

CITY OF CUMBERLAND ZONING BOARD OF APPEALS
MEETING AGENDA

October 21, 2020 – 4:00 PM
Virtual Zoom Meeting

1. **Call to Order**
2. **Roll Call**
3. **Chairman’s Comments**
4. **Adoption of Minutes from the December 4, 2019 meeting**

Public Hearings:

5. ZA 20-02 – Knox Street – Conditional Use – Setback Modification *Applicant*

Discussion Items:

6. ZA 20-02 – Knox Street – Conditional Use – Setback Modification *BOA members*

City Planner’s Report:

Administrative Approval of ZA 20-01 – 100 W. Reynolds Street – Setback Variance

6. **Adjourn**

NOTE: If the scheduled Board of Appeals meeting is cancelled due to inclement weather, acts of nature, or the lack of a quorum, any items on the agenda that cannot be conducted will be rescheduled for Board’s next regular meeting.

File Attachments for Item:

BOZA Staff Report

CUMBERLAND ZONING BOARD OF APPEALS STAFF REPORT

ZA 20-02: Knox Street Setback Modification – Conditional Use

September 23, 2020

OVERVIEW:

On August 28, 2020, applicant William Rothman, of Rocon, LLC, on behalf of property owners Dominic and Marcy Dearcangelis, filed a petition (ZA 20-02), which is subject to specific conditions as specified in Section 25-206 (g) in the Cumberland Zoning Ordinance, for a request for setback modification to construct a speculative Cellular Communications Tower located on Knox Street. The Zoning Ordinance authorizes the Board of Appeals to consider the variance request as a conditional use approval. A copy of the application and all associated submittals is attached to this report.

The applicant is seeking this setback relief from Section 25-206 (g) of the Cumberland Zoning Ordinance, which requires that each telecommunication tower have a minimum setback of one (1) foot from all adjacent property lines for every foot of height of the tower. As specifically applied to the applicant's 195-foot tall proposed tower structure, a 195-foot minimum setback from each property line would be required from the center-point of the tower. Per the originally submitted site plans (a copy of which is attached to this report), the applicants were seeking relief for the right yard setback.

OCTOBER 20, 2020 ADDENDUM

Subsequent to the revised October 7, 2020 Legal Notice, on October 19, 2020, Matthew Gilmore, attorney on behalf of applicant William Rothman, submitted supplemental documents and changes to the project site plans. These new site plans show significant changes to the placement and fall zone of the proposed Cellular Communication Tower. A copy of the new site plans and associated submittals are attached to this report.

As per the most recently submitted site plans (received on October 19, 2020), the greatest setbacks that can be achieved are 544 feet and 6 inches (544'6") to the rear, 73 feet and 6 inches (73'6") to the front, 26 feet to the right side, and 34 feet and 2 inches (34'2") to the left side. The newly reported fall zone of the tower is twenty-five feet (25'), (certified and submitted by the original project Engineer), as noted in the site plan on page 14 and in the letter on page 19 of this report. The newly reported fall zone meets all setbacks and seeks approval from the Zoning Board of Appeals, as noted in Section 25-206 (g) (5) of the Zoning

Ordinance. The entire lot in question is somewhat 'L'-shaped, measuring one-hundred thirty-two feet (132') in the front yard along Knox Street, reaching back five-hundred forty-six feet (546') on the right side, cutting left fifty-one feet (51'), coming down the left side four-hundred seventy-six feet (476'), jutting out to the left twenty-two feet (22'), coming down fifty feet (50'), jutting out to the left seventy-six feet (76'), and coming down forty-five feet (45') to meet the front left side of the lot. The fenced in leased area intended to house the proposed cellular communications tower is thirty-five feet (35') by seventy feet (70') in size.

PROCEDURAL STATUS:

The applicant prepared a Preliminary Plot Plan on July 2, 2020. These site plans were revised and resubmitted with their application on August 28, 2020. The application was reviewed by City Staff and was determined to comply with all basic requirements on the Zoning Ordinance, with the exception of the side yard setbacks. Based on this determination, staff scheduled the petition for a public hearing before the Zoning Board of Appeals on October 21, 2020. The applicant submitted further revised site plans on October 19, 2020, relocating and reducing the fall zone of the proposed tower. Action on the petition for modifications to the setback requirements must be approved by the Zoning Board of Appeals before staff can take any further action on the Revised Preliminary Plat Plan.

STAFF RECOMMENDATION:

Staff reviewed the packet of information filed by the applicant with the Conditional Use petition and confirmed that the proposed tower does not satisfy the minimum setback required by Section 25-206 (g). The applicant is seeking approval for setback modifications per Section 25-206 (g) (5) of the Zoning Ordinance.

Staff has not determined in the proposed tower has been approved by the Federal Aviation Administration for compliance with F.A.R. Part 77 and any other formal review that may be required to ensure that the tower will not create an air navigation hazard for planes arriving and departing from the Greater Cumberland Regional Airport in Wiley Ford, WV. Such approvals may be necessary for this project to be constructed. The Zoning Board of Appeals is authorized to issue a variance from specific requirements of the City's Zoning Ordinance *only*, and no assurance can be implied or suggested that the applicant will be relieved from any subsequent requirements that may be imposed by any cognizant Federal or State Agency (either in Maryland or West Virginia) regardless of whether or not such requirements are more restrictive than any relief that may be granted by the Zoning Board of Appeals. Written

approval by the FAA will be required of the applicant prior to filing an application for a building permit.

According to Section 25-174 (i) of the Zoning Ordinance, the applicant shall bear the “burden of proof” for any conditional use or variance application before the Zoning Board of Appeals. Under Maryland Law, this “burden of proof” requires that the applicant produce evidence to the Board in support of the request and to persuade the Board of the justification for the requested relief based on that evidence. Based on the materials submitted with the application and a site investigation of the area, staff can offer the following additional facts and determinations for the Board’s consideration with regard to the application:

OCTOBER 20, 2020 ADDENDUM:

1. The subject property is located in the I-G – Industrial General Zone.
2. There are no applicable height restrictions in the I-G zone that would limit the ultimate height of the proposed tower. The only applicable height restriction within the zone is fifty (50) stories, and an antenna tower has no stories.
3. There were 15 parcels identified within two-hundred feet (200’) of the proposed tower location. While the parcel in question is located in the Industrial General Zone, it borders the Business Highway and Urban Residential Zones. There were 3 residential land use parcels and 1 residential/commercial land use parcels identified within two-hundred feet (200’) of the proposed tower location.
4. The applicant has asserted that the engineered fall zone for the proposed tower is twenty-five feet (25’) from the center-point, according to the letter and site plan in the appendix, in which there were no residences identified. Attaches is a letter from the engineer providing certification that asserts that the tower has been designed to collapse in a way that will result in a fall radius no greater than twenty-five feet (25’).
5. The applicant has indicated that AT&T will use 2 of the 4 antennas, with the remaining 2 available for future leasing.
6. The applicant has provided no specific justification for the proposed one-hundred ninety-five foot (195’) height of the tower.

In order to approve the requested variance, the Zoning Board of Appeals must find that the request satisfies the 7 specific criteria outlined in Section 25-175 (1) (c) of the Zoning Ordinance. The following list indicates the *minimum* questions that should be asked of any applicant for a conditional use to address the aforementioned criteria. The Zoning Board of Appeals may ask additional related or follow-up questions, but *must* make findings of fact for its decision that address the basic questions below:

1. a. **How is the proposed use in accordance with the Cumberland Comprehensive Plan?**
- b. **How is the proposed use consistent with the spirit, purpose, and intent of the Zoning Ordinance?**
2. **How is the proposed use in the best interests of the City, the convenience of the community, and the public welfare?**
3. **How do you show that the proposed use is suitable for the property in question and will be designed, constructed, operated, and maintained so as to be in harmony with and appropriate in appearance with the existing or intended character of the general vicinity?**
4. **Does the proposed use comply with all applicable requirements of this Ordinance?**
5. **How is the proposed use suitable in terms of permitting the logical, efficient, and economical extension of public services and facilities, such as public water, sewers, police and fire protection, and public schools?**
6. **How is the proposed use suitable in terms of effects on street traffic and safety with adequate sidewalks and vehicular access arrangements to protect major streets from undue congestion and hazard?**
7. **How do you show that the proposed use is in complete conformance with the performance standards contained in Section 25-138 of this Ordinance?**

Staff recommends that the Zoning Board of Appeals apply the following conditions to any approval of the petition:

1. Approval of this Petition by the City does not relieve the owner and applicant from the responsibility of compliance with all applicable local, state, and federal codes, ordinances, and regulations lawfully in effect at later stages of the approval and development process.
2. Documentation or written approval by the Federal Aviation Administration and non-interference with flight approach, departure, and air hazard safety zones associated with and surrounding the Greater Cumberland Regional Airport shall be provided by the applicant prior to approval of a building permit for the proposed tower.
3. While this application is to be handled as a Conditional Use, according to Section 20-206 (g) (5), the 7 legal requirements/standards attached to variance petitions should still be reviewed in regards to this project, since dimensional issues are prominent.
4. In a previous Communication Tower project, the Board imposed required liability insurance as a condition of approval. The precedence of this condition is not required by any ordinance, but due to the proximity of neighboring parcels, a similar condition could be considered by the Board.
5. The Board should consider any site-specific adverse impacts that are inherent to Cellular Communication Towers. These adverse impacts that might be considered cannot be those which would exist regardless of where the use would exist in the applicable zone.

Board of Appeals Action:

[] Approve the requested Conditional Use Setback Modification petition in accordance with the findings of fact indicated on the ZA 20-02 Zoning Appeal form, and with the following additional conditions of approval, if deemed necessary, by the Zoning Board of Appeals:

[] Deny the requested Conditional Use Setback Modification, based on the following findings of fact:

Motion by: _____

Seconded by: _____

Vote:

In favor of motion: _____ Opposed: _____ Abstained: _____

Number of voting members present: _____

Signed:

Chair, Zoning Board of Appeals

Date: _____

Secretary, Zoning Board of Appeals

Date: _____

APPENDIX A

Permit Application, Maps, & Documentation



City of Cumberland

Department of Community Development • 57 N. Liberty Street • Cumberland, MD 21502 • www.cumberlandmd.gov
301-759-6442 • Fax 301-759-6432 • debbie.helmstetter@cumberlandmd.gov

ZA # _____

ZONING APPEAL REVIEW APPLICATION

- Variance Petition - *public hearing required*
- Conditional Use or Special Exception - *public hearing required*
- Appeal from an Administrative Decision - *public hearing required*
- Approval Extension Request (*no fee*)

Requirements vary depending on the type of appeal

All appeals must be applied for in writing, accompanied by a written explanation of the rationale or justification for the extension.

Project Location Knox Street, Cumberland, Maryland 21502 Tax ID # 05 - 002389

The Tax ID# can be found on your deed or by visiting www.dat.state.md.us/RealProperty/RealPropertySearch. When construction is being done and several property account numbers are involved, properties must be combined under one property number. It will be necessary to contact the State of Maryland Assessment Office, 112 Baltimore Street, Gateway Center, 301-777-2113, prior to applying.

Applicant Name Rocon, LLC Contact Name William Rothman

Address 9101 Chesapeake Avenue, Sparrow's Point, Maryland 21219

Phone 443-804-8007 Fax _____ Email roconllc@gmail.com
410-499-7010

- Attach a site plan drawn to scale and bearing the dimensional requirements for which the variance is being sought. All boundaries of the property must be shown and all buildings located correctly to scale within them. This may include minimum yard setbacks, maximum building coverage, height requirements and size requirements for signs
- Provide written justification addressing the variance legal requirements from the Zoning Ordinance 3607, Section 7.05.021.
- The basic submission requirements for Conditional Use or Special Exception application are specified in the Zoning Ordinance 3607, Section 7.04.09 (2).
- Certain uses (listed in Zoning Ordinance 3607, Section 8.06) will have additional special requirements that the applicant must satisfy in writing for approval by the Board.
- An Appeal from an Administrative Decision should include a copy of the denial (or reasons stated for the denial) and a statement of the applicant's rationale or reasons why the decision should be overturned.
- All appeals require a public hearing.
- There is a non-refundable \$300 Zoning Appeal review fee payable at time of application.
- There is no fee for an approval extension request.

Applicant's signature:  Date: 8-28-20

1/Community Development/Permit Apps 2017/20a



October 15, 2020

City of Cumberland
Board of Zoning Appeals
Attn: Jeff Rhodes, City Administrator
57 N. Liberty St.
Cumberland, MD 21502

RE: Application for Conditional Use-Knox Street (Tax Account No. 05-002389)

Dear Board Members:

This office represents Rocon, LLC ("Rocon"), a telecommunications tower company leasing a portion of property owned by Dominic and Marcy Dearcangelis, on Knox Street abutting the CSX railway (the "Property"). On August 28, Rocon submitted an application for a conditional use to modify the setback requirements for a proposed cellular communications tower on the Property (the "Tower"). Since then, the proposed location of the Tower and certain design specifications have changed. Specifically, the fall radius of the Tower has been determined to be 25 feet, as shown on the enclosed letter and site plan. Additionally, the Tower would now be located at a different location within the compound. As requested, the design and foundation drawings for the Tower are also enclosed. Please consider this correspondence a supplement to the legal justification submitted with the application, based upon the modified specifications. We also request that the enclosed specifications be used during the Board of Zoning Appeal's review process in place of the letter, site plan, and design/foundation drawings previously submitted.

