underlain by sands and loamy sands which extended to depths ranging from 10 to 12 feet below the existing ground surface. Test Pits 3 and 4 were terminated in this stratum. Sandy clay loams to sandy clays were encountered in Test Pits 1 and 2 at depths of 10 and 12 feet, respectively, and extended to the termination depth of both test pits, 14 feet.

Moderate to rapid groundwater seepage was encountered at depths ranging from approximately 8.5 to 9.8 feet below the ground surface. Mottling, which can be indicative of periodic seasonal saturation was encountered at depths ranging from approximately 7 to 8 feet below the existing ground surface.

Laboratory tube permeameter testing was performed on relatively undisturbed samples obtained from the deeper natural sandy soils in Test Pits 1 through 4 at depths ranging from 5 to 12 feet below the existing ground surface. The results of the permeability tests are summarized below:

Summary of Laboratory Permeability Test Results			
Exploration No.	**Depth of Sample (ft)**	**Permeability (in/hr)***	**Visual Classification of Soil Tested**
Test Pit 1	6	>20	Sand to Loamy Sand
Test Pit 1	9	>20	Sand
Test Pit 2	5	17	Loamy Sand
Test Pit 2	9	>20	Sand
Test Pit 3	5	10.5	Loamy Sand
Test Pit 3	7	>20	Sand
Test Pit 4	5	>20	Sand
Test Pit 4	7	>20	Loamy Sand
Test Pit 4	10	8.8	Loamy Sand

*Two replicates were tested and the slowest of the replicates is reported

The results of the laboratory permeability tests indicate the sandy and sandy loams encountered below the clay loam layer exhibited permeability rates ranging from 8.8 to >20 inches per hour. Moderate to rapid groundwater seepage was encountered at a depth of about 8 to 8.5 feet, with soil mottling at 7 to 8 feet below the ground surface, which would be above the invert elevation of the proposed dry wells shown on the plans provided and would have to be considered in the design.

Based on our observations during the test pits, it is our opinion that the proposed lightly loaded foundations for the future building established on the native, undisturbed stiff clayey soils or medium

dense sandy soils may be designed assuming a maximum net allowable bearing capacity of up to 3,000 pounds per square foot. Lightly loaded foundations supported on these materials generally experience post-construction settlements. Existing fill or disturbed soils resulting from building demolition would be unsuitable for foundation support. The presence of these materials and the suitability of additional fill and subgrades for foundation support would have to be confirmed at the time of construction by qualified personnel.

Please contact us if you have any questions regarding this information.

The following Plates and Appendix are attached and complete this report:

Plate 1 – Site Location Map
Plate 2 – Plot Plan
Plates 3A through 3D – Logs of Test Pits
Plate 4 – USDA Textural Triangle
Appendix – Limitations

Very truly yours,

MELICK-TULLY and ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

Christopher P. Tansey, P.E.
Associate Principal

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Principal

CPT:RES/mh
(1 copy submitted via e-mail)

