STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

July 1, 2024

Daniel Patrick, Esq.
Lucia Chiocchio, Esq.
Cuddy & Feder LLP
445 Hamilton Ave
14th Floor
White Plains, New York 10601
dpatrick@cuddyfeder.com
lchiocchio@cuddyfeder.com

RE: **PETITION NO. 1590 –** TowerNorth Development, LLC and New Cingular Wireless, PCS d/b/a AT&T Declaratory Ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the replacement of an existing municipal communications tower located at 13 Pomeroy Avenue, Meriden, Connecticut. **Compliance with Condition Nos. 3 and 4.**

Dear Attorneys Patrick and Chiocchio:

The Connecticut Siting Council (Council) is in receipt of your correspondence dated June 28, 2024 regarding compliance with Condition Nos. 3 and 4 of the Declaratory Ruling issued by the Council on December 21, 2023 for the above-referenced facility. The correspondence includes the final structural analysis for the replacement tower and foundation, stamped by a Professional Engineer duly licensed in the State of Connecticut, and the final structural design drawings that include a yield point, in accordance with Condition Nos. 3 and 4.

Therefore, the Council acknowledges that Condition Nos. 3 and 4 have been satisfied. This acknowledgment applies only to the conditions satisfied by the June 28, 2024 correspondence.

Please be advised that deviations from the standards established by the Council in the Declaratory Ruling are enforceable under the provisions of Connecticut General Statutes §16-50u.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MB/ANM/dll

s:\petitions\1501-1600\1590\proceduralcorrespondence\pe1590_ack conditions3and4-07.01.24.docx

From: Mary Caulfield <mcaulfield@towernorth.com>
Sent: Friday, June 28, 2024 1:32 PM
To: CSC-DL Siting Council <Siting.Council@ct.gov>
Cc: Mark Sperotto <msperotto@towernorth.com>; Jeff DelliColli <jdellicolli@clinellc.com>
Subject: Meriden Fire Dept - 13 Pomeroy Avenue PETITION NO. 1590

Good Afternoon,

Please find attached deliverables to satisfy conditions 3 & 4 of the Petition.

Thanks,
Mary

TowerNorth

Mary Caulfield | Site Development Manager
Mobile: 978-994-0252 (Eastern Standard Time)
mcaulfield@towernorth.com | www.towernorth.com

MERIDEN FIRE DEPT

13 POMEROY AVENUE
MERIDEN, CT 06450
NEW HAVEN COUNTY

E-911 ADDRESS

THE E-911 ADDRESS FOR THE SUBJECT PROPERTY IS:
15 POMEROY AVENUE
MERIDEN, CT 06450

GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.

2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.

3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE LESEE/LICENSEE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.

4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.

5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS / CONTRACT DOCUMENTS.

7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.

9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS, ESTABLISHING AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.

12. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC/TERM DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.

13. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.

14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.

15. THE CONTRACTOR SHALL NOTIFY THE LESEE/LICENSEE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESEE/LICENSEE REPRESENTATIVE.

16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.

17. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. CALL THE FOLLOWING FOR ALL PRE-CONSTRUCTION NOTIFICATION 72-HOURS PRIOR TO ANY EXCAVATION ACTIVITY: DIG SAFE SYSTEM (MA, ME, NH, RI, VT): 1-888-344-7233 CALL BEFORE YOU DIG (CT): 1-800-922-4455

18. ALL DIMENSIONS SHOWN THUS ± ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS WHICH EFFECT THE CONTRACTORS WORK. CONTRACTOR TO VERIFY ALL DIMENSIONS WITH PROJECT OWNER PRIOR TO CONSTRUCTION.

19. NORTH ARROW SHOWN ON PLANS REFERS TO APPROXIMATE TRUE NORTH. PRIOR TO THE START OF CONSTRUCTION, ORDERING OR FABRICATING OF ANTENNA MOUNTS, CONTRACTOR SHALL CONSULT WITH PROJECT OWNER'S RF ENGINEER AND FIELD VERIFY ALL ANTENNA SECTOR LOCATIONS AND ANTENNA AZIMUTHS.

20. THE CONTRACTOR AND OR HIS SUB CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.

21. ANTENNA INSTALLATION SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS, TRANSMISSION LINES AND SUPPORT STRUCTURES.

22. COAXIAL CABLE CONNECTORS AND TRANSMITTER EQUIPMENT SHALL BE PROVIDED BY THE PROJECT OWNER AND IS NOT INCLUDED IN THESE CONSTRUCTION DOCUMENTS. A SCHEDULE OF PROJECT OWNER SUPPLIED MATERIALS IS ATTACHED TO THE BID DOCUMENTS (SEE EXHIBIT 3). ALL OTHER HARDWARE TO BE PROVIDED BY THE CONTRACTOR. CONNECTION HARDWARE SHALL BE STAINLESS STEEL.

23. WHEN "PAINT TO MATCH" IS SPECIFIED FOR ANTENNA CONCEALMENT, PAINT PRODUCT FOR ANTENNA RADOME SHALL BE SHERWIN WILLIAMS CORDTHANE II. SURFACE PREPARATION AND APPLICATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND PROJECT OWNER'S GUIDELINE'S.

24. COORDINATION, LAYOUT, AND FURNISHING OF CONDUIT, CABLE AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

25. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.

26. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW.

27. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF UTILITY COMPANY ENGINEERING. THE AREAS OF THE PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE EQUIPMENT, DRIVEWAY OR LEASE AREA SHALL BE RESTORED TO ORIGINAL CONDITION.

28. GRAVEL SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED AND COVERED WITH MULCH UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN SOIL EROSION AND SEDIMENTATION CONTROLS AT ALL TIMES.

29. DURING CONSTRUCTION. PER FCC MANDATE, ENHANCED EMERGENCY (E911) SERVICE IS REQUIRED TO MEET NATIONWIDE STANDARDS.

30. FOR WIRELESS COMMUNICATIONS SYSTEMS. PROJECT OWNER'S IMPLEMENTATION REQUIRES DEPLOYMENT OF EQUIPMENT AND ANTENNAS GENERALLY DEPICTED ON THIS PLAN, ATTACHED TO OR MOUNTED IN CLOSE PROXIMITY TO THE BTS RADIO CABINETS. PROJECT OWNER RESERVES THE RIGHT TO MAKE REASONABLE MODIFICATIONS TO E911 EQUIPMENT AND LOCATION AS TECHNOLOGY EVOLVES TO MEET REQUIRED SPECIFICATIONS.

31. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-H, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE:

2015 INTERNATIONAL BUILDING CODE
2018 CT STATE BUILDING CODE (CSBC)
ELECTRICAL CODE: NEC 2017
NFPA 780 2014

VICINITY MAP

NORTH

VICINITY MAP
SCALE: NTS

SHEET INDEX

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A-1	PROPOSED SITE PLAN	3
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EC-1	EROSION CONTROL PLAN	3
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PROJECT SUMMARY

SITE NUMBER:	CT0005-A
SITE NAME:	MERIDEN FIRE DEPT
SITE ADDRESS:	13 POMEROY AVENUE MERIDEN, CT 06450
ASSESSOR'S PARCEL NO.:	N/A
CONSTRUCTION TYPE:	NSB
PROPERTY OWNER: (BOTH PARCELS)	CITY OF MERIDEN FIRE STATION 13 POMEROY AVENUE MERIDEN, CT 06451
APPLICANT,	TOWER NORTH, LLC 750 W CENTER ST #301, WEST BRIDGEWATER, MA 02379
TOWER TYPE:	MONOPOLE
TOWER HEIGHT:	150 FEET

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

TowerNorth
750 WEST CENTER STREET, SUITE 301
WEST BRIDGEWATER, MA 02379

ADVANCED ENGINEERING GROUP, P.C.
Civil Engineering - Site Development
Surveying - Telecommunications
500 North Broadway
East Providence, RI 02914
Tel: (401) 354-2403
Fax: (401) 633-6354

STATE OF CONNECTICUT
SCOTT N. ADAMS
36381
LICENSED
PROFESSIONAL ENGINEER

AEG PROJECT #: 2019-0027

DRAWN BY: JWH

CHECKED BY: SNA

SUBMITTALS

REV#	DATE	DESCRIPTION
0	01/16/24	ISSUED FOR REVIEW
1	02/23/24	ISSUED FOR CONSTRUCTION
2	03/27/24	REVISED
3	06/28/24	REVISED

MERIDEN FIRE DEPT

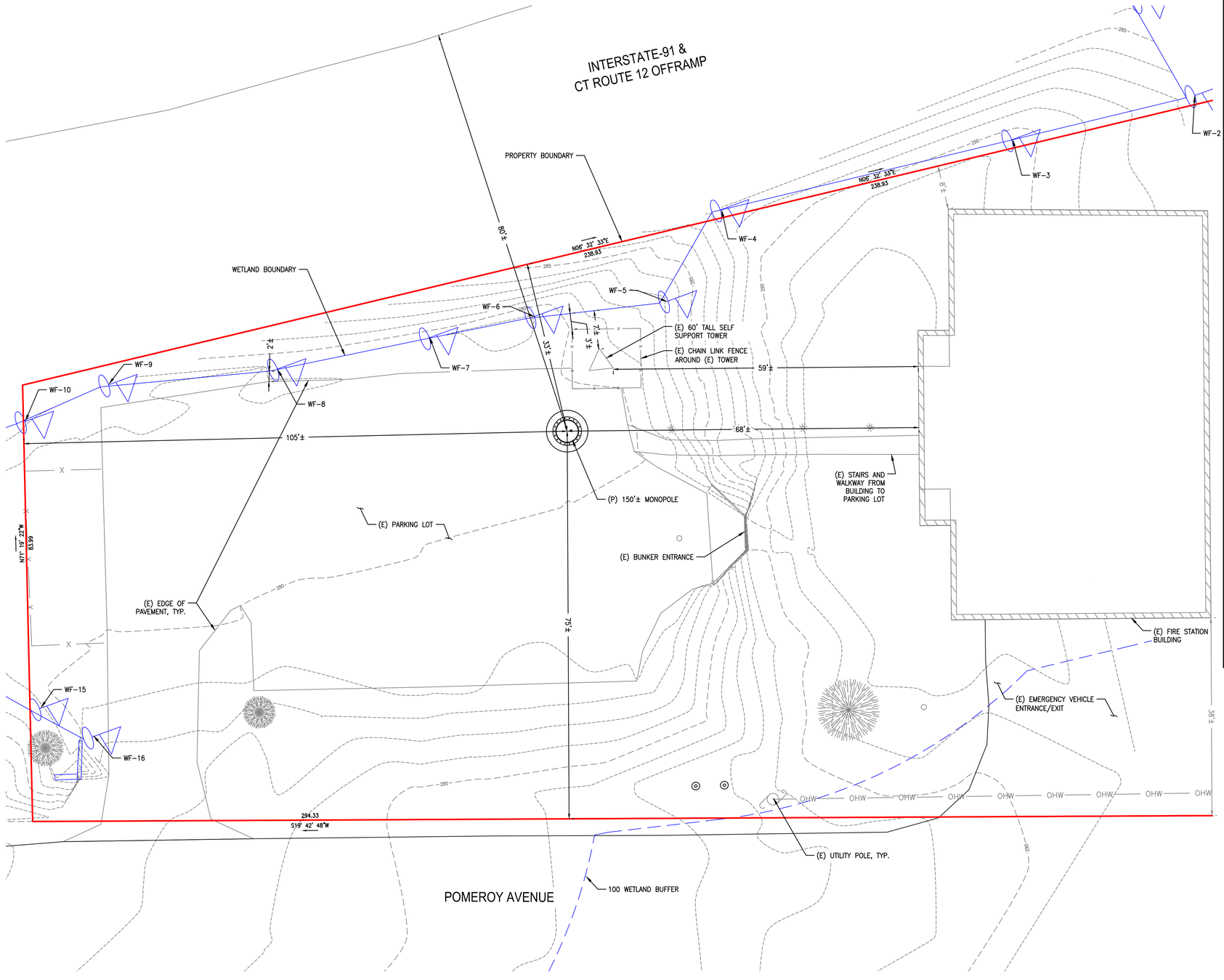
13 POMEROY AVENUE
MERIDEN, CT 06450
NEW HAVEN COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



NORTH

1 / C-1 EXISTING CONDITION SITE PLAN

SCALE: 1" =10'

0 10' 20' 30'

SURVEY NOTES

1. FIELD SURVEY DATE: 08/29/2022
2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
3. HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD83)
4. CENTER OF (P) TOWER: LAT: N 41° 31' 31.96" LONG: W 72° 46' 03.86" ELEV.: 280'±
5. PROPERTY OWNER: CITY OF MERIDEN FIRE STATION, 13 POMEROY AVENUE, MERIDEN, CT 06451
6. SITE ADDRESS: 13 POMEROY AVENUE, MERIDEN, CT 06451
7. APPLICANT: TOWER NORTH DEVELOPMENT, 750 WEST CENTER STREET, SUITE 301, WEST BRIDGEWATER, MA 02379, 1-800-821-5825 x2, SITEACCESS@TOWERNORTH.COM
8. JURISDICTION: CITY OF MERIDEN
9. TAX ID: 1007-0322-0001-0000
10. DEED REFERENCE: BOOK 480 PAGE 621
11. PLAN REFERENCES: HIGHWAY PLAN 2867 DATED JAN 1966
12. ZONING JURISDICTION: COMMERCIAL HIGHWAY (C-3)
13. TOTAL LAND AREA 0.66001 ACRES
14. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. CALL THE FOLLOWING FOR ALL PRE-CONSTRUCTION NOTIFICATION 72-HOURS PRIOR TO ANY EXCAVATION ACTIVITY:
DIG SAFE SYSTEM (MA, ME, NH, RI, VT): 1-888-344-7233
CALL BEFORE YOU DIG (CT): 1-800-922-4455
15. PROPERTY LINE INFORMATION IS COMPILED FROM A PARTIAL FIELD BOUNDARY SURVEY, AND IS SUBJECT TO CHANGE AS AN ACCURATE FIELD SURVEY MAY DISCLOSE. A FULL BOUNDARY SURVEY WAS NOT PERFORMED.
16. THE PURPOSE OF THIS SURVEY IS TO SUPPORT THE DESIGN AND CONSTRUCTION OF A TELECOMMUNICATION FACILITY. USE OF THIS SURVEY BY ANYONE OTHER THAN TOWER NORTH AND USE OF THIS SURVEY FOR ANY PURPOSE NOT RELATED TO THE DESIGN OF THE INTENDED FACILITY IS STRICTLY PROHIBITED.
17. BEARING SYSTEM OF THIS PLAN IS BASED ON TRUE NORTH. TRUE NORTH WAS ESTABLISHED FROM GPS READINGS ON 12/03/20.
18. WETLANDS WERE OBSERVED WITHIN 100' OF THE LIMIT OF WORK AND ARE SHOWN ON THE PLAN. SITE WAS WALKED BY ECOTEC INC ON 09/09/2022.
19. IN THE EVENT THAT BENCHMARKS (TBM'S), ESTABLISHED FOR THIS PROJECT AND PUBLISHED ON THIS SURVEY, ARE DESTROYED, NOT RECOVERABLE OR A DISCREPANCY IS FOUND, THE USER SHOULD NOTIFY THIS FIRM IN WRITING PRIOR TO COMMENCING OR CONTINUING ANY WORK.
20. THE PROPERTY LINES SHOWN ON THIS PLAN ARE THE LINES DIVIDING EXISTING OWNERSHIPS, AND THE LINES OF STREETS AND WAYS SHOWN ARE THOSE OF PUBLIC OR PRIVATE STREETS OR WAYS ALREADY ESTABLISHED, AND NO NEW LINES FOR DIVISION OF EXISTING OWNERSHIP OR FOR NEW WAYS ARE SHOWN.

LEGEND

- PROPERTY LINE
- ABUTTING PROPERTY LINE
- WETLAND BOUNDARY & FLAG
- WETLAND BUFFER
- (E) MAJOR CONTOUR
- (E) MINOR CONTOUR
- (E) OVERHEAD UTILITY WIRES
- (E) FENCE LINE

1. PLOT PLAN BASED ON TAX ASSESSOR'S MAPS FROM THE CITY GIS, DEEP, DIGITAL PARCEL DATA, AND RECORD PLANS NOTED. A METES AND BOUNDS SURVEY WAS NOT CONDUCTED BY ADVANCED ENGINEERING GROUP, PC.
2. SETBACKS ARE TAKEN FROM THE CENTER OF PROPOSED TOWER TO PROPERTY LINES.

TowerNorth
750 WEST CENTER STREET, SUITE 301
WEST BRIDGEWATER, MA 02379

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STATE OF CONNECTICUT
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AEG PROJECT #: 2019-0027

DRAWN BY: JWH

CHECKED BY: SNA

SUBMITTALS

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3	06/28/24	REVISED

MERIDEN FIRE DEPT

13 POMEROY AVENUE
MERIDEN, CT 06450
NEW HAVEN COUNTY

SHEET TITLE

EXISTING CONDITION
SITE PLAN

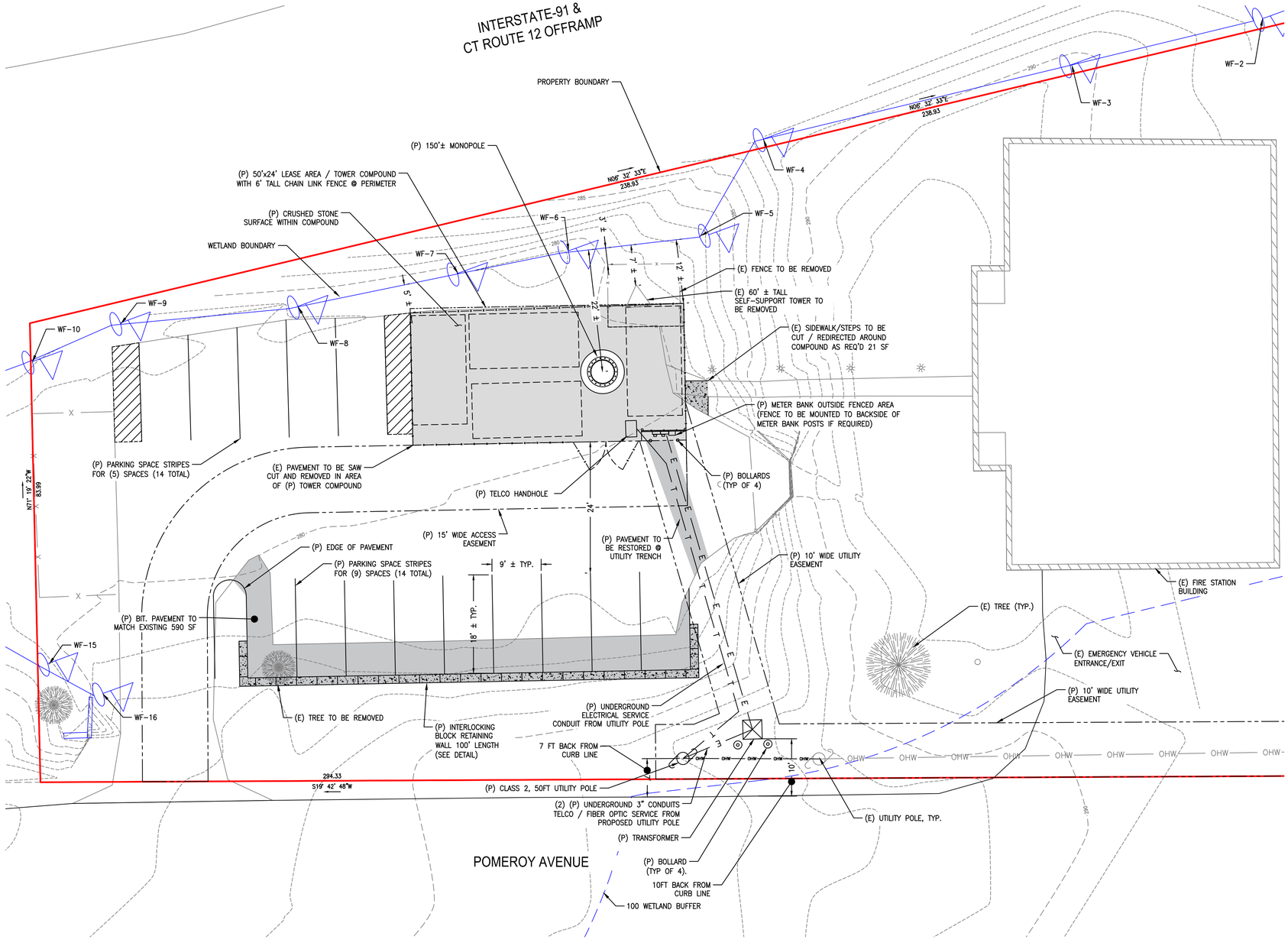
SHEET NUMBER

C-1

IMPERVIOUS SURFACE AREAS:	
IMPERVIOUS AREA ADDED	611± SQ. FT.
IMPERVIOUS AREA REMOVED	1,175± SQ. FT.
REDUCED IMPERVIOUS AREA	564± SQ. FT.

TOWER FALL ZONE NOTE:
TOWER WILL BE DESIGNED IN SUCH A WAY AS TO COLLAPSE AND FOLD OVER IN THE MIDDLE. PREVENTING THE TOWER FROM FALLING OUTSIDE THE PROPERTY LINES.

NOTE:
GC TO CLEAR AND GRUB ENTIRE PERIMETER OF PARKING LOT PRIOR TO PERFORMING ANY STRIPING ACTIVITY.



NORTH

1 / A-1 PROPOSED SITE PLAN
SCALE: 1" =10'
0 10' 20' 30'

ENGINEERING NOTES

1. THE TYPE, DIMENSIONS, MOUNTING HARDWARE, AND POSITIONS OF ALL PROJECT OWNER'S EQUIPMENT ARE SHOWN IN ILLUSTRATIVE FASHION. THESE DRAWINGS ARE NOT INTENDED FOR CONSTRUCTION. ACTUAL HARDWARE DETAILS AND FINAL LOCATIONS MAY DIFFER SLIGHTLY FROM WHAT IS SHOWN.
2. THE PROJECT OWNER'S PCS FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. THE PROJECT OWNER'S BASE TRANSMISSION STATION (BTS) CABINET IS A VANDAL RESISTANT STEEL CABINET CONTAINING RECTIFIERS, AMPLIFIERS, RADIOS, AND OTHER INTEGRATED ELECTRONIC CONTROL EQUIPMENT. BATTERY BACKUP FOR EMERGENCY STANDBY POWER IS CONTAINED WITHIN A SEPARATE BATTERY RACK CONTAINING 12-VOLT, CLOSED-CELL DC BATTERIES. THE BATTERIES ARE LEAD-ACID RECHARGEABLE STANDBY INDUSTRIAL POWER CELLS MANUFACTURED TO MEET ENVIRONMENTAL QUALITY AND RUGGEDNESS STANDARDS OF THE INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA). THE BATTERY CHARGING SYSTEM IS COMPUTER-CONTROLLED AND THE EQUIPMENT CABINET IS REMOTELY MONITORED AT PROJECT OWNER'S NETWORK OPERATIONS CONTROL CENTER 24-HOURS A DAY, 7 DAYS A WEEK FOR FAULTS AND ALARMS.
4. THE DESIGN OF THE ANTENNA MOUNTING HARDWARE AND STRUCTURAL REINFORCEMENT OF EXISTING BUILDING ROOF/FLOOR (IF NECESSARY) TO SUPPORT THE BTS EQUIPMENT CABINETS WILL MEET THE ANSI/EIA/TIA-222-G STANDARDS FOR STRUCTURAL STEEL ANTENNA SUPPORTING STRUCTURES AND STATE BUILDING CODE REQUIREMENTS. DETAILED CONSTRUCTION DRAWINGS AND STRUCTURAL CALCULATIONS WILL BE PREPARED BY A REGISTERED PROFESSIONAL ENGINEER AND SUBMITTED WITH A BUILDING PERMIT APPLICATION FOR REVIEW AND APPROVAL BY THE LOCAL BUILDING CODE ENFORCEMENT OFFICIAL.
5. ONCE THE FACILITY BECOMES FULLY OPERATIONAL, NORMAL AND ROUTINE MAINTENANCE BY PROJECT OWNER'S TECHNICIANS WILL BE PERFORMED ON A MONTHLY BASIS. THEREFORE, THE ESTIMATED VEHICLE TRIP GENERATION RATE IS 2 TRIPS PER MONTH. THE AVERAGE DAILY TRIP GENERATION RATE (ADT) IS 0.07.
6. PER FCC MANDATE, ENHANCED EMERGENCY (E911) SERVICE IS REQUIRED TO MEET NATIONWIDE STANDARDS FOR WIRELESS COMMUNICATIONS SYSTEMS. PROJECT OWNER'S IMPLEMENTATION REQUIRES DEPLOYMENT OF EQUIPMENT AND ANTENNAS GENERALLY DEPICTED ON THIS PLAN, ATTACHED TO OR MOUNTED IN CLOSE PROXIMITY TO THE BTS RADIO CABINETS. RESERVES THE RIGHT TO MAKE REASONABLE MODIFICATIONS TO E911 EQUIPMENT AND LOCATION AS TECHNOLOGY EVOLVES TO MEET REQUIRED SPECIFICATIONS.
7. APPLICANT: TOWER NORTH DEVELOPMENT
750 WEST CENTER STREET, SUITE 301
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1-800-821-5825 x2
SITEACCESS@TOWERNORTH.COM
8. OWNER: CITY OF MERIDEN FIRE STATION
13 POMEROY AVENUE
MERIDEN, CT 06451
9. ZONING DISTRICT: COMMERCIAL HIGHWAY (C-3)
10. JURISDICTION: CITY OF MERIDEN
11. TAX ID: 1007-0322-0001-0000
12. ALL MEASUREMENTS ARE SHOWN IN FEET ± UNLESS OTHERWISE NOTED.
13. PLOT PLAN MEASUREMENTS ARE APPROXIMATE AND BASED ON SCALED ASSESSORS MAPS AND OTHER AVAILABLE INFORMATION.
14. ALL SETBACKS SHOWN FROM PROPOSED ANTENNAS TO THE EDGE OF THE ROOF ARE APPROXIMATE AND SHOULD BE USED FOR REFERENCE ONLY.