With a 25-foot setback, the Tower fulfills all requirements for a conditional use, as set forth in the legal justification. To provide additional context, Rocon's application for a conditional use modification of a permitted use in the Property's zoning district is subject to the City of Cumberland's Zoning Ordinance, which is consistent with Maryland law governing special exceptions (i.e. conditional use). In short, a conditional use for a use otherwise permitted in the same zoning district should only be denied when it is shown that the use in the proposed location would have an adverse effect greater than that inherent to such use, irrespective of its location within the same zone. Here, the proposed Tower in the location shown on the updated site plan would have no greater impact there than it would anywhere else in the Industrial-Gateway district where the Property is located.

21 Prospect Square \ Cumberland, Maryland 21502
Main: 301.777.1515 \ Fax: 301.777.0532 \ gmpglaw.com

A conditional use is distinct from a variance and may be granted without a showing of unnecessary hardship. *Martin Marietta Aggregates v. Citizens for Pres. of S. Mountain-Antietam Env't*, 41 Md. App. 26, 34, 395 A.2d 179, 183 (1978). A conditional use contemplates a permitted use once prescribed conditions are met. In other words, “a special exception [conditional use] is a use which has been legislatively predetermined to be conditionally compatible with the uses permitted as of right in a particular zone, the condition being that a zoning body must, in each case, decide under specified statutory standards whether the presumptive compatibility in fact exists.” *Creswell v. Baltimore Aviation Serv., Inc.*, 257 Md. 712, 719, 264 A.2d 838, 842 (1970).

A conditional use is appropriate where there are no facts or circumstances in a particular case changing this presumptive finding. *Montgomery Cty. v. Merlands Club, Inc.*, 202 Md. 279, 287, 96 A.2d 261, 264 (1953). To warrant a denial of a conditional use, there must be a finding that “the special exception use [conditional use] and location proposed would cause an adverse effect upon adjoining and surrounding properties unique and different, in kind or degree, than that inherently associated with such a use regardless of its location within the zone.” *People's Counsel for Baltimore Cty. v. Mangione*, 85 Md. App. 738, 750, 584 A.2d 1318, 1324 (1991). A conditional use will only fail where the adverse effect from the proposed use would be above and beyond the adverse effects inherently associated with such use, irrespective of its location within the zone. *Schultz v. Pritts*, 291 Md. 1, 22–23, 432 A.2d 1319, 1331 (1981). A zoning board of appeals' decision to deny a cellular tower conditional use because of its impact on rural views has been held to have violated the Federal Telecommunications Act and to be contrary to Maryland law regarding conditional uses. *T-Mobile Ne. LLC v. Frederick Cty. Bd. of Appeals*, 761 F. Supp. 2d 282, 287–288 (D. Md. 2010).

The Property in question is located in the Gateway-Industrial zoning district where cellular communications towers are permitted as of right. The proposed Tower has therefore been legislatively predetermined, by the City of Cumberland in adopting its Zoning Ordinance, to be compatible with the permitted uses in that zoning district. Accordingly, the requested conditional use for a setback modification should only be denied if the adverse effects of the Tower in this location would exceed those inherent to such use elsewhere in the same zone.

A cellular communications tower at the proposed location with a 25-foot setback from all adjacent lot lines would have no greater adverse effect upon adjoining and surrounding properties than it would in any other location within the Gateway-Industrial zone. With the 25-foot fall radius ensuring the Tower's safety with respect to surrounding properties, there is no other feature of the Tower with the requested conditional use that would have any adverse effects greater than those inherent to cellular communications towers in general.

City of Cumberland
Board of Zoning Appeals
October 15, 2020
Page Three

Moreover, a communications tower on the Property in question is consistent with the stated purpose of the Gateway-Industrial district, which is “to permit and encourage a mixture of industrial/commercial and residential uses within the North Mechanic Street/North Centre Street Corridor”. Zoning Ordinance, Section 25-101(b)(12). If approved, the Tower would support this purpose by providing essential communication services to nearby businesses and residents, in harmony with the blended character of this zone.

The public meeting on Rocon’s application is currently set for October 21. We are prepared to go forward with the hearing and hope that the scheduled date can be maintained. However, if it is not possible to keep the current hearing date, we will be happy to reschedule a hearing as early as is convenient for the Board of Zoning Appeals.

Thank you for your time and consideration in this matter. Please do not hesitate to reach out if you need any supplemental or follow-up information regarding the Tower specifications.

Very truly yours,

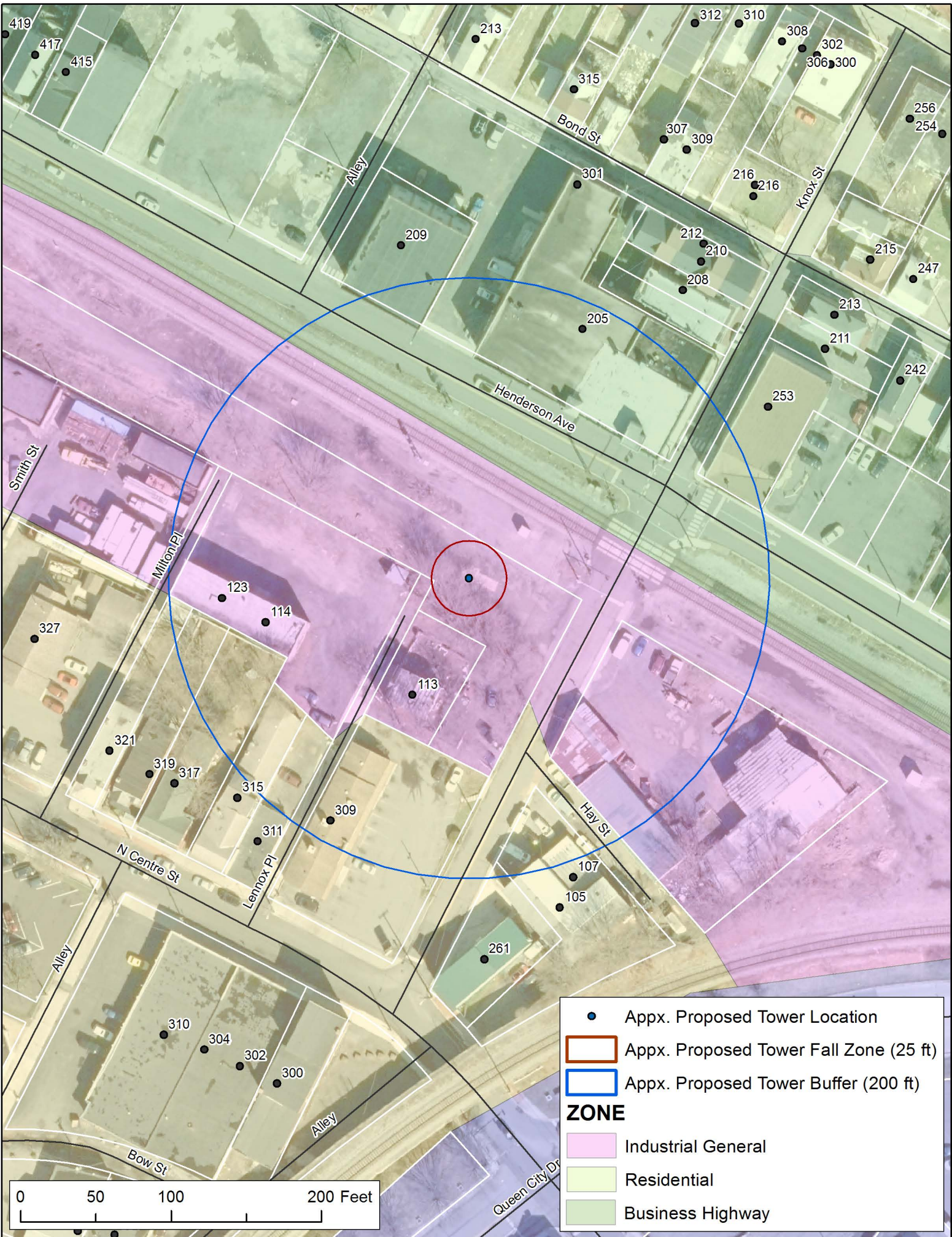
GEPPERT, McMULLEN, PAYE & GETTY

By 
J. MATTHEW GILMORE

JMG/fle

cc: Bill Rothman

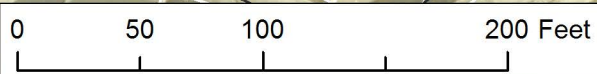
Enclosures

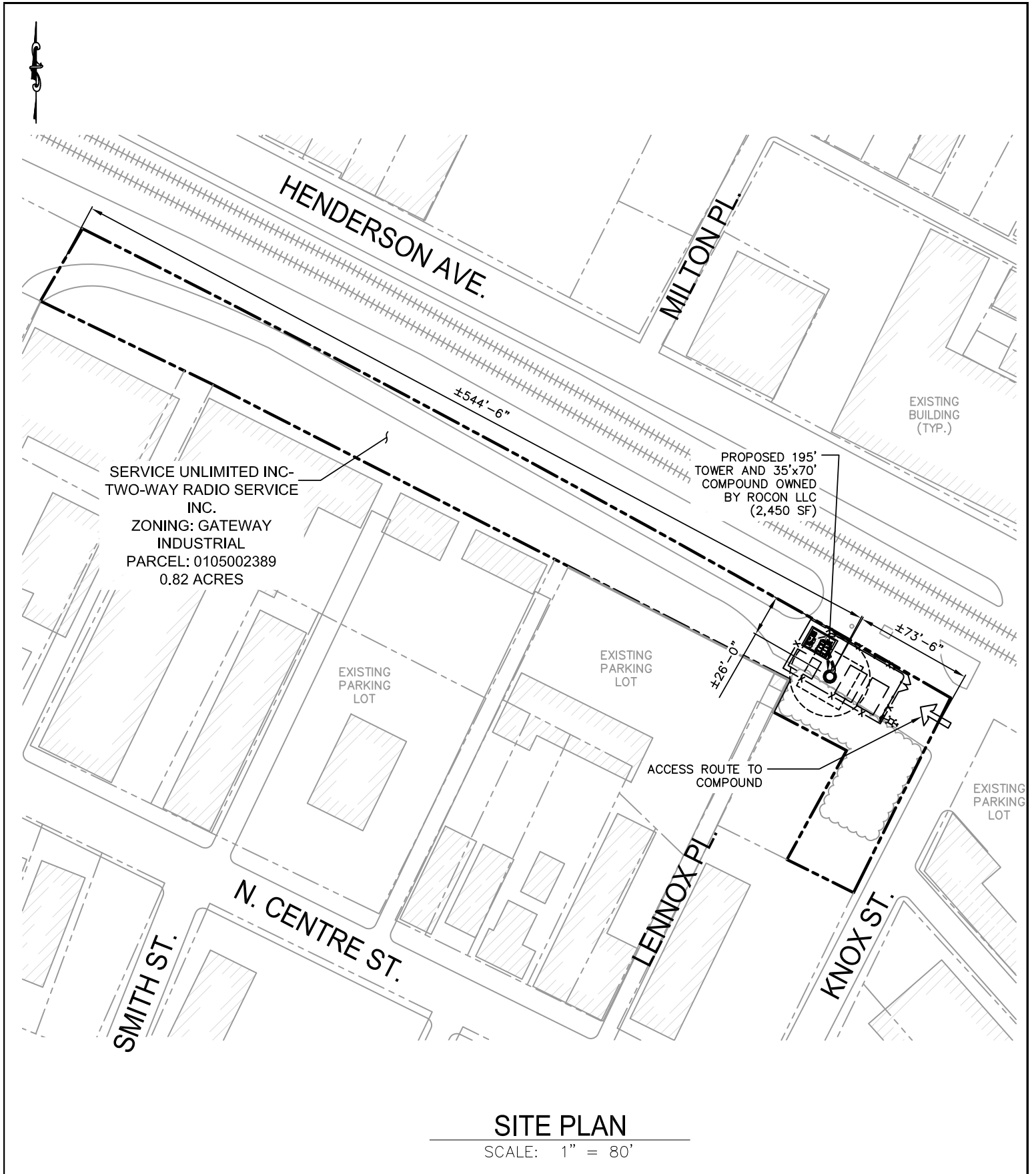


- Appx. Proposed Tower Location
- ◻ Appx. Proposed Tower Fall Zone (25 ft)
- ◻ Appx. Proposed Tower Buffer (200 ft)

ZONE

- ◻ Industrial General
- ◻ Residential
- ◻ Business Highway





SITE PLAN

SCALE: 1" = 80'



KCI TECHNOLOGIES, INC.
11830 West Market Place, Suite F
Fulton, MD 20759
Phone: 410.792.8086