Aerial Photo courtesy of Google Earth Pro

MELICK–TULLY AND ASSOCIATES
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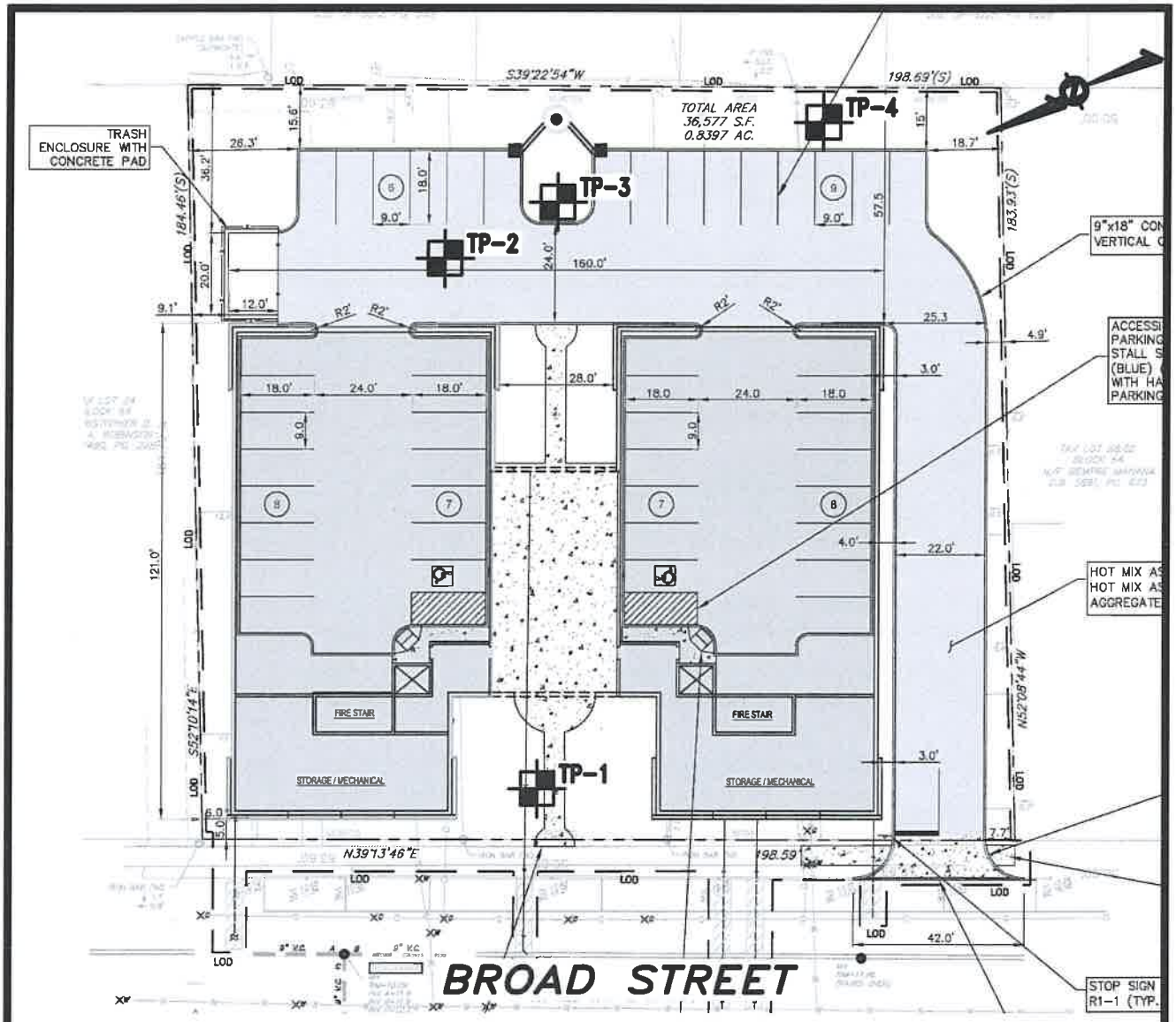
SITE LOCATION MAP

PROPOSED RESIDENTIAL BUILDING
34–44 BROAD STREET
MANASQUAN, NEW JERSEY
MR. BRAD SEPE

JOB NO.	FILE NO.	DR. BY	CHK. BY	DATE	SCALE	PLATE
26.0091827.00	–	VJD	CPT	6/27/19	1"=2,000'	1



KEY: TP-1 **NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY**

NOTES:

1. **This drawing is part of Melick–Tully and Associates, a Division of GZA, Report No. 26.0091827.00 and should be read together with the report for complete evaluation.**
2. **General layout was obtained from a drawing prepared by Engenuity Infrastructure, entitled "major Site Plan", dated 5/13/19 scale 1"= 20'.**

MELICK–TULLY AND ASSOCIATES
A Division of GZA
Geotechnical Engineers & Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356–3400