LEGEND

- PROPERTY LINE
- ABUTTING PROPERTY LINE
- WETLAND BOUNDARY & FLAG
- WETLAND BUFFER
- (E) MAJOR CONTOUR
- (E) MINOR CONTOUR
- (P) CONTOUR
- (P) EASEMENT
- E E E (P) ELECTRICAL SERVICE CONDUIT
- T T T (P) TELCO/FIBER SERVICE CONDUIT
- OHW OHW (E) OVERHEAD UTILITY WIRES
- x x x x (E) FENCE LINE
- x x x x x (P) FENCE LINE

1. PLOT PLAN BASED ON TAX ASSESSOR'S MAPS FROM THE CITY GIS, DEEP, DIGITAL PARCEL DATA, AND RECORD PLANS NOTED. A METES AND BOUNDS SURVEY WAS NOT CONDUCTED BY ADVANCED ENGINEERING GROUP, PC.
2. SETBACKS ARE TAKEN FROM THE CENTER OF PROPOSED TOWER TO PROPERTY LINES.

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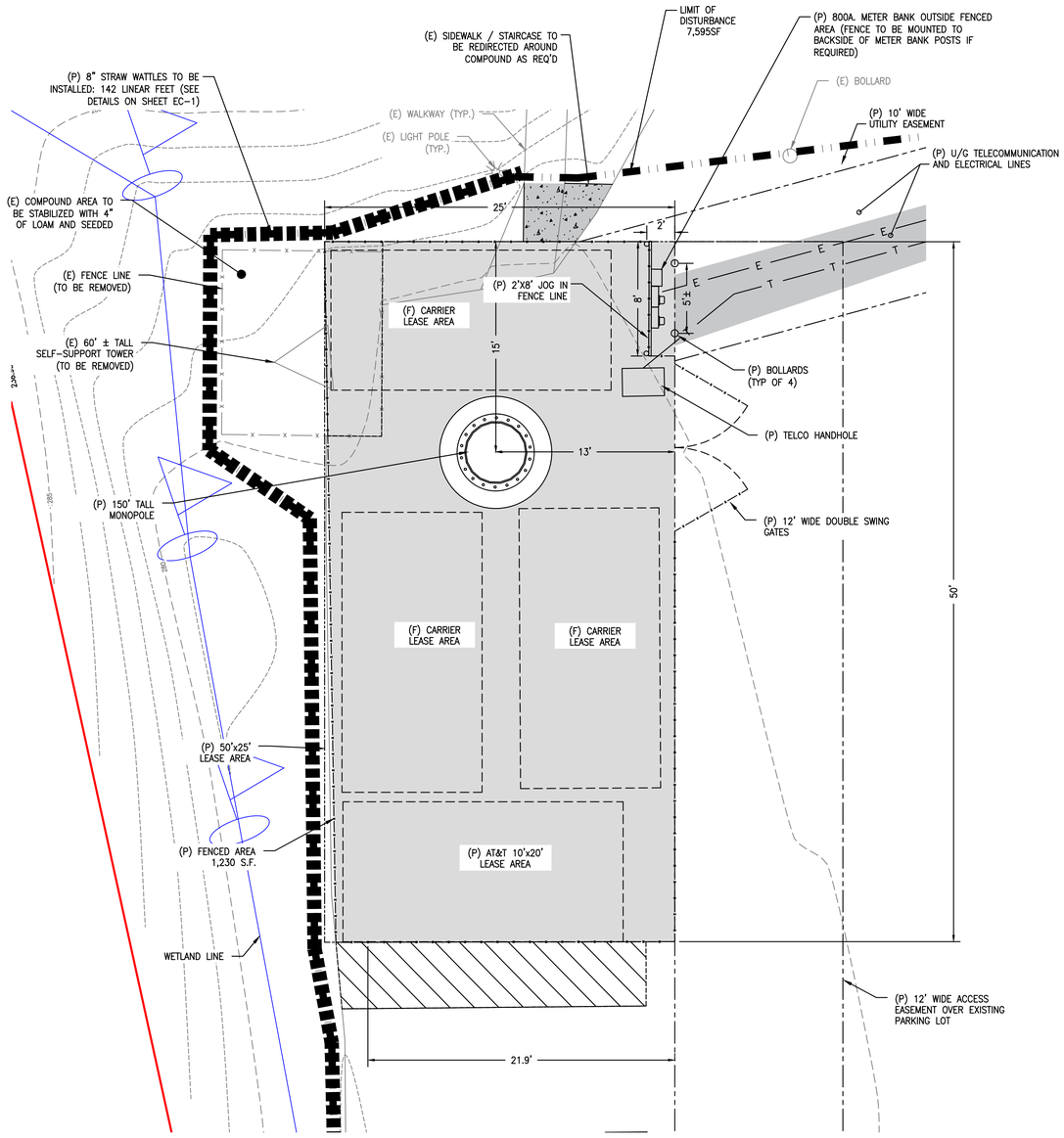
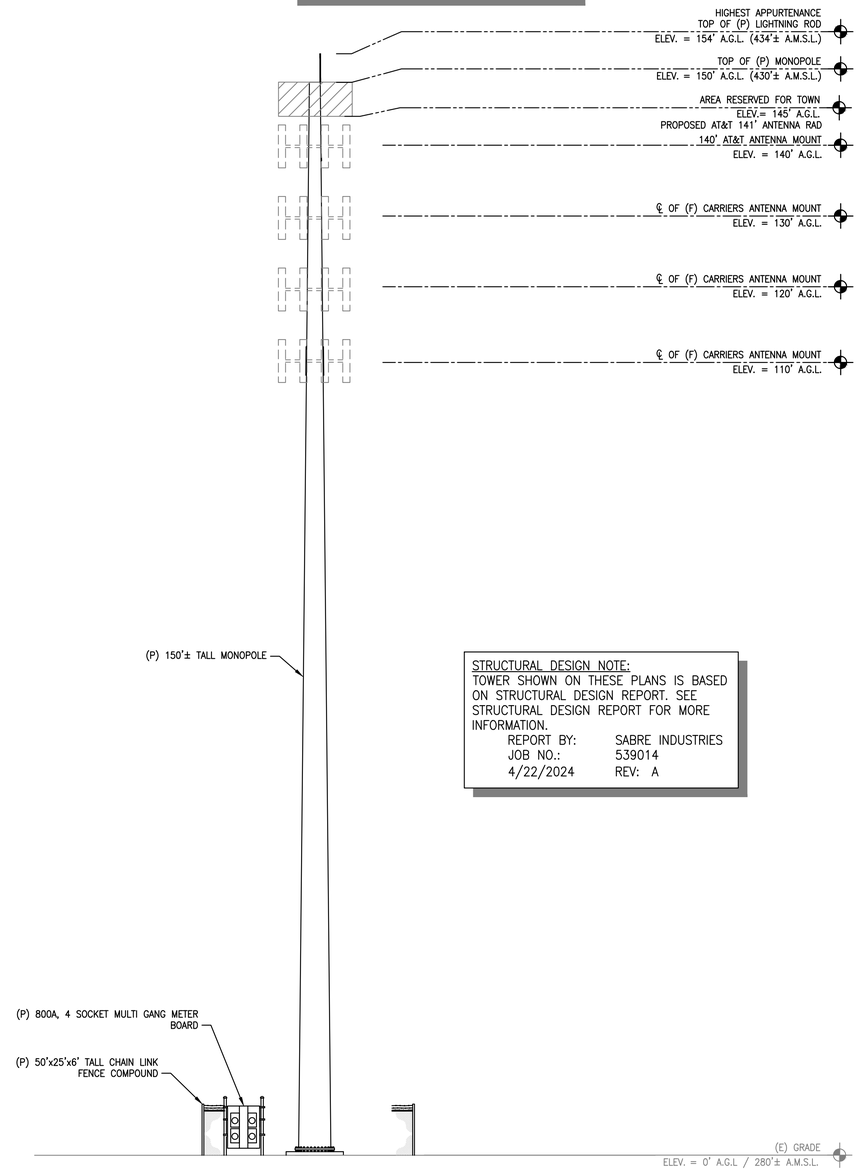
SHEET NUMBER
A-1



1 A-2 **COMPOUND PLAN**
SCALE: 1"= 5'

0 5' 10' 15'

TOWER FALL ZONE NOTE:
TOWER WILL BE DESIGNED IN SUCH A WAY AS TO COLLAPSE AND FOLD OVER IN THE MIDDLE. PREVENTING THE TOWER FROM FALLING OUTSIDE THE PROPERTY LINES.



STRUCTURAL DESIGN NOTE:
TOWER SHOWN ON THESE PLANS IS BASED ON STRUCTURAL DESIGN REPORT. SEE STRUCTURAL DESIGN REPORT FOR MORE INFORMATION.
REPORT BY: SABRE INDUSTRIES
JOB NO.: 539014
4/22/2024 REV: A

2 A-2 **ELEVATION**
SCALE: 1"=10'

0 10' 20' 30'

TowerNorth
750 WEST CENTER STREET, SUITE 301
WEST BRIDGEWATER, MA 02379

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STATE OF CONNECTICUT
SCOTT N. ADAMS
36381
LICENSED
PROFESSIONAL ENGINEER

AEG PROJECT #: 2019-0027

DRAWN BY: JWH

CHECKED BY: SNA

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MERIDEN FIRE DEPT

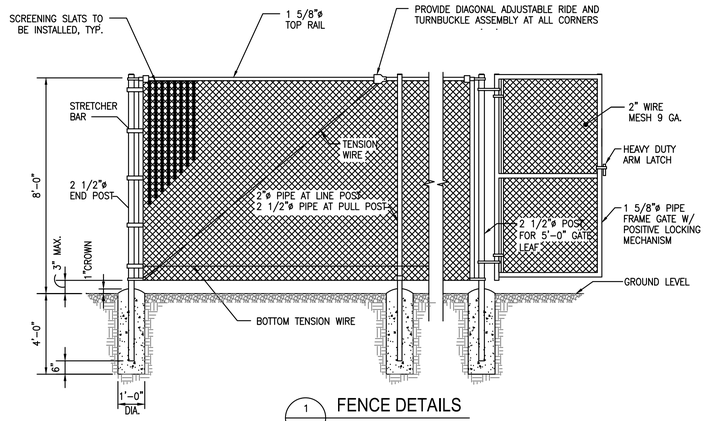
13 POMEROY AVENUE
MERIDEN, CT 06450
NEW HAVEN COUNTY

SHEET TITLE

COMPOUND PLAN
& ELEVATION

SHEET NUMBER

A-2

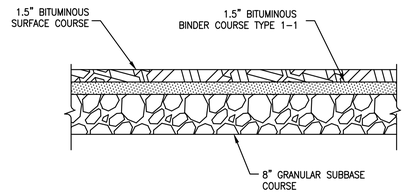


1 A-3 FENCE DETAILS

SCALE: N.T.S.

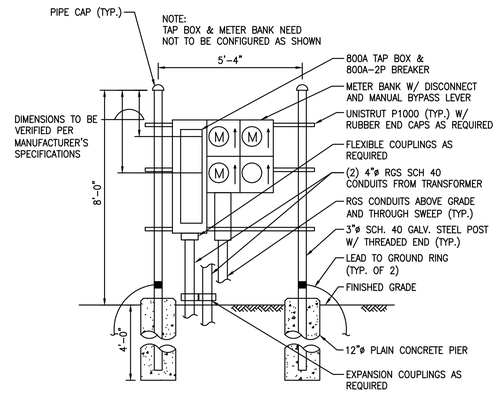
FENCE NOTES:

1. INSTALL FENCING PER ASTM F-567, SWING GATE PER ASTM F-900.
2. ALL END POSTS, LINE POSTS, PULL POSTS, POSTS FOR GATE LEAF, PIPES FOR GATE FRAME AND TOP RAILS SHALL BE SCHEDULE 40 PIPE PER ASTM F-1083.
3. FABRIC SHALL BE 12 GA. CORE WIRE SIZE 2" MESH CONFORMING TO ASTM A-392.
4. TENSION WIRE SHALL BE 7 GA. GALV. STEEL.
5. TIE WIRE SHALL BE 11 GA. GALV. STEEL (MIN.) AT POSTS AND RAILS. A SINGLE WRAP FABRIC TIE AT TENSION WIRE BY HOG RINGS SPACED MAX. OF 24" INTERVALS
6. BARBED WIRE SHALL BE DOUBLE STRAND 12 1/2" O.D. TWISTED WIRE TO MATCH W/FABRIC 14 GA., 4 PT. BARBS SPACES AT APPROXIMATELY 5" O.C.
7. COMPLY WITH LOCAL ORDINANCES OF BARBED WIRE PERMIT REQUIREMENTS, IF REQUIRED.
8. STEEL FENCE SYSTEM SHALL INCLUDE THE FENCE POSTS, FABRIC, GATE SYSTEM AND ALL NECESSARY ERECTION ACCESSORIES, FITTINGS AND FASTENINGS. ALL FENCE SYSTEM COMPONENTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153. GATES SHALL BE SWING GATES WITH 5'-0" LEAFS. REFER TO TYPICAL FENCE DETAIL FOR ADDITIONAL INFORMATION. INSTALL FENCE AFTER CONCRETE HAS ATTAINED 75% OF 28 DAY DESIGN STRENGTH.
9. SCREENING SLATS SHALL BE INSTALLED ON PROPOSED FENCING (COLOR: GREEN OR AS DET'S BY PROJECT OWNER)



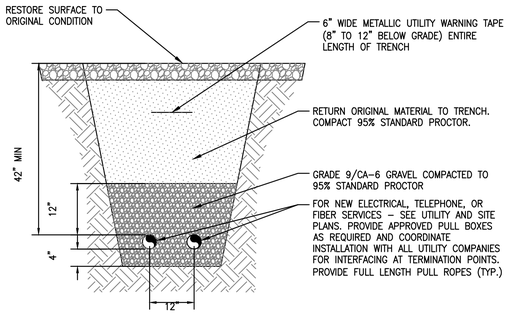
2 A-3 BITIMINIOUS CONCRETE DETAIL

SCALE: N.T.S.



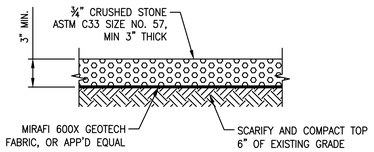
3 A-3 METER BOARD DETAIL

SCALE: N.T.S.



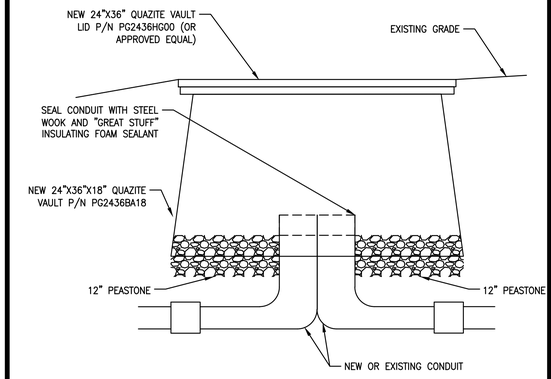
4 A-3 TRENCH DETAIL AT ACCESS CROSSING

SCALE: N.T.S.



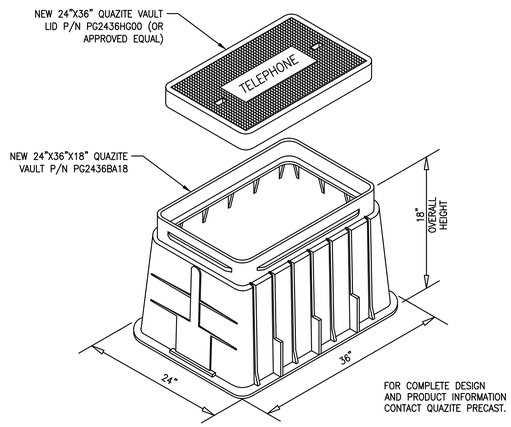
5 A-3 GRAVEL COMPOUND DETAIL

SCALE: N.T.S.



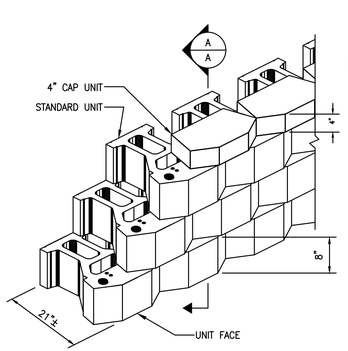
6 A-3 TELCO HANDHOLE WITH LID DETAIL

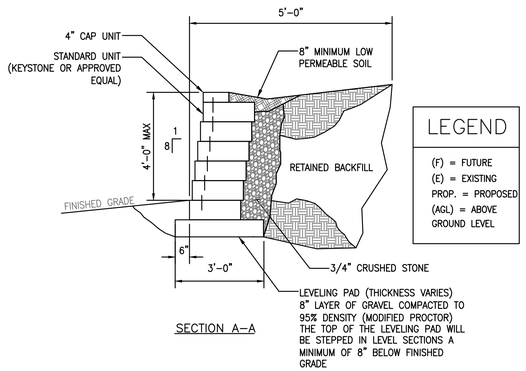
SCALE: N.T.S.



7 A-3 TELCO HANDHOLE ISOMETRIC

SCALE: N.T.S.

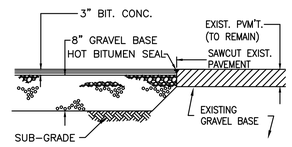




UNIT FACE

8 A-3 RETAINING WALL DETAIL

SCALE: N.T.S.



NOTE:
BASE AND SUBGRADE SHALL BE COMPACTED TO A MINIMUM OF 95% OF IT'S MODIFIED PROCTOR MAXIMUM DRY DENSITY TO A MINIMUM DEPTH OF 12".

6 D-4 PAVEMENT JOINING DETAIL

SCALE: N.T.S.

TowerNorth
SITE NAME: XXXXXXXXX
SITE ID: XX-000
FCC ASR: 000000
CONTACT INFO
SiteAccess@TowerNorth.com
1-800-821-5825x2
www.TowerNorth.com

SIGN TO BE INSTALLED CONSPICUOUSLY ON COMPOUND FENCE, ADJACENT TO GATE

10 A-3 SIGNAGE DETAIL

SCALE: N.T.S.

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NEW HAVEN COUNTY

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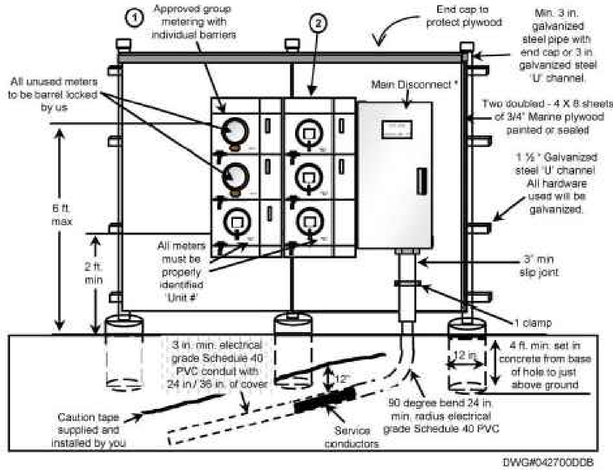
DETAILS

SHEET NUMBER

A-3

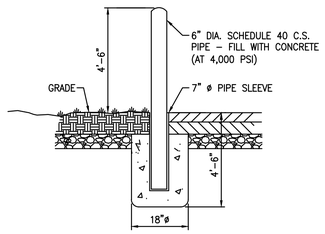
Figure 28
Cell Site Metering Pedestal



1. Individual meter sockets with individual barriers as well as provisions for seals and barrel locks.
2. Single-phase 120/208 volt Network, Three-phase 208Y/120 volt Network and Three-phase 480Y/277 volt services shall be cold sequenced.

Note:
A. Utilizing a main disconnect is the preferred installation to allow for additional meters beyond six.
B. Metering pedestal must be protected by barriers if there is a potential for damage by vehicles..

1 / A–4 CELL SITE METERING PEDESTAL DETAIL
SCALE: N.T.S.



2 / A–4 BOLLARD DETAIL
SCALE: N.T.S.

NOTE:
GC IS TO FAMILIARIZE THEMSELVES WITH THE EVERSOURSE CONNECTICUT INFORMATION & REQUIREMENTS FOR ELECTRICAL SUPPLY BELOW 600VOLTS (2018) PRIOR TO BID AND CONSTRUCTION.

CONTRACTOR AND/OR LICENSED ELECTRICIAN IS TO ENSURE COMPLIANCE WITH ABOVE REFERENCED REQUIREMENTS AS NEEDED.

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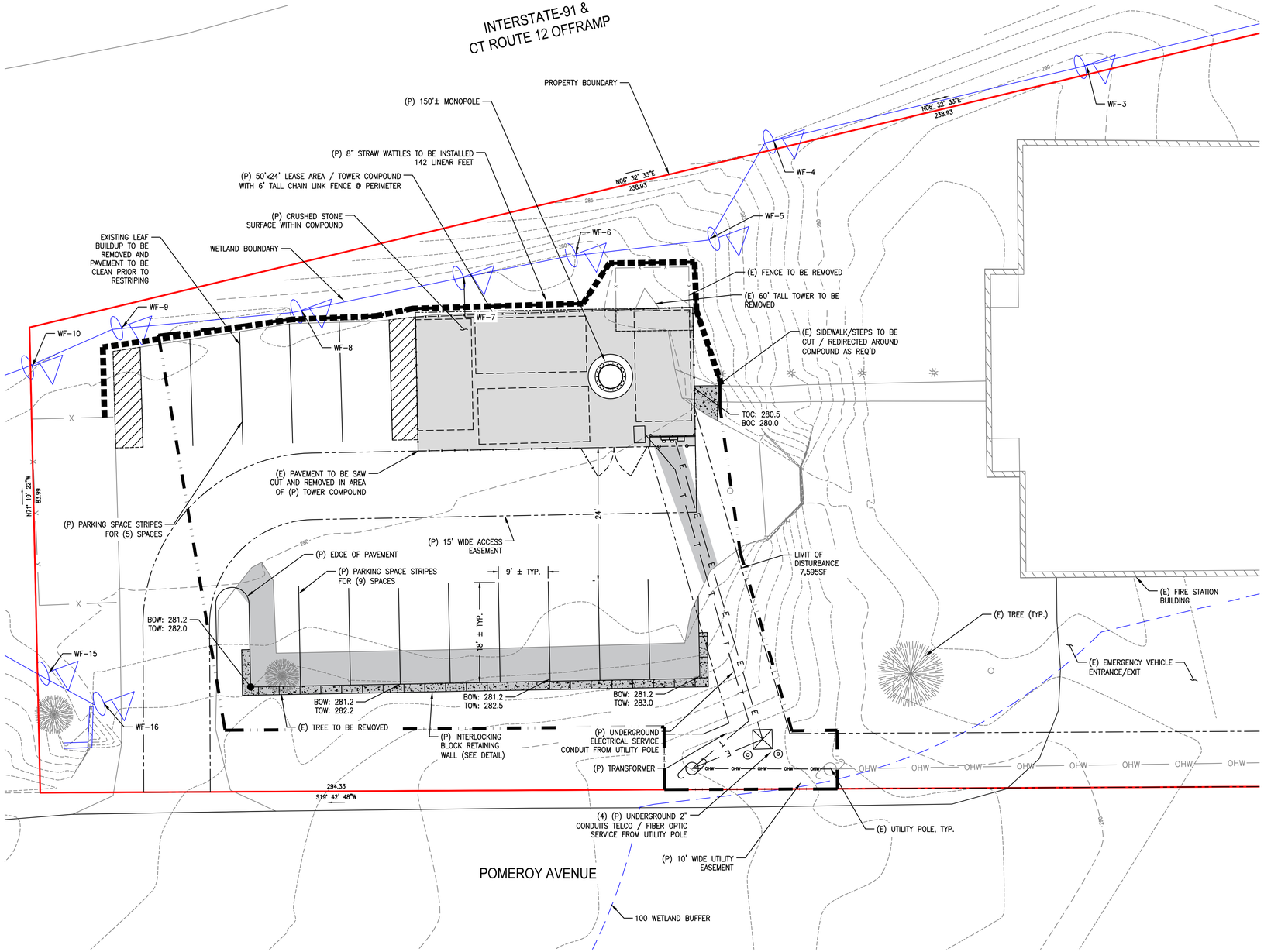
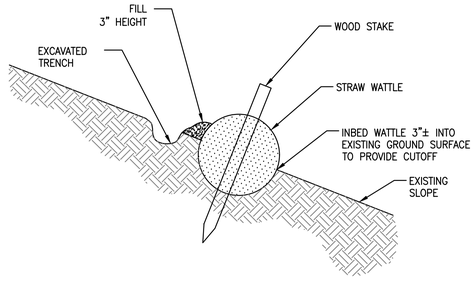
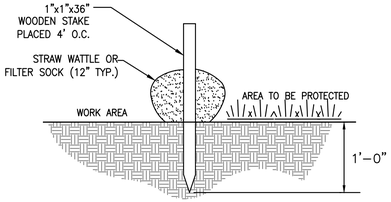


1 EC-1 EROSION CONTROL & GRADING PLAN

SCALE: 1" =10'

0 10' 20' 30'





2 EC-1 EROSION CONTROL BARRIER DETAIL

SCALE: NTS

EROSION AND SEDIMENT CONTROL NOTES:

1. PRIOR TO STARTING ANY WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONRTOL MEASURES, AND REMOVE SEDIMENT THEREFROM ON A WEEKLY BASIS AND WITHIN TWELVE HOURS AFTER EACH STORM EVENT AND DISPOSE OF SEDIMENTS IN AN UPLAND AREA SUCH THAT THEY DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE SYSTEM.

