Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

February 23, 2021

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
79 Putnam Pike, Dayville, CT 06241
Latitude: 41.8474360000
Longitude: -71.8788830000
T-Mobile Site#: CT11396B – L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 148-foot level of the existing 150-foot monopole at 79 Putnam Pike, Dayville, CT. The 150-foot monopole and property are owned by the Town of Killingly. T-Mobile now intends to remove the six (6) existing antennas and replace with six (6) new 600/700/1900 MHz antennas. The new antennas will support 5G services and will be installed at the same 148-foot level of the tower. Mount modifications are also required as detailed in the enclosed mount analysis.

Planned Modifications:
Tower:
Remove
(6) 1-5/8" coax

Remove and Replace:
(3) EMS RR90-17-00DP antennas for (3) RFS APX16DWV-16DWV 1900 MHz antennas
(3) LNX-6515DS antennas for (3) RFS APXVAALL24-43-U-NA20 600/700 MHz antennas

Install New:
(3) Radio 4449 B71+B12
(1) 1-5/8" Hybrid

Existing to Remain:
(3) TMA
(6) 1-5/8" coax

Ground:
Install New: Equipment inside existing 6201 cabinet

This tower was originally approved by the Town of Killingly via zoning permit on June 18, 1998. The record of the approval did not include original conditions of approval. A copy of this zoning permit is enclosed with the filing.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Town Manager -Mary Calorio, Elected Official, and Ann-Marie L. Aubrey, Director of Planning and Development.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S;A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kyle Richers
Transcend Wireless
Cell: 908-447-4716
Email: krichers@transcendwireless.com

Attachments
cc: Mary Calorio – Town Manager of the Town of Killingly
Ann-Marie L. Aubrey– Director of Planning & Development – Town of Killingly

View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   Customers with a scheduled Pickup
   - Your driver will pickup your shipment(s) as usual.

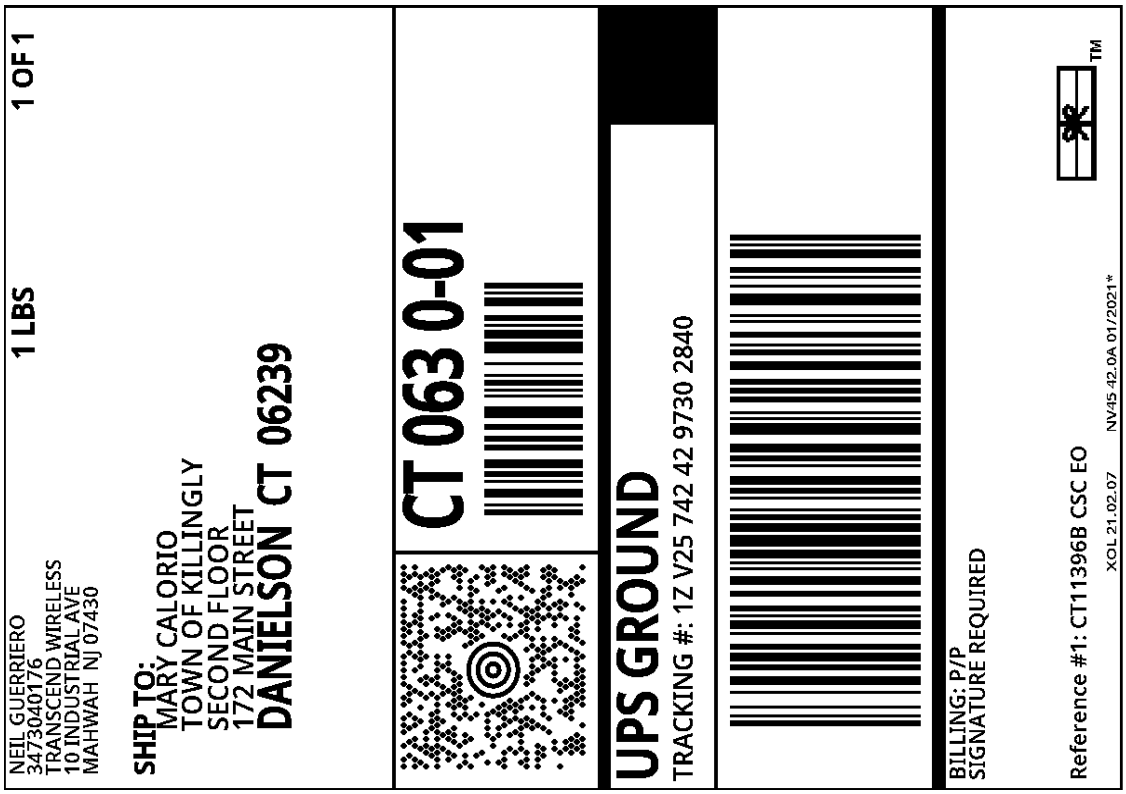
   Customers without a scheduled Pickup
   - Schedule a Pickup on ups.com to have a UPS driver pickup all of your packages.
   - Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find the location nearest you, please visit the 'Locations' Quick link at ups.com.