1362 MELLON RD, STE 140
HANOVER, MD 21076
PHONE: (410)582-8043
FAX: (410)221-2962



7150 STANDARD DRIVE
HANOVER, MD 21076

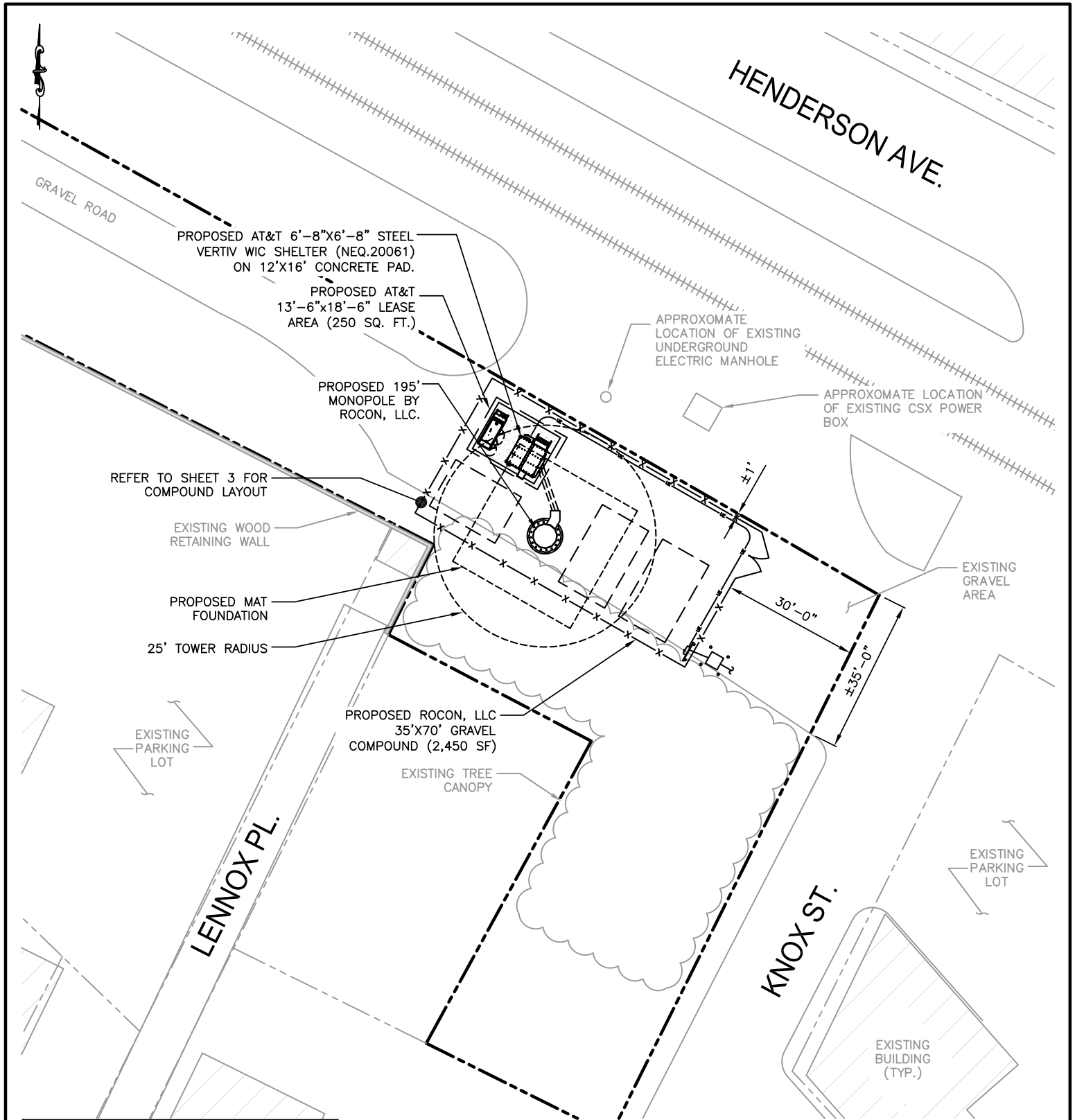
SUBMITTALS

A	PRELIMINARY	7-2-20
B	REVISED PER COMMENTS	7-15-20
C	REVISED PER COMMENTS	7-31-20
D	REVISED PER COMMENTS	8-06-20
E	TOWER RELOCATED	10-16-20
F	REVISED PER COMMENTS	10-19-20

SHEET 1 OF 5

WINIFRED
KNOX STREET
CUMBERLAND, MD 21502
ALLEGANY COUNTY

FA#: 14372653
SITE#: 1945



PROPOSED AT&T 6'-8"x6'-8" STEEL VERTIV WIC SHELTER (NEQ.20061) ON 12'X16' CONCRETE PAD.

PROPOSED AT&T 13'-6"x18'-6" LEASE AREA (250 SQ. FT.)

PROPOSED 195' MONOPOLE BY ROCON, LLC.

APPROXIMATE LOCATION OF EXISTING UNDERGROUND ELECTRIC MANHOLE

APPROXIMATE LOCATION OF EXISTING CSX POWER BOX

REFER TO SHEET 3 FOR COMPOUND LAYOUT

EXISTING WOOD RETAINING WALL

PROPOSED MAT FOUNDATION

25' TOWER RADIUS

EXISTING PARKING LOT

PROPOSED ROCON, LLC 35'X70' GRAVEL COMPOUND (2,450 SF)

EXISTING TREE CANOPY

EXISTING GRAVEL AREA

EXISTING PARKING LOT

EXISTING BUILDING (TYP.)

SITE PLAN

SCALE: 1" = 30'

- NOTES:**
1. TREES WILL BE LOCATED AT TIME OF SURVEY AND USED TO DETERMINE IF TREE TRIMMING/REMOVAL IS NECESSARY.
 2. EXISTING UNDERGROUND UTILITIES MUST BE LOCATED IN ORDER TO ENSURE NO CONFLICT WITH PROPOSED EQUIPMENT.



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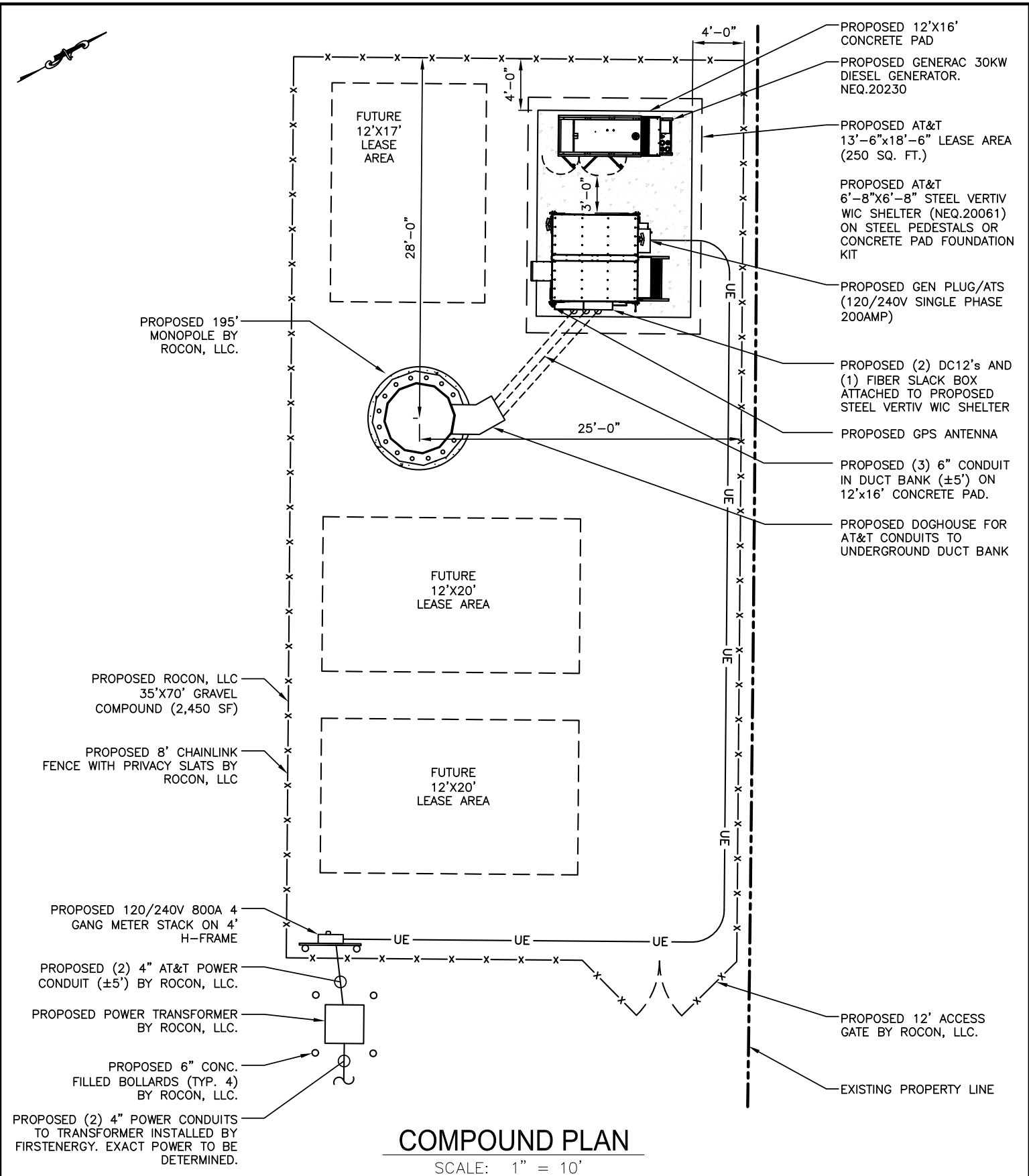
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SHEET 2 OF 5

WINIFRED
KNOX STREET
CUMBERLAND, MD 21502
ALLEGANY COUNTY

FA#: 14372653
SITE#: 1945



PROPOSED 195'
MONOPOLE BY
ROCON, LLC.

FUTURE
12'X17'
LEASE
AREA

- PROPOSED 12'X16'
CONCRETE PAD
- PROPOSED GENERAC 30KW
DIESEL GENERATOR.
NEQ.20230
- PROPOSED AT&T
13'-6"x18'-6" LEASE AREA
(250 SQ. FT.)
- PROPOSED AT&T
6'-8"x6'-8" STEEL VERTIV
WIC SHELTER (NEQ.20061)
ON STEEL PEDESTALS OR
CONCRETE PAD FOUNDATION
KIT
- PROPOSED GEN PLUG/ATS
(120/240V SINGLE PHASE
200AMP)
- PROPOSED (2) DC12's AND
(1) FIBER SLACK BOX
ATTACHED TO PROPOSED
STEEL VERTIV WIC SHELTER
- PROPOSED GPS ANTENNA
- PROPOSED (3) 6" CONDUIT
IN DUCT BANK (±5') ON
12'X16' CONCRETE PAD.
- PROPOSED DOGHOUSE FOR
AT&T CONDUITS TO
UNDERGROUND DUCT BANK

FUTURE
12'X20'
LEASE AREA

PROPOSED ROCON, LLC
35'X70' GRAVEL
COMPOUND (2,450 SF)

PROPOSED 8' CHAINLINK
FENCE WITH PRIVACY SLATS BY
ROCON, LLC

FUTURE
12'X20'
LEASE AREA

PROPOSED 120/240V 800A 4
GANG METER STACK ON 4'
H-FRAME

PROPOSED (2) 4" AT&T POWER
CONDUIT (±5') BY ROCON, LLC.

PROPOSED POWER TRANSFORMER
BY ROCON, LLC.

PROPOSED 6" CONC.
FILLED BOLLARDS (TYP. 4)
BY ROCON, LLC.

PROPOSED (2) 4" POWER CONDUITS
TO TRANSFORMER INSTALLED BY
FIRSTENERGY. EXACT POWER TO BE
DETERMINED.

PROPOSED 12' ACCESS
GATE BY ROCON, LLC.

EXISTING PROPERTY LINE

COMPOUND PLAN

SCALE: 1" = 10'



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SHEET 3 OF 5

WINIFRED
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- TYPICAL PER SECTOR**
- (2) PROPOSED ANTENNA
 - (2) FUTURE ANTENNA
 - (4) RRH
 - (1) FUTURE RRH
 - (1) DC9
- TOTAL COUNT**
- (6) PROPOSED ANTENNA
 - (6) FUTURE ANTENNA
 - (12) RRH
 - (3) FUTURE RRH
 - (3) DC9

- OVERALL HEIGHT
HEIGHT @ 199' AGL
- TOP OF PROPOSED MONOPOLE
HEIGHT @ 195' AGL
- FUTURE CARRIER ANTENNAS
RAD CENTER @ 194' AGL
- PROPOSED AT&T ANTENNA TIP
HEIGHT @ 188' AGL
- PROPOSED AT&T ANTENNA
RAD CENTER @ 184' AGL
- FUTURE CARRIER ANTENNAS
RAD CENTER @ 174' AGL
- FUTURE CARRIER ANTENNAS
RAD CENTER @ 164' AGL

PROPOSED 4' LIGHTNING ROD

PROPOSED 8' CHAIN LINK FENCE WITH PRIVACY SLATS BY ROCON, LLC.

PROPOSED 195' MONOPOLE BY ROCON, LLC.