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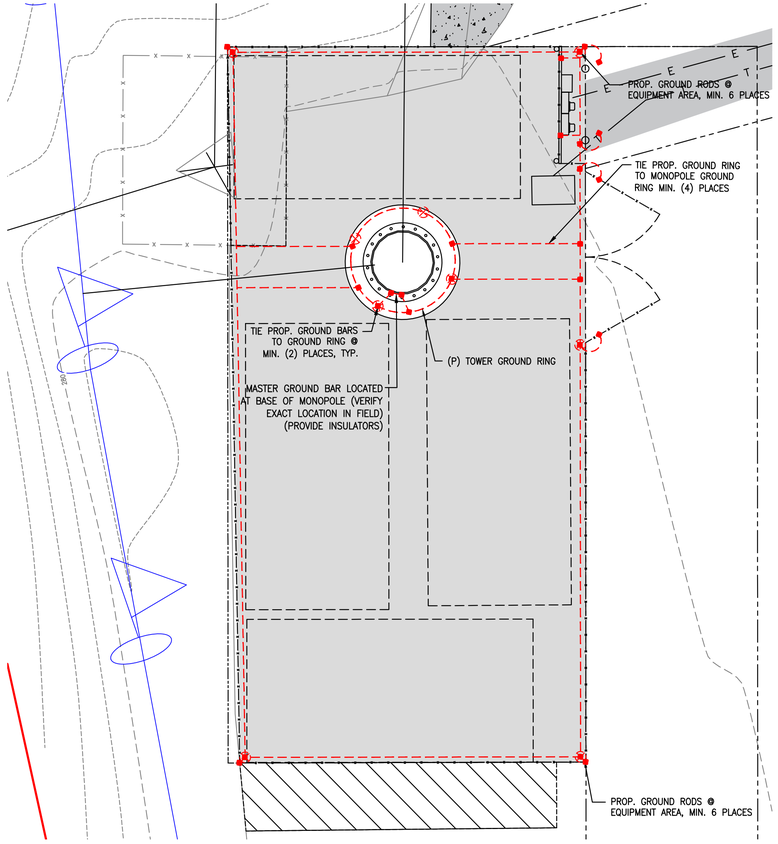
NEW HAVEN COUNTY

SHEET TITLE

EROSION CONTROL
PLAN

SHEET NUMBER

EC-1



1 E-1 GROUNDING PLAN
SCALE: 1"=5'-0"

GROUNDING LEGEND

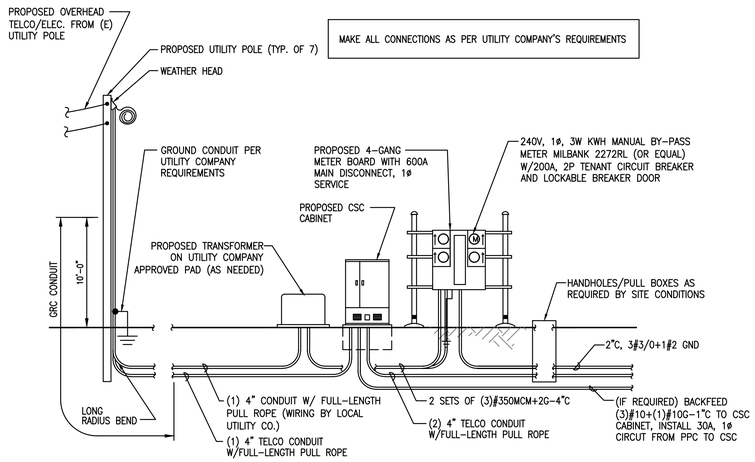
- EXOTHERMIC TYPE CONNECTION
- COMPRESSION TYPE CONNECTION
- #2 SOLID TINNED COPPER WIRE UNLESS OTHERWISE NOTED
- 5/8" x 10'-0" COPPER CLAD GROUND ROD
- GROUND WELL

ELECTRICAL NOTES

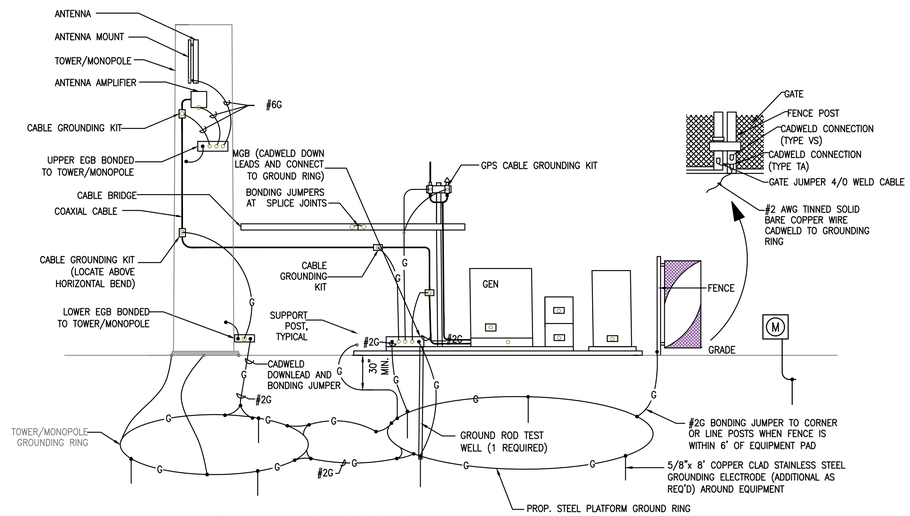
1. UTILITY SERVICES SHOWN ARE PROPOSED, THE ELECTRIC CONTRACTOR SHALL COORDINATE EXACT TELEPHONE AND ELECTRIC SERVICE CONNECTION POINTS, PULL BOXES, ROUTING AND ASSOCIATED REQUIREMENTS WITH LOCAL UTILITY COMPANIES.
2. VISIT SITE AND EXAMINE CONDITIONS UNDER WHICH WORK MUST BE PERFORMED. REPORT ADVERSE CONDITIONS IN WRITING TO LICENSEE. COMMENCEMENT OF WORK SHALL BE CONSTRUED AS COMPLETE ACCEPTANCE OF EXISTING CONDITIONS INCLUDING PREPARATORY WORK DONE BY OTHERS.
3. ALL EXISTING UNDERGROUND LINES ON SITE SHALL BE LOCATED PRIOR TO CONSTRUCTION.
4. GIVE NOTICES, FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY FEES AND BACK CHARGES, AND OBTAIN NECESSARY APPROVALS FROM AUTHORITIES THAT HAVE JURISDICTION.
5. PERFORM WORK AS REQUIRED BY BOCA AND PER LOCAL LAWS.
6. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONDUIT ROUTING WITH LOCAL UTILITY COMPANIES AND FIELD CONSTRUCTION MANAGER.
7. ALL EXTERIOR WALL PENETRATIONS SHALL BE SILICONE SEALED.
8. MATERIAL AND EQUIPMENT SHALL BE UL, NEMA, ANSI, IEEE, ADA & CBM APPROVED FOR INTENDED SERVICE. INSTALLATION SHALL MEET REQUIREMENTS OF NATIONAL AND STATE ELECTRICAL CODE.
9. ALL ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THEN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C..
10. ALL NEW WIRING SHALL BE TYPE THWN RATED 75°C., 600 VOLT. WET OR DRY LOCATIONS. MINIMUM BRANCH CIRCUIT WIRING SHALL BE #12 AWG SOLID COPPER.
11. ALL METALLIC CONDUITS SHALL BE PROVIDED WITH BONDING BUSHINGS.
12. ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO THE LICENSEE PROJECT MANAGER AT JOB COMPLETION.
13. PROVIDE THE OWNER WITH ONE SET OF COMPLETE ELECTRICAL "AS BUILT" DRAWINGS AT THE COMPLETION OF THE JOB.
14. GUARANTEE WORK IN WRITING FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS OR INSTALLATION AT NO COST TO OWNER. CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE AT NO COST TO OWNER.
15. CONTRACTOR SHALL CONTACT "DIG SAFE" (1-888-DIG-SAFE) PRIOR TO COMMENCEMENT OF WORK.

GROUNDING NOTES

1. ALL GROUND WIRE SHALL BE BARE COPPER #2 AWG UNLESS OTHERWISE NOTED.
2. ALL GROUND WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
3. ELECTRICAL CONTRACTOR SHALL COORDINATE INSTALLATION OF GROUND RODS AND GROUND RING WITH FOUNDATION AND UNDERGROUND CONDUIT.
4. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MIGB) WITH #2 AWG INSULATED STRANDED COPPER WIRE. EQUIPMENT CABINETS SHALL EACH HAVE (2) CONNECTIONS.
5. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE (TYPICAL FOR FOUR MOUNTING PIPES PER SECTOR).
6. ANTENNA GROUND KITS SHALL BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR.
7. COORDINATE NEW LICENSEE GROUND SYSTEM WITH EXISTING SITE GROUND SYSTEM.
8. EACH SECTION OF CABLE TRAY, ICE BRIDGE AND ICE SHIELD SHALL BE CONNECTED IN A FASHION TO PROVIDE A CONTINUOUS GROUND.
9. AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANELS AND FRAMES OF EQUIPMENT, AND WHERE EXPOSED FOR GROUNDING, CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE WITH STAINLESS STEEL SELF-TAPPING SCREWS.
10. ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
11. ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI-CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH LICENSEE PROJECT MANAGER.
12. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
13. INSTALL GROUND BUSHINGS ON ALL METALLIC CONDUITS AND BOND TO THE EQUIPMENT GROUND BUS IN THE PANELBOARD.
14. GROUND ANTENNA BASES, FRAMES, CABLE RACKS AND OTHER METALLIC COMPONENTS WITH #2 GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
15. GROUND COAXIAL SHIELD AT BOTH ENDS USING MANUFACTURER'S GUIDELINES.
16. REINFORCEMENT IN EQUIPMENT SLAB TO BE WELDED AND REINFORCEMENT TO BE BONDED TO GROUNDING RING.
17. CONCRETE-ENCASED ELECTRODES GREATER THAN 20 S.F. OF SURFACE AREA & 1/2" OR GREATER REINFORCING STEEL MUST BE BONDED TO THE GROUNDING RING PER NEC 250.50.



2 E-1 TYPICAL POWER RISER DIAGRAM
SCALE: N.T.S.



3 E-1 GROUNDING RISER DIAGRAM
SCALE: N.T.S.

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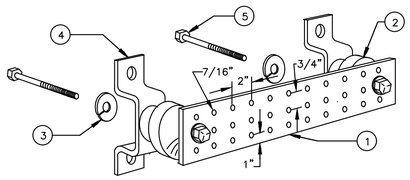
SHEET TITLE

GROUNDING PLAN, ONE LINE DIAGRAM, & NOTES

SHEET NUMBER

E-1



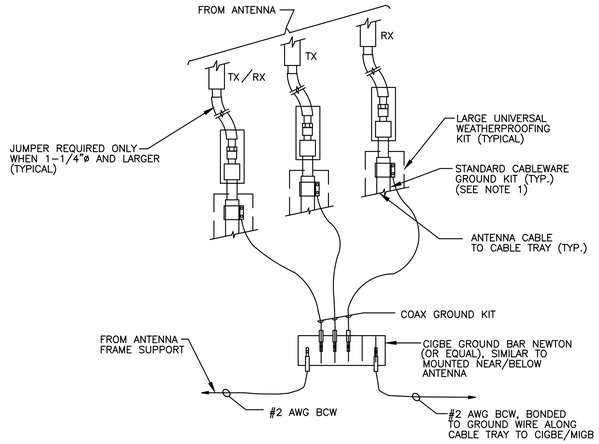
LEGEND

1– COPPER TINNED GROUND BAR, 1/4"X 4"X 20", OR OTHER LENGTH AS REQUIRED, HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2– INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061–4 OR EQUAL
3– 5/8" LOCKWASHERS OR EQUAL
4– WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A–6056 OR EQUAL
5– 5/8–11 X 1" H.H.C.S.BOLTS

NOTE:
ALL BOLTS, NUTS, WASHERS AND LOCK WASHERS SHALL BE 18–8 STAINLESS STEEL.

GROUNDING - STANDARD DETAIL IGROUND BAR

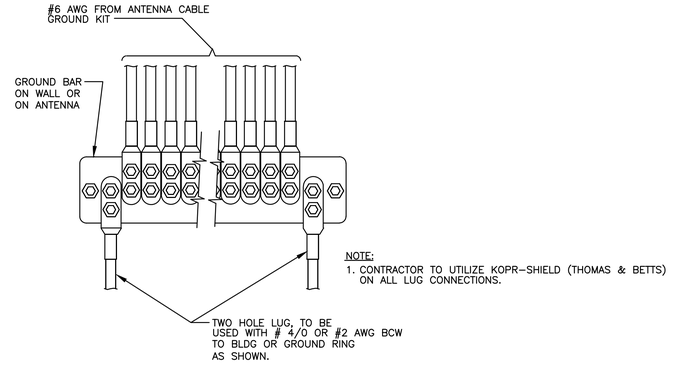
1 / E–2 SCALE: N.T.S.



NOTE:
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

STANDARD DETAIL CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE)

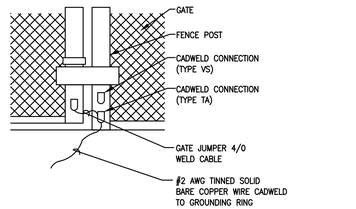
2 / E–2 SCALE: N.T.S.



NOTE:
1. CONTRACTOR TO UTILIZE KOPR–SHIELD (THOMAS & BETTS) ON ALL LUG CONNECTIONS.

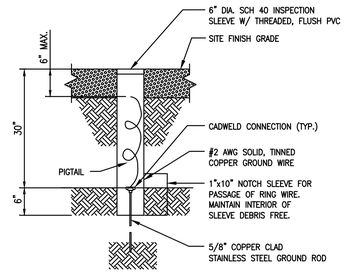
GROUNDING - STANDARD DETAIL INSTALLATION OF GROUND WIRES TO GROUND BAR

3 / E–2 SCALE: N.T.S.



SWING GATE GROUNDING DETAIL

4 / E–2 SCALE: N.T.S.



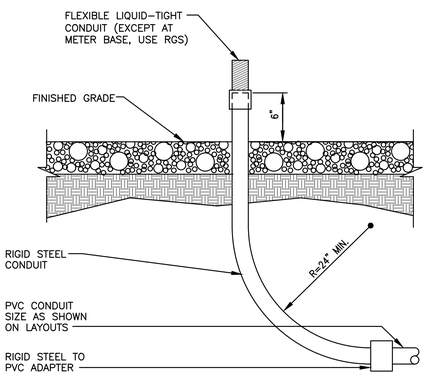
GROUND ROD TEST WELL DETAIL

5 / E–2 SCALE: N.T.S.

NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYP. GROUND BAR CONNECTIONS DETAIL

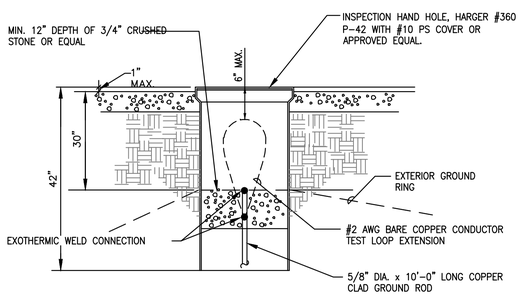
6 / E–2 SCALE: N.T.S.



NOTE:
CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF CONDUIT STUB–UP.

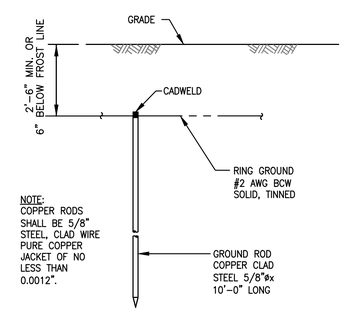
CONDUIT STUB-UP

7 / E–2 SCALE: N.T.S.



GROUND WELL DETAIL

8 / E–2 SCALE: N.T.S.



NOTE:
COPPER RODS SHALL BE 5/8" STEEL, CLAD WIRE PURE COPPER JACKET OF NO LESS THAN 0.0012".

TYP. GROUND ROD DETAIL

9 / E–2 SCALE: N.T.S.

TowerNorth
750 WEST CENTER STREET, SUITE 301
WEST BRIDGEWATER, MA 02379

ADVANCED ENGINEERING GROUP, P.C.
Civil Engineering - Site Development
Surveying - Telecommunications
500 North Broadway
East Providence, RI 02914
Tel: (401) 354-2403
Fax: (401) 633-6354

STATE OF CONNECTICUT
SCOTT N. ADAMS
36381
LICENSED PROFESSIONAL ENGINEER

AEG PROJECT #: 2019–0027

DRAWN BY: JWH

CHECKED BY: SNA

SUBMITTALS

REV#	DATE	DESCRIPTION
0	01/16/24	ISSUED FOR REVIEW
1	02/23/24	ISSUED FOR CONSTRUCTION
2	03/27/24	REVISED
3	06/28/24	REVISED

MERIDEN FIRE DEPT

13 POMEROY AVENUE
MERIDEN, CT 06450
NEW HAVEN COUNTY

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

E-2

Sabre Industries™
INNOVATION DELIVERED

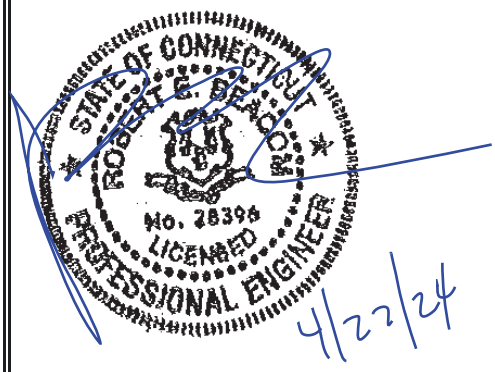
Structural Design Report

150' Monopole
Site: Meriden Fire Dept, CT
Site Number: CT0005-A

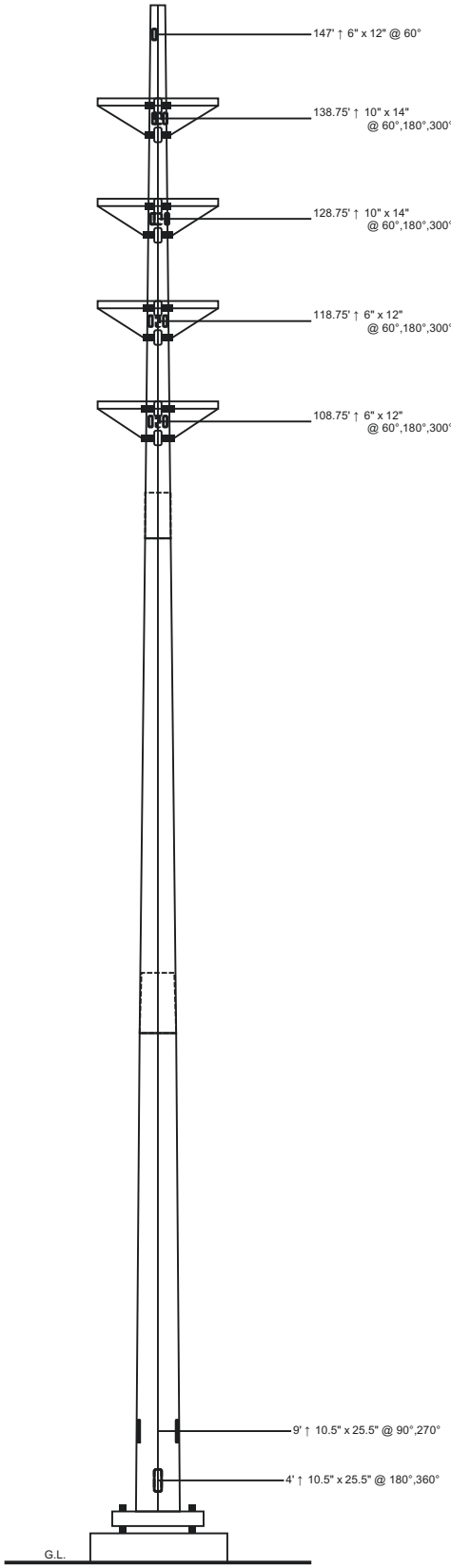
Prepared for: TOWERNORTH DEVELOPMENT, LLC
by: Sabre Industries ™

Job Number: 539014
Revision A

April 22, 2024



Length (ft)	52'-9"	53'-6"							
Number Of Sides	18								
Thickness (in)	1/4"	3/8"							
Lap Splice (ft)		4' - 6"							
Top Diameter (in)	18.25"	29.54"							
Bottom Diameter (in)	31.14"	42.62"							
Taper (in/ft)	0.2444								
Grade	A572-65								
Weight (lbs)	4165	8214							
Overall Steel Height (ft)	149								
Length (ft)		53'-6"	53'-3"						
Number Of Sides		18							
Thickness (in)		3/8"	7/16"						
Lap Splice (ft)		4' - 6"							
			6' - 0"						
Top Diameter (in)		29.54"	40.4"						
Bottom Diameter (in)		42.62"	53.42"						
Taper (in/ft)		0.2444							
Grade		A572-65							
Weight (lbs)		8214	14067						
Overall Steel Height (ft)		149							



Designed Appurtenance Loading

Elev	Description	Tx-Line
140	Platform - 12' w/ Enhanced Support Rail	
140	(1) 30,000 sq. in. (5000 lbs) (below top)	(20) 1 5/8"
130	Platform - 12' w/ Enhanced Support Rail	
130	(1) 30,000 sq. in. (5000 lbs) (below top)	(20) 1 5/8"
120	Platform - 12' w/ Enhanced Support Rail	
120	(1) 20,000 sq. in. (4000 lbs) (below top)	(12) 1 5/8"
110	Platform - 12' w/ Enhanced Support Rail	
110	(1) 15,000 sq. in. (3500 lbs) (below top)	(12) 1 5/8"

Design Criteria - ANSI/TIA-222-H

Wind Speed (No Ice)	130 mph
Wind Speed (Ice)	50 mph
Design Ice Thickness	1.00 in
Risk Category	III
Exposure Category	B
Topographic Factor Procedure	Method 1 (Simplified)
Topographic Category	1
Ground Elevation	280 ft
Seismic Importance Factor, Ie	1.25
0.2-sec Spectral Response, Ss	0.206 g
1-sec Spectral Response, S1	0.055 g
Site Class	D (DEFAULT)
Seismic Design Category	B
Basic Seismic Force-Resisting System	Telecommunication Tower (Pole: Steel)

Limit State Load Combination Reactions

Load Combination	Axial (kips)	Shear (kips)	Moment (ft-k)	Deflection (ft)	Sway (deg)
1.2 D + 1.0 Wo	69.12	40.95	4961.47	12.97	9.34
0.9 D + 1.0 Wo	51.88	41.17	4848.08	12.54	8.98
1.2 D + 1.0 Di + 1.0 Wi	102.06	10.23	1300.37	3.54	2.53
1.2 D + 1.0 Ev + 1.0 Eh	71.63	1.73	235.18	0.65	0.47
0.9 D - 1.0 Ev + 1.0 Eh	49.29	1.73	226.96	0.62	0.44
1.0 D + 1.0 Wo (Service @ 60 mph)	57.64	7.8	936.37	2.49	1.77

Base Plate Dimensions

Shape	Diameter	Thickness	Bolt Circle	Bolt Qty	Bolt Diameter
Round	66"	2.25"	60.25"	18	2.25"

Anchor Bolt Dimensions

Length	Diameter	Hole Diameter	Weight	Type	Finish
84"	2.25"	2.625"	2179.8	A615-75	Galv

Notes

1) Antenna Feed Lines Run Inside Pole
2) All dimensions are above ground level, unless otherwise specified.
3) Weights shown are estimates. Final weights may vary.
4) This tower design and, if applicable, the foundation design(s) shown on the following page(s) also meet or exceed the requirements of the 2022 Connecticut Building Code.
5) Full Height Step Bolts
6) Tower Rating: 99.2%

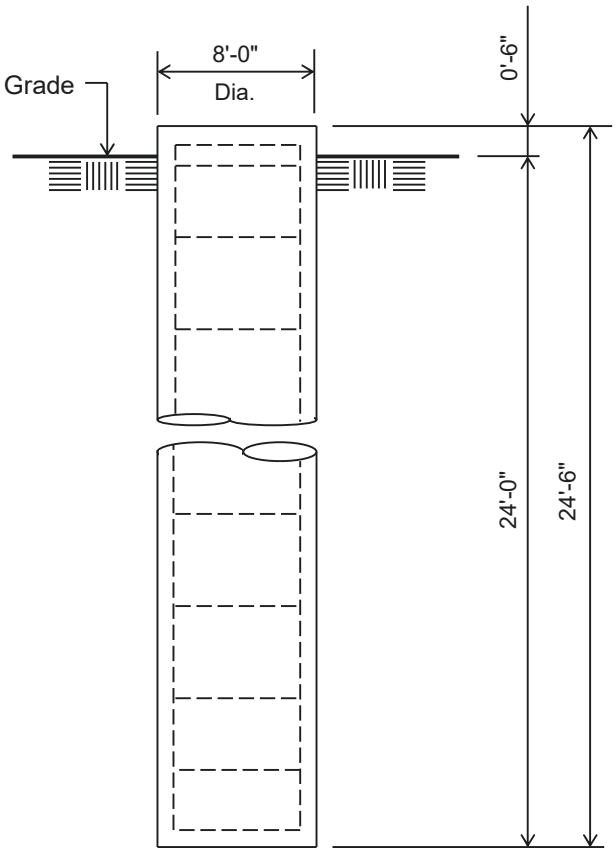
Sabre Industries
INNOVATION DELIVERED

Sabre Industries
7101 Southbridge Drive
P.O. Box 658
Sioux City, IA 51102-0658
Phone: (712) 258-6690
Fax: (712) 279-0814

Job:	**539014A**
Customer:	TOWERNORTH DEVELOPMENT, LLC
Site Name:	Meriden Fire Dept, CT CT0005-A
Description:	150' Monopole
Date:	4/22/2024 By: REB

No.: 539014
Date: 04/22/24
By: REB
Revision A

Customer: TOWERNORTH DEVELOPMENT, LLC
Site: Meriden Fire Dept, CT CT0005-A
150’ Monopole



ELEVATION VIEW
(45.61 Cu. Yds.)
(1 REQUIRED; NOT TO SCALE)

Notes:

1) Concrete shall have a minimum 28-day compressive strength of 4,500 psi, in accordance with ACI 318-14.
2) Rebar to conform to ASTM specification A615 Grade 60.
3) All rebar to have a minimum of 3” concrete cover.
4) All exposed concrete corners to be chamfered 3/4”.
5) The foundation design is based on the geotechnical report by AEG Advanced Engineering Group, P.C. project no. 24-01019, dated: 4/11/24.
6) See the geotechnical report for drilled pier installation requirements, if specified.
7) The bottom anchor bolt template shall be positioned as closely as possible to the bottom of the anchor bolts.