UPS Access Point™
MICHAELS STORE # 7773
75 INTERSTATE SHOP CTR
RAMSEY NJ 07446-1130

UPS Access Point™
THE UPS STORE
115 FRANKLIN TPKE
MAHWAH NJ 07430-1325

UPS Access Point™
THE UPS STORE
120 E MAIN ST
RAMSEY NJ 07446-1925

FOLD HERE



View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   Customers with a scheduled Pickup
   - Your driver will pickup your shipment(s) as usual.

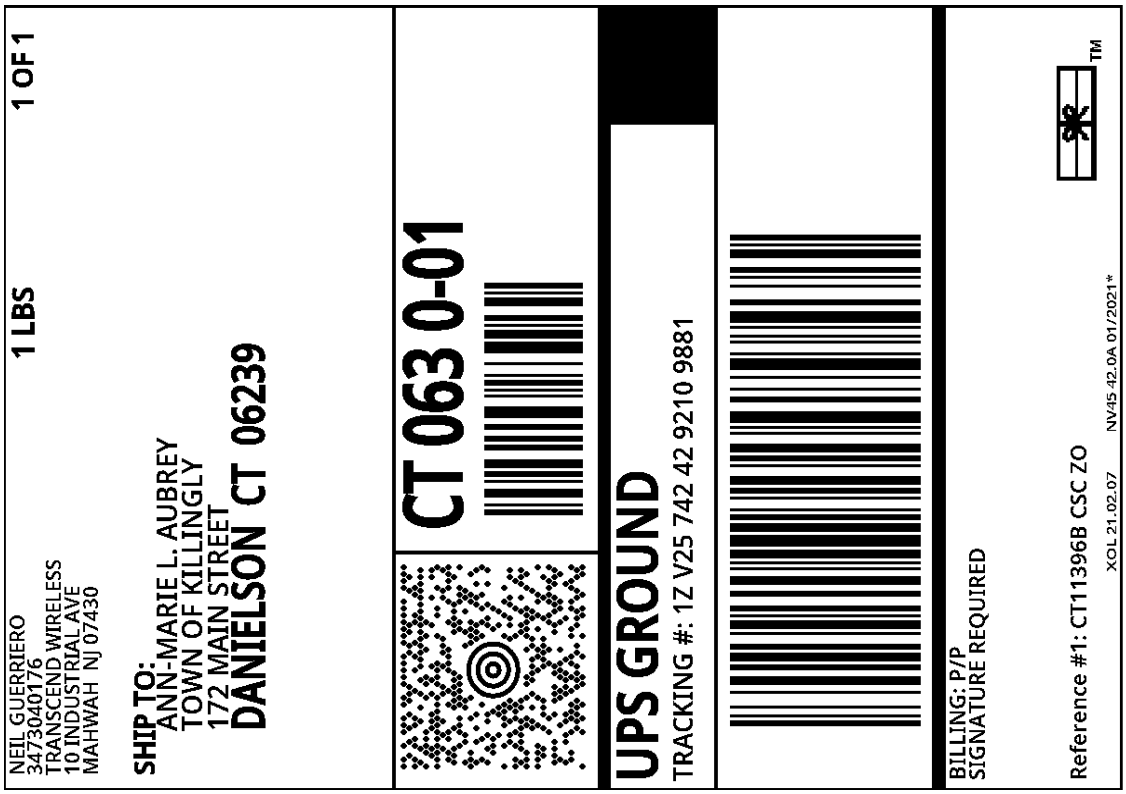
   Customers without a scheduled Pickup
   - Schedule a Pickup on ups.com to have a UPS driver pickup all of your packages.
   - Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find the location nearest you, please visit the 'Locations' Quick link at ups.com.