PLOT PLAN

PROPOSED RESIDENTIAL BUILDING
34–44 BROAD STREET
MANASQUAN, NEW JERSEY
MR. BRAD SEPE

JOB NO.	FILE NO.	DR. BY	CHK. BY	DATE	SCALE	PLATE
26.0091827.00	–	VJD	CPT	6/27/19	1"=40'	2

LOG OF TEST PIT

TEST PIT NO. 1

COMPLETION DATE: 6/12/19 | SURFACE ELEVATION: N/A | WATER LEVEL: 9.8'

JOB NUMBER: 26.0091827.00 | READING DATE: 6/12/19

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	DEPTH (INCHES)	DESCRIPTION	DEPTH
			0-9	Topsoil - Brown (10YR, 5/3) silt loam, weak fine angular blocky, moist, friable, abrupt smooth boundary, common medium roots	
	S1, T1		9-34	FILL - Dark brown (10YR, 3/3) silt loam, with 2% asphalt, weak fine angular blocky, moist, friable, clear wavy boundary	
	S2, T2		34-60	Strong brown (7.5YR, 5/6) clay loam, moderate medium angular blocky, moist, friable	
5	S3, T3		60-84	Reddish yellow (7.5YR, 6/8) sand to loamy sand, single grain moist, loose, clear wavy boundary	5
	S4, T4		84-120	Brownish yellow (10YR, 6/6) sand, 15% gravel, single grain, moist, loose, gradual irregular boundary, few fine faint gray (10YR, 6/1) mottles encountered @ 96 inches to 120 inches	
10	S5, T5		120-168	Light brownish gray (10YR, 6/2) sandy clay loam to sandy clay, strong medium angular blocky, wet, friable	10
15				Test pit completed @ 14' Moderate groundwater seepage encountered @ 9.8'	15
20					20

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: CSK/pm 6/19

Sheet: 1 of 1 PLATE: 3A

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

LOG OF TEST PIT

TEST PIT NO. 2

COMPLETION DATE: 6/12/19 | SURFACE ELEVATION: N/A | WATER LEVEL: 9'

JOB NUMBER: 26.0091827.00 | READING DATE: 6/12/19

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	DEPTH (INCHES)	DESCRIPTION	DEPTH
			0-14	Topsoil - Brown (10YR, 2/1 silt loam, weak fine angular blocky, moist, friable, clear wavy boundary, common medium roots	
	S1, T1		14-48	Strong brown (7.5YR, 4/6) clay loam, 10% gravel, strong coarse subangular blocky, moist, friable, clear wavy boundary, few fine roots	
5	S2, T2		48-84	Brownish yellow (10YR, 6/8) loamy sand, 10% gravel, single grain, moist, loose, clear wavy boundary	5
	S3, T3		84-144	Reddish yellow (7.5YR, 6/8) sand, 15% gravel, single grain, moist to wet, loose, clear wavy boundary, few fine faint gray (10YR, 6/1) mottles encountered @ 88 inches to 144 inches	
10					10
	S4, T4		144-168	Brownish yellow (10YR, 6/6) sandy clay loam to sandy clay, 10% gravel, strong coarse subangular blocky, wet, friable, common medium distinct gray (10YR, 6/1) mottles encountered @ 144 inches to 168 inches	
15				Test pit completed @ 14' Moderate groundwater seepage encountered @ 9'	15
20					20

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: CSK/pm 6/19

Sheet: 1 of 1 PLATE: 3B

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

LOG OF TEST PIT

TEST PIT NO. 3

COMPLETION DATE: 6/12/19 | SURFACE ELEVATION: N/A | WATER LEVEL: 8.5'

JOB NUMBER: 26.0091827.00 | READING DATE: 6/12/19

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	DEPTH (INCHES)	DESCRIPTION	DEPTH
			0-18	Fill - Black (10YR, 2/1) silt loam, weak fine angular blocky, moist, friable, gradual irregular boundary, few fine roots	
	S1, T1		18-48	Strong brown (7.5YR, 5/4) clay loam, moderate medium angular blocky, moist, friable, clear wavy boundary, few fine roots	
5	S2, T2		48-72	Brownish yellow (10YR, 6/6) loamy sand, 10% gravel, single grain, moist, loose, clear wavy boundary	5
	S3, T3		72-144	Brownish yellow (10YR, 6/8) sand, 10% gravel, single grain, moist, loose, comon medium distinct gray (10YR, 6/1) mottles encountered @ 84 inches to 144 inches	
10	S4, T4				10
15				Test pit completed @ 12' Rapid groundwater seepage encountered @ 8.5'	15
20					20