Rebar Schedule for Pier	
Pier	(44) #10 vertical rebar w/ #5 ties, (2) within top 5” of pier, then 7” C/C

7101 Southbridge Drive - P.O. Box 658 - Sioux City, IA 51102-0658 - Phone 712.258.6690 - Fax 712.279.0814

150' Monopole / Meriden Fire Dept, CT

* All pole diameters shown on the following pages are across corners.
See profile drawing for widths across flats.

POLE GEOMETRY

ELEV ft	SECTION NAME	No. SIDE	OUTSIDE DIAM in	THICK -NESS in	RESISTANCES **Pn kip	**Mn ft-kip	SPLICE TYPE	OVERLAP... LENGTH ft	RATIO	w/t
149.0										
			18.53	0.250	1061.2	390.6				
	A	18								11.6
			30.50	0.250	1657.7	1015.1				
100.7										
			30.50	0.250	1657.7	1015.1				
	A/B	18					SLIP	4.50	1.76	
			31.12	0.375	2677.2	1659.9				
96.2										
			31.12	0.375	2677.2	1659.9				
	B	18								13.5
			41.78	0.375	3482.7	2916.5				
53.2										
			41.78	0.375	3482.7	2916.5				
	B/C	18					SLIP	6.00	1.72	
			42.53	0.438	4275.4	3634.9				
47.2										
			42.53	0.438	4275.4	3634.9				
	C	18								16.0
			54.24	0.438	5103.9	5559.6				
0.0										

POLE ASSEMBLY

SECTION NAME	BASE ELEV ft	BOLTS AT BASE OF SECTION. NUMBER	TYPE	DIAM in	STRENGTH ksi	THREADS IN SHEAR PLANE	CALC BASE ELEV ft
A	96.250	0	A325	0.00	92.0	0	96.250
B	47.250	0	A325	0.00	92.0	0	47.250
C	0.000	0	A325	0.00	92.0	0	0.000

POLE SECTIONS

SECTION NAME	No.of SIDES	LENGTH ft	OUTSIDE.DIAMETER BOT * in	TOP * in	BEND RAD in	MAT-ERIAL ID	FLANGE.ID BOT	TOP	FLANGE.WELD ..GROUP.ID.. BOT	TOP
A	18	52.75	31.62	18.53	0.625	1	0	0	0	0
B	18	53.50	43.28	30.00	0.625	2	0	0	0	0
C	18	53.25	54.24	41.03	0.625	3	0	0	0	0

* - Diameter of circumscribed circle

MATERIAL TYPES

TYPE OF SHAPE	TYPE NO	NO OF ELEM.	ORIENT	HEIGHT	WIDTH	.THICKNESS. WEB	FLANGE	IRREGULARITY .PROJECTION. % OF AREA	ORIENT

			& deg	in	in	in	in		deg
PL	1	1	0.0	31.62	0.25	0.250	0.250	0.00	0.0
PL	2	1	0.0	43.28	0.38	0.375	0.375	0.00	0.0
PL	3	1	0.0	54.24	0.44	0.438	0.438	0.00	0.0

& - With respect to vertical

MATERIAL PROPERTIES
==========

MATERIAL TYPE NO.	ELASTIC MODULUS ksi	UNIT WEIGHT pcf	.. STRENGTH .. Fu ksi	Fy ksi	THERMAL COEFFICIENT /deg
1	29000.0	490.0	80.0	65.0	0.00001170
2	29000.0	490.0	80.0	65.0	0.00001170
3	29000.0	490.0	80.0	65.0	0.00001170

* Only 5 condition(s) shown in full
* Some concentrated wind loads may have been derived from full-scale wind tunnel testing

==========

LOADING CONDITION A ==========

130 mph wind with no ice. Wind Azimuth: 0• (1.2 D + 1.0 Wo)

LOADS ON POLE
==========

LOAD TYPE	ELEV ft	APPLY..LOAD..AT RADIUS ft	AZI	LOAD AZI	.....FORCES..... HORIZ kip	DOWN kip	.....MOMENTS..... VERTICAL ft-kip	TORSNAL ft-kip
C	144.500	0.00	0.0	0.0	0.0323	0.0151	0.0000	0.0000
C	139.000	0.00	0.0	0.0	0.0000	3.4694	0.0000	0.0000
C	139.000	0.00	0.0	0.0	9.2693	8.5836	0.0000	0.0000
C	135.000	0.00	0.0	0.0	0.0352	0.0168	0.0000	0.0000
C	129.000	0.00	0.0	0.0	0.0000	3.2198	0.0000	0.0000
C	129.000	0.00	0.0	0.0	9.0751	8.5836	0.0000	0.0000
C	125.000	0.00	0.0	0.0	0.0344	0.0168	0.0000	0.0000
C	119.000	0.00	0.0	0.0	0.0000	1.7821	0.0000	0.0000
C	119.000	0.00	0.0	0.0	6.2812	7.3836	0.0000	0.0000
C	115.000	0.00	0.0	0.0	0.0336	0.0168	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	1.6324	0.0000	0.0000
C	109.000	0.00	0.0	0.0	4.8644	6.7836	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0327	0.0168	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0318	0.0168	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0308	0.0168	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0297	0.0168	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0285	0.0168	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0272	0.0168	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0257	0.0168	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0239	0.0168	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0229	0.0168	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0229	0.0168	0.0000	0.0000
D	149.000	0.00	180.0	0.0	0.0506	0.0612	0.0000	0.0000
D	100.750	0.00	180.0	0.0	0.0703	0.0937	0.0000	0.0000
D	100.750	0.00	180.0	0.0	0.0720	0.2429	0.0000	0.0000
D	96.250	0.00	180.0	0.0	0.0720	0.2429	0.0000	0.0000
D	96.250	0.00	180.0	0.0	0.0734	0.1510	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0819	0.1943	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0816	0.4326	0.0000	0.0000
D	47.250	0.00	180.0	0.0	0.0816	0.4326	0.0000	0.0000
D	47.250	0.00	180.0	0.0	0.0800	0.2393	0.0000	0.0000
D	23.625	0.00	180.0	0.0	0.0783	0.2636	0.0000	0.0000
D	23.625	0.00	180.0	0.0	0.0808	0.2717	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0880	0.2960	0.0000	0.0000

==========

LOADING CONDITION M ==========

130 mph wind with no ice. Wind Azimuth: 0• (0.9 D + 1.0 Wo)

LOADS ON POLE
==========

LOAD TYPE	ELEV ft	APPLY..LOAD..AT RADIUS ft	AZI	LOAD AZI	.....FORCES..... HORIZ kip	DOWN kip	.....MOMENTS..... VERTICAL ft-kip	TORSNAL ft-kip
C	144.500	0.00	0.0	0.0	0.0323	0.0113	0.0000	0.0000
C	139.000	0.00	0.0	0.0	0.0000	2.6021	0.0000	0.0000
C	139.000	0.00	0.0	0.0	9.2693	6.4377	0.0000	0.0000
C	135.000	0.00	0.0	0.0	0.0352	0.0126	0.0000	0.0000
C	129.000	0.00	0.0	0.0	0.0000	2.4149	0.0000	0.0000
C	129.000	0.00	0.0	0.0	9.0751	6.4377	0.0000	0.0000
C	125.000	0.00	0.0	0.0	0.0344	0.0126	0.0000	0.0000
C	119.000	0.00	0.0	0.0	0.0000	1.3366	0.0000	0.0000
C	119.000	0.00	0.0	0.0	6.2812	5.5377	0.0000	0.0000
C	115.000	0.00	0.0	0.0	0.0336	0.0126	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	1.2243	0.0000	0.0000
C	109.000	0.00	0.0	0.0	4.8644	5.0877	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0327	0.0126	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0318	0.0126	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0308	0.0126	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0297	0.0126	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0285	0.0126	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0272	0.0126	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0257	0.0126	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0239	0.0126	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0229	0.0126	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0229	0.0126	0.0000	0.0000
D	149.000	0.00	180.0	0.0	0.0506	0.0459	0.0000	0.0000
D	100.750	0.00	180.0	0.0	0.0703	0.0702	0.0000	0.0000
D	100.750	0.00	180.0	0.0	0.0720	0.1822	0.0000	0.0000
D	96.250	0.00	180.0	0.0	0.0720	0.1822	0.0000	0.0000
D	96.250	0.00	180.0	0.0	0.0734	0.1133	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0819	0.1458	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0816	0.3244	0.0000	0.0000
D	47.250	0.00	180.0	0.0	0.0816	0.3244	0.0000	0.0000
D	47.250	0.00	180.0	0.0	0.0800	0.1794	0.0000	0.0000
D	23.625	0.00	180.0	0.0	0.0783	0.1977	0.0000	0.0000
D	23.625	0.00	180.0	0.0	0.0808	0.2038	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0880	0.2220	0.0000	0.0000

==========

LOADING CONDITION Y ==========

50 mph wind with 1 ice. Wind Azimuth: 0• (1.2 D + 1.0 Di + 1.0 Wi)

LOADS ON POLE
==========

LOAD TYPE	ELEV ft	APPLY..LOAD..AT RADIUS ft	AZI	LOAD AZI	.....FORCES..... HORIZ kip	DOWN kip	.....MOMENTS..... VERTICAL ft-kip	TORSNAL ft-kip
C	144.500	0.00	0.0	0.0	0.0299	0.0271	0.0000	0.0000
C	139.000	0.00	0.0	0.0	0.0000	3.4694	0.0000	0.0000
C	139.000	0.00	0.0	0.0	2.1377	15.4801	0.0000	0.0000
C	135.000	0.00	0.0	0.0	0.0324	0.0288	0.0000	0.0000
C	129.000	0.00	0.0	0.0	0.0000	3.2198	0.0000	0.0000
C	129.000	0.00	0.0	0.0	2.0873	15.4291	0.0000	0.0000
C	125.000	0.00	0.0	0.0	0.0315	0.0288	0.0000	0.0000
C	119.000	0.00	0.0	0.0	0.0000	1.7821	0.0000	0.0000
C	119.000	0.00	0.0	0.0	1.4508	13.1278	0.0000	0.0000
C	115.000	0.00	0.0	0.0	0.0305	0.0288	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	1.6324	0.0000	0.0000
C	109.000	0.00	0.0	0.0	1.1270	11.8295	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0295	0.0288	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0284	0.0288	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0273	0.0288	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0261	0.0288	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0247	0.0288	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0233	0.0288	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0216	0.0288	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0197	0.0288	0.0000	0.0000

C	25.000	0.00	0.0	0.0	0.0183	0.0288	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0176	0.0288	0.0000	0.0000
D	149.000	0.00	180.0	0.0	0.0149	0.0951	0.0000	0.0000
D	100.750	0.00	180.0	0.0	0.0197	0.1426	0.0000	0.0000
D	100.750	0.00	180.0	0.0	0.0201	0.2936	0.0000	0.0000
D	96.250	0.00	180.0	0.0	0.0201	0.2936	0.0000	0.0000
D	96.250	0.00	180.0	0.0	0.0205	0.2029	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0224	0.2573	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0223	0.4968	0.0000	0.0000
D	47.250	0.00	180.0	0.0	0.0223	0.4968	0.0000	0.0000
D	47.250	0.00	180.0	0.0	0.0218	0.3038	0.0000	0.0000
D	23.625	0.00	180.0	0.0	0.0212	0.3310	0.0000	0.0000
D	23.625	0.00	180.0	0.0	0.0218	0.3403	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0235	0.3589	0.0000	0.0000

LOADING CONDITION AK

Seismic - Azimuth: 0• (1.2 D + 1.0 Ev + 1.0 Eh)

LOADS ON POLE

LOAD TYPE	ELEV	APPLY..LOAD..AT RADIUS	AZI	LOAD AZI	.....FORCES..... HORIZ	DOWN	.....MOMENTS..... VERTICAL	TORSNAL
	ft	ft			kip	kip	ft-kip	ft-kip
C	144.500	0.00	0.0	0.0	0.0007	0.0157	0.0000	0.0000
C	139.000	0.00	0.0	0.0	0.3653	8.8983	0.0000	0.0000
C	139.000	0.00	0.0	0.0	0.1477	3.5966	0.0000	0.0000
C	135.000	0.00	0.0	0.0	0.0007	0.0174	0.0000	0.0000
C	129.000	0.00	0.0	0.0	0.3146	8.8983	0.0000	0.0000
C	129.000	0.00	0.0	0.0	0.1180	3.3379	0.0000	0.0000
C	125.000	0.00	0.0	0.0	0.0006	0.0174	0.0000	0.0000
C	122.620	0.00	0.0	0.0	0.1380	4.3194	0.0000	0.0000
C	119.000	0.00	0.0	0.0	0.2303	7.6543	0.0000	0.0000
C	119.000	0.00	0.0	0.0	0.0556	1.8474	0.0000	0.0000
C	115.000	0.00	0.0	0.0	0.0005	0.0174	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.1775	7.0323	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0427	1.6923	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0004	0.0174	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0003	0.0174	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0003	0.0174	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0002	0.0174	0.0000	0.0000
C	74.000	0.00	0.0	0.0	0.1117	9.6008	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0002	0.0174	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0001	0.0174	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0001	0.0174	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0000	0.0174	0.0000	0.0000
C	26.620	0.00	0.0	0.0	0.0218	14.5094	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0000	0.0174	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0000	0.0174	0.0000	0.0000
D	149.000	0.00	180.0	180.0	0.0000	0.0000	0.0000	0.0000
D	0.000	0.00	180.0	180.0	0.0000	0.0000	0.0000	0.0000

LOADING CONDITION AL

Seismic - Azimuth: 0• (0.9 D - 1.0 Ev + 1.0 Eh)

LOADS ON POLE

LOAD TYPE	ELEV	APPLY..LOAD..AT RADIUS	AZI	LOAD AZI	.....FORCES..... HORIZ	DOWN	.....MOMENTS..... VERTICAL	TORSNAL
	ft	ft			kip	kip	ft-kip	ft-kip
C	144.500	0.00	0.0	0.0	0.0007	0.0107	0.0000	0.0000
C	139.000	0.00	0.0	0.0	0.3653	6.1230	0.0000	0.0000
C	139.000	0.00	0.0	0.0	0.1477	2.4749	0.0000	0.0000
C	135.000	0.00	0.0	0.0	0.0007	0.0120	0.0000	0.0000
C	129.000	0.00	0.0	0.0	0.3146	6.1230	0.0000	0.0000
C	129.000	0.00	0.0	0.0	0.1180	2.2968	0.0000	0.0000

C	125.000	0.00	0.0	0.0	0.0006	0.0120	0.0000	0.0000
C	122.620	0.00	0.0	0.0	0.1380	2.9722	0.0000	0.0000
C	119.000	0.00	0.0	0.0	0.2303	5.2670	0.0000	0.0000
C	119.000	0.00	0.0	0.0	0.0556	1.2713	0.0000	0.0000
C	115.000	0.00	0.0	0.0	0.0005	0.0120	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.1775	4.8390	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0427	1.1644	0.0000	0.0000
C	105.000	0.00	0.0	0.0	0.0004	0.0120	0.0000	0.0000
C	95.000	0.00	0.0	0.0	0.0003	0.0120	0.0000	0.0000
C	85.000	0.00	0.0	0.0	0.0003	0.0120	0.0000	0.0000
C	75.000	0.00	0.0	0.0	0.0002	0.0120	0.0000	0.0000
C	74.000	0.00	0.0	0.0	0.1117	6.6063	0.0000	0.0000
C	65.000	0.00	0.0	0.0	0.0002	0.0120	0.0000	0.0000
C	55.000	0.00	0.0	0.0	0.0001	0.0120	0.0000	0.0000
C	45.000	0.00	0.0	0.0	0.0001	0.0120	0.0000	0.0000
C	35.000	0.00	0.0	0.0	0.0000	0.0120	0.0000	0.0000
C	26.620	0.00	0.0	0.0	0.0218	9.9840	0.0000	0.0000
C	25.000	0.00	0.0	0.0	0.0000	0.0120	0.0000	0.0000
C	15.000	0.00	0.0	0.0	0.0000	0.0120	0.0000	0.0000
D	149.000	0.00	180.0	180.0	0.0000	0.0000	0.0000	0.0000
D	0.000	0.00	180.0	180.0	0.0000	0.0000	0.0000	0.0000

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150' Monopole / Meriden Fire Dept, CT

MAXIMUM POLE DEFORMATIONS CALCULATED(w.r.t. wind direction)

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MAST ELEV ft	DEFLECTIONS (ft) HORIZONTAL ALONG	HORIZONTAL ACROSS	DOWN	ROTATIONS (deg) TILT ALONG	TILT ACROSS	TWIST
149.0	12.97L	-0.03H	1.57L	9.34L	-0.01H	0.00N
142.1	11.88L	-0.03H	1.39L	9.33L	-0.01H	0.00N
135.2	10.78L	-0.03H	1.22L	9.30L	-0.01H	0.00N
128.3	9.70L	-0.02H	1.04L	9.15L	-0.01H	0.00N
121.4	8.64L	-0.02H	0.88L	8.84L	-0.01H	0.00N
114.5	7.63L	-0.02H	0.72L	8.39L	-0.01H	0.00N
107.6	6.67L	-0.02H	0.59L	7.82L	-0.02H	0.00N
100.7	5.79L	-0.02H	0.47L	7.14L	-0.02H	0.00N
96.2	5.24L	-0.02H	0.40L	6.82L	-0.02H	0.00N
90.1	4.55L	-0.01H	0.32L	6.33L	-0.02H	0.00N
84.0	3.90L	-0.01H	0.26L	5.83L	-0.02H	0.00N
77.8	3.31L	-0.01H	0.20L	5.32L	-0.01H	0.00N
71.7	2.77L	-0.01H	0.15L	4.81L	-0.01H	0.00N
65.5	2.29L	-0.01H	0.11L	4.30L	-0.01H	0.00N
59.4	1.86L	-0.01H	0.08L	3.81L	-0.01H	0.00N
53.2	1.48L	0.00H	0.06L	3.32L	-0.01H	0.00N
47.2	1.15L	0.00H	0.04L	2.92L	-0.01H	0.00N

41.3	0.87L	0.00H	0.03L	2.51L	-0.01H	0.00N
35.4	0.63L	0.00H	0.02L	2.12L	-0.01H	0.00N
29.5	0.44L	0.00H	0.01L	1.74L	-0.01H	0.00N
23.6	0.28L	0.00H	0.01L	1.37L	0.00H	0.00N
17.7	0.15L	0.00H	0.00L	1.01L	0.00H	0.00N
11.8	0.07L	0.00H	0.00L	0.66L	0.00H	0.00N
5.9	0.02L	0.00H	0.00AD	0.32L	0.00H	0.00N
0.0	0.00A	0.00A	0.00A	0.00A	0.00A	0.00A

MAXIMUM POLE FORCES CALCULATED(w.r.t. to wind direction)

MAST ELEV ft	TOTAL AXIAL kip	SHEAR.w.r.t.WIND.DIR ALONG kip	ACROSS kip	MOMENT.w.r.t.WIND.DIR ALONG ft-kip	ACROSS ft-kip	TORSION ft-kip
149.0	-0.01 K	0.01 N	0.00 B	0.02 W	-0.01 R	0.00 B
	0.71 AA	0.39 N	0.00 B	-1.51 K	0.01 B	0.00 R
142.1	0.71 AD	0.41 L	-0.01 W	-1.51 A	-0.04 O	0.01 O
	20.38 AD	10.05 L	-0.01 W	-47.61 L	0.07 W	-0.02 F
135.2	20.38 AD	10.06 E	0.03 E	-47.61 E	0.07 W	-0.02 W
	39.83 AD	19.57 E	0.03 E	-138.25 E	-0.18 E	-0.04 F
128.3	39.83 AD	19.57 L	-0.04 R	-138.28 E	-0.20 U	-0.04 F
	40.68 AD	20.01 L	-0.04 R	-298.11 E	0.39 R	-0.09 F
121.4	40.68 AD	20.02 L	-0.03 R	-298.07 B	0.36 R	-0.09 F
	56.49 AD	26.77 L	-0.03 R	-494.23 L	0.58 R	-0.15 F
114.5	56.49 AD	26.77 A	-0.04 R	-494.27 L	0.59 R	-0.15 F
	70.86 AD	32.09 A	-0.04 R	-718.89 A	0.82 R	-0.21 F
107.6	70.86 AD	32.09 W	0.04 H	-718.82 A	0.83 R	0.21 Q
	71.85 AD	32.60 W	0.04 H	-977.66 A	0.94 R	-0.26 C
100.7	71.85 Y	32.62 O	-0.05 O	-977.72 A	0.92 R	-0.27 C
	73.17 Y	32.95 O	-0.05 O	-1147.24 L	0.93 R	-0.29 F
96.2	73.17 AD	33.07 L	-0.14 H	-1147.25 A	0.90 R	-0.29 F
	74.47 AD	33.55 L	-0.14 H	-1381.68 L	1.08 I	0.35 N
90.1	74.47 AD	33.57 L	-0.18 H	-1381.57 L	1.07 I	0.35 N
	75.81 AD	34.06 L	-0.18 H	-1617.65 L	1.54 L	0.42 N
84.0	75.81 AD	34.05 L	-0.20 H	-1617.55 L	1.50 L	0.42 N
	77.18 AD	34.51 L	-0.20 H	-1854.93 L	2.67 H	0.51 N
77.8	77.18 AD	34.51 L	-0.24 H	-1854.87 L	2.63 H	0.52 N
	78.62 AD	35.01 L	-0.24 H	-2093.49 L	4.13 H	0.60 N
71.7	78.62 AD	35.03 L	-0.21 H	-2093.45 L	4.12 H	0.60 N
	80.08 AD	35.51 L	-0.21 H	-2333.29 L	5.44 H	0.72 N
65.5	80.08 AD	35.61 P	0.20 N	-2333.31 L	5.42 H	0.72 N

	81.62 AD	36.12 P	0.20 N	−2574.15 L	6.55 H	0.84 N
59.4	.....					
	81.62 AD	36.09 P	0.19 N	−2574.12 L	6.49 H	0.84 N
	83.20 AD	36.61 P	0.19 N	−2815.81 L	7.70 H	0.95 N
53.2	.....					
	83.20 AD	36.67 P	0.21 N	−2815.81 L	7.67 H	0.95 N
	86.19 AD	37.16 P	0.21 N	−3053.55 L	8.64 H	1.04 N
47.2	.....					
	86.18 AD	37.13 P	0.19 N	−3053.55 L	8.66 H	1.05 N
	88.03 AD	37.63 P	0.19 N	−3289.05 L	9.44 H	1.12 N
41.3	.....					
	88.03 AD	37.62 P	0.24 N	−3289.00 L	9.41 H	1.12 N
	89.88 AD	38.09 P	0.24 N	−3525.32 L	10.33 H	1.20 N
35.4	.....					
	89.88 AD	38.22 P	0.23 N	−3525.32 L	10.37 H	1.20 N
	91.81 AD	38.71 P	0.23 N	−3762.62 L	11.33 H	1.26 N
29.5	.....					
	91.81 AD	38.68 P	0.21 N	−3762.63 L	11.30 H	1.26 N
	93.77 AD	39.17 P	0.21 N	−4000.74 L	12.54 H	1.31 N
23.6	.....					
	93.77 AD	39.15 P	0.20 N	−4000.71 L	12.55 H	1.31 N
	95.79 AD	39.63 P	0.20 N	−4239.66 L	13.71 H	1.34 N
17.7	.....					
	95.79 AD	39.63 P	−0.21 H	−4239.63 L	13.71 H	1.34 N
	97.87 AD	40.15 P	−0.21 H	−4479.43 L	14.97 H	1.37 N
11.8	.....					
	97.87 AD	40.13 P	0.21 N	−4479.43 L	14.96 H	1.37 N
	99.95 AD	40.63 P	0.21 N	−4720.03 L	16.20 H	1.38 N
5.9	.....					
	99.95 AD	40.66 P	−0.21 H	−4720.03 L	16.20 H	1.38 N
	102.06 AD	41.17 P	−0.21 H	−4961.47 L	17.43 H	1.39 N
base reaction	102.06 AD	−41.17 P	0.21 H	4961.47 L	−17.43 H	−1.39 N