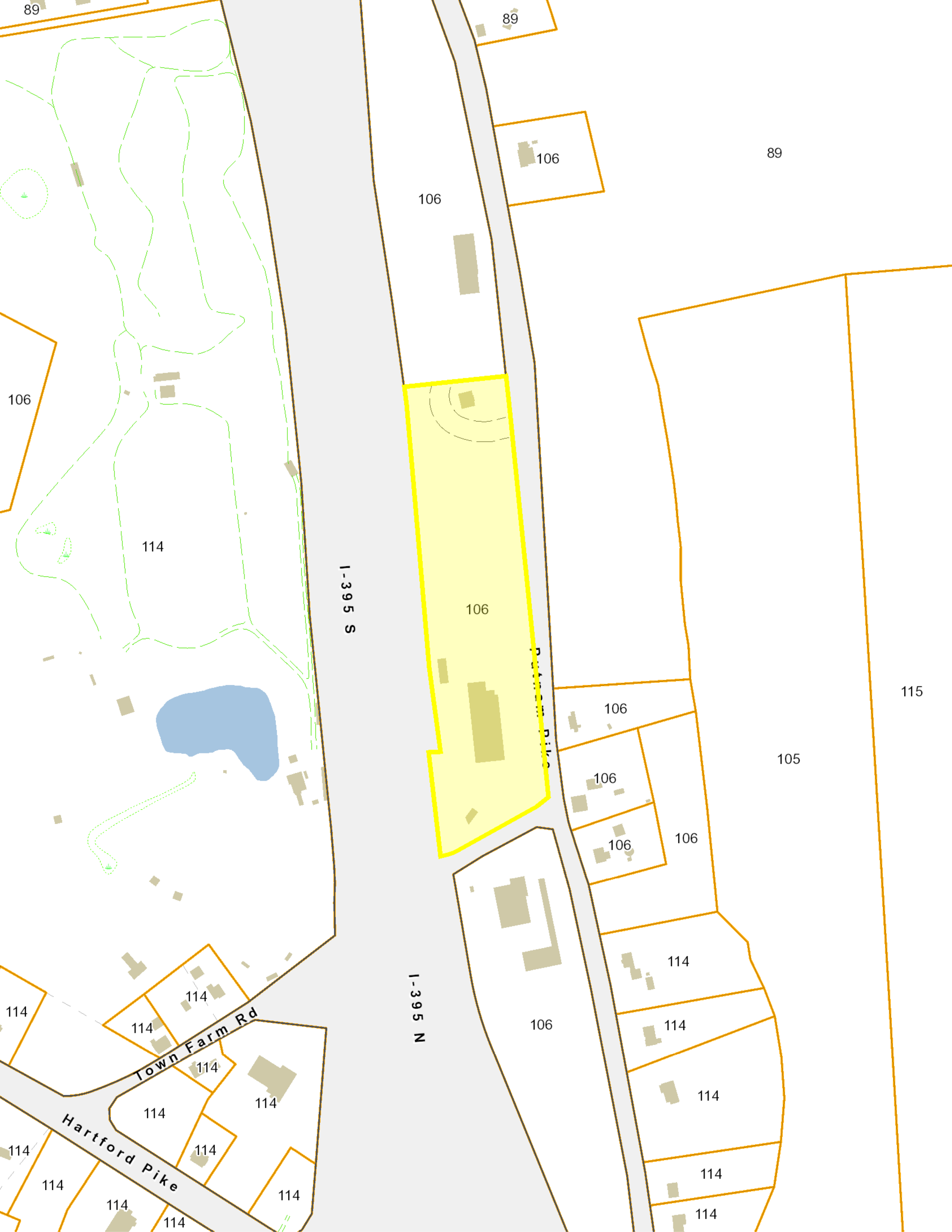
UPS Access Point™
MICHAELS STORE # 7773
75 INTERSTATE SHOP CTR
RAMSEY NJ 07446-1130