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: CSK/pm 6/19

Sheet: 1 of 1 PLATE: 3C

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

LOG OF TEST PIT

TEST PIT NO. 4

COMPLETION DATE: 6/12/19 | SURFACE ELEVATION: | WATER LEVEL: 8.5'

JOB NUMBER: 26.0091827.00 | READING DATE: 6/12/19

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	DEPTH (INCHES)	DESCRIPTION	DEPTH
			0-12	Topsoil - Brown (10YR, 4/3) silt loam, weak fine angular blocky, moist, friable, gradual irregular boundary, many coarse roots	
	S1, T1		12-36	Strong brown (7.5YR, 5/6) clay loam, 10% gravel, strong medium angular blocky, moist, firm, clear wavy boundary, common medium roots	
5	S2, T2		36-82	Yellow (10YR, 8/6) sand, 10% gravel, single grain, moist, loose, clear wavy boundary	5
	S3, T3		82-132	Pale brown (10YR, 6/3) loamy sand, 10% gravel, single grain, wet, loose, few fine faint gray (10YR, 6/1) mottles encountered @ 86 inches to 132 inches	
10	S4, T4				10
				Test pit completed @ 11'	
				Moderate groundwater seepage encountered @ 8.5'	
15					15
20					20

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: CSK/pm 6/19

Sheet: 1 of 1 PLATE: 3D

MELICK-TULLY AND ASSOCIATES,
a Division of GZA GeoEnvironmental, Inc.

Texture Triangle:

Fine Earth Texture Classes (——)