PROPOSED AT&T CABLES INSIDE MONOPOLE
(3) FIBER
(9) DC BUNDLES

FIBER/DC POWER LENGTH TO RAD CENTER IS ±223'

- PROPOSED DOGHOUSE FOR AT&T CONDUITS TO UNDERGROUND DUCT BANK
- PROPOSED AT&T 6'-8"X6'-8" STEEL VERTIV WIC SHELTER (NEQ.20061) ON STEEL PEDESTALS OR CONCRETE PAD FOUNDATION KIT
- PROPOSED GPS ATTACHED TO SIDE OF WIC.
- PROPOSED GENERAC 30KW DIESEL GENERATOR. NEQ.20230
- PROPOSED 12'x16' CONCRETE PAD

- (3) 6" CONDUIT FROM TOWER TO WIC
- (1) 6" FIBER
- (1) 6" DC POWER
- (1) 6" FUTURE

TOWER ELEVATION

SCALE: N.T.S



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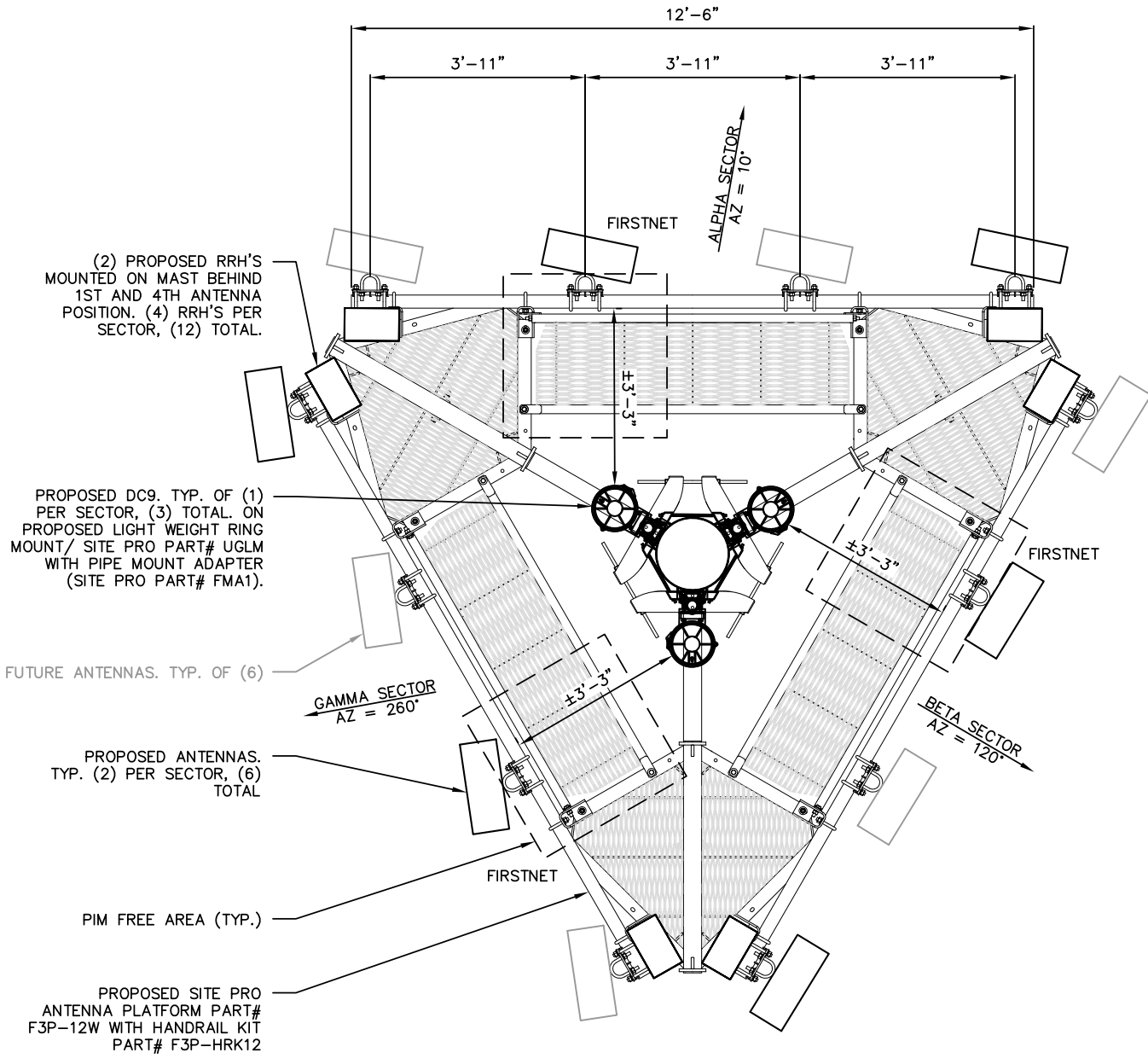
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SHEET 4 OF 5

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ANTENNA LAYOUT PLAN
SCALE: 1" = 3'



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D	REVISED PER COMMENTS	8-06-20
E	TOWER RELOCATED	10-16-20
F	REVISED PER COMMENTS	10-19-20

WINIFRED
KNOX STREET
CUMBERLAND, MD 21502
ALLEGANY COUNTY

FA#: 14372653
SITE#: 1945



1 Fairholm Avenue
Peoria, IL 61603 USA
Phone 309-566-3000
FAX 309-566-3079
Toll Free 800-727-ROHN

October 16, 2020

Rocon LLC
9101 Chesapeake Ave
Sparrow's Point, MD 21219

Attn: Bill Rothman

Reference: 195' Tapered Steel Pole
Site Name: Winifred
Allegany County (Cumberland), MD
File # 235008

Dear Mr. Rothman

The referenced pole is designed to meet the specified loading requirements in accordance with ANSI/TIA-222-G for a 115 MPH ASCE 7-10 Factored wind speed with no ice and a 30 MPH 3-second gust wind speed with .75 inch radial ice, Structure Class: II; Exposure Category: C and Topographic Category: 1.

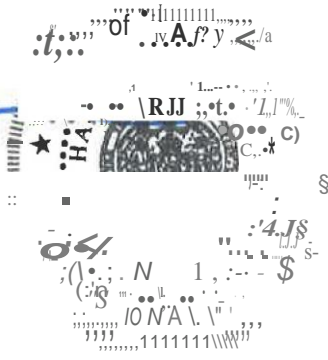
It is our understanding that the design of the referenced pole requires consideration of a contained fall radius in the event that a catastrophic wind speed would result in collapse. Although the pole is not designed to fail, stronger sections than required by analysis is provided in the lower sections of the pole. This will result in an increased safety factor in the lower sections. This design enables the pole to fail through a combination of bending and buckling in the upper portion of the pole under a catastrophic wind loading. Failure in this manner will result in the upper portion of the pole folding over the lower portion, resulting in a fall radius no greater than **25** ft. The failure mode will theoretically be a local buckling failure involving a crippling of the pole wall on one side of the pole as opposed to the pole shearing off or completely breaking off and hitting the ground.

Please contact us at your convenience should you have further questions concerning the safety of pole structures or other aspects of pole design.

Sincerely,

Habib Azouri, P.E.
Engineering Manager

cc: Ray Adams





1 Fairholm Avenue
Peoria, IL 61603 USA
Phone: (309)-566-3000
Fax: (309)-566-3079

DATE: OCTOBER 16, 2020

PURCHASER: ROCON LLC

PROJECT: 195 FT TAPERED STEEL POLE
WINIFRED SITE, CUMBERLAND, MARYLAND

FILE NUMBER:235008

DRAWINGS: 235008-01-D1 R4, 235008-01-FI, B090548

I CERTIFY THAT THE REFERENCED DRAWINGS WERE PREPARED UNDER MY SUPERVISION IN ACCORDANCE WITH THE DESIGN AND LOADING CRITERIA SPECIFIED BY THE PURCHASER AND THAT I AM A REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

THE REFERENCED FOUNDATION DESIGN IS BASED ON PRESUMPTIVE SOIL PARAMETERS. A GEOTECHNICAL SITE INVESTIGATION SHALL BE PERFORMED PRIOR TO INSTALLATION FOR COMPETENT PROFESSIONAL EXAMINATION AND VALIDATION OF THE SUITABILITY OF THE PRESUMPTIVE SOIL PARAMETERS FOR THE SITE.

CERTIFIED BY: HWA
DATE: 10/16/20

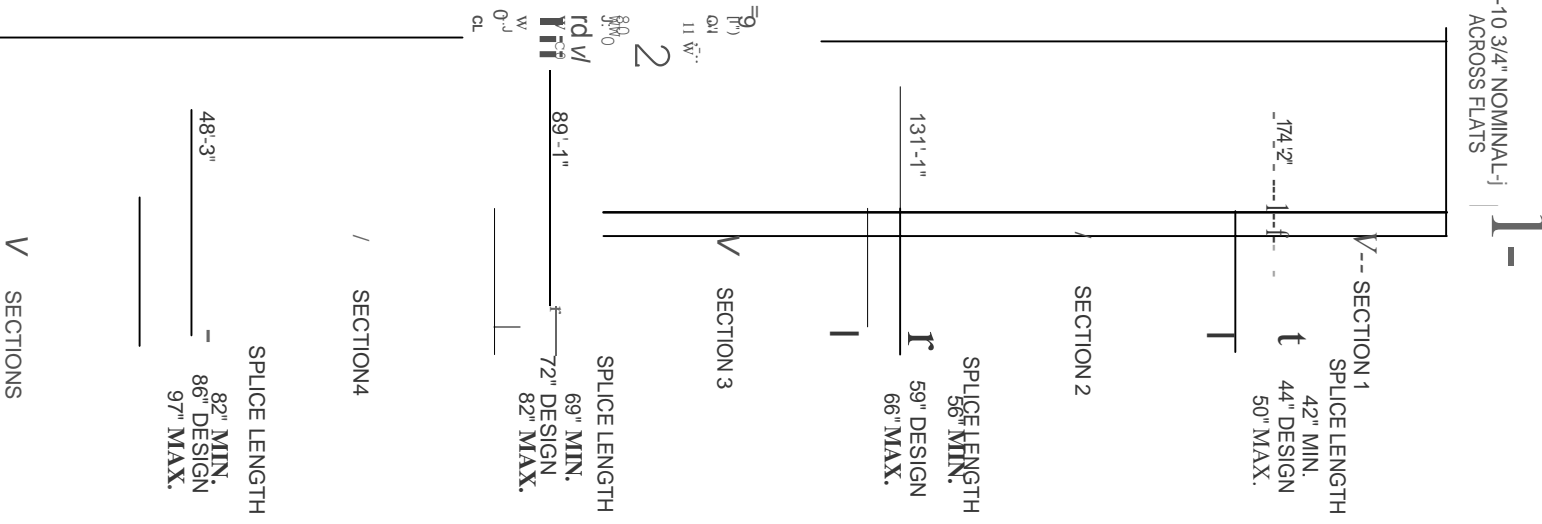


GENERAL NOTES

- ROHN PRODUCTS POLE DESIGNS CONFORM TO ANSITIA-222-G UNLESS OTHERWISE SPECIFIED UNDER POLE DESIGN LOADING
- THE DESIGN LOADING CRITERIA INDICATED HAS BEEN PROVIDED TO ROHN. THE DESIGN LOADING CRITERIA HAS BEEN ASSUMED TO BE BASED ON SITE-SPECIFIC DATA IN ACCORDANCE WITH ANSITIA-222-G AND MUST BE VERIFIED BY OTHERS PRIOR TO INSTALLATION.
- ANTENNAS AND LINES LISTED IN POLE DESIGN LOADING TABLE ARE PROVIDED BY OTHERS UNLESS OTHERWISE SPECIFIED.
- STEP BOLTS WITH SAFETY CLIMB SYSTEM ARE PROVIDED AS A CUMMING FACILITY FOR THE INSTALLATION OF THE STRUCTURE.
- POLE MEMBER DESIGN DOES NOT INCLUDE STRESSES DUE TO ERECTION SINCE ERECTION EQUIPMENT AND CONDITIONS ARE UNKNOWN. DESIGN ASSUMES COMPETENT AND QUALIFIED PERSONNEL WILL ERECT THE POLE.
- WORK SHALL BE IN ACCORDANCE WITH ANSITIA-222-G, "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES".
- FIELD CONNECTIONS SHALL BE BOLTED. NO FIELD WELDS SHALL BE ALLOWED.
- STRUCTURAL BOLTS SHALL CONFORM TO GRADE A325 PER ASTM F3125, EXCEPT WHERE NOTED.
- STRUCTURAL STEEL AND CONNECTION BOLTS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION. IN ACCORDANCE WITH ANSITIA-222-G.
- ALL HIGH STRENGTH BOLTS ARE TO BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS BEING IN THE ROHN "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS". NO OTHER MINIMUM TENSION OR TORQUE VALUES ARE REQUIRED.
- PURCHASER SHALL VERIFY THE INSTALLATION IS IN CONFORMANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS FOR OBSTRUCTION MARKING AND LIGHTING.
- TOLERANCE ON POLE STEEL HEIGHT IS EQUAL TO PLUS 1% OR MINUS 1/2%.
- DESIGN ASSUMES THAT, AS A MINIMUM, MAINTENANCE AND INSPECTION WILL BE PERFORMED OVER THE LIFE OF THE STRUCTURE IN ACCORDANCE WITH ANSITIA-222-G.
- DESIGN ASSUMES LEVEL GRADE AT POLE SITE.
- THE PURCHASER SHALL VERIFY THAT ACTUAL SITE SOIL PARAMETERS MEET OR EXCEED TIA REV. G "PRESUMPTIVE" CLAY SOIL PARAMETERS.
- DESIGN ASSUMES ALL ANTENNAS ARE MOUNTED SYMMETRICALLY TO MINIMIZE TORQUE, IF APPLICABLE.
- DESIGN ASSUMES ALL PANEL ANTENNAS WITH MOUNTING FRAMES ARE MOUNTED SYMMETRICALLY.
- DESIGN ASSUMES ALL TRANSMISSION LINES ARE ROUTED INTERNALLY.
- POLE SHAFT CONFORMS TO ASTM A572 GR 65. POLE BASE PLATE STEEL CONFORMS TO ASTM A572 GR 50 WITH CHARNPY IMPACT REQUIREMENTS. POLE ANCHOR BOLTS CONFORM TO ASTM A615 GR 75.
- JACKING LUGS ARE PROVIDED ABOVE AND BELOW EACH SUP JOINT TO FACILITATE THE USE OF JACKING DEVICES. NON-STAINING LUBRICANTS SHALL BE APPLIED TO THE SUP JOINTS. JACKING FORCES SHOULD BE APPLIED UNTIL THE JOINT IS TIGHT WITH NO GAPS GREATER THAN 1/4".
- POLE DESIGN INCLUDES CONSIDERATION OF A CONTAINED FALL RADIUS EQUAL TO 25'-0" BY PROVIDING STRONGER SECTIONS THAN REQUIRED BY ANALYSIS IN THE LOWER PORTION OF THE POLE.