UPS Access Point™
THE UPS STORE
115 FRANKLIN TPKE
MAHWAH NJ 07430-1325

UPS Access Point™
THE UPS STORE
120 E MAIN ST
RAMSEY NJ 07446-1925

FOLD HERE





89
89
106
89
106
106
114
I-395 S
106
106
115
106
105
106
106
114
114
I-395 N
114
114
106
Town Farm Rd
114
114
114
114
114
114
114
114
Hartford Pike
114
114
114
114
114

tyler
clt division

COMMERCIAL PROPERTY RECORD CARD 2020

TOWN OF KILLINGLY

Situs : 79 PUTNAM PIKE	Map ID: 006994	Class: Town of Killingly	Card: 1 of 1	Printed: June 4, 2020

CURRENT OWNER

KILLINGLY TOWN OF-081
HIGHWAY GARAGE
172 MAIN ST
KILLINGLY CT 06239

GENERAL INFORMATION

Living Units	
Neighborhood	302
Alternate Id	106-42
Vol / Pg	34/1
District	2
Zoning	GENERAL COMMERCIAL
Class	EXEMPT

Property Notes

79-GARAGE 105-DOG PND

Land Information

Type		Size	Influence Factors	Influence %	Value
Primary	AC	3.0000			600,000
Rear	AC	3.7000			5,550

Total Acres: 6.7
Spot: Location:

Assessment Information

	Assessed	Appraised	Cost	Income	Market
Land	423,920	605,600	605,600	605,600	0
Building	387,520	553,600	553,600	245,600	0
Total	811,440	1,159,200	1,159,200	851,200	0

Manual Override Reason
Base Date of Value 10/01/2019
Value Flag COST APPROACH **Effective Date of Value** 10/01/2020
150 ' MONOPOLE 115125

Entrance Information

Date	ID	Entry Code	Source
06/29/16	CLP	Exterior	Asmt Staff
11/25/09	MHB	View ed	Asmt Staff
12/27/06	DH	Complete	Asmt Staff

Permit Information

Date Issued	Number	Price	Purpose		% Complete
07/12/18	26169	20,000	81 CELE	Replace 6 Existing Antennas W/ 6	997
06/15/17	25354	11,820	97 BPP	Remove & Repl 3 Panel Antennas,	997
10/20/15	23978	285	88 CHET	Nvc Repl Boiler & Burner	997
07/01/15	23714	60,000	97 BPP	Remove/Repl 6 Antennaes & Add	995
04/09/15	23485	15,000	BLDG	Modification Of Existing Telecom F	996

Sales/Ownership History

Transfer Date	Price	Type	Validity	Deed Reference	Deed Type	Grantee

Inspection Witnessed By _____

tyler
clt division

COMMERCIAL PROPERTY RECORD CARD 2020

TOWN OF KILLINGLY

Situs : 79 PUTNAM PIKE	Parcel Id: 006994	Class: Town of Killingly	Card: 1 of 1	Printed: June 4, 2020

Building Information

Year Built/Eff Year	1960 /
Building #	1
Structure Type	Auto Service Garag
Identical Units	1
Total Units	
Grade	C
# Covered Parking	
# Uncovered Parking	
DBA	TOWN GARAGE&PCS EQU

Building Other Features

Line	Type	+/-	Meas1	Meas2	# Stops	Ident	Units	Line	Type	+/-	Meas1	Meas2	# Stops	Ident	Units