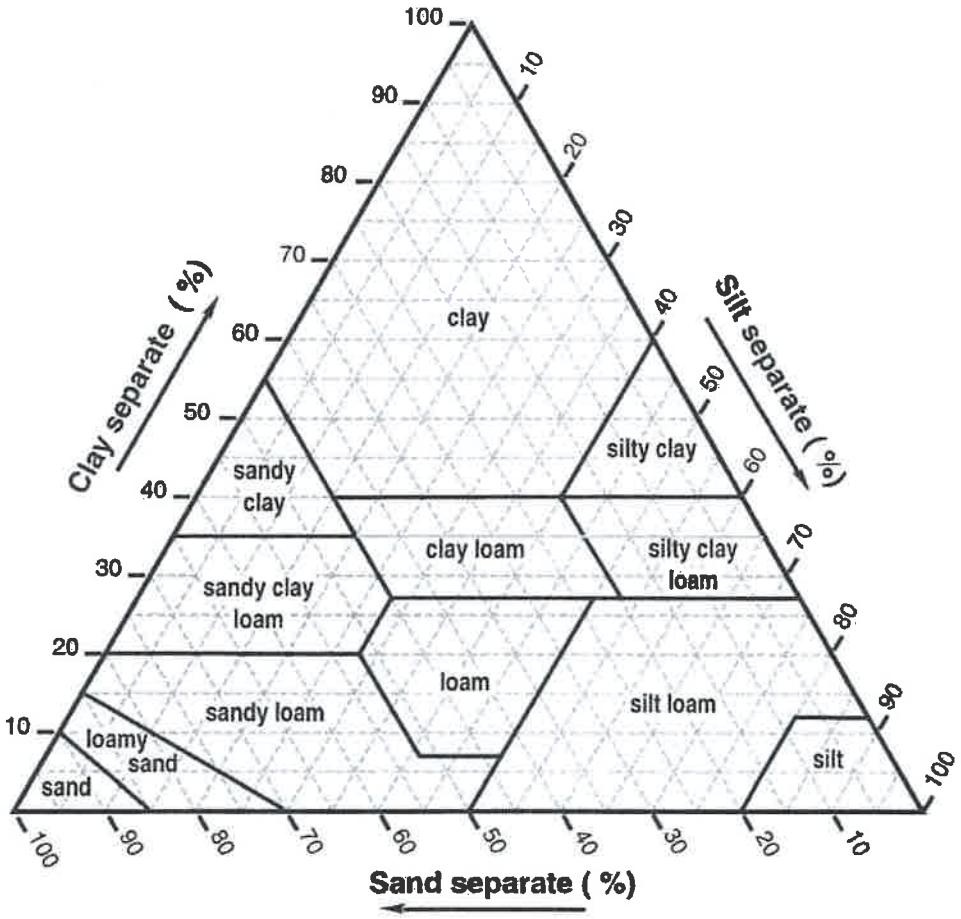


PLATE 4

APPENDIX

APPENDIX

Limitations

A. Subsurface Information

Locations: The locations of the explorations were approximately determined by tape measurement from existing site features shown on plans provided to us. Elevations of the explorations were not available. The locations of the explorations should be considered accurate only to the degree implied by the method used.

Interface of Strata: The stratification lines shown on the individual logs of the subsurface explorations represent the approximate boundaries between soil types, and the transitions may be gradual.

Field Logs/Final Logs: A field log was prepared for each exploration by a member of our staff. The field log contains factual information and interpretation of the soil conditions between samples. Our recommendations are based on the final logs as shown in this report and the information contained therein, and not on the field logs. The final logs represent our interpretation of the contents of the field logs, and the results of the laboratory observations and/or tests of the field samples.

Water Levels: Water level readings have been made in the explorations at times and under conditions stated on the individual logs. These data have been reviewed and interpretations made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater will occur due to variations in rainfall, temperature, and other factors.

Pollution/Contamination: Unless specifically indicated to the contrary in this report, the scope of our services was limited only to investigation and evaluation of the geotechnical engineering aspects of the site conditions, and did not include any consideration of potential site pollution or contamination resulting from the presence of chemicals, metals, radioactive elements, etc. This report offers no facts or opinions related to potential pollution/contamination of the site.

Environmental Considerations: Unless specifically indicated to the contrary in this report, this report does not address environmental considerations which may affect the site development, e.g., wetlands determinations, flora and fauna, wildlife, etc. The conclusions and recommendations of this report are not intended to supersede any environmental conditions which should be reflected in the site planning.

B. Applicability of Report

This report has been prepared in accordance with generally accepted soils and foundation engineering practices for the exclusive use of Mr. Brad Sepe for specific application to the design of the proposed dry wells on 33-44 Broad Street in Manasquan, New Jersey. No other warranty, expressed or implied, is made.

This report may be referred to in the project specifications for general information purposes only but should not be used as the technical specifications for the work, as it was prepared for design purposes exclusively.

C. Reinterpretation of Recommendations

Change in Location or Nature of Facilities: In the event that any changes in the nature, design or location of the dry wells are planned, the findings contained in this report shall not be considered valid unless the changes are reviewed, and conclusions of this report modified or verified in writing.

Changed Conditions During Construction: The findings submitted in this report are based in part upon the data obtained from four test pit excavations performed for this study. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

Changes in State-of-the-Art: The findings contained in this report are based upon the applicable standards of our profession at the time this report was prepared.

D. Use of Report by Prospective Bidders

This soils engineering report was prepared for the project by Melick-Tully and Associates, a Division of GZA GeoEnvironmental, Inc. (MTA) for design purposes and may not be sufficient to prepare an accurate bid. Contractors utilizing the information in the report should do so with the express understanding that its scope was developed to address design considerations. Prospective bidders should obtain the owner's permission to perform whatever additional explorations or data gathering they deem necessary to prepare their bid accurately.

E. Construction Observation

We recommend that MTA be retained to provide on-site soils engineering services during the earthwork construction and foundation phases of the work. This is to observe compliance with the design concepts and to allow changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.