POLE DESIGN LOADING

DESIGN WIND LOAD PER ANSITIA-222-G USING THE FOLLOWING DESIGN CRITERIA: ASCE 7-10 ULTIMATE WIND SPEED (NO ICE): 115 MPH BASIC WIND SPEED (W/ICE): 30 MPH PER ASCE 7-10 DESIGN ICE THICKNESS: 0.75" PER ASCE 7-10 EXPOSURE CATEGORY: C STRUCTURE CLASS: II TOPOGRAPHIC CATEGORY: I EARTHQUAKE SPECTRAL RESPONSE ACCELERATION: Ss: 0.118, S1: 0.053, SITE CLASS: D		
THIS STRUCTURE HAS BEEN DESIGNED TO SUPPORT THE FOLLOWING LOADS:		
ELEVATION (FT)	ANTENNA LOADING	LINE SIZE (NOM)
TOP	LIGHTNING ROD	-
TOP	(12) 80010866 & (18) RRH2X40 ON A LP MOUNT	(12) 1-5/8"
185	(12) 80010866 & (18) RRH2X40 ON A LP MOUNT	(12) 1-5/8"
175	(12) 80010866 & (18) RRH2X40 ON A LP MOUNT	(12) 1-5/8"
165	(12) 80010866 & (18) RRH2X40 ON A LP MOUNT	(12) 1-5/8"



BASE PLATE 2.50" X 75.00" ROUND
W/(20) 2.25" DIA. X 84.00" LONG ANCHOR
RODS EQUALLY SPACED ON A 70.00" B.C.

ADJUSTED FACTORED REACTIONS	
DOWNLOAD =	163.8 KIPS
SHEAR =	52.3 KIPS
O.T.M =	8,248.2 FT-KIPS

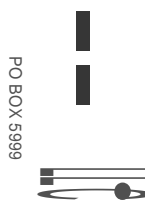
SECTION	LENGTH (FT)	DIAMETER		WALL THICK (IN)	Fy (KSD)	WEIGHT (KIPS)
		BOI	TOP			
1	24.54	28.33	22.75	0.2500	65.0	1.8
2	48.00	37.74	26.83	0.3125	65.0	5.5
3	48.00	46.75	35.84	0.4375	65.0	9.8
4	48.00	55.26	44.35	0.4375	65.0	11.9
5	48.00	63.50	52.59	0.5000	65.0	15.9

NOTE:
FOR POLYGONAL POLES, DIAMETER IS MEASURED ACROSS FLATS.
TABULATED WEIGHTS ARE APPROXIMATE. REFER TO ASSEMBLY DRAWING FOR FINAL WEIGHTS. ALL WEIGHTS SHALL BE VERIFIED PRIOR TO LIFTING.

FILE NO.

235008

REVISIONS			
REV	DESCRIPTION	DATE	BY
4	REVISED FOR 1/2\"/>		



PO BOX 5999

TOLL FREE 800-727-ROHN

ROCON LLC
DESIGN KUFULE
193 F1 1ST

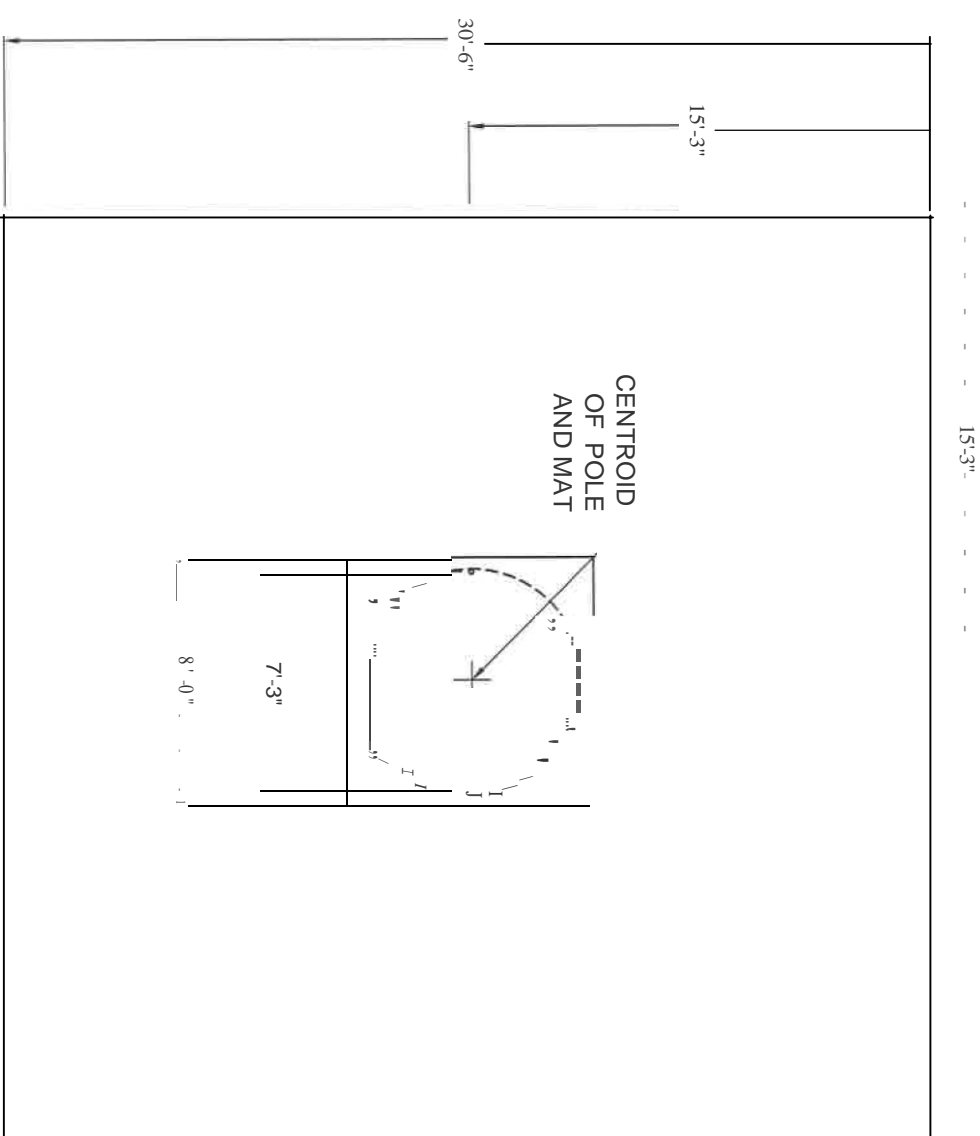
WINNERED SITE, CUMBERLAND, MD

OWN: SWG | CHKD: HA | DATE: 08/04/2020

PRJ ENGR: SWG | PRJ MNGR: HA | DATE: 08/04/2020

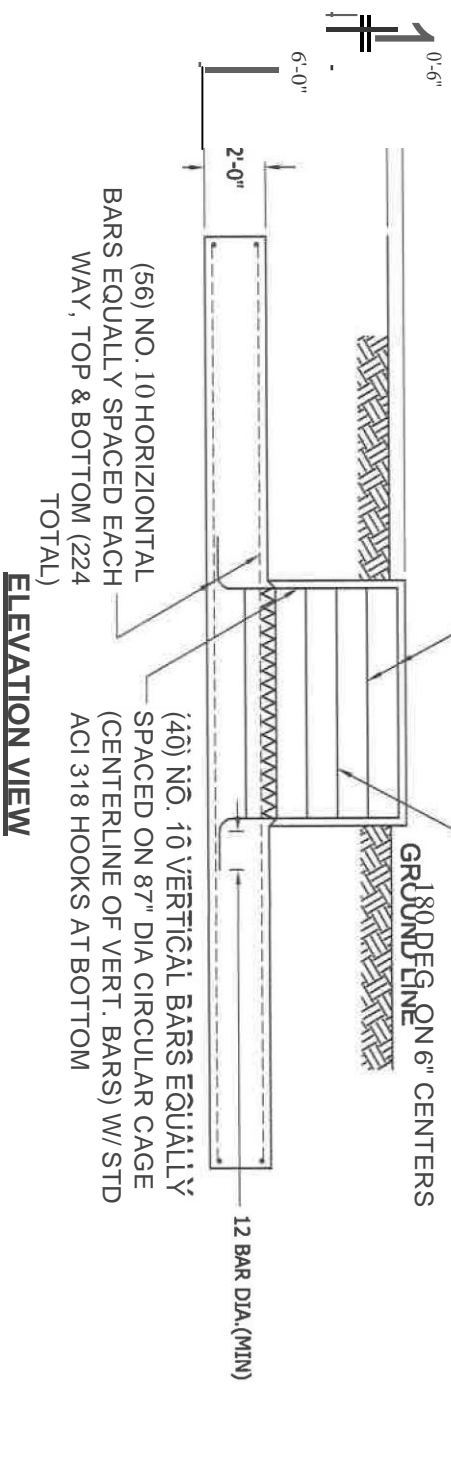
DRAWING NO: 235008-01-D1 | REV: 4

NOTE: SEE DRAWING NO. 8090548 FOR STANDARD FOUNDATION NOTES.



PLAN VIEW

(2) NO. 5 CIRCULAR STIRRUPS ENCLOSING VERTICAL BARS @ 2'-1/2" C-C W/ 180 DEG. STAGGERED 6" MIN LAPS TERMINATED AT EACH END WITH A STD. ACI 318 HOOK ENGAGING A VERTICAL BAR WITH 2" COVER (TYP).



ELEVATION VIEW

(56) NO. 10 HORIZONTAL BARS EQUALLY SPACED EACH WAY, TOP & BOTTOM (224 TOTAL)

(40) NO. 10 VERTICAL BARS EQUALLY SPACED ON 8" DIA CIRCULAR CAGE (CENTERLINE OF VERT. BARS) W/ STD ACI 318 HOOKS AT BOTTOM

NO. 5 CIRCULAR STIRRUPS ENCLOSING VERTICAL BARS WITH 30" LAPS STAGGERED

180 DEG ON 6" CENTERS

12 BAR DIA. (MIN)

ADJUSTED FACTORED REACTIONS

O.T.M. = 8,248.2 FT-K
 DOWNLOAD = 163.8 KIPS
 SHEAR = 52.4 KIPS

CONCRETE VOLUME

SQUARE PIER 10.7 CU.YDS
 PAD 68.9 CU.YDS
 TOTAL 79.6 CU.YDS

FILE NO. 235008

REVISIONS
 DESCRIPTION DWN CHK APP

21



PO BOX 5999
 PEORIA, IL 61601-5999
 TOLL FREE 800-727-RQHN

REVISIONS
 DESCRIPTION
 DATE

MAT W/RAISED PIER
 PRESUMPTIVE CLAY PER ANS/ITA-222-G

DWN: WG CHK'D: HA DATE: 7/24/2020

ENGR: HA SHEET#: 1 OF 1

PRJ ENGR: SWG PRI. MANG'R:

DRAWING NO: 235008-01-F1 REV: 0

STANDARD FOUNDATION NOTES
ANSI/TIA-222-G/H

- STANDARD FOUNDATION DESIGNS ARE IN ACCORDANCE WITH ANSI/TIA-222-G/H, "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES" FOR THE FOLLOWING PRESUMPTIVE CLAY SOIL PARAMETERS:

N (blows/ft) [blows/m]	C _p (deg)	Y (lb/ft ³) [kN/m ³]	C (psf) [kPa]	Ultimate Bearing (psf) [kPa]		Ultimate Skin Friction (psf) [kPa]	K (pci) [kN/m ³]	E _{so}
				Shallow Fnds.	Deep Fnds.			
8 [26]	0	110 [17]	1000 [48]	5000 [240]	9000 [431]	500 [24]	150 [41,000]	0.01

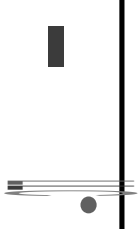
GROUND WATER TABLE IS AT OR BELOW FOUNDATION DEPTH
MAXIMUM FROST PENETRATION DEPTH LESS THAN FOUNDATION DEPTH