Interior/Exterior Information

Line	Level	From	To	Int Fin	Area	Perim	Use Type	Wall Height	Ext Walls	Construction	Partitions	Heating	Cooling	Plumbing	Physical	Functional
1	01	01		100	11,520	464	Auto Parts/Service	16	Brick Venee	Pre-Engineered Stee	Normal	Hot Water/Ste	None	Normal	3	3
2	M1	M1		100	1,200	120	Multi-Use Office	8	Enclosure	Fire Resistant	Normal	Hot Water/Ste	None	Normal	3	3
3	01	01		100	1,540	158	Auto Parts/Service	16	Brick Venee	Fire Resistant	Normal	Hot Water/Ste	None	None	3	3
4	02	02		100	1,540	158	Support Area	8	Brick Venee	Fire Resistant	Normal	Hot Water/Ste	None	None	3	3

Interior/Exterior Valuation Detail

Line	Area	Use Type	% Good	% Complete	Use Value/RCNLD
1	11,520	Auto Parts/Service	45		253,860
2	1,200	Multi-Use Office	45		39,730
3	1,540	Auto Parts/Service	45		56,930
4	1,540	Support Area	45		36,720

Outbuilding Data

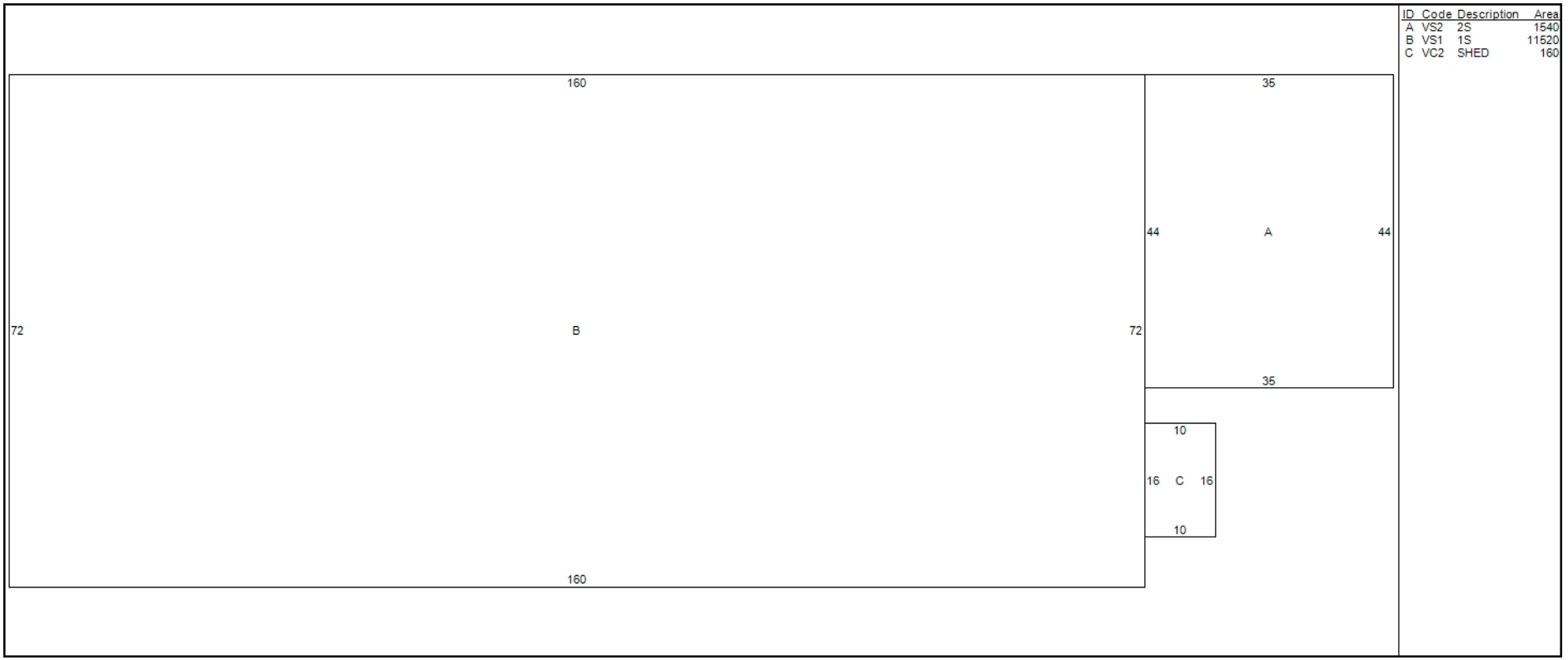
Line	Type	Yr Blt	Meas1	Meas2	Qty	Area	Grade	Phy	Fun	Value
1	Asph Pav	1960			1	20,000	C	3	3	24,000
2	Mas Garage	1960	60	22	1	1,320	C	3	3	17,950
3	Kennel	2009	18	50	1	900	D	3	3	4,460
4	Br/St Shed	2014	12	30	1	360	C	3	3	4,780