COMPLIANCE WITH 4.8.2 & 4.5.4

ELEV ft	AXIAL	BENDING	SHEAR + TORSIONAL	TOTAL	SATISFIED	D/t(w/t)	MAX ALLOWED
149.00	.....						
	0.00K	0.00W	0.00N	0.00K	YES	11.64A	45.2
	0.00AA	0.00K	0.00N	0.00L	YES	12.83A	45.2
142.11	.....						
	0.00AD	0.00A	0.00L	0.00C	YES	12.83A	45.2
	0.02AD	0.09L	0.02L	0.10L	YES	14.01A	45.2
135.21	.....						
	0.02AD	0.09E	0.02E	0.10E	YES	14.01A	45.2
	0.03AD	0.22E	0.03E	0.23E	YES	15.20A	45.2
128.32	.....						
	0.03AD	0.22E	0.03L	0.23E	YES	15.20A	45.2
	0.03AD	0.40E	0.03L	0.42E	YES	16.39A	45.2
121.43	.....						
	0.03AD	0.40B	0.03L	0.42B	YES	16.39A	45.2
	0.04AD	0.60L	0.04L	0.62L	YES	17.58A	45.2
114.54	.....						
	0.04AD	0.60L	0.04A	0.62L	YES	17.58A	45.2
	0.04AD	0.78A	0.04A	0.81A	YES	18.77A	45.2
107.64	.....						
	0.04AD	0.78A	0.04W	0.81A	YES	18.77A	45.2

	0.04AD	0.96A	0.04W	0.99A	YES	19.96A	45.2
100.75							
	0.03Y	0.61A	0.02O	0.63A	YES	13.19A	45.2
	0.03Y	0.67L	0.02O	0.69L	YES	13.70A	45.2
96.25							
	0.03AD	0.69A	0.02L	0.71A	YES	13.47A	45.2
	0.03AD	0.76L	0.02L	0.77L	YES	14.17A	45.2
90.11							
	0.03AD	0.76L	0.02L	0.77L	YES	14.17A	45.2
	0.03AD	0.81L	0.02L	0.82L	YES	14.88A	45.2
83.96							
	0.03AD	0.81L	0.02L	0.82L	YES	14.88A	45.2
	0.03AD	0.85L	0.02L	0.86L	YES	15.59A	45.2
77.82							
	0.03AD	0.85L	0.02L	0.86L	YES	15.59A	45.2
	0.02AD	0.88L	0.02L	0.90L	YES	16.29A	45.2
71.68							
	0.02AD	0.88L	0.02L	0.90L	YES	16.29A	45.2
	0.02AD	0.91L	0.02L	0.93L	YES	17.00A	45.2
65.54							
	0.02AD	0.91L	0.02P	0.93L	YES	17.00A	45.2
	0.02AD	0.94L	0.02P	0.96L	YES	17.70A	45.2
59.39							
	0.02AD	0.94L	0.02P	0.96L	YES	17.70A	45.2
	0.02AD	0.97L	0.02P	0.98L	YES	18.41A	45.2
53.25							
	0.02AD	0.80L	0.02P	0.82L	YES	15.73A	45.2
	0.02AD	0.81L	0.02P	0.83L	YES	16.32A	45.2
47.25							
	0.02AD	0.84L	0.02P	0.85L	YES	16.02A	45.2
	0.02AD	0.85L	0.02P	0.87L	YES	16.60A	45.2
41.34							
	0.02AD	0.85L	0.02P	0.87L	YES	16.60A	45.2
	0.02AD	0.86L	0.02P	0.88L	YES	17.18A	45.2
35.44							
	0.02AD	0.86L	0.02P	0.88L	YES	17.18A	45.2
	0.02AD	0.87L	0.02P	0.88L	YES	17.76A	45.2
29.53							
	0.02AD	0.87L	0.02P	0.88L	YES	17.76A	45.2
	0.02AD	0.88L	0.02P	0.89L	YES	18.35A	45.2
23.62							
	0.02AD	0.88L	0.02P	0.89L	YES	18.35A	45.2
	0.02AD	0.88L	0.02P	0.90L	YES	18.93A	45.2
17.72							
	0.02AD	0.88L	0.02P	0.90L	YES	18.93A	45.2
	0.02AD	0.89L	0.02P	0.90L	YES	19.51A	45.2
11.81							
	0.02AD	0.89L	0.02P	0.90L	YES	19.51A	45.2
	0.02AD	0.89L	0.02P	0.90L	YES	20.09A	45.2
5.91							
	0.02AD	0.89L	0.02P	0.90L	YES	20.09A	45.2
	0.02AD	0.89L	0.02P	0.91L	YES	20.67A	45.2
0.00							

MAXIMUM LOADS ONTO FOUNDATION(w.r.t. wind direction)

DOWN	SHEAR.w.r.t.WIND.DIR		MOMENT.w.r.t.WIND.DIR		TORSION
	ALONG	ACROSS	ALONG	ACROSS	
kip	kip	kip	ft-kip	ft-kip	ft-kip
102.06	41.17	-0.21	-4961.47	17.43	1.39
AD	P	H	L	H	N

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 150' Monopole / Meriden Fire Dept, CT


*********************************************************************************
************************  Service Load Condition  ************************
*********************************************************************************

* Only 1 condition(s) shown in full
* Some concentrated wind loads may have been derived from full-scale wind tunnel testing

 LOADING CONDITION  A    ======================================================

60 mph wind with no ice. Wind Azimuth: 0• (1.0 D + 1.0 Wo)


 LOADS ON POLE
 =============

 LOAD       ELEV  APPLY..LOAD..AT    LOAD  ......FORCES......  ......MOMENTS.....
 TYPE             RADIUS     AZI     AZI     HORIZ      DOWN  VERTICAL   TORSNAL
                    ft         ft                       kip       kip    ft-kip    ft-kip

 C       144.500      0.00     0.0     0.0    0.0062    0.0126    0.0000    0.0000
 C       139.000      0.00     0.0     0.0    0.0000    2.8912    0.0000    0.0000
 C       139.000      0.00     0.0     0.0    1.7667    7.1530    0.0000    0.0000
 C       135.000      0.00     0.0     0.0    0.0067    0.0140    0.0000    0.0000
 C       129.000      0.00     0.0     0.0    0.0000    2.6832    0.0000    0.0000
 C       129.000      0.00     0.0     0.0    1.7297    7.1530    0.0000    0.0000
 C       125.000      0.00     0.0     0.0    0.0066    0.0140    0.0000    0.0000
 C       119.000      0.00     0.0     0.0    0.0000    1.4851    0.0000    0.0000
 C       119.000      0.00     0.0     0.0    1.1972    6.1530    0.0000    0.0000
 C       115.000      0.00     0.0     0.0    0.0064    0.0140    0.0000    0.0000
 C       109.000      0.00     0.0     0.0    0.0000    1.3603    0.0000    0.0000
 C       109.000      0.00     0.0     0.0    0.9271    5.6530    0.0000    0.0000
 C       105.000      0.00     0.0     0.0    0.0062    0.0140    0.0000    0.0000
 C        95.000      0.00     0.0     0.0    0.0061    0.0140    0.0000    0.0000
 C        85.000      0.00     0.0     0.0    0.0059    0.0140    0.0000    0.0000
 C        75.000      0.00     0.0     0.0    0.0057    0.0140    0.0000    0.0000
 C        65.000      0.00     0.0     0.0    0.0054    0.0140    0.0000    0.0000
 C        55.000      0.00     0.0     0.0    0.0052    0.0140    0.0000    0.0000
 C        45.000      0.00     0.0     0.0    0.0049    0.0140    0.0000    0.0000
 C        35.000      0.00     0.0     0.0    0.0046    0.0140    0.0000    0.0000
 C        25.000      0.00     0.0     0.0    0.0044    0.0140    0.0000    0.0000
 C        15.000      0.00     0.0     0.0    0.0044    0.0140    0.0000    0.0000

 D       149.000      0.00   180.0     0.0    0.0096    0.0510    0.0000    0.0000
 D       100.750      0.00   180.0     0.0    0.0134    0.0781    0.0000    0.0000
 D       100.750      0.00   180.0     0.0    0.0137    0.2024    0.0000    0.0000
 D        96.250      0.00   180.0     0.0    0.0137    0.2024    0.0000    0.0000
 D        96.250      0.00   180.0     0.0    0.0140    0.1258    0.0000    0.0000
 D        53.250      0.00   180.0     0.0    0.0156    0.1619    0.0000    0.0000
 D        53.250      0.00   180.0     0.0    0.0155    0.3605    0.0000    0.0000
 D        47.250      0.00   180.0     0.0    0.0155    0.3605    0.0000    0.0000
 D        47.250      0.00   180.0     0.0    0.0152    0.1994    0.0000    0.0000
 D        23.625      0.00   180.0     0.0    0.0149    0.2197    0.0000    0.0000
 D        23.625      0.00   180.0     0.0    0.0154    0.2264    0.0000    0.0000
 D         0.000      0.00   180.0     0.0    0.0168    0.2467    0.0000    0.0000

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 MAXIMUM POLE DEFORMATIONS CALCULATED(w.r.t. wind direction)
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MAST ELEV ft	DEFLECTIONS (ft) HORIZONTAL ALONG	HORIZONTAL ACROSS	DOWN	ROTATIONS (deg) TILT ALONG	TILT ACROSS	TWIST
149.0	2.49F	0.00L	0.06A	1.77F	0.00L	0.00I
142.1	2.28F	0.00L	0.06A	1.77F	0.00L	0.00I
135.2	2.07F	0.00L	0.05A	1.76F	0.00L	0.00I
128.3	1.86F	0.00L	0.04A	1.73F	0.00L	0.00I
121.4	1.65F	0.00L	0.04A	1.68F	0.00L	0.00I
114.5	1.45F	0.00L	0.03A	1.59F	0.00L	0.00I
107.6	1.27F	0.00L	0.02A	1.48F	0.00L	0.00I
100.7	1.10F	0.00L	0.02A	1.35C	0.00L	0.00I
96.2	1.00F	0.00L	0.02A	1.29C	0.00L	0.00I
90.1	0.86F	0.00L	0.01A	1.20C	0.00L	0.00I
84.0	0.74F	0.00L	0.01A	1.10C	0.00L	0.00L
77.8	0.63F	0.00L	0.01A	1.00F	0.00L	0.00L
71.7	0.52F	0.00L	0.01A	0.91F	0.00L	0.00L
65.5	0.43F	0.00L	0.01A	0.81F	0.00L	0.00L
59.4	0.35F	0.00L	0.00A	0.72F	0.00L	0.00L
53.2	0.28F	0.00L	0.00A	0.63F	0.00L	0.00L
47.2	0.22F	0.00L	0.00A	0.55F	0.00L	0.00L
41.3	0.16F	0.00L	0.00A	0.47F	0.00L	0.00L
35.4	0.12F	0.00L	0.00A	0.40F	0.00L	0.00L
29.5	0.08F	0.00L	0.00A	0.33F	0.00L	0.00L
23.6	0.05F	0.00L	0.00A	0.26F	0.00L	0.00L
17.7	0.03F	0.00L	0.00A	0.19F	0.00L	0.00L
11.8	0.01F	0.00L	0.00A	0.12F	0.00L	0.00L
5.9	0.00F	0.00L	0.00A	0.06F	0.00L	0.00L
0.0	0.00A	0.00A	0.00A	0.00A	0.00A	0.00A

MAXIMUM POLE FORCES CALCULATED(w.r.t. to wind direction)

MAST ELEV ft	TOTAL AXIAL kip	SHEAR.w.r.t.WIND.DIR ALONG kip	SHEAR.w.r.t.WIND.DIR ACROSS kip	MOMENT.w.r.t.WIND.DIR ALONG ft-kip	MOMENT.w.r.t.WIND.DIR ACROSS ft-kip	TORSION ft-kip
149.0	0.00 B	0.00 I	0.00 C	-0.01 I	0.00 E	0.00 E
	0.38 A	0.08 A	0.00 C	-0.29 B	0.00 F	0.00 C
142.1	0.38 A	0.08 A	0.00 L	-0.29 B	0.00 C	0.00 E
	10.81 A	1.92 A	0.00 L	-9.04 A	-0.01 L	0.00 L
135.2	10.82 A	1.92 D	0.00 I	-9.04 A	-0.01 L	0.00 I
	21.08 A	3.73 D	0.00 I	-26.22 D	-0.03 L	0.00 I
128.3	21.08 K	3.73 F	0.00 E	-26.22 A	-0.03 L	0.00 I
	21.54 K	3.81 F	0.00 E	-56.53 A	0.04 F	0.00 I
121.4						

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        21.54 K      3.82 C     -0.01 E    -56.53 A      0.04 F      0.00 I

        29.67 K      5.10 C     -0.01 E    -93.67 A      0.08 E      0.01 I
114.5   ..........................................................................
        29.67 K      5.10 F     -0.01 E    -93.67 A      0.08 E      0.01 I

        37.18 K      6.12 F     -0.01 E   -136.12 A      0.14 E      0.01 I
107.6   ..........................................................................
        37.18 K      6.12 F     -0.01 C   -136.12 A      0.14 E      0.01 I

        37.72 K      6.22 F     -0.01 C   -184.95 A      0.17 E      0.01 I
100.7   ..........................................................................
        37.72 A      6.22 D      0.01 B   -184.94 A      0.19 E      0.01 I

        38.63 A      6.29 D      0.01 B   -216.99 A      0.20 E      0.01 I
 96.2   ..........................................................................
        38.63 A      6.28 C      0.02 L   -217.03 A      0.21 E      0.01 I

        39.43 A      6.38 C      0.02 L   -261.04 A      0.20 E      0.01 I
 90.1   ..........................................................................
        39.43 E      6.37 B      0.02 L   -261.01 A      0.20 E      0.02 I

        40.27 E      6.47 B      0.02 L   -305.28 A     -0.32 L      0.02 I
 84.0   ..........................................................................
        40.27 E      6.47 B     -0.03 E   -305.28 A     -0.31 L      0.02 I

        41.12 E      6.56 B     -0.03 E   -349.82 C     -0.47 L      0.02 I
 77.8   ..........................................................................
        41.12 E      6.56 F      0.03 L   -349.83 C     -0.46 L      0.02 I

        42.01 E      6.65 F      0.03 L   -394.64 C     -0.63 L      0.02 I
 71.7   ..........................................................................
        42.01 E      6.66 F      0.03 L   -394.63 C     -0.64 L      0.02 I

        42.93 E      6.75 F      0.03 L   -439.62 C     -0.80 L      0.02 I
 65.5   ..........................................................................
        42.93 E      6.76 F      0.02 L   -439.62 C     -0.80 L      0.02 I

        43.89 E      6.86 F      0.02 L   -484.96 F     -0.95 L      0.02 I
 59.4   ..........................................................................
        43.89 E      6.85 B      0.03 L   -484.95 F     -0.93 L      0.02 I

        44.88 E      6.95 B      0.03 L   -530.51 F     -1.12 L      0.02 L
 53.2   ..........................................................................
        44.88 E      6.95 C      0.02 L   -530.51 F     -1.12 L      0.02 L

        47.05 E      7.04 C      0.02 L   -575.29 C     -1.27 L      0.03 L
 47.2   ..........................................................................
        47.05 E      7.04 E      0.03 L   -575.29 C     -1.27 L      0.03 L

        48.25 E      7.13 E      0.03 L   -619.65 C     -1.43 L      0.03 L
 41.3   ..........................................................................
        48.25 E      7.13 C      0.03 L   -619.64 C     -1.43 L      0.03 L

        49.47 E      7.22 C      0.03 L   -664.20 C     -1.59 L      0.03 L
 35.4   ..........................................................................
        49.47 E      7.22 C      0.03 L   -664.21 C     -1.59 L      0.03 L

        50.74 E      7.31 C      0.03 L   -708.99 C     -1.76 L      0.03 L
 29.5   ..........................................................................
        50.74 E      7.32 F      0.03 L   -708.99 C     -1.76 L      0.03 L

        52.04 E      7.41 F      0.03 L   -754.00 F     -1.93 L      0.03 L
 23.6   ..........................................................................
        52.04 E      7.41 F      0.03 L   -754.00 F     -1.93 L      0.03 L

        53.39 E      7.50 F      0.03 L   -799.23 F     -2.09 L      0.03 L
 17.7   ..........................................................................
        53.39 E      7.50 F     -0.03 E   -799.24 F     -2.09 L      0.03 L

        54.79 E      7.60 F     -0.03 E   -844.72 F     -2.26 L      0.03 L
 11.8   ..........................................................................
        54.79 E      7.60 F      0.03 B   -844.72 F     -2.26 L      0.03 L

        56.20 E      7.70 F      0.03 B   -890.43 F     -2.44 L      0.03 L
  5.9   ..........................................................................
        56.20 E      7.70 F      0.03 B   -890.43 F     -2.43 L      0.03 L

        57.64 E      7.80 F      0.03 B   -936.37 F     -2.60 L      0.03 L
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base
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reaction 57.64 E -7.80 F -0.03 B 936.37 F 2.60 L -0.03 L

COMPLIANCE WITH 4.8.2 & 4.5.4

ELEV ft	AXIAL	BENDING	SHEAR + TORSIONAL	TOTAL	SATISFIED	D/t(w/t)	MAX ALLOWED
149.00	0.00B	0.00I	0.00I	0.00I	YES	11.64A	45.2
	0.00A	0.00B	0.00A	0.00A	YES	12.83A	45.2
142.11	0.00A	0.00B	0.00A	0.00B	YES	12.83A	45.2
	0.01A	0.02A	0.00A	0.02A	YES	14.01A	45.2
135.21	0.01A	0.02A	0.00D	0.02A	YES	14.01A	45.2
	0.02A	0.04D	0.01D	0.06D	YES	15.20A	45.2
128.32	0.02K	0.04A	0.01F	0.06A	YES	15.20A	45.2
	0.01K	0.08A	0.01F	0.09A	YES	16.39A	45.2
121.43	0.01K	0.08A	0.01C	0.09A	YES	16.39A	45.2
	0.02K	0.11A	0.01C	0.13A	YES	17.58A	45.2
114.54	0.02K	0.11A	0.01F	0.13A	YES	17.58A	45.2
	0.02K	0.15A	0.01F	0.17A	YES	18.77A	45.2
107.64	0.02K	0.15A	0.01F	0.17A	YES	18.77A	45.2
	0.02K	0.18A	0.01F	0.20A	YES	19.96A	45.2
100.75	0.01A	0.12A	0.00D	0.13A	YES	13.19A	45.2
	0.01A	0.13A	0.00D	0.14A	YES	13.70A	45.2
96.25	0.01A	0.13A	0.00C	0.15A	YES	13.47A	45.2
	0.01A	0.14A	0.00C	0.16A	YES	14.17A	45.2
90.11	0.01E	0.14A	0.00B	0.16A	YES	14.17A	45.2
	0.01E	0.15A	0.00B	0.17A	YES	14.88A	45.2
83.96	0.01E	0.15A	0.00B	0.17A	YES	14.88A	45.2
	0.01E	0.16C	0.00B	0.17C	YES	15.59A	45.2
77.82	0.01E	0.16C	0.00F	0.17C	YES	15.59A	45.2
	0.01E	0.17C	0.00F	0.18C	YES	16.29A	45.2
71.68	0.01E	0.17C	0.00F	0.18C	YES	16.29A	45.2
	0.01E	0.17C	0.00F	0.19C	YES	17.00A	45.2
65.54	0.01E	0.17C	0.00F	0.19C	YES	17.00A	45.2
	0.01E	0.18F	0.00F	0.19F	YES	17.70A	45.2
59.39	0.01E	0.18F	0.00B	0.19F	YES	17.70A	45.2
	0.01E	0.18F	0.00B	0.19F	YES	18.41A	45.2
53.25	0.01E	0.15F	0.00C	0.16F	YES	15.73A	45.2
	0.01E	0.15C	0.00C	0.16C	YES	16.32A	45.2
47.25	0.01E	0.16C	0.00E	0.17F	YES	16.02A	45.2
	0.01E	0.16C	0.00E	0.17C	YES	16.60A	45.2
41.34	0.01E	0.16C	0.00C	0.17C	YES	16.60A	45.2

	0.01E	0.16C	0.00C	0.17C	YES	17.18A	45.2
35.44	.....						
	0.01E	0.16C	0.00C	0.17C	YES	17.18A	45.2
	0.01E	0.16C	0.00C	0.17C	YES	17.76A	45.2
29.53	.....						
	0.01E	0.16C	0.00F	0.17C	YES	17.76A	45.2
	0.01E	0.17F	0.00F	0.18F	YES	18.35A	45.2
23.62	.....						
	0.01E	0.17F	0.00F	0.18F	YES	18.35A	45.2
	0.01E	0.17F	0.00F	0.18F	YES	18.93A	45.2
17.72	.....						
	0.01E	0.17F	0.00F	0.18F	YES	18.93A	45.2
	0.01E	0.17F	0.00F	0.18F	YES	19.51A	45.2
11.81	.....						
	0.01E	0.17F	0.00F	0.18F	YES	19.51A	45.2
	0.01E	0.17F	0.00F	0.18F	YES	20.09A	45.2
5.91	.....						
	0.01E	0.17F	0.00F	0.18F	YES	20.09A	45.2
	0.01E	0.17F	0.00F	0.18F	YES	20.67A	45.2
0.00	.....						

MAXIMUM LOADS ONTO FOUNDATION(w.r.t. wind direction)

DOWN	SHEAR.w.r.t.WIND.DIR		MOMENT.w.r.t.WIND.DIR		TORSION
	ALONG	ACROSS	ALONG	ACROSS	
kip	kip	kip	ft-kip	ft-kip	ft-kip
57.64	7.80	0.03	-936.37	-2.60	0.03
E	F	B	F	L	L

Seismic Load Effects
Equivalent Lateral Force Procedure
ANSI/TIA-222-H

Parameters	
Risk Category	III
R	1.500
S_S	0.206
S_1	0.055
Site Class	D (default)
T_L (sec)	6.000
F_a	1.600
F_v	2.400
S_{MS}	0.330
S_{M1}	0.132
S_{DS}	0.220
S_{D1}	0.088
T_s	0.400
I_e	1.250
Ω	1.500
C_S	0.030
E (ksi)	29,000
I_{top} (in^4)	586
I_{bot} (in^4)	26,155
I_{avg} (in^4)	13,371
g (in/s^2)	386.4
W_t (kips)	57.580
W_u (kips)	26.112
W_L (kips)	31.468
L_p (in)	1788
f_1 (Hertz)	0.244
T (sec)	4.103
k_e	2.0000
V_s (kips)	1.727
Seismic Design Category	B

Vertical Distribution of Seismic Forces

Description	h_i (ft.)	w_i (kips)	W_u (kips)	$w_i h_i^{ke}$	F_{sz} or E_h (kips)	E_V (kips)	1.2 D + 1.0 E_V (kips)	0.9 D - 1.0 E_V (kips)
Step Bolts/Safety Climb Load	144.50	0.0126	0.0000	263.0912	0.0007	0.0006	0.0157	0.0107
Line Deadload	139.00	2.8912	0.0000	55,860.8752	0.1477	0.1272	3.5966	2.4749
Mount/Antenna Load	139.00	7.1530	7.1530	138,203.1130	0.3653	0.3147	8.8983	6.1230
Step Bolts/Safety Climb Load	135.00	0.0140	0.0000	255.1500	0.0007	0.0006	0.0174	0.0120
Line Deadload	129.00	2.6832	0.0000	44,651.1312	0.1180	0.1181	3.3379	2.2968
Mount/Antenna Load	129.00	7.1530	7.1530	119,033.0730	0.3146	0.3147	8.8983	6.1230
Step Bolts/Safety Climb Load	125.00	0.0140	0.0000	218.7500	0.0006	0.0006	0.0174	0.0120
Structure - Section 1	122.62	3.4722	0.0000	52,206.8339	0.1380	0.1528	4.3194	2.9722
Line Deadload	119.00	1.4851	0.0000	21,030.5011	0.0556	0.0653	1.8474	1.2713
Mount/Antenna Load	119.00	6.1530	6.1530	87,132.6330	0.2303	0.2707	7.6543	5.2670
Step Bolts/Safety Climb Load	115.00	0.0140	0.0000	185.1500	0.0005	0.0006	0.0174	0.0120
Line Deadload	109.00	1.3603	0.0000	16,161.7243	0.0427	0.0599	1.6923	1.1644
Mount/Antenna Load	109.00	5.6530	5.6530	67,163.2930	0.1775	0.2487	7.0323	4.8390
Step Bolts/Safety Climb Load	105.00	0.0140	0.0000	154.3500	0.0004	0.0006	0.0174	0.0120
Step Bolts/Safety Climb Load	95.00	0.0140	0.0000	126.3500	0.0003	0.0006	0.0174	0.0120
Step Bolts/Safety Climb Load	85.00	0.0140	0.0000	101.1500	0.0003	0.0006	0.0174	0.0120
Step Bolts/Safety Climb Load	75.00	0.0140	0.0000	78.7500	0.0002	0.0006	0.0174	0.0120
Structure - Section 2	74.00	7.7177	0.0000	42,262.1252	0.1117	0.3396	9.6008	6.6063
Step Bolts/Safety Climb Load	65.00	0.0140	0.0000	59.1500	0.0002	0.0006	0.0174	0.0120
Step Bolts/Safety Climb Load	55.00	0.0140	0.0000	42.3500	0.0001	0.0006	0.0174	0.0120
Step Bolts/Safety Climb Load	45.00	0.0140	0.0000	28.3500	0.0001	0.0006	0.0174	0.0120
Step Bolts/Safety Climb Load	35.00	0.0140	0.0000	17.1500	0.0000	0.0006	0.0174	0.0120
Structure - Section 3	26.62	11.6635	0.0000	8,265.0407	0.0218	0.5132	14.5094	9.9840
Step Bolts/Safety Climb Load	25.00	0.0140	0.0000	8.7500	0.0000	0.0006	0.0174	0.0120
Step Bolts/Safety Climb Load	15.00	0.0140	0.0000	3.1500	0.0000	0.0006	0.0174	0.0120
	Σ	57.58	26.1120	653,511.98	1.73	2.53	71.63	49.29