- THE PURCHASER SHALL VERIFY THAT ACTUAL SITE SOIL PARAMETERS MEET OR EXCEED ANSI/TIA-222-G/H PRESUMPTIVE CLAY SOIL DESIGN PARAMETERS AND THAT THE DEPTH OF STANDARD FOUNDATIONS ARE ADEQUATE BASED ON THE FROST PENETRATION AND/OR ZONE OF SEASONAL MOISTURE VARIATION AT THE SITE. FOUNDATION DESIGN MODIFICATIONS MAY BE REQUIRED IN THE EVENT PRESUMPTIVE CLAY SOIL PARAMETERS ARE NOT APPLICABLE FOR THE ACTUAL SUBSURFACE CONDITIONS ENCOUNTERED.
- A SITE-SPECIFIC INVESTIGATION IS REQUIRED FOR CLASS III STRUCTURES IN ACCORDANCE WITH ANSI/TIA-222-G/H.
- FOUNDATION DESIGNS ASSUME FIELD INSPECTIONS WILL BE PERFORMED BY THE PURCHASER'S REPRESENTATIVE TO VERIFY THAT CONSTRUCTION MATERIALS, INSTALLATION METHODS AND ASSUMED DESIGN PARAMETERS ARE ACCEPTABLE BASED ON THE CONDITIONS EXISTING AT THE SITE.
- WORK SHALL BE IN ACCORDANCE WITH THE PROJECT CONSTRUCTION DOCUMENTS, LOCAL CODES, SAFETY REGULATIONS AND UNLESS OTHERWISE NOTED, THE LATEST REVISION OF ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE". PROCEDURES FOR THE PROTECTION OF EXCAVATIONS, EXISTING CONSTRUCTION AND UTILITIES SHALL BE ESTABLISHED PRIOR TO FOUNDATION INSTALLATION.
- CONCRETE MATERIALS SHALL CONFORM TO THE APPROPRIATE STATE REQUIREMENTS FOR EXPOSED STRUCTURAL CONCRETE.
- PROPORTIONS OF CONCRETE MATERIALS SHALL BE SUITABLE FOR THE INSTALLATION METHOD UTILIZED AND SHALL RESULT IN DURABLE CONCRETE FOR RESISTANCE TO LOCAL ANTICIPATED AGGRESSIVE ACTIONS. THE DURABILITY REQUIREMENT OF ACI 318 SHALL BE SATISFIED BASED ON THE CONDITIONS EXPECTED AT THE SITE. AS A MINIMUM, CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4500 PSI (31.0 MPa) IN 28 DAYS.
- MAXIMUM SIZE OF AGGREGATE SHALL NOT EXCEED SIZE SUITABLE FOR INSTALLATION METHOD UTILIZED OR 3/4 CLEAR DISTANCE BEHIND OR BETWEEN REINFORCING. WORKABILITY AND METHODS OF CONSOLIDATION SUCH AS VIBRATING SHALL BE UTILIZED TO PREVENT HONEYCOMBS OR VOIDS.
- REINFORCEMENT SHALL BE DEFORMED AND CONFORM TO THE REQUIREMENTS OF ASTM A615 GRADE 60 UNLESS OTHERWISE NOTED. SPLICES IN REINFORCEMENT SHALL NOT BE ALLOWED UNLESS OTHERWISE INDICATED.
- REINFORCING CAGES SHALL BE BRACED TO RETAIN PROPER DIMENSIONS DURING HANDLING, THROUGHOUT PLACEMENT OF CONCRETE AND DURING EXTRACTION OF TEMPORARY CASING.
- WELDING IS PROHIBITED ON REINFORCING STEEL AND EMBEDMENTS.
- MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE 3 INCHES (76mm) UNLESS OTHERWISE NOTED. APPROVED SPACERS SHALL BE USED TO INSURE A 3 INCH (76 mm) MINIMUM COVER ON REINFORCEMENT. CONCRETE COVER FROM TOP OF FOUNDATION TO ENDS OF VERTICAL REINFORCEMENT SHALL NOT EXCEED 3 INCHES (76 mm) NOR BE LESS THAN 2 INCHES (51 mm).

FILE NO.

REVISIONS			
REF.	DESCRIPTION	DWN	CHKD APP
	REVISED TO ANSIm A-222-G/H	SWG	HA HA
	ONE - 11.2.W2D20		

- SPACERS SHALL BE ATTACHED INTERMITTENTLY THROUGHOUT THE ENTIRE LENGTH OF VERTICAL REINFORCING CAGES TO INSURE CONCENTRIC PLACEMENT OF CAGES IN EXCAVATIONS.
- FOUNDATION DESIGNS ASSUME STRUCTURAL BACKFILL TO BE COMPACTED IN 8 INCH (200 mm) MAXIMUM LAYERS TO 95% OF MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D698. ADDITIONALLY, STRUCTURAL BACKFILL MUST HAVE A MINIMUM COMPACTED UNIT WEIGHT OF 110 POUNDS PER CUBIC FOOT (17 kN/m³).
- FOUNDATION DESIGNS ASSUME AN INSTALLATION ON A PROPERLY DRAINED LEVEL SITE.
- FOUNDATION INSTALLATION SHALL BE SUPERVISED BY PERSONNEL KNOWLEDGEABLE AND EXPERIENCED WITH THE PROPOSED FOUNDATION TYPE. CONSTRUCTION SHALL BE IN ACCORDANCE WITH GENERALLY ACCEPTED INSTALLATION PRACTICES
- ALL CONSTRUCTION AND SAFETY EQUIPMENT AND TEMPORARY SUPPORTS REQUIRED FOR CONSTRUCTION SHALL BE DETERMINED, FURNISHED AND INSTALLED BY THE CONTRACTOR BASED ON THE MEANS AND METHODS CHOSEN BY THE CONTRACTOR. ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED BY COMPETENT, QUALIFIED AND TRAINED PERSONNEL.
- FOR FOUNDATION AND ANCHOR TOLERANCES SEE ANCHOR ROD LAYOUT DRAWING.
- LOOSE MATERIAL SHALL BE REMOVED FROM BOTTOM OF EXCAVATION PRIOR TO CONCRETE PLACEMENT.
- SIDES OF EXCAVATION SHALL BE ROUGH AND FREE OF LOOSE CUTTINGS.
- CONCRETE SHALL BE PLACED IN A MANNER THAT WILL PREVENT SEGREGATION OF CONCRETE MATERIALS, INFILTRATION OF WATER OR SOIL AND OTHER OCCURRENCES WHICH MAY DECREASE THE STRENGTH OR DURABILITY OF THE FOUNDATION.
- FREE FALL CONCRETE MAY BE USED PROVIDED FALL IS VERTICAL DOWN WITHOUT HITTING SIDES OF EXCAVATION, FORMWORK, REINFORCING BARS, ANCHORAGES, FORM TIES, CAGE BRACING OR OTHER OBSTRUCTIONS. UNDER NO CIRCUMSTANCES SHALL CONCRETE FALL THROUGH WATER.
- CONCRETE SHALL BE PLACED AGAINST UNDISTURBED SOIL EXCEPT FOR PIERS SUPPORTED ON SPREAD FOUNDATIONS. FORMS FOR PIERS SHALL BE REMOVED PRIOR TO PLACING STRUCTURAL BACKFILL.
- CONSTRUCTION JOINTS, IF REQUIRED IN DRILLED PIER OR CAISSON FOUNDATIONS, SHALL BE AT LEAST 12 INCHES (305 mm) BELOW BOTTOM OF EMBEDMENTS AND MUST BE INTENTIONALLY ROUGHENED TO A FULL AMPLITUDE OF 1/4 INCH (6mm). FOUNDATION DESIGN ASSUMES NO OTHER CONSTRUCTION JOINTS.
- CONSTRUCTION JOINTS, IF REQUIRED AT THE BASE OF PIERS SUPPORTED ON SPREAD FOUNDATIONS, SHALL BE INTENTIONALLY ROUGHENED TO A FULL AMPLITUDE OF 1/4 INCH (6mm). FOUNDATION DESIGN ASSUMES NO OTHER CONSTRUCTION JOINTS.
- CASING, IF USED, SHALL NOT BE LEFT IN PLACE. EQUIPMENT, PROCEDURES, AND PROPORTIONS OF CONCRETE MATERIALS SHALL INSURE CONCRETE WILL NOT BE ADVERSELY DISTURBED UPON CASING REMOVAL. DRILLING FLUID, IF USED, SHALL BE FULLY DISPLACED BY CONCRETE AND SHALL NOT BE DETRIMENTAL TO CONCRETE OR SURROUNDING SOIL. CONTAMINATED CONCRETE SHALL BE REMOVED FROM TOP OF FOUNDATION AND REPLACED WITH FRESH CONCRETE.
- TOP OF FOUNDATION SHALL BE SLOPED TO DRAIN WITH A FLOATED FINISHED. EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" X 3/4" (19 mm X 19 mm) MINIMUM.
- FOR ANCHOR BLOCK TYPE FOUNDATIONS, FOR GUYED MASTS, ADDITIONAL CORROSION PROTECTION MAY BE REQUIRED FOR STEEL GUY ANCHORS IN DIRECT CONTACT WITH SOIL. DESIGN ASSUMES PERIODIC INSPECTIONS WILL BE PERFORMED OVER THE LIFE OF THE STRUCTURE TO DETERMINE IF ADDITIONAL ANCHOR CORROSION PROTECTION MEASURES SHALL BE IMPLEMENTED BASED ON OBSERVED SITE-SPECIFIC CONDITIONS.



PO BOX 5999
 PEORIA, IL 61601-5999
 TOLL FREE 800-727-ROHN

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ANSI/TIA-222-G/H
STANDARD FOUNDATION DESIGN NOTES

DWN:	CHK'D:	HA	DATE:	11/20/2009
ENG'R:	ENG'R:	HA	SHEET#:	1 OF 1
PRI. ENGR:	PRI. MANG'R:			
DRAWING NO:	B090548	REV:	6	

TowerSoft

ENGINEERING SOFTWARE

TSTowar - v 5.8.6 Tower Analyia Program
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Peoria, J:L

R4

File: W:\Joba\2020\235008\ENGJ:NB:ERJ:NG\235008.out
Contract: 235008
Project: 195 FT TSP
Data and Time: 8/4/2020 10:28:13 AM
Project: 195 FT TSP
Data and Time: 8/4/2020 10:28:13 AM

Revision: 0
Site: WJ:NJ:FRED-MD
Engineer: SWG
Site: WJ:NJ:FRED-MD
Engineer: SWG

VJ

DESIGN SPECIFICATION

Design Standard: ANSI/TIA-222-G-2005 Add.2
Ultimate Design Wind Speed (No Ice)= 115.0 (mph)
Nominal Design Wind Speed (No Ice)= 89.1 (mph)
Basic Wind Speed (With Ice)= 30.0 (mph)
Design Ice Thickness=0.75 (in)
Structure Class=II
Exposure Category= C
Topographic Category= 1

Set.	Length (ft)	Overlap To (ft)	Dia.Bot (in)	Dia. Thick. (in)
5	24.62	0.00	22.75	0.2500
4	48.00	3.67	26.94	0.3125
3	48.00	4.92	35.95	0.4375
2	48.00	6.08	44.45	0.4375
1	48.21	7.17	52.71	0.5000

195.00

MAXIMUM BASE REACTIONS

Download (Kips) 154.9
Shear (Kips) 49.5
Moment (Kipsft) 7800.4

163.8
52.
82. +8, t



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..In-R.. U.A..111-
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 Peoria, J:L

File: W:\Jobs\2020\235008\ENGJ:NEERJ:NG\235008.out
 Contract: 235008
 Project: 195 FT TSP
 Date and Time: 8/4/2020 10:28:13 AM

Revision: 0
 Site: WJ:NJ:FRED- MD
 Engineer: SWG

Section A: PROJECT DATA

Project Title: 195 FT TSP
 Customer Name: ROCON LLC
 Site: WINIFRED- MD
 Contract No.: 235008
 Revision: 0
 Engineer: SWG
 Date: Aug 4 2020
 Time: 10:27:52 AM
 Project Notes: 65 FT FALL RADIU
 Design Standard: ANSI/TIA-222-G-2005 Addendum 2

GENERAL DESIGN CONDITIONS

Start wind direction: 0.00 (Deg)
 End wind direction: 315.00 (Deg)
 Increment winddirection: 45.00 (Deg)
 Elevation above ground: 0.00(ft)
 Gust Response Factor Gh: 1.10
 Structure class: II
 Exposure category: C
 Topographic category: I
 Material Density: 490.1 (lbs/ftA3)
 Young's Modulus: 29000.0(ksi)
 Poisson Ratio: 0.30
 Weight Multiplier: 1.06

WIND ONLY CONDITIONS:
 Ultimate Design Wind Speed (No Ice): 115.00 (mph)
 Nominal Design Wind Speed (No Ice): 89.08 (mph)
 Directionality Factor Kd: 0.95
 Importance Factor I: 1.00
 Wind Load Factor: 1.60
 Dead Load Factor: 1.20

WIND AND ICE CONDITIONS:
 Basic Wind Speed (With Ice): 30.00 (mph)
 Directionality Factor Kd: 0.95
 Wind Load Importance Factor Iw: 1.00
 Ice Thickness Importance Factor Ii: 1.00
 Ice Thickness: 0.75 (in)
 Ice Density: 56.19 (lbs/ftA3)
 Wind Load Factor: 1.00
 Dead Load Factor: 1.20
 Ice Load Factor: 1.00

WIND ONLY SERVICEABILITY CONDITIONS:
 Serviceability Wind Speed: 60.00 (mph)
 Directionality Factor Kd: 0.85
 Importance Factor I: 1.00
 Wind Load Factor: 1.00
 Dead Load Factor: 1.00

EARTHQUAKE CONDITIONS:
 Site class definition: D
 Spectral response acceleration Ss: 0.118
 Spectral response acceleration Sl: 0.053
 Acceleration-based site coefficient Fa: 1.600
 Velocity-based site coefficient Fv: 2.400
 Design spectral response acceleration Sds: 0.126
 Design spectral response acceleration Sdl: 0.085



TSTowar - v 5.8.6 Tower Analysis Program
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DWA, Inc.
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Peoria, IL

File: W:\Jobs\2020\235008\ENGINEERING\235008.out
Contract: 235008
Project: 195 FT TSP
Data and Time: 8/4/2020 10:28:13 AM

Revision: 0
Sita: WINIFRED- MD
Engineer: SWG

Seismic analysis method: 1
Fundamental frequency of structure fl: 0.272
Total seismic shear Vs (Kips) 1.12

Analysis performed using: TowerSoft Finite Element Analysis Program



TSTower - v 5.8.6 Tower Analyaisa Program
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 Peoria, IL

File: W:\Jobs\2020\235008\ENGINEERING\235008.out
 Contract: 235008
 Project: 195 FT TSP
 Date and Time: 8/4/2020 10:28:13 AM

Revision: 0
 Site: WINIFRED- MD
 Engineer: SWG

Section B: STRUCTURE GEOMETRY

Total Height (ft)	Bottom Diameter (in)	Top Diameter (in)
195.00	63.50	22.75

Sect. No	Length (ft)	Overlap (ft)	Bot Dia. (in)	Top Dia. (in)	Thick. (in)	Sides	Joint Type	Yield Stress (ksi)	Mass (lbs)	Calculated Taper (in/ft)
5	24.62	0.00	28.26	22.75	0.2500	18-sided	Telescop c	65.0	1780.0	0.22372
4	48.00	3.67	37.68	26.94	0.3125	18-sided	Telescop c	65.0	5494.8	0.22372
3	48.00	4.92	46.69	35.95	0.4375	18-sided	Telescop c	65.0	9829.8	0.22372
2	48.00	6.08	55.19	44.45	0.4375	18-sided	Telescop c	65.0	11874.1	0.22372
1	48.21	7.17	63.50	52.71	0.5000	18-sided	Flange	65.0	15898.7	0.22372

Total Mass: 44877.4



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 Engineer: SWG

Section D: TRANSMISSION LINE DATA

Transmission Lines Position

No.	Bot El (ft)	Top El (ft)	Desc.	Radius (ft)	Az.	Orient.	No.	Shielded	Shielded Lines	Antenna
1	0.00	195.00	3/8" CABLE	3.00	0.00	0.00	1	No	0	
2	0.00	195.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	
3	0.00	185.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	
4	0.00	175.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	
5	0.00	165.00	LDF7P-50A	0.00	0.00	0.00	12	Yes	12	

Transmission Lines Details

No.	Desc.	Width (in)	Depth (in)	Unit Mass (lb/ft)
1	3/8" CABLE	0.38	0.38	1.00
2	LDF7P-50A	2.01	2.01	0.92
3	LDF7P-50A	2.01	2.01	0.92
4	LDF7P-50A	2.01	2.01	0.92
5	LDF7P-50A	2.01	2.01	0.92

Utilization of the cross-section for TX Lines: 21.05%



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Section F: POINT LOAD DATA

Structure Azimuth from North:0.00

POINT LOADS

No.	Description	Elev. (ft)	Radius (ft)	Azim. (Deg)	Orient. (Deg)	Vertical Offset (ft)	TxLine	Comments
1	LIGHTNING ROD	195.00	0.00	0.0	0.0	0.00		
2	CARRIER	195.00	1.00	0.0	0.0	0.00		
3	CARRIER	185.00	1.00	120.0	120.0	0.00		
4	CARRIER	175.00	1.00	240.0	240.0	0.00		
5	CARRIER	165.00	1.00	0.0	0.0	0.00		

POINT LOADS WIND AREAS AND WEIGHTS

No.	Description	Frontal Bare Area (ft"2)	Lateral Bare Area (ft"2)	Frontal Iced Area (ft"2)	Lateral Iced Area (ft"2)	Weight Bare (Kips)	Weight Iced (Kips)	Gh
1	LIGHTNING ROD	1.00	1.00	2.00	2.00	0.10	0.20	1.10
2	CARRIER	159.32	159.32	271.57	271.57	4.89	17.20	1.10
3	CARRIER	159.32	159.32	271.57	271.57	4.89	17.20	1.10
4	CARRIER	159.32	159.32	271.57	271.57	4.89	17.20	1.10
5	CARRIER	159.32	159.32	271.57	271.57	4.89	17.20	1.10



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Engineer: SWG

Section H: STRUCTURE DISPLACEMENT DATA

Load Combination Wind Only - Serviceability

Wind Direction		Maximum displacements				
Elev. (ft)	N-S Disp (in)	W-E Disp (in)	Vert.Disp (in)	N-S Rot (deg)	W-E Rot (deg)	Twist Rot (deg)
195.00	-59.5	59.4	-1.0	2.89	2.91	0.02
190.81	-56.9	56.9	-1.0	2.89	2.90	-0.02
186.62	-54.4	54.3	-0.9	2.87	2.88	-0.01
182.43	-51.9	51.8	-0.8	2.85	2.86	-0.01
178.23	-49.4	49.3	-0.8	2.82	2.82	-0.01
174.04	-46.9	46.9	-0.7	2.77	2.78	-0.01
170.38	-44.8	44.8	-0.7	2.73	2.74	-0.01
162.49	-40.4	40.4	-0.6	2.62	2.63	-0.01
154.61	-36.1	36.1	-0.5	2.49	2.50	-0.01
146.73	-32.1	32.1	-0.4	2.34	2.34	-0.01
138.84	-28.4	28.4	-0.3	2.17	2.17	-0.01
130.96	25.0	25.0	-0.3	1.99	2.00	-0.01
126.04	23.0	23.0	-0.3	1.88	1.88	0.00
118.64	20.2	20.2	-0.2	1.76	1.76	0.00
111.24	17.5	17.5	-0.2	1.63	1.63	0.00
103.84	15.1	15.1	-0.1	1.50	-1.50	0.00
96.44	12.9	12.9	-0.1	1.38	-1.38	0.00
89.04	10.8	10.8	-0.1	1.26	-1.26	0.00
82.96	9.3	9.3	-0.1	1.16	-1.16	0.00
76.01	7.7	7.7	-0.1	1.04	-1.04	0.00
69.06	6.3	6.3	0.0	0.93	-0.93	0.00
62.11	5.0	5.0	0.0	0.82	-0.82	0.00
55.16	3.9	3.9	0.0	0.71	-0.71	0.00
48.21	2.9	2.9	0.0	0.60	-0.60	0.00
41.04	2.1	2.1	0.0	0.50	-0.50	0.00
34.20	1.4	1.4	0.0	0.41	-0.41	0.00
27.36	0.9	0.9	0.0	0.32	-0.32	0.00
20.52	0.5	0.5	0.0	0.24	-0.24	0.00
13.68	0.2	0.2	0.0	0.16	-0.16	0.00
6.84	0.1	0.1	0.0	0.08	-0.08	0.00
0.00	0.0	0.0	0.0	0.00	0.00	0.00



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Section K: POLE OUTPUT LOAD DATA

Load Combination	Max Envelope			
Wind Direction	Maximum			
Elev. (ft)	Axial Ld. (kips)	Shear Ld. (kips)	Torque (kipsft)	Bend Mom. (kipsft)
195.00	18.68	9.12	8.87	18.15
190.81	18.68	9.12	8.86	43.75
190.81	19.34	9.46	8.85	43.66
186.62	19.34	9.46	8.84	82.98
186.62	31.17	15.21	7.63	82.15
182.43	31.17	15.21	7.62	145.36
182.43	38.91	18.95	8.48	145.84
178.23	38.91	18.95	8.48	224.00
178.23	43.84	21.30	6.54	222.58
174.04	43.84	21.30	6.53	311.08
174.04	58.62	28.33	0.09	307.79
170.38	58.62	28.33	0.09	410.79
170.38	65.93	31.61	2.63	410.88
162.49	65.93	31.61	2.61	657.11
162.49	80.49	38.15	8.34	660.59
154.61	80.49	38.15	8.32	957.79
154.61	82.57	38.80	8.24	957.24
146.73	82.57	38.80	8.23	1260.75
146.73	84.75	39.42	8.15	1260.24
138.84	84.75	39.42	8.15	1567.40
138.84	87.01	40.03	8.08	1566.91
130.96	87.01	40.03	8.08	1878.86
130.96	88.90	40.50	8.03	1878.49
126.04	88.90	40.50	8.03	2075.81
126.04	91.56	41.08	7.99	2075.47
118.64	91.56	41.08	7.99	2377.09
118.64	94.89	41.81	7.95	2376.70
111.24	94.89	41.81	7.95	2682.26
111.24	97.76	42.45	7.92	2681.91
103.84	97.76	42.45	7.92	2993.63
103.84	100.73	43.08	7.89	2993.30
96.44	100.73	43.08	7.8'	:::1:308.39
96.44	103.79	43.71	7.86	3308.08
89.04	103.79	43.71	7.86	3629.26
89.04	106.65	44.26	7.84	3629.00
82.96	106.65	44.26	7.85	3895.35
82.96	110.32	44.84	7.83	3895.12
76.01	110.32	44.84	7.83	4204.41
76.01	114.23	45.40	7.82	4204.18
69.06	114.23	45.40	7.82	4517.47
69.06	117.37	45.88	7.81	4517.66
62.11	117.37	45.88	7.81	4834.46
62.11	120.60	46.34	7.80	4834.65
55.16	120.60	46.34	7.80	5154.86
55.16	123.89	46.79	7.79	5155.02
48.21	123.89	46.79	7.80	5478.53
48.21	127.32	47.21	7.79	5478.66
41.04	127.32	47.21	7.79	5814.61
41.04	132.27	47.67	7.79	5814.73
34.20	132.27	47.67	7.79	6140.11
34.20	137.36	48.08	7.79	6140.21
27.36	137.36	48.08	7.79	6467.06
27.36	141.17	48.41	7.79	6467.12
20.52	141.17	48.41	7.79	6798.08
20.52	145.04	48.70	7.79	6798.13
13.68	145.04	48.70	7.79	7129.72
13.68	148.98	48.95	7.79	7129.75

Program

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6.84	148.98	48.95	7.79	7464.90
6.84	152.94	49.18	7.79	7464.90
0.00	152.94	49.18	7.79	7800.42
Base	154.92	49.52	7.79	7800.43



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Section I: STRENGTH ASSESSMENT DATA

Load Combination	Max Envelope				
Wind Direction	Maximum				
Elev. (ft)	Axial Ld. (kips)	Axial Cap (kips)	Moment (kipsft)	Mom. Cap (kipsft)	Assess.
195.00	18.68	1326.40	18.15	611.93	0.044
190.81	18.68	1381.68	43.75	664.28	0.032
190.81	19.34	1381.68	43.66	664.28	0.069
186.62	19.34	1436.96	82.98	718.78	0.119
186.62	31.17	1436.96	82.15	718.78	0.120
182.43	31.17	1492.23	145.36	775.43	0.193
182.43	38.91	1492.23	145.84	775.43	0.196
178.23	38.91	1532.87	224.00	826.34	0.278
178.23	43.84	1532.87	222.58	826.34	0.278
174.04	43.84	1572.52	311.08	878.27	0.363
174.04	58.62	1572.52	307.79	878.27	0.362
170.38	65.93	2022.49	410.88	1137.89	0.371
162.49	65.93	2152.45	657.11	1289.67	0.519
162.49	80.49	2152.45	660.59	1289.67	0.525
154.61	80.49	2282.41	957.79	1450.97	0.672
154.61	82.57	2282.41	957.24	1450.97	0.672
146.73	82.57	2391.01	1260.75	1607.40	0.796
146.73	84.75	2391.01	1260.24	1607.40	0.797
138.84	84.75	2483.78	1567.40	1760.55	0.902
138.84	87.01	2483.78	1566.91	1760.55	0.903
130.96	87.01	2572.86	1878.86	1917.74	0.992 /
130.96	88.90	2572.86	1878.49	1917.74	0.993 v
126.04	91.56	3777.31	2075.47	2833.52	0.742
118.64	91.56	3948.10	2377.09	3097.09	0.776
118.64	94.89	3948.10	2376.70	3097.09	0.777
111.24	94.89	4118.89	2682.26	3372.38	0.804
111.24	97.76	4118.89	2681.91	3372.38	0.805
103.84	97.76	4289.68	2993.63	3659.40	0.827
103.84	100.73	4289.68	2993.30	3659.40	0.828
96.44	100.73	4460.47	3308.39	3958.14	0.845
96.44	103.79	4460.47	3308.08	3958.14	0.846
89.04	103.79	4615.27	3629.26	4253.86	0.863
89.04	106.65	4615.27	3629.00	4253.86	0.863
82.96	110.32	4652.16	3895.12	4334.71	0.910
76.01	110.32	4768.33	4204.41	4596.61	0.925
76.01	114.23	4768.33	4204.18	4596.61	0.926
69.06	114.23	4881.64	4517.47	4863.16	0.940
69.06	117.37	4881.64	4517.66	4863.16	0.941
62.11	117.37	4992.08	4834.46	5134.06	0.953
62.11	120.60	4992.08	4834.65	5134.06	0.954
55.16	120.60	5099.67	5154.86	5409.04	0.965
55.16	123.89	5099.67	5155.02	5409.04	0.965
48.21	123.89	5204.38	5478.53	5687.83	0.975
48.21	127.32	5204.38	5478.66	5687.83	0.976
41.04	132.27	6243.23	5814.73	6901.54	0.854
34.20	132.27	6370.58	6140.11	7244.38	0.858
34.20	137.36	6370.58	6140.21	7244.38	0.859
27.36	137.36	6495.16	6467.06	7592.06	0.863
27.36	141.17	6495.16	6467.12	7592.06	0.864
20.52	141.17	6616.97	6798.08	7944.31	0.867
20.52	145.04	6616.97	6798.13	7944.31	0.868
13.68	145.04	6735.99	7129.72	8300.87	0.871
13.68	148.98	6735.99	7129.75	8300.87	0.871
6.84	148.98	6852.25	7464.90	8661.48	0.874
6.84	152.94	6852.25	7464.90	8661.48	0.875
0.00	152.94	6965.73	7800.42	9025.87	0.877