Sabre Industries™
INNOVATION DELIVERED

SO#: 539014A
Site Name: Meriden Fire Dept, CT
Date: 4/22/2024

Round Base Plate and Anchor Rods, per ANSI/TIA 222-H

Pole Data

Diameter:	53.420	in (flat to flat)
Thickness:	0.4375	in
Yield (Fy):	65	ksi
# of Sides:	18	"0" IF Round
Strength (Fu):	80	ksi

Reactions

Moment, Mu:	4961.47	ft-kips
Axial, Pu:	69.12	kips
Shear, Vu:	40.95	kips

Anchor Rod Data

Quantity:	18		
Diameter:	2.25	in	
Rod Material:	A615		
Strength (Fu):	100	ksi	
Yield (Fy):	75	ksi	
BC Diam. (in):	60.25	BC Override:	

Plate Data

Diameter (in):	66	Dia. Override:	
Thickness:	2.25	in	
Yield (Fy):	50	ksi	
Eff Width/Rod:	9.42	in	
Drain Hole:	2.625	in. diameter	
Drain Location:	24.5	in. center of pole to center of drain hole	
Center Hole:	41	in. diameter	

Anchor Rod Results

(per 4.9.9)

Maximum Put:	216.71	Kips
Φt*Rnt:	243.75	Kips
Vu:	2.28	Kips
Φv*Rnv:	149.10	Kips
Tension Interaction Ratio:	0.79	
Maximum Puc:	223.43	Kips
Φc*Rnc:	268.39	Kips
Vu:	2.28	Kips
Φc*Rnvc:	120.77	Kips
Compression Interaction Ratio:	0.83	
Maximum Interaction Ratio:	**83.3%**	**Pass**

Base Plate Results

Base Plate (Mu/Z):	40.7	ksi	
Allowable Φ*Fy:	45.0	ksi	(per AISC)
Base Plate Interaction Ratio:	**90.4%**	**Pass**	

```
================================================================================

                    LPile for Windows, Version 2019-11.009

                Analysis of Individual Piles and Drilled Shafts
               Subjected to Lateral Loading Using the p-y Method
                          © 1985-2019 by Ensoft, Inc.
                              All Rights Reserved

================================================================================

This copy of LPile is being used by:

Sabre
Sioux City, IA

Serial Number of Security Device: 160777296

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Use of this program by any entity other than Sabre Communications Corporation
is a violation of the software license agreement.

--------------------------------------------------------------------------------
                            Files Used for Analysis
--------------------------------------------------------------------------------

Path to file locations:
\Program Files (x86)\Ensoft\Lpile2019\files\

Name of input data file:
539014A.lp11d

Name of output report file:
539014A.lp11o

Name of plot output file:
539014A.lp11p

Name of runtime message file:
539014A.lp11r


--------------------------------------------------------------------------------
                          Date and Time of Analysis
--------------------------------------------------------------------------------

               Date:  April 22, 2024              Time:  13:34:38


--------------------------------------------------------------------------------
                                  Problem Title
--------------------------------------------------------------------------------

Site         : Meriden Fire Dept, CT


Tower        : 150' Monopole


Prepared for : TOWERNORTH DEVELOPMENT, LLC


Job Number   : 539014 Revision A


Engineer     : REB



--------------------------------------------------------------------------------
                        Program Options and Settings
--------------------------------------------------------------------------------

Computational Options:
```

```
 - Conventional Analysis
Engineering Units Used for Data Input and Computations:
 - US Customary System Units (pounds, feet, inches)

Analysis Control Options:
 - Maximum number of iterations allowed                =          999
 - Deflection tolerance for convergence                =   1.0000E-05 in
 - Maximum allowable deflection                        =     100.0000 in
 - Number of pile increments                           =          100

Loading Type and Number of Cycles of Loading:
 - Static loading specified

 - Use of p-y modification factors for p-y curves not selected
 - Analysis uses layering correction (Method of Georgiadis)
 - No distributed lateral loads are entered
 - Loading by lateral soil movements acting on pile not selected
 - Input of shear resistance at the pile tip not selected
 - Input of moment resistance at the pile tip not selected
 - Input of side resistance moment along pile not selected
 - Computation of pile-head foundation stiffness matrix not selected
 - Push-over analysis of pile not selected
 - Buckling analysis of pile not selected

Output Options:
 - Output files use decimal points to denote decimal symbols.
 - Report only summary tables of pile-head deflection, maximum bending moment,
   and maximum shear force in output report file.
 - No p-y curves to be computed and reported for user-specified depths
 - Print using wide report formats



---------------------------------------------------------------------------
                     Pile Structural Properties and Geometry
---------------------------------------------------------------------------

Number of pile sections defined                       =            1
Total length of pile                                  =       24.500 ft
Depth of ground surface below top of pile             =       0.5000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over
the length of the pile. A summary of values of pile diameter vs. depth follows.

             Depth Below           Pile
Point         Pile Head          Diameter
 No.             feet              inches
-----      -------------     -------------
  1             0.000           96.0000
  2            24.500           96.0000


Input Structural Properties for Pile Sections:
----------------------------------------------

Pile Section No. 1:

   Section 1 is a round drilled shaft, bored pile, or CIDH pile
   Length of section                                  =    24.500000 ft
   Shaft Diameter                                     =    96.000000 in
   Shear capacity of section                          =       0.0000 lbs



---------------------------------------------------------------------------
                       Ground Slope and Pile Batter Angles
---------------------------------------------------------------------------

Ground Slope Angle                                    =        0.000 degrees
                                                      =        0.000 radians

Pile Batter Angle                                     =        0.000 degrees
                                                      =        0.000 radians


---------------------------------------------------------------------------
                       Soil and Rock Layering Information
```

The soil profile is modelled using 5 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	0.500000 ft
Distance from top of pile to bottom of layer	=	2.500000 ft
Effective unit weight at top of layer	=	110.000000 pcf
Effective unit weight at bottom of layer	=	110.000000 pcf
Friction angle at top of layer	=	28.000000 deg.
Friction angle at bottom of layer	=	28.000000 deg.
Subgrade k at top of layer	=	25.000000 pci
Subgrade k at bottom of layer	=	25.000000 pci

Layer 2 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	2.500000 ft
Distance from top of pile to bottom of layer	=	5.500000 ft
Effective unit weight at top of layer	=	47.600000 pcf
Effective unit weight at bottom of layer	=	47.600000 pcf
Friction angle at top of layer	=	28.000000 deg.
Friction angle at bottom of layer	=	28.000000 deg.
Subgrade k at top of layer	=	20.000000 pci
Subgrade k at bottom of layer	=	20.000000 pci

Layer 3 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	5.500000 ft
Distance from top of pile to bottom of layer	=	10.500000 ft
Effective unit weight at top of layer	=	47.600000 pcf
Effective unit weight at bottom of layer	=	47.600000 pcf
Friction angle at top of layer	=	35.000000 deg.
Friction angle at bottom of layer	=	35.000000 deg.
Subgrade k at top of layer	=	60.000000 pci
Subgrade k at bottom of layer	=	60.000000 pci

Layer 4 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	10.500000 ft
Distance from top of pile to bottom of layer	=	15.500000 ft
Effective unit weight at top of layer	=	47.600000 pcf
Effective unit weight at bottom of layer	=	47.600000 pcf
Friction angle at top of layer	=	36.000000 deg.
Friction angle at bottom of layer	=	36.000000 deg.
Subgrade k at top of layer	=	125.000000 pci
Subgrade k at bottom of layer	=	125.000000 pci

Layer 5 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	15.500000 ft
Distance from top of pile to bottom of layer	=	25.500000 ft
Effective unit weight at top of layer	=	47.600000 pcf
Effective unit weight at bottom of layer	=	47.600000 pcf
Friction angle at top of layer	=	38.000000 deg.
Friction angle at bottom of layer	=	38.000000 deg.
Subgrade k at top of layer	=	125.000000 pci
Subgrade k at bottom of layer	=	125.000000 pci

(Depth of the lowest soil layer extends 1.000 ft below the pile tip)

Summary of Input Soil Properties

Layer Num.	Soil Type Name (p-y Curve Type)	Layer Depth ft	Effective Unit Wt. pcf	Angle of Friction deg.	kpy pci
1	Sand	0.5000	110.0000	28.0000	25.0000
	(Reese, et al.)	2.5000	110.0000	28.0000	25.0000
2	Sand	2.5000	47.6000	28.0000	20.0000
	(Reese, et al.)	5.5000	47.6000	28.0000	20.0000
3	Sand	5.5000	47.6000	35.0000	60.0000

	(Reese, et al.)	10.5000	47.6000	35.0000	60.0000
4	Sand	10.5000	47.6000	36.0000	125.0000
	(Reese, et al.)	15.5000	47.6000	36.0000	125.0000
5	Sand	15.5000	47.6000	38.0000	125.0000
	(Reese, et al.)	25.5000	47.6000	38.0000	125.0000

Static Loading Type

Static loading criteria were used when computing p-y curves for all analyses.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 2

Load Analysis No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length	Run
1	1	V = 54507. lbs	M = 79266240. in-lbs	92160.	No	Yes
2	1	V = 7800. lbs	M = 11242920. in-lbs	57640.	No	Yes

V = shear force applied normal to pile axis
M = bending moment applied to pile head
y = lateral deflection normal to pile axis
S = pile slope relative to original pile batter angle
R = rotational stiffness applied to pile head
Values of top y vs. pile lengths can be computed only for load types with
specified shear loading (Load Types 1, 2, and 3).
Thrust force is assumed to be acting axially for all pile batter angles.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:

Dimensions and Properties of Drilled Shaft (Bored Pile):

Length of Section	=	24.500000 ft
Shaft Diameter	=	96.000000 in
Concrete Cover Thickness (to edge of long. rebar)	=	3.625000 in
Number of Reinforcing Bars	=	44 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	7238. sq. in.
Total Area of Reinforcing Steel	=	55.737823 sq. in.
Area Ratio of Steel Reinforcement	=	0.77 percent
Edge-to-Edge Bar Spacing	=	4.970752 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	6.63
Offset of Center of Rebar Cage from Center of Pile	=	0.0000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity = 0.85 Fc Ac + Fy As	=	30817.300 kips
Tensile Load for Cracking of Concrete	=	-3348.733 kips
Nominal Axial Tensile Capacity	=	-3344.269 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar	Bar Diam.	Bar Area	X	Y

Number	inches	sq. in.	inches	inches
1	1.270000	1.266769	43.740000	0.00000
2	1.270000	1.266769	43.294790	6.224851
3	1.270000	1.266769	41.968223	12.322982
4	1.270000	1.266769	39.787303	18.170253
5	1.270000	1.266769	36.796430	23.647629
6	1.270000	1.266769	33.056486	28.643609
7	1.270000	1.266769	28.643609	33.056486
8	1.270000	1.266769	23.647629	36.796430
9	1.270000	1.266769	18.170253	39.787303
10	1.270000	1.266769	12.322982	41.968223
11	1.270000	1.266769	6.224851	43.294790
12	1.270000	1.266769	0.00000	43.740000
13	1.270000	1.266769	-6.224851	43.294790
14	1.270000	1.266769	-12.322982	41.968223
15	1.270000	1.266769	-18.170253	39.787303
16	1.270000	1.266769	-23.647629	36.796430
17	1.270000	1.266769	-28.643609	33.056486
18	1.270000	1.266769	-33.056486	28.643609
19	1.270000	1.266769	-36.796430	23.647629
20	1.270000	1.266769	-39.787303	18.170253
21	1.270000	1.266769	-41.968223	12.322982
22	1.270000	1.266769	-43.294790	6.224851
23	1.270000	1.266769	-43.740000	0.00000
24	1.270000	1.266769	-43.294790	-6.224851
25	1.270000	1.266769	-41.968223	-12.322982
26	1.270000	1.266769	-39.787303	-18.170253
27	1.270000	1.266769	-36.796430	-23.647629
28	1.270000	1.266769	-33.056486	-28.643609
29	1.270000	1.266769	-28.643609	-33.056486
30	1.270000	1.266769	-23.647629	-36.796430
31	1.270000	1.266769	-18.170253	-39.787303
32	1.270000	1.266769	-12.322982	-41.968223
33	1.270000	1.266769	-6.224851	-43.294790
34	1.270000	1.266769	0.00000	-43.740000
35	1.270000	1.266769	6.224851	-43.294790
36	1.270000	1.266769	12.322982	-41.968223
37	1.270000	1.266769	18.170253	-39.787303
38	1.270000	1.266769	23.647629	-36.796430
39	1.270000	1.266769	28.643609	-33.056486
40	1.270000	1.266769	33.056486	-28.643609
41	1.270000	1.266769	36.796430	-23.647629
42	1.270000	1.266769	39.787303	-18.170253
43	1.270000	1.266769	41.968223	-12.322982
44	1.270000	1.266769	43.294790	-6.224851

NOTE: The positions of the above rebars were computed by LPile

Minimum spacing between any two bars not equal to zero = 4.971 inches
between bars 15 and 16.

Ratio of bar spacing to maximum aggregate size = 6.63

Concrete Properties:

Compressive Strength of Concrete	=	4500. psi
Modulus of Elasticity of Concrete	=	3823676. psi
Modulus of Rupture of Concrete	=	-503.115295 psi
Compression Strain at Peak Stress	=	0.002001
Tensile Strain at Fracture of Concrete	=	-0.0001152
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 2

Number	Axial Thrust Force kips
1	57.640
2	92.160

Summary of Results for Nominal Moment Capacity for Section 1

Moment values interpolated at maximum compressive strain = 0.003

or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
1	57.640	137859.702	0.00300000
2	92.160	139079.681	0.00300000

Note that the values of moment capacity in the table above are not factored by a strength reduction factor (phi-factor).

In ACI 318, the value of the strength reduction factor depends on whether the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.75).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, or the value required by the design standard being followed.

The following table presents factored moment capacities and corresponding bending stiffnesses computed for common resistance factor values used for reinforced concrete sections.

Axial Load No.	Resist. Factor	Nominal Ax. Thrust kips	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in^2
1	0.65	57.640000	137860.	37.466000	89609.	3.2624E+09
2	0.65	92.160000	139080.	59.904000	90402.	3.2951E+09
1	0.75	57.640000	137860.	43.230000	103395.	3.1451E+09
2	0.75	92.160000	139080.	69.120000	104310.	3.1782E+09
1	0.90	57.640000	137860.	51.876000	124074.	2.0513E+09
2	0.90	92.160000	139080.	82.944000	125172.	2.0769E+09

Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	0.5000	0.00	N.A.	No	0.00	12806.
2	2.5000	2.0000	Yes	No	12806.	54442.
3	5.5000	4.4862	Yes	No	67248.	233489.
4	10.5000	9.6024	Yes	No	300737.	410298.
5	15.5000	13.9752	Yes	No	711035.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

Summary of Pile-head Responses for Conventional Analyses

Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians
Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type 1	Pile-head Load 1	Load Type 2	Pile-head Load 2	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max Shear in Pile lbs	Max Moment in Pile in-lbs
1	V, lb	54507.	M, in-lb	7.93E+07	92160.	8.9707	-0.04504	-688289.	8.17E+07
2	V, lb	7800.	M, in-lb	1.12E+07	57640.	0.1890	-9.47E-04	-89509.	1.16E+07

```
Maximum pile-head deflection = 8.9706750008 inches
Maximum pile-head rotation   = -0.0450362089 radians = -2.580385 deg.

The analysis ended normally.
```

IBC 1807.3.2.1

Moment (ft·k)	4,954.14	
Shear (k)	40.88	
Caisson diameter (ft)	8	
Caisson height above ground (ft)	0.5	
Caisson height below ground (ft)	24	
Lateral soil pressure (lb/ft^2)	**450.00**	
Ground to application of force, h (ft)	121.69	
Applied lateral force, P (lb)	40,880	
Lateral soil bearing pressure, S_1 (lb/ft)	3,600.00	
Diameter, b (ft)	8	
A	3.32	$= (2.34P)/(S_1 b)$
Minimum depth of embedment, d (ft)	22.72	$= 0.5A[\,1 + (\,1 + (\,4.36h / A\,)\,)^{1/2}\,]$

Date: **April 25, 2024**

Mary Caulfield
TowerNorth Development
750 W Center Street, Suite 301
W Bridgewater, MA 02379

MTS Engineering, P.L.L.C.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Site Number:	CT1445
	Site Name:	Meriden CT
	FA Number:	15406711
TowerNorth Designation:	**Site Number:**	CT0005-A
	Site Name:	Meriden Fire Dept
Engineering Firm Designation:	**Project Number:**	170327.001.01.0001
Site Data:	**13 Pomeroy Avenue, Meriden, New Haven County, CT** **Latitude 41° 31' 31.96", Longitude -72° 46' 3.86"** **149 Foot - Proposed Monopole Tower**	

Dear Mary Caulfield,

We are pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

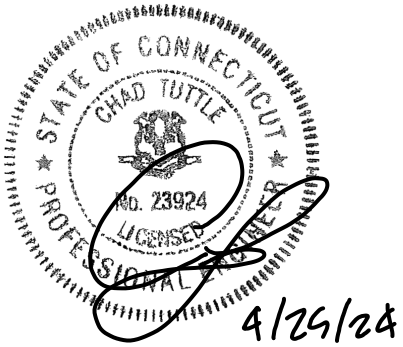
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

Proposed Equipment Configuration **Sufficient Capacity**

The jurisdiction has adopted the 2021 International Building Code. This analysis has been performed in accordance with the TIA-222-H Standard.

Structural analysis prepared by : Kishore Machani

Respectfully submitted by: MTS Engineering, P.L.L.C.
COA: BER: 2386985 Date: 09/22/2024



Chad E. Tuttle, P.E.

tnxTower Report - version 8.2.4.3

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 149 ft. proposed monopole designed by Sabre.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	119 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
140.0	141.0	3	Ericsson	2012 B29 RRU	6 2	0.92 1/2
		3	Ericsson	4415 B30 RRU		
		3	Ericsson	4478 B14 RRU		
		3	Ericsson	4490 B5/B12 RRU		
		3	Ericsson	4890 B25/B66 RRU		
		3	CCI Antennas	OPA65R-BU8DA-K		
		3	Ericsson	AIR 6419 B77D		
		3	Ericsson	AIR 6419 B77G		
		3	Quintel Tech.	QD8616-7		
		2	Raycap	DC9-48-60-24-8C-EV		
	140.0	3	Valmont	VFA12-WLL-30120 Sector Frames		

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Tower Data	Manufacturer Drawing by Sabre, Job No. 539014	Date: 04/22/2024	TowerNorth
Foundation Data	Foundation Drawing by Sabre, Job No. 539014	Date: 04/22/2024	TowerNorth
Soil Properties	Geotech Report by Advanced Eng. Group	Date: 04/11/2024	TowerNorth
Proposed Loading	Tower Loading Form	Date: 03/27/2024	TowerNorth
	CD by TEP	Date: 05/11/2023	

3.1) Analysis Method

tnxTower (version 8.2.4.3), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) The tower and structures were maintained in accordance with the - TIA-222 standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. We should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	149 - 96.25	Pole	TP31.14x18.25x0.25	1	-9.150	1452.003	34.1	Pass
L2	96.25 - 47.25	Pole	TP42.62x29.54x0.375	2	-18.421	2981.338	30.9	Pass
L3	47.25 - 0	Pole	TP53.42x40.403x0.438	3	-34.621	4519.211	31.4	Pass
							Summary	
						Pole (L1)	34.1	Pass
						Rating =	34.1	Pass

Table 4 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	Base	30.2	Pass
1,2	Base Plate	Base	31.3	Pass
1,2	Base Foundation (Structure)	Base	18.1	Pass
1,2	Base Foundation (Soil Interaction)	Base	45.5	Pass

Structure Rating (max from all components) =	**45.5%**

Notes:
1) See additional documentation in “Appendix C - Additional Calculations” for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H Section 15.5.

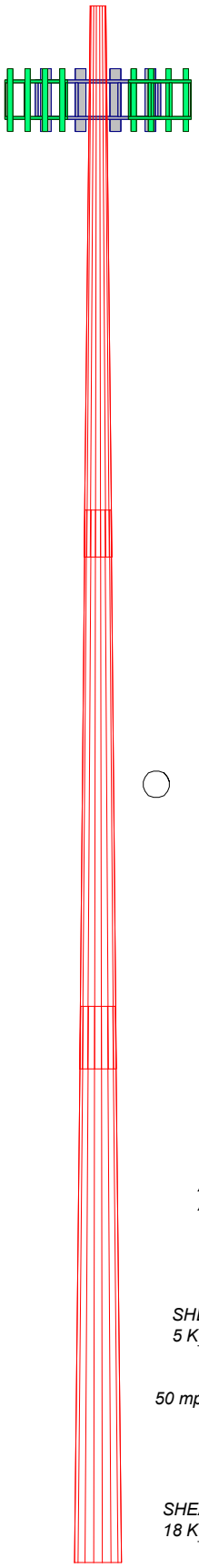
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3
Length (ft)	52.750	53.500	53.250
Number of Sides	18	18	18
Thickness (in)	0.250	0.375	0.438
Socket Length (ft)	4.500	6.000	
Top Dia (in)	18.250	29.540	40.403
Bot Dia (in)	31.140	42.620	53.420
Grade		A572-65	
Weight (K)	3.5	7.7	11.7



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 119 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 34.1%

ALL REACTIONS ARE FACTORED

AXIAL 45 K
SHEAR 5 K
MOMENT 519 kip-ft
TORQUE 1 kip-ft
50 mph WIND - 1.000 in ICE

AXIAL 35 K
SHEAR 18 K
MOMENT 1790 kip-ft
TORQUE 4 kip-ft
REACTIONS - 119 mph WIND

MTS Engineering, P.L.L.C.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

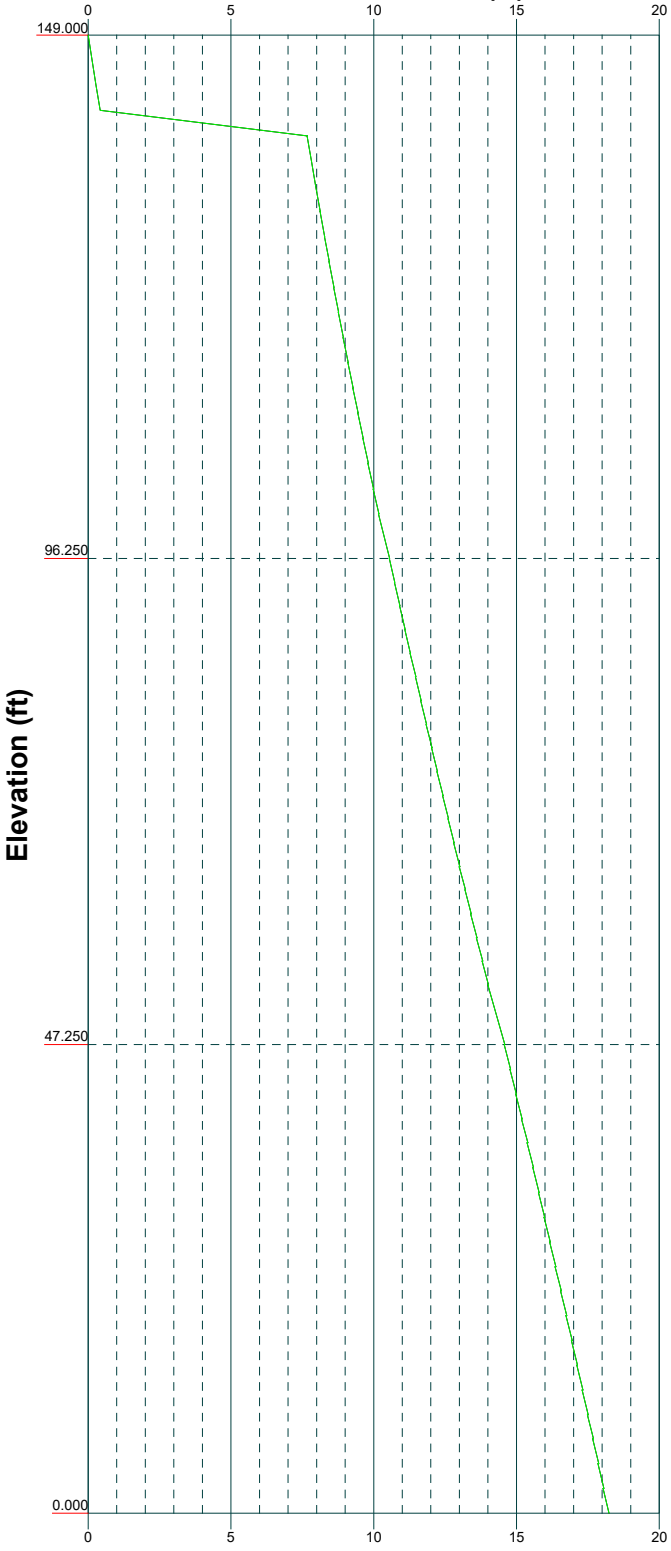
Job:	***170327.001.01.0001 - Meriden CT, CT (Site# CT144***		
Project:			
Client: TowerNorth	Drawn by: V. RAO	App'd:	
Code: TIA-222-H	Date: 04/24/24	Scale: NTS	
Path:		Dwg No. E-1	