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Section M: SECTION PROPERTIES DATA

Elev. (ft)	Diam. (in)	Width (in)	Thick. (in)	W/t	Area (inA2)	S (inA3)
195.0	22.7	3.5	0.250	14.0	17.9	98.84
190.8	23.7	3.7	0.250	14.7	18.6	107.29
190.8	23.7	3.7	0.250	14.7	18.6	107.29
186.6	24.6	3.8	0.250	15.4	19.3	116.10
186.6	24.6	3.8	0.250	15.4	19.3	116.10
182.4	25.6	4.0	0.250	16.0	20.1	125.25
182.4	25.6	4.0	0.250	16.0	20.1	125.25
178.2	26.5	4.2	0.250	16.7	20.8	134.74
178.2	26.5	4.2	0.250	16.7	20.8	134.74
174.0	27.4	4.3	0.250	17.4	21.6	144.59
174.0	27.4	4.3	0.250	17.4	21.6	144.59
170.4	28.3	4.5	0.250	17.9	22.2	153.49
170.4	27.8	4.3	0.313	13.7	27.2	183.79
162.5	29.5	4.6	0.313	14.7	29.0	208.31
162.5	29.5	4.6	0.313	14.7	29.0	208.31
154.6	31.3	4.9	0.313	15.7	30.7	234.36
154.6	31.3	4.9	0.313	15.7	30.7	234.36
146.7	33.0	5.2	0.313	16.6	32.5	261.94
146.7	33.0	5.2	0.313	16.6	32.5	261.94
138.8	34.8	5.5	0.313	17.6	34.2	291.06
138.8	34.8	5.5	0.313	17.6	34.2	291.06
131.0	36.6	5.8	0.313	18.6	36.0	321.72
131.0	36.6	5.8	0.313	18.6	36.0	321.72
126.0	37.7	6.0	0.313	19.3	37.1	341.62
126.0	37.1	5.7	0.438	12.9	50.8	457.66
118.6	38.7	6.0	0.438	13.6	53.1	500.24
118.6	38.7	6.0	0.438	13.6	53.1	500.24
111.2	40.4	6.2	0.438	14.3	55.4	544.70
111.2	40.4	6.2	0.438	14.3	55.4	544.70
103.8	42.0	6.5	0.438	14.9	57.7	591.06
103.8	42.0	6.5	0.438	14.9	57.7	591.06
96.4	43.7	6.8	0.438	15.6	60.0	639.31
96.4	43.7	6.8	0.438	15.6	60.0	639.31
89.0	45.3	7.1	0.438	16.3	62.3	689.45
89.0	45.3	7.1	0.438	16.3	62.3	689.45
83.0	46.7	7.4	0.438	16.8	64.2	732.09
83.0	45.8	7.2	0.438	16.5	63.0	704.53
76.0	47.4	7.5	0.438	17.1	65.2	753.87
76.0	47.4	7.5	0.438	17.1	65.2	753.87
69.1	48.9	7.8	0.438	17.7	67.3	804.88
69.1	48.9	7.8	0.438	17.7	67.3	804.88
62.1	50.5	8.0	0.438	18.3	69.5	857.57
62.1	50.5	8.0	0.438	18.3	69.5	857.57
55.2	52.0	8.3	0.438	19.0	71.6	911.92
55.2	52.0	8.3	0.438	19.0	71.6	911.92
48.2	53.6	8.6	0.438	19.6	73.8	967.94
48.2	53.6	8.6	0.438	19.6	73.8	967.94
41.0	55.2	8.9	0.438	20.2	76.0	1027.46
41.0	54.3	8.6	0.500	17.2	85.4	1132.94
34.2	55.8	8.8	0.500	17.7	87.8	1198.59
34.2	55.8	8.8	0.500	17.7	87.8	1198.59
27.4	57.4	9.1	0.500	18.2	90.3	1266.08
27.4	57.4	9.1	0.500	18.2	90.3	1266.08
20.5	58.9	9.4	0.500	18.8	92.7	1335.43
20.5	58.9	9.4	0.500	18.8	92.7	1335.43
13.7	60.4	9.7	0.500	19.3	95.1	1406.62
13.7	60.4	9.7	0.500	19.3	95.1	1406.62
6.8	62.0	9.9	0.500	19.9	97.5	1479.66
6.8	62.0	9.9	0.500	19.9	97.5	1479.66



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Sita: WINIFRED- MD
Engineer: SWG

0.0 63.5 10.2 0.500 20.4 100.0 1554.55

Note: w/t values marked with* (asterisk) indicate width to thickness
exceeding maximum allowable values by standards.

Customer: ROCON LLC
 Project: 195 Ff TSP
 Site: WINIFRED- MD
 Engr. File: 235008
 Build Code: ANS1/TIA-222-O-2005



Mat Foundation

ver.2.2.14

Design Parameters

Description	Load Case					
	1	2	3	4	5	Service
Total Moment, ft-kips	8,248.19	8,082.77	1,223.69	194.67	190.48	1,961.29
Total Shear, kips	52.36	52.30	6.80	1.12	1.12	12.55
Total Tower Wt, kips	92.32	69.21	163.81	87.44	65.58	72.86
Max. Uplift, kips	NIA	NIA	NIA	NIA	NIA	NIA
Shear, kips	NIA	NIA	NIA	NIA	NIA	NIA
Max Download, kips	NIA	NIA	NIA	NIA	NIA	NIA
Shear	NIA	NIA	NIA	NIA	NIA	NIA
Soil L.F.	1.20	0.90	1.20	1.20	0.90	1.00
Concrete L.F.	1.20	0.90	1.20	1.20	0.90	1.00

Foundation	
Ht. AGL, ft	0.50
Depth, ft.	6.00
Pole	
Butt OD, ft	5.29
Offset, in	.00
Soil	
Blow Count	NIA
Inplace Unit Wt, pcf	110.00
Submerged Unit Wt, pcf	60.00
Friction Angle, ϕ, deg.	30.00
Cohesion, ksf	NIA
Uplift Angle, deg.	30.00
Water Depth, ft	None
Ult Bearing Capacity, ksf	5.00

Mat	
Thickness, ft	2.00
Width, ft	30.50
EA, in	23.00
Batter, in/ft	0.00

Pier	
Height, ft	4.50
Diameter, ft	8.00
No. Piers	1
Shape	Square

Anchor Bolts	
Diameter, in	2.2500
No.	20
Length, in	84.00
Bolt Circle, in	70.00
Projection, in	13.00

Pocket	
Diameter, in	NIA
Thickness, ft	NIA

Concrete	
28 Day Strength, ksi	4.50
Dry Unit Wt, pcf	150.00
Wet Unit Wt, pcf	88.00

Rebar Fv	
Vertical, ksi	60.00
Circular, ksi	60.00
Horizontal, ksi	60.00

KEY: PRESUMPTIVE 'CLAY'

Results

ϕ MN - Parallel Axis 8,936.10 ft-kips
 ϕ MN - Diagonal Axis 9,088.12 ft-kips
 Moment - Interaction Ratio 0.943
 ϕ V N - Lateral Load 185.78 kips
 Lateral Load - Interaction Ratio 0.282

Final Mat Dimension : 30.50 x 30.50 x 2.00 ft. thick w/ (I) 8.00 ft. Square Pier

Final Pocket Dimension : Pockets not required

Total Volume of Concrete : 79.6 yd³

Designed By: S.W.G.
 Date: 04 Aug.20 @ 10:52 AM

Checked By:
 Date: 11/16/12

11/16/12
 1 | L | ;:c:0

Customer: ROCONLLC
 Project: 195 FT TSP
 Site: WINIFRED - MD
 Engr. File: 235008
 Build Code: ANSI/TIA-222-G -2005



Products

Mat Foundation

ver.2.2.14

OTM Capacity

Controlling Load Case: 2 [Wind w/Min. Dead Load]
 Foundation Width = 30.50 ft
 Mu = 8,422.7 ft-kips

	<l>MN, ft-kips	x, ft	N	cr,,
Parallel	8,936.1	6.374	0.209	5.00
Diagonal	9,088.1	13.942	0.323	5.00

<l>MN = 8,936.10 ft-kips ! Ratio = 0.943
 (j)VN = 185.78 kips ! Ratio = 0.282

Mat Design

Ye = 123.33 pcf

Exterior Slab	x, ft	N	CJK, ksf	P. kips	Psu kips	Moment, ft-kios/ft		Shear, kips/ft	
						DownLoad Side	Uplift Side	Download Side	Uplift Side
Parallel	7.704	0.253	3.10	21.27	0.00	134.39	63.32	18.73	10.62
Diagonal	15.253	0.354	3.13	21.27	0.00	84.15	36.67	18.78	8.35

Punching Shear	Download			Uplift			Description
	Interior	Edge	Corner	Interior	Edge	Corner	
bo, ft	38.33	NIA	NIA	NIA	NIA	NIA	2-Way Shear
Vsu, psi	137.22	NIA	NIA	NIA	NIA	NIA	
<l>Ve, psi	208.25	NIA	NIA	NIA	NIA	NIA	
IR	0.66	NIA	NIA	NIA	NIA	NIA	
0.5* Mut, ft-kips	2,545.1			NIA			Moment transfer to slab
Be, ft	14.0			NIA			
Mu, ft-kips/ft	181.8			NIA			
Edge Distances: a = 15.25 ft. b = 15.25 ft. c = 15.25 ft.							

Summary	Max. Value	Utilization
Slab Moment, ft-kips/ft	181.80	0.975
Slab Shear, kips/ft	18.78	0.722
Punching Shear, psi	137.22	0.659
Soil Bearing Required, <JuR, ksf	4.17	0.834

Mat Reinforcement	
Min. Steel Area (Strength)	2.257 in' /ft.
Min. Steel Area (Temperature)	.259 in' /ft.
Steel Strain Actual	0.010
Minimum Steel Strain Required	0.005

56 - #10 Horizontal bars equally spaced @6.55 in., each way, top and bottom, total of 224, A, = 2.326 in²/ft

Designed By: _SWG_ _____
 Date: 04 Aug.20 @ 10:52 AM

Checked By: _____
 Date: 10/16/20

Customer: ROCONLLC
 Project: 195 FT TSP
 Site: WINIFRED- MD
 Eng r. File: 235008
 Build Code: ANSI/TIA-222-O-2005



Mat Foundation

ver.2.2.14

Pier Design

Controlling Load Case: I [Wind w/Max. Dead Load]

C = 92.32 kips	Ve = 52.36 kips	Mc = 8,483.81 ft-kips
T = .00 kips	Vt = .00 kips	Mt = .00 ft-kips
Fy = 60.00 ksi	Fyt = 60.00 ksi	L.F. = 1.00
H = 96.00 in.	Ds = 87.00 in.	F'c = 4.50 ksi
U = 1.00	Irs = Square	

*** NOTE : Pier cross section is Square ***

SUMMARY OF ANALYSIS

Minimum area of steel required = 49.020 in ²	(Rhomin = 0.0053)
Area of ste I provided. = 50.671 in ²	(Rhoactual= 0.0055)
Maximum (eel arealimit = 579.060 in ²	(Rhomax = 0.0628)

(40) #10 Vertical Bars equally spaced w/ #5 Circular Ties @ 6" on center.

CIRCULAR TIE DATA

$V_u < 0.85 * V_c / 2$, shear reinforcement is not required

Use maximum tie spacing specified in ACI 318,
 Section 7.10.5 for compression reinforcement.

DEVELOPMENT LENGTH MODIFIERS FOR BAR DEVELOPMENT

Modifier for tension development = 1.000

Modifier for compression development = 0.692

REQUIRED Ld = MODIFIER * BASIC Ld * AC! 318 MODIFIERS, (12 in. min.)

Designed By: _S_W_G_ _ _ _ _
 Date: 04 Aug. 20 @ 10 :5 2 AM

Checked By: HA
 Date: 10/16/20

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