TIA-222-H - 119 mph/50 mph 1.000 in Ice Exposure C

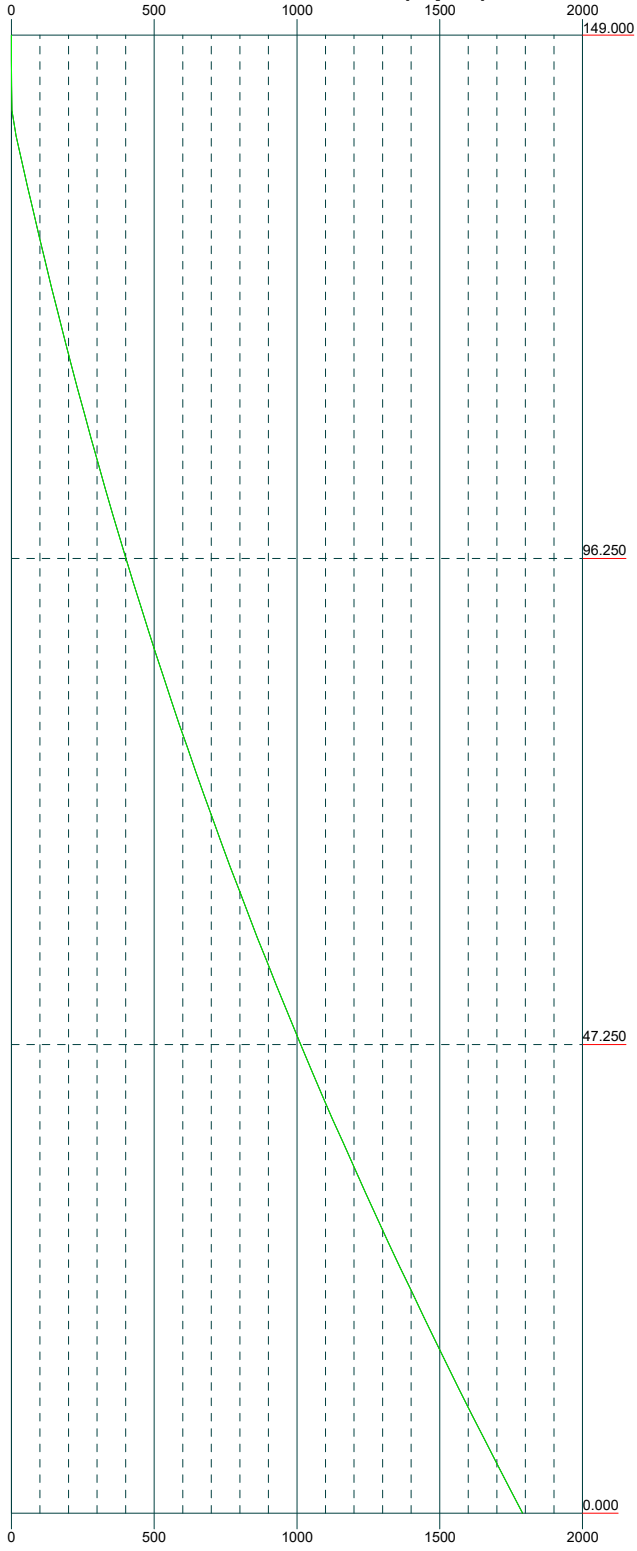
Maximum Values

Vx Vz Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



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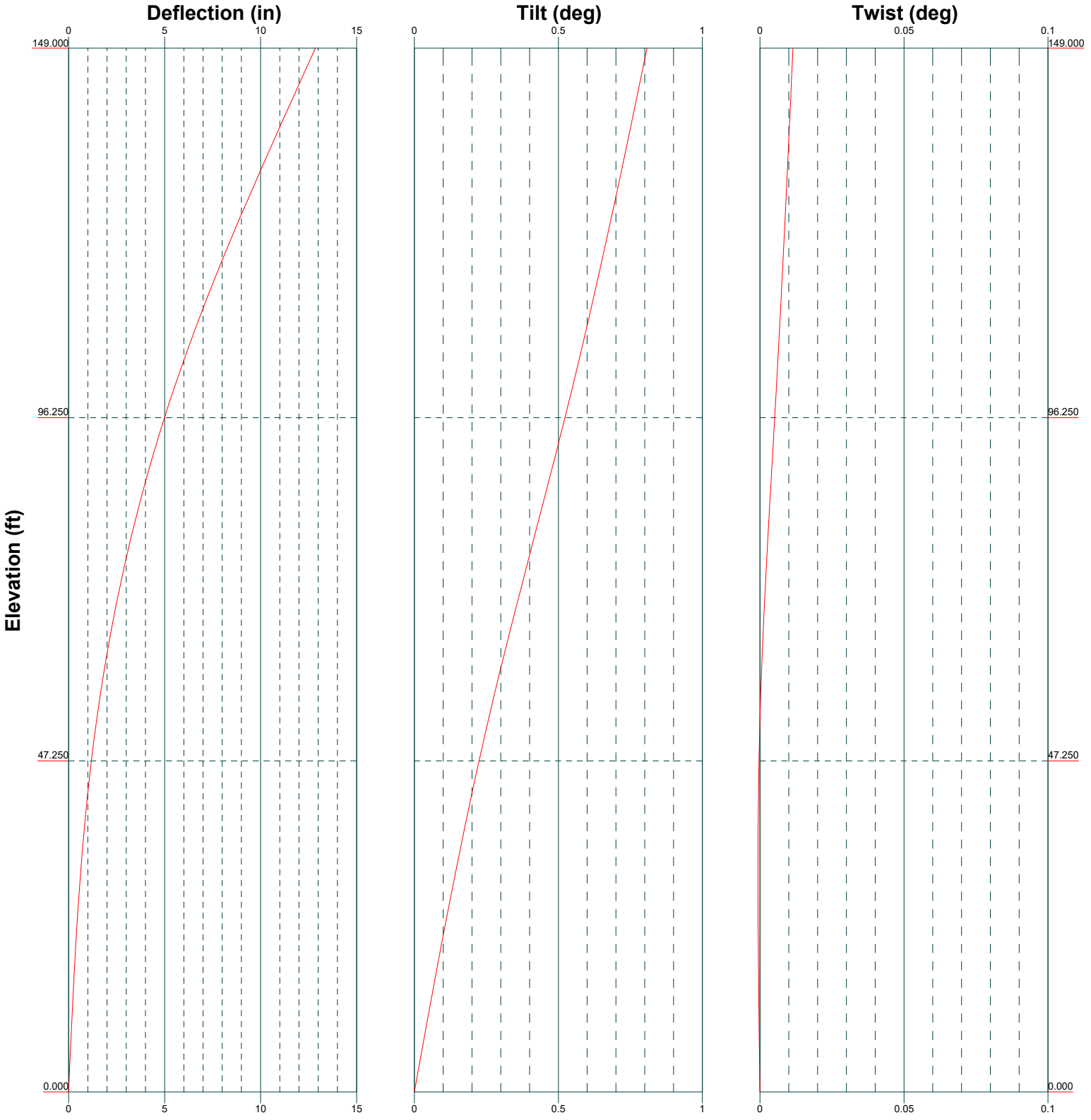
Job: *170327.001.01.0001 - Meriden CT, CT (Site# CT144*			
Project:			
Client: TowerNorth	Drawn by: V. RAO	App'd:	
Code: TIA-222-H	Date: 04/24/24	Scale: NTS	
Path:		Dwg No. E-4	

TIA-222-H - Service - 60 mph

Maximum Values



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Phone: (918) 587-4630
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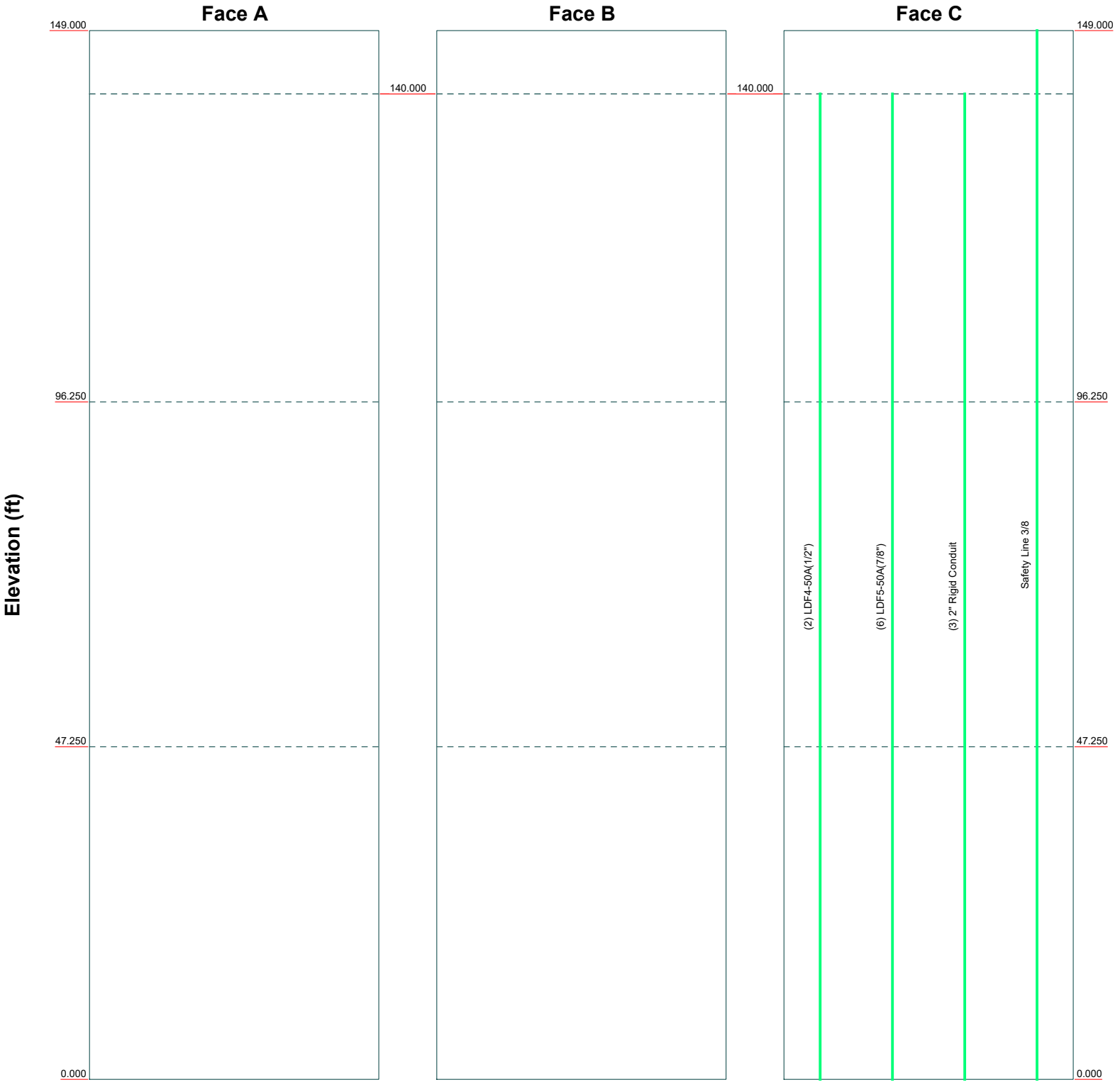
Job:	***170327.001.01.0001 - Meriden CT, CT (Site# CT144***		
Project:			
Client: TowerNorth		Drawn by: V. RAO	App'd:
Code: TIA-222-H		Date: 04/24/24	Scale: NTS
Path:			Dwg No. E-5

Feed Line Distribution Chart
0' - 149'

Round | Flat | App In Face | App Out Face | Truss Leg



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Job:	***170327.001.01.0001 - Meriden CT, CT (Site# CT144***		
Project:			
Client: TowerNorth		Drawn by: V. RAO	App'd:
Code: TIA-222-H		Date: 04/24/24	Scale: NTS
Path:			Dwg No. E-7

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Tower base elevation above sea level: 280.000 ft.
Basic wind speed of 119 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
TIA-222-H Annex S.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
Maximum demand-capacity ratio is: 1.05.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Horizontals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Consider Moments - Diagonals	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
Use Moment Magnification	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Stress Ratios	Retension Guys To Initial Tension	Offset Girt At Foundation
√ Use Code Safety Factors - Guys	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Escalate Ice	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Always Use Max Kz	√ Project Wind Area of Appurtenances	Use TIA-222-H Bracing Resist. Exemption
Use Special Wind Profile	Alternative Appurt. EPA Calculation	Use TIA-222-H Tension Splice Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	√ Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	√ Pole Without Linear Attachments
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole With Shroud Or No Appurtenances
Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules	Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	149.000-96.250	52.750	4.500	18	18.250	31.140	0.250	1.000	A572-65 (65 ksi)
L2	96.250-47.250	53.500	6.000	18	29.540	42.620	0.375	1.500	A572-65 (65 ksi)
L3	47.250-0.000	53.250		18	40.403	53.420	0.438	1.750	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	18.493	14.283	584.658	6.390	9.271	63.063	1170.085	7.143	2.772	11.088
	31.582	24.511	2954.868	10.966	15.819	186.791	5913.624	12.258	5.041	20.163
L2	31.055	34.714	3730.599	10.354	15.007	248.599	7466.106	17.360	4.539	12.104
	43.220	50.282	11337.090	14.997	21.651	523.630	22689.097	25.146	6.841	18.243
L3	42.448	55.497	11199.079	14.188	20.525	545.637	22412.894	27.754	6.341	14.494
	54.177	73.573	26092.745	18.809	27.137	961.506	52219.824	36.793	8.632	19.73

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 149.000-96.250				1	1	1			
L2 96.250-47.250				1	1	1			
L3 47.250-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
*											

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF4-50A(1/2")	C	No	No	Inside Pole	140.000 - 0.000	2	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
LDF5-50A(7/8")	C	No	No	Inside Pole	140.000 - 0.000	6	No Ice	0.000	0.000

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
2" Rigid Conduit	C	No	No	Inside Pole	140.000 - 0.000	3	1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							No Ice	0.000	0.003
							1/2" Ice	0.000	0.003
							1" Ice	0.000	0.003
*									
Safety Line 3/8	C	No	No	CaAa (Out Of Face)	149.000 - 0.000	1	No Ice	0.037	0.000
							1/2" Ice	0.137	0.001
							1" Ice	0.238	0.001
*									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	149.000-96.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.978	0.479
L2	96.250-47.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.837	0.534
L3	47.250-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.772	0.515

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	149.000-96.250	A	0.968	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	12.187	0.533
L2	96.250-47.250	A	0.917	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	11.320	0.584
L3	47.250-0.000	A	0.822	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	10.442	0.561

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	149.000-96.250	-0.297	0.171	-0.914	0.528

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L2	96.250-47.250	-0.299	0.173	-0.963	0.556
L3	47.250-0.000	-0.301	0.174	-0.950	0.548

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
QD8616-7_TIA w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	19.052 19.793 20.543	11.738 13.269 14.825	0.183 0.316 0.460
QD8616-7_TIA w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	19.052 19.793 20.543	11.738 13.269 14.825	0.183 0.316 0.460
QD8616-7_TIA w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	19.052 19.793 20.543	11.738 13.269 14.825	0.183 0.316 0.460
AIR 6419 B77G_TIA w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	3.870 4.178 4.497	2.324 2.720 3.132	0.078 0.113 0.152
AIR 6419 B77G_TIA w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	3.870 4.178 4.497	2.324 2.720 3.132	0.078 0.113 0.152
AIR 6419 B77G_TIA w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	3.870 4.178 4.497	2.324 2.720 3.132	0.078 0.113 0.152
AIR 6419 B77D_TIA w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	3.985 4.297 4.619	2.479 2.880 3.298	0.078 0.114 0.155
AIR 6419 B77D_TIA w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	3.985 4.297 4.619	2.479 2.880 3.298	0.078 0.114 0.155
AIR 6419 B77D_TIA w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	3.985 4.297 4.619	2.479 2.880 3.298	0.078 0.114 0.155
OPA65R-BU8DA-K_TIA w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	18.109 18.843 19.586	10.260 11.781 13.327	0.111 0.233 0.364
OPA65R-BU8DA-K_TIA w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	18.109 18.843 19.586	10.260 11.781 13.327	0.111 0.233 0.364
OPA65R-BU8DA-K_TIA w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	18.109 18.843 19.586	10.260 11.781 13.327	0.111 0.233 0.364
Ericsson 4478 B14 RRU	A	From Leg	4.000 0.000 1.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	1.843 2.012 2.190	1.059 1.197 1.342	0.060 0.076 0.094
Ericsson 4478 B14 RRU	B	From Leg	4.000 0.000	0.000	140.000	No Ice 1/2" Ice	1.843 2.012	1.059 1.197	0.060 0.076

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.000			1" Ice	2.190	1.342	0.094
Ericsson 4478 B14 RRU	C	From Leg	4.000	0.000	140.000	No Ice	1.843	1.059	0.060
			0.000			1/2" Ice	2.012	1.197	0.076
			1.000			1" Ice	2.190	1.342	0.094
Ericsson 2012 B29 RRU	A	From Leg	4.000	0.000	140.000	No Ice	3.145	1.285	0.060
			0.000			1/2" Ice	3.365	1.438	0.083
			1.000			1" Ice	3.592	1.600	0.110
Ericsson 2012 B29 RRU	B	From Leg	4.000	0.000	140.000	No Ice	3.145	1.285	0.060
			0.000			1/2" Ice	3.365	1.438	0.083
			1.000			1" Ice	3.592	1.600	0.110
Ericsson 2012 B29 RRU	C	From Leg	4.000	0.000	140.000	No Ice	3.145	1.285	0.060
			0.000			1/2" Ice	3.365	1.438	0.083
			1.000			1" Ice	3.592	1.600	0.110
Ericsson 4490 B5/B12 RRU	A	From Leg	4.000	0.000	140.000	No Ice	1.968	1.408	0.071
			0.000			1/2" Ice	2.144	1.564	0.090
			1.000			1" Ice	2.328	1.727	0.111
Ericsson 4490 B5/B12 RRU	B	From Leg	4.000	0.000	140.000	No Ice	1.968	1.408	0.071
			0.000			1/2" Ice	2.144	1.564	0.090
			1.000			1" Ice	2.328	1.727	0.111
Ericsson 4490 B5/B12 RRU	C	From Leg	4.000	0.000	140.000	No Ice	1.968	1.408	0.071
			0.000			1/2" Ice	2.144	1.564	0.090
			1.000			1" Ice	2.328	1.727	0.111
Ericsson 4890 B25/B66 RRU	A	From Leg	4.000	0.000	140.000	No Ice	2.139	1.686	0.109
			0.000			1/2" Ice	2.321	1.850	0.131
			1.000			1" Ice	2.511	2.022	0.156
Ericsson 4890 B25/B66 RRU	B	From Leg	4.000	0.000	140.000	No Ice	2.139	1.686	0.109
			0.000			1/2" Ice	2.321	1.850	0.131
			1.000			1" Ice	2.511	2.022	0.156
Ericsson 4890 B25/B66 RRU	C	From Leg	4.000	0.000	140.000	No Ice	2.139	1.686	0.109
			0.000			1/2" Ice	2.321	1.850	0.131
			1.000			1" Ice	2.511	2.022	0.156
Ericsson 4415 B30 RRU	A	From Leg	4.000	0.000	140.000	No Ice	1.843	0.820	0.047
			0.000			1/2" Ice	2.012	0.943	0.061
			1.000			1" Ice	2.190	1.075	0.078
Ericsson 4415 B30 RRU	B	From Leg	4.000	0.000	140.000	No Ice	1.843	0.820	0.047
			0.000			1/2" Ice	2.012	0.943	0.061
			1.000			1" Ice	2.190	1.075	0.078
Ericsson 4415 B30 RRU	C	From Leg	4.000	0.000	140.000	No Ice	1.843	0.820	0.047
			0.000			1/2" Ice	2.012	0.943	0.061
			1.000			1" Ice	2.190	1.075	0.078
DC9-48-60-24-8C-EV	B	From Leg	2.000	0.000	140.000	No Ice	1.145	1.145	0.026
			0.000			1/2" Ice	1.792	1.792	0.047
			1.000			1" Ice	2.002	2.002	0.070
DC9-48-60-24-8C-EV	C	From Leg	2.000	0.000	140.000	No Ice	1.145	1.145	0.026
			0.000			1/2" Ice	1.792	1.792	0.047
			1.000			1" Ice	2.002	2.002	0.070
VFA12-WLL-30120	A	From Leg	2.000	0.000	140.000	No Ice	13.200	13.200	0.658
			0.000			1/2" Ice	19.500	19.500	0.804
			0.000			1" Ice	25.800	25.800	1.015
VFA12-WLL-30120	B	From Leg	2.000	0.000	140.000	No Ice	13.200	13.200	0.658
			0.000			1/2" Ice	19.500	19.500	0.804
			0.000			1" Ice	25.800	25.800	1.015
VFA12-WLL-30120	C	From Leg	2.000	0.000	140.000	No Ice	13.200	13.200	0.658
			0.000			1/2" Ice	19.500	19.500	0.804
			0.000			1" Ice	25.800	25.800	1.015

*

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	149 - 96.25	Pole	Max Tension	33	0.000	-0.000	0.000
			Max. Compression	26	-14.825	0.055	-0.244
			Max. Mx	20	-9.150	354.287	-0.033
			Max. My	14	-9.150	0.012	-354.373
			Max. Vy	20	-10.181	354.287	-0.033
			Max. Vx	14	10.181	0.012	-354.373
			Max. Torque	9			-3.389
L2	96.25 - 47.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-26.159	0.134	-0.289
			Max. Mx	20	-18.421	927.419	-0.092
			Max. My	14	-18.421	0.029	-927.500
			Max. Vy	20	-14.021	927.419	-0.092
			Max. Vx	14	14.021	0.029	-927.500
			Max. Torque	9			-3.440
L3	47.25 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-45.025	0.245	-0.353
			Max. Mx	20	-34.621	1790.108	-0.110
			Max. My	14	-34.621	0.052	-1790.180
			Max. Vy	20	-18.242	1790.108	-0.110
			Max. Vx	14	18.242	0.052	-1790.180
			Max. Torque	9			-3.505

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	45.025	0.000	-5.499
	Max. H_x	20	34.629	18.228	-0.000
	Max. H_z	2	34.629	0.000	18.228
	Max. M_x	2	1789.932	0.000	18.228
	Max. M_z	8	1790.003	-18.228	-0.000
	Max. Torsion	21	3.505	18.228	-0.000
	Min. Vert	17	25.971	9.114	-15.786
	Min. H_x	8	34.629	-18.228	-0.000
	Min. H_z	14	34.629	0.000	-18.228
	Min. M_x	14	-1790.180	0.000	-18.228
	Min. M_z	20	-1790.108	18.228	-0.000
	Min. Torsion	9	-3.505	-18.228	-0.000

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	28.857	0.000	0.000	0.099	0.042	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	34.629	-0.000	-18.228	-1789.932	0.052	-0.284
0.9 Dead+1.0 Wind 0 deg - No Ice	25.971	0.000	-18.228	-1777.879	0.039	-0.284

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 30 deg - No Ice	34.629	9.114	-15.786	-1550.104	-894.988	-3.319
0.9 Dead+1.0 Wind 30 deg - No Ice	25.971	9.114	-15.786	-1539.671	-888.955	-3.319
1.2 Dead+1.0 Wind 60 deg - No Ice	34.629	15.786	-9.114	-894.905	-1550.183	0.107
0.9 Dead+1.0 Wind 60 deg - No Ice	25.971	15.786	-9.114	-888.894	-1539.729	0.108
1.2 Dead+1.0 Wind 90 deg - No Ice	34.629	18.228	0.000	0.110	-1790.003	3.504
0.9 Dead+1.0 Wind 90 deg - No Ice	25.971	18.228	0.000	0.081	-1777.932	3.505
1.2 Dead+1.0 Wind 120 deg - No Ice	34.629	15.786	9.114	895.152	-1550.183	0.391
0.9 Dead+1.0 Wind 120 deg - No Ice	25.971	15.786	9.114	889.077	-1539.729	0.392
1.2 Dead+1.0 Wind 150 deg - No Ice	34.629	9.114	15.786	1550.366	-894.965	-2.826
0.9 Dead+1.0 Wind 150 deg - No Ice	25.971	9.114	15.786	1539.865	-888.938	-2.826
1.2 Dead+1.0 Wind 180 deg - No Ice	34.629	-0.000	18.228	1790.180	0.052	0.284
0.9 Dead+1.0 Wind 180 deg - No Ice	25.971	0.000	18.228	1778.063	0.039	0.284
1.2 Dead+1.0 Wind 210 deg - No Ice	34.629	-9.114	15.786	1550.366	895.069	3.319
0.9 Dead+1.0 Wind 210 deg - No Ice	25.971	-9.114	15.786	1539.865	889.016	3.319
1.2 Dead+1.0 Wind 240 deg - No Ice	34.629	-15.786	9.114	895.153	1550.288	-0.107
0.9 Dead+1.0 Wind 240 deg - No Ice	25.971	-15.786	9.114	889.077	1539.807	-0.108
1.2 Dead+1.0 Wind 270 deg - No Ice	34.629	-18.228	0.000	0.110	1790.108	-3.504
0.9 Dead+1.0 Wind 270 deg - No Ice	25.971	-18.228	0.000	0.081	1778.010	-3.505
1.2 Dead+1.0 Wind 300 deg - No Ice	34.629	-15.786	-9.114	-894.905	1550.287	-0.391
0.9 Dead+1.0 Wind 300 deg - No Ice	25.971	-15.786	-9.114	-888.894	1539.807	-0.392
1.2 Dead+1.0 Wind 330 deg - No Ice	34.629	-9.114	-15.786	-1550.105	895.092	2.826
0.9 Dead+1.0 Wind 330 deg - No Ice	25.971	-9.114	-15.786	-1539.671	889.033	2.826
1.2 Dead+1.0 Ice+1.0 Temp	45.025	0.000	0.000	0.353	0.245	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	45.025	-0.000	-5.499	-518.392	0.255	-0.305
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	45.025	2.749	-4.762	-448.889	-259.131	-0.650
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	45.025	4.762	-2.749	-259.007	-449.014	0.032
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	45.025	5.499	0.000	0.378	-518.516	0.705
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	45.025	4.762	2.749	259.764	-449.014	0.337
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	45.025	2.749	4.762	449.648	-259.130	-0.121
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	45.025	-0.000	5.499	519.150	0.255	0.305
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	45.025	-2.749	4.762	449.649	259.640	0.650

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	45.025	-4.762	2.749	259.765	449.524	-0.032
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	45.025	-5.499	0.000	0.378	519.026	-0.705
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	45.025	-4.762	-2.749	-259.007	449.524	-0.337
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	45.025	-2.749	-4.762	-448.890	259.641	0.121
Dead+Wind 0 deg - Service	28.857	0.000	-4.367	-427.162	0.043	-0.068
Dead+Wind 30 deg - Service	28.857	2.184	-3.782	-369.919	-213.589	-0.796
Dead+Wind 60 deg - Service	28.857	3.782	-2.184	-213.529	-369.978	0.029
Dead+Wind 90 deg - Service	28.857	4.367	0.000	0.102	-427.221	0.847
Dead+Wind 120 deg - Service	28.857	3.782	2.184	213.735	-369.978	0.098
Dead+Wind 150 deg - Service	28.857	2.184	3.782	370.125	-213.588	-0.678
Dead+Wind 180 deg - Service	28.857	0.000	4.367	427.367	0.043	0.068
Dead+Wind 210 deg - Service	28.857	-2.184	3.782	370.125	213.675	0.796
Dead+Wind 240 deg - Service	28.857	-3.782	2.184	213.735	370.065	-0.029
Dead+Wind 270 deg - Service	28.857	-4.367	0.000	0.102	427.308	-0.847
Dead+Wind 300 deg - Service	28.857	-3.782	-2.184	-213.529	370.065	-0.098
Dead+Wind 330 deg - Service	28.857	-2.184	-3.782	-369.919	213.676	0.678

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-28.857	0.000	0.000	28.857	0.000	0.000%
2	0.000	-34.629	-18.228	0.000	34.629	18.228	0.000%
3	0.000	-25.971	-18.228	0.000	25.971	18.228	0.000%
4	9.114	-34.629	-15.786	-9.114	34.629	15.786	0.000%
5	9.114	-25.971	-15.786	-9.114	25.971	15.786	0.000%
6	15.786	-34.629	-9.114	-15.786	34.629	9.114	0.000%
7	15.786	-25.971	-9.114	-15.786	25.971	9.114	0.000%
8	18.228	-34.629	0.000	-18.228	34.629	-0.000	0.000%
9	18.228	-25.971	0.000	-18.228	25.971	-0.000	0.000%
10	15.786	-34.629	9.114	-15.786	34.629	-9.114	0.000%
11	15.786	-25.971	9.114	-15.786	25.971	-9.114	0.000%
12	9.114	-34.629	15.786	-9.114	34.629	-15.786	0.000%
13	9.114	-25.971	15.786	-9.114	25.971	-15.786	0.000%
14	0.000	-34.629	18.228	0.000	34.629	-18.228	0.000%
15	0.000	-25.971	18.228	0.000	25.971	-18.228	0.000%
16	-9.114	-34.629	15.786	9.114	34.629	-15.786	0.000%
17	-9.114	-25.971	15.786	9.114	25.971	-15.786	0.000%
18	-15.786	-34.629	9.114	15.786	34.629	-9.114	0.000%
19	-15.786	-25.971	9.114	15.786	25.971	-9.114	0.000%
20	-18.228	-34.629	0.000	18.228	34.629	-0.000	0.000%
21	-18.228	-25.971	0.000	18.228	25.971	-0.000	0.000%
22	-15.786	-34.629	-9.114	15.786	34.629	9.114	0.000%
23	-15.786	-25.971	-9.114	15.786	25.971	9.114	0.000%
24	-9.114	-34.629	-15.786	9.114	34.629	15.786	0.000%
25	-9.114	-25.971	-15.786	9.114	25.971	15.786	0.000%
26	0.000	-45.025	0.000	0.000	45.025	0.000	0.000%
27	0.000	-45.025	-5.498	0.000	45.025	5.499	0.000%
28	2.749	-45.025	-4.762	-2.749	45.025	4.762	0.000%
29	4.762	-45.025	-2.749	-4.762	45.025	2.749	0.000%
30	5.498	-45.025	0.000	-5.499	45.025	-0.000	0.000%
31	4.762	-45.025	2.749	-4.762	45.025	-2.749	0.000%
32	2.749	-45.025	4.762	-2.749	45.025	-4.762	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
33	0.000	-45.025	5.498	0.000	45.025	-5.499	0.000%
34	-2.749	-45.025	4.762	2.749	45.025	-4.762	0.000%
35	-4.762	-45.025	2.749	4.762	45.025	-2.749	0.000%
36	-5.498	-45.025	0.000	5.499	45.025	-0.000	0.000%
37	-4.762	-45.025	-2.749	4.762	45.025	2.749	0.000%
38	-2.749	-45.025	-4.762	2.749	45.025	4.762	0.000%
39	0.000	-28.857	-4.367	0.000	28.857	4.367	0.000%
40	2.184	-28.857	-3.782	-2.184	28.857	3.782	0.000%
41	3.782	-28.857	-2.184	-3.782	28.857	2.184	0.000%
42	4.367	-28.857	0.000	-4.367	28.857	0.000	0.000%
43	3.782	-28.857	2.184	-3.782	28.857	-2.184	0.000%
44	2.184	-28.857	3.782	-2.184	28.857	-3.782	0.000%
45	0.000	-28.857	4.367	0.000	28.857	-4.367	0.000%
46	-2.184	-28.857	3.782	2.184	28.857	-3.782	0.000%
47	-3.782	-28.857	2.184	3.782	28.857	-2.184	0.000%
48	-4.367	-28.857	0.000	4.367	28.857	0.000	0.000%
49	-3.782	-28.857	-2.184	3.782	28.857	2.184	0.000%
50	-2.184	-28.857	-3.782	2.184	28.857	3.782	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00003744
3	Yes	4	0.00000001	0.00001765
4	Yes	5	0.00000001	0.00004065
5	Yes	4	0.00000001	0.00077002
6	Yes	5	0.00000001	0.00004591
7	Yes	4	0.00000001	0.00086778
8	Yes	4	0.00000001	0.00052015
9	Yes	4	0.00000001	0.00034721
10	Yes	5	0.00000001	0.00004687
11	Yes	4	0.00000001	0.00088595
12	Yes	5	0.00000001	0.00005648
13	Yes	5	0.00000001	0.00002719
14	Yes	4	0.00000001	0.00003745
15	Yes	4	0.00000001	0.00001765
16	Yes	5	0.00000001	0.00005732
17	Yes	5	0.00000001	0.00002762
18	Yes	5	0.00000001	0.00004652
19	Yes	4	0.00000001	0.00087938
20	Yes	4	0.00000001	0.00052018
21	Yes	4	0.00000001	0.00034723
22	Yes	5	0.00000001	0.00004558
23	Yes	4	0.00000001	0.00086162
24	Yes	5	0.00000001	0.00004082
25	Yes	4	0.00000001	0.00077312
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00052970
28	Yes	4	0.00000001	0.00057133
29	Yes	4	0.00000001	0.00057177
30	Yes	4	0.00000001	0.00053281
31	Yes	4	0.00000001	0.00057413
32	Yes	4	0.00000001	0.00057566
33	Yes	4	0.00000001	0.00053137

34	Yes	4	0.00000001	0.00057850
35	Yes	4	0.00000001	0.00057392
36	Yes	4	0.00000001	0.00053341
37	Yes	4	0.00000001	0.00057192
38	Yes	4	0.00000001	0.00057155
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00002753
41	Yes	4	0.00000001	0.00002083
42	Yes	4	0.00000001	0.00003153
43	Yes	4	0.00000001	0.00002245
44	Yes	4	0.00000001	0.00004170
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00004340
47	Yes	4	0.00000001	0.00002189
48	Yes	4	0.00000001	0.00003154
49	Yes	4	0.00000001	0.00002041
50	Yes	4	0.00000001	0.00002626

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	149 - 96.25	12.852	45	0.809	0.011
L2	100.75 - 47.25	5.533	45	0.552	0.003
L3	53.25 - 0	1.467	46	0.257	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.000	QD8616-7_TIA w/ Mount Pipe	45	11.365	0.763	0.009	36907

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	149 - 96.25	53.867	14	3.390	0.046
L2	100.75 - 47.25	23.195	14	2.314	0.013
L3	53.25 - 0	6.148	14	1.079	0.004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.000	QD8616-7_TIA w/ Mount Pipe	14	47.636	3.201	0.039	8853

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	149 - 96.25 (1)	TP31.14x18.25x0.25	52.750	0.000	0.0	23.639	-9.150	1382.860	0.007
L2	96.25 - 47.25 (2)	TP42.62x29.54x0.375	53.500	0.000	0.0	48.536	-18.421	2839.370	0.006
L3	47.25 - 0 (3)	TP53.42x40.403x0.438	53.250	0.000	0.0	73.573	-34.621	4304.010	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	149 - 96.25 (1)	TP31.14x18.25x0.25	354.367	1010.300	0.351	0.000	1010.300	0.000
L2	96.25 - 47.25 (2)	TP42.62x29.54x0.375	927.500	2916.150	0.318	0.000	2916.150	0.000
L3	47.25 - 0 (3)	TP53.42x40.403x0.438	1790.192	5564.200	0.322	0.000	5564.200	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	149 - 96.25 (1)	TP31.14x18.25x0.25	10.181	414.859	0.025	3.202	1082.325	0.003
L2	96.25 - 47.25 (2)	TP42.62x29.54x0.375	14.021	851.810	0.016	3.254	3041.933	0.001
L3	47.25 - 0 (3)	TP53.42x40.403x0.438	18.242	1291.200	0.014	3.319	5991.108	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	149 - 96.25 (1)	0.007	0.351	0.000	0.025	0.003	0.358	1.050	✔

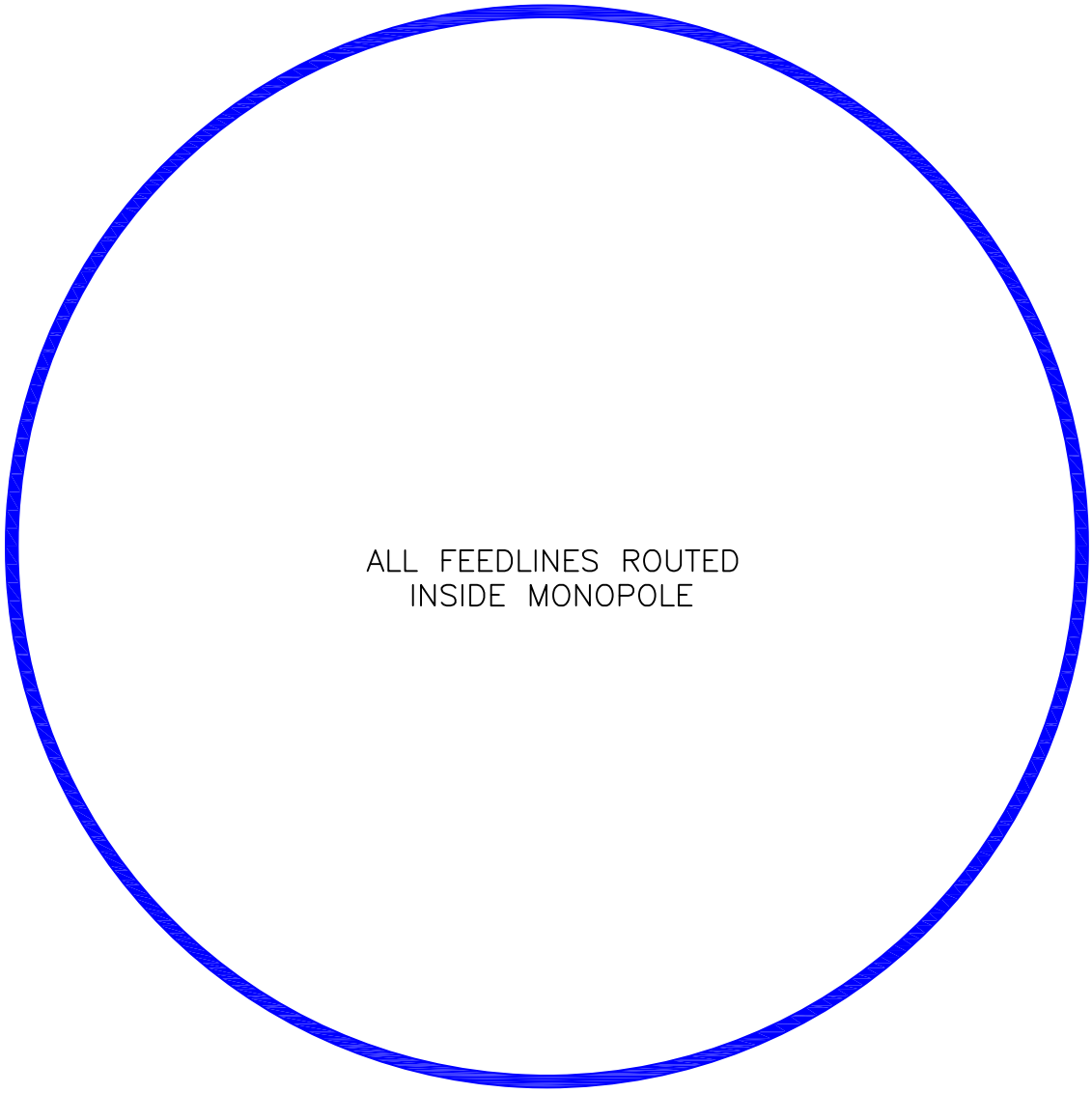
Section No.	Elevation ft	Ratio $P_u / \phi P_n$	Ratio $M_{ux} / \phi M_{nx}$	Ratio $M_{uy} / \phi M_{ny}$	Ratio $V_u / \phi V_n$	Ratio $T_u / \phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L2	96.25 - 47.25 (2)	0.006	0.318	0.000	0.016	0.001	0.325	1.050	✔
L3	47.25 - 0 (3)	0.008	0.322	0.000	0.014	0.001	0.330	1.050	✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	149 - 96.25	Pole	TP31.14x18.25x0.25	1	-9.150	1452.003	34.1	Pass
L2	96.25 - 47.25	Pole	TP42.62x29.54x0.375	2	-18.421	2981.338	30.9	Pass
L3	47.25 - 0	Pole	TP53.42x40.403x0.438	3	-34.621	4519.211	31.4	Pass
							Summary	
							Pole (L1) 34.1	Pass
							RATING = 34.1	**Pass**

APPENDIX B

BASE LEVEL DRAWING



PROJECT NUMBER: 170327.001.01.0001

APPENDIX C

ADDITIONAL CALCULATIONS

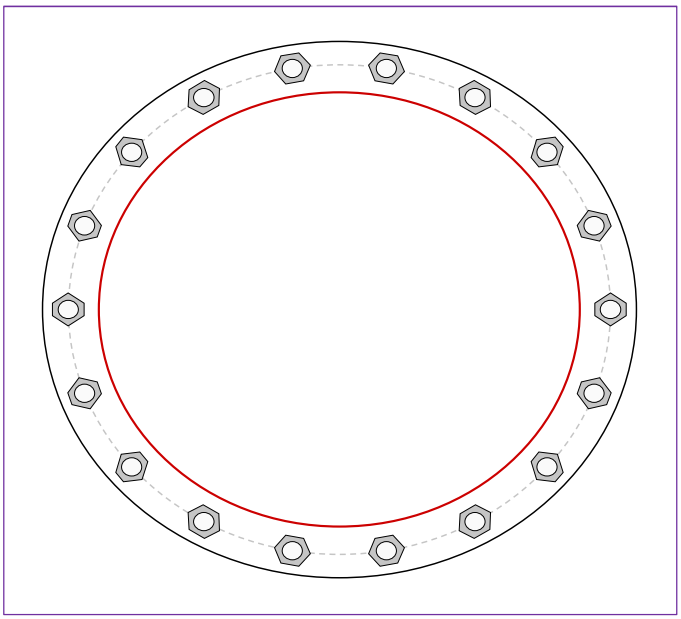
Monopole Base Plate Connection

Site Info	
Site #	CT1445
Site Name	Meriden CT, CT
Project #	170327.001.01.0001

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0

Applied Loads	
Moment (kip-ft)	1790.00
Axial Force (kips)	35.00
Shear Force (kips)	18.00

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(18) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 60.25" BC

Base Plate Data

66" OD x 2.25" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Stiffener Data

N/A

Pole Data

53.42" x 0.4375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_t = 77.24	ϕPn_t = 243.75	**Stress Rating**
Vu = 1	ϕVn = 149.1	**30.2%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	14.78	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	**31.3%**	**Pass**

Analysis Date: 24-04-2024

Drilled Pier Foundation

Site# :	CT1445
Site Name:	Meriden CT, CT
Project Number:	170327.001.01.0001
TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	1790	
Axial Force (kips)	35	
Shear Force (kips)	18	

Material Properties		
Concrete Strength, f'c:	4.5	ksi
Rebar Strength, Fy:	60	ksi
Tie Yield Strength, Fyt:	60	ksi

Pier Design Data		
Depth	24	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 24' below grade		
Pier Diameter	8	ft
Rebar Quantity	44	
Rebar Size	10	
Clear Cover to Ties	3	in
Tie Size	5	
Tie Spacing	7	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	6.53	-
Soil Safety Factor	3.20	-
Max Moment (kip-ft)	1892.59	-
Rating*	*39.6%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	99.90	-
End Bearing (kips)	263.89	-
Weight of Concrete (kips)	138.86	-
Total Capacity (kips)	363.80	-
Axial (kips)	173.86	-
Rating*	*45.5%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.43	-
Critical Moment (kip-ft)	1892.53	-
Critical Moment Capacity	10314.20	-
Rating*	*17.5%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	17.85	-
Critical Shear (kip)	223.64	-
Critical Shear Capacity	1178.41	-
Rating*	*18.1%*	-

Structural Foundation Rating*	**18.1%**
Soil Interaction Rating*	**45.5%**

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐
Design Options	
Input Effective Depths (else Actual):	☐
Consider non-tapered moment capacity:	☐
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

Go to Soil Calculations

Soil Profile

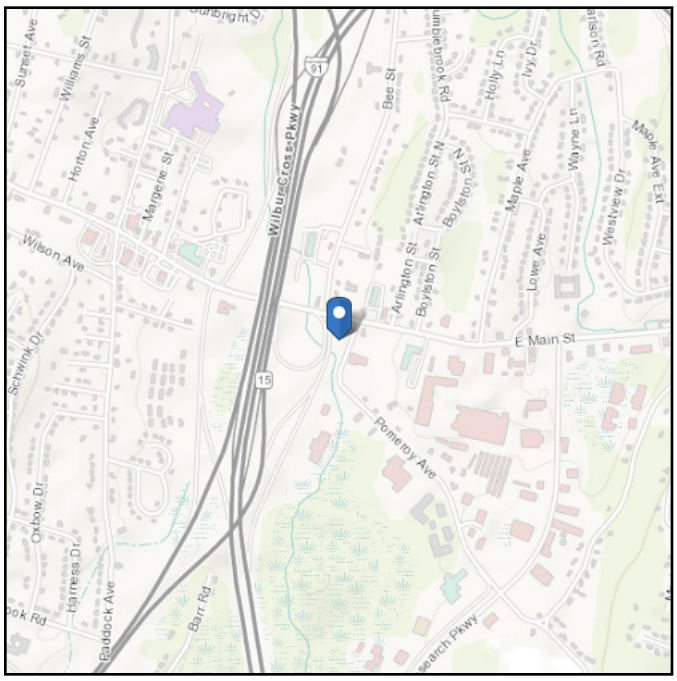
Groundwater Depth	2	# of Layers	6

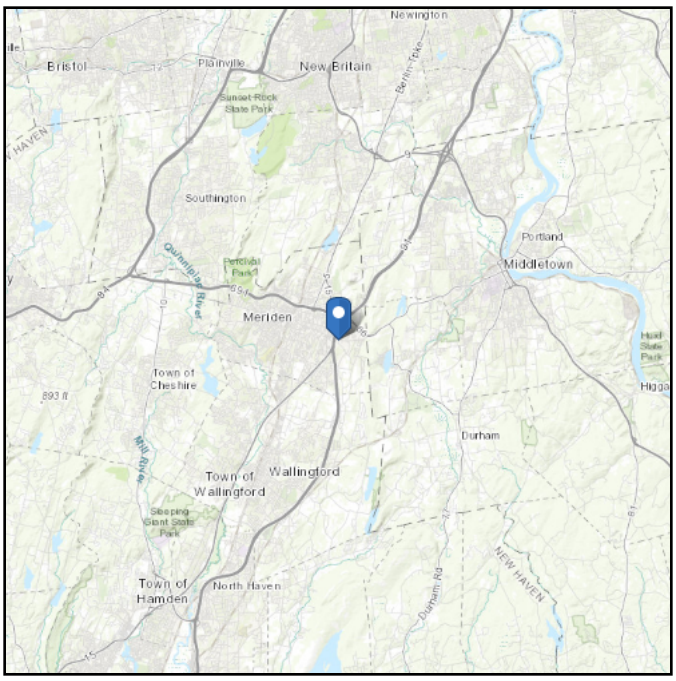
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2	2	110	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	2	4	2	47.6	87.6	0	0	0.000	0.000	0.00	0.00			Cohesionless
3	4	5	1	47.6	87.6	0	28	0.000	0.000	0.08	0.08			Cohesionless
4	5	10	5	47.6	87.6	0	35	0.000	0.000	0.17	0.17			Cohesionless
5	10	15	5	47.6	87.6	0	36	0.000	0.000	0.26	0.26			Cohesionless
6	15	24	9	47.6	87.6	0	38	0.000	0.000	0.34	0.34	7		Cohesionless

ASCE Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	41.525544
Risk Category:	II	**Longitude:**	-72.767739
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	279.8804425257277 ft (NAVD 88)





Wind

Results:

Wind Speed	119 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Wed Apr 03 2024

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Seismic

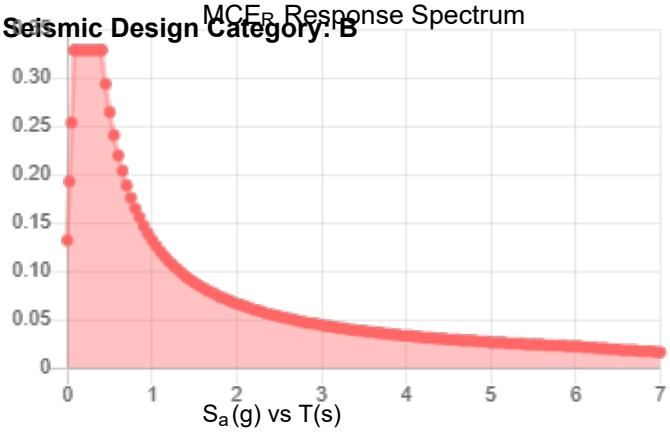
Site Soil Class: D - Default (see Section 11.4.3)

Results:

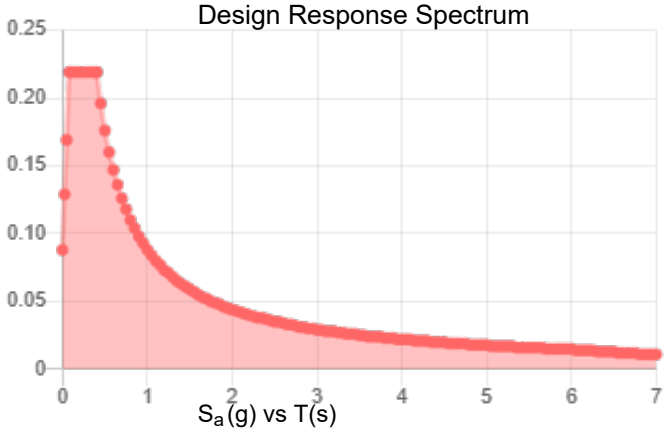
S_S :	0.206	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.114
F_v :	2.4	PGA_M :	0.18
S_{MS} :	0.329	F_{PGA} :	1.571
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.219	C_v :	0.711

Seismic Design Category: B

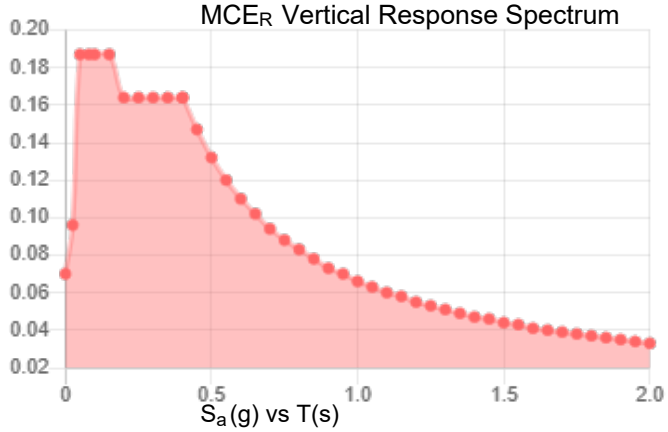
MCE_R Response Spectrum



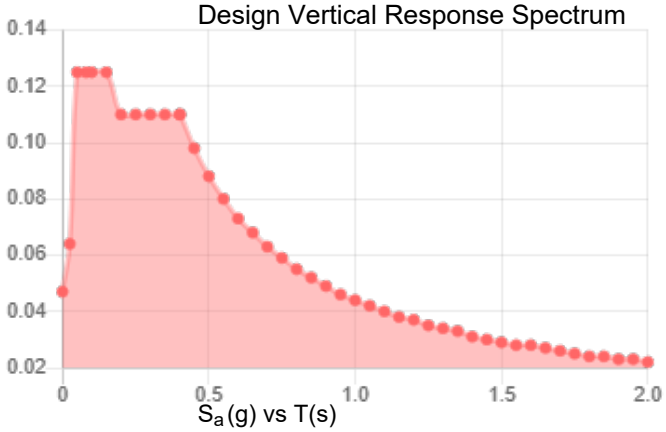
Design Response Spectrum



MCE_R Vertical Response Spectrum



Design Vertical Response Spectrum



Data Accessed: **Wed Apr 03 2024**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed Apr 03 2024

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.