tyler
clt division

COMMERCIAL PROPERTY RECORD CARD 2020

TOWN OF KILLINGLY

Situs : 79 PUTNAM PIKE	Parcel Id: 006994	Class: Town of Killingly	Card: 1 of 1	Printed: June 4, 2020



ID	Code	Description	Area
A	VS2	2S	1540
B	VS1	1S	11520
C	VC2	SHED	160

Addtional Property Photos

tyler clt division

COMMERCIAL PROPERTY RECORD CARD 2020

TOWN OF KILLINGLY

Situs : 79 PUTNAM PIKE	Parcel Id: 006994	Class: Town of Killingly	Card: 1 of 1	Printed: June 4, 2020

Income Detail (Includes all Buildings on Parcel)

Use Grp	Mod Type	Inc Mod	Model Description	Units	Net Area	Income Rate	Econ Adjust	Potential Gross Income	Vac Model	Vac Adj	Additional Income	Effective Gross Income	Expense Model %	Expense Adj %	Expense Adj	Other Expenses	Total Expenses	Net Operating Income
00	S	001	Support Or Municipal Prope	0	1,540						0							
11	S	001	Auto Service	0	13,060	8.00		104,480	7.5		0	96,644	15			14,497	14,497	82,147
22	S	001	Multi Use Office	0	1,200	8.50		10,200	12.5		0	8,925	35			3,124	3,124	5,801

Apartment Detail - Building 1 of 1

Line	Use Type	Per Bldg	Beds	Baths	Units	Rent	Income

Building Cost Detail - Building 1 of 1

Total Gross Building Area	15,800
Replace, Cost New Less Depr	387,240
Percent Complete	100
Number of Identical Units	1
Economic Condition Factor	
Final Building Value	387,240
Value per SF	24.51

Notes - Building 1 of 1

SP #00-755 DOG POUND ADDN

Income Summary (Includes all Building on Parcel)

Total Net Income	87,948
Capitalization Rate	0.104000
Sub total	845,650
Residual Land Value	5,550
Final Income Value	851,200
Total Gross Rent Area	14,260
Total Gross Building Area	15,800

DATE: 6/18/98

TOWN OF KILLINGLY, CONNECTICUT
ZONING PERMIT

№ 006352

Complete Items #1-9 and the plot plan on the reverse side of the top sheet.

1. Location of Property 79 Putnam Pike
   House # & Street
   Tax Map Number 4683 Block 329 Lot 1 Zoning District LD Volume 34 Page 1 List 6991
2. Property Owner's Name Town of Killingly Phone
3. Property Owner's Address if different from property location 172 Main St.
4. Applicant's Name and Address if different from Property Owner's Name and Address ~~Robert~~ Omnipoint
   25 Van Zant St Norwalk CT Phone 203-855-5427

5. Lot Size 30,000 sq ft Lot Frontage 100'
6. This permit is applied for in accordance with the requirements of the Town of Killingly and/or Borough of Danielson Zoning Regulations for:
   - ☒ new construction
   - ☐ addition
   - ☐ accessory structure (sheds, satellite dishes, etc.)
   - ☐ swimming pool
   - ☐ excavating/filling/earth removal
   - ☐ sign
   - ☐ change of use
   - ☐ other
7. Proposed structure or project —
   Provide description and dimensions:
   Construction of a 150' monopole with related telecommunication facilities

8. Property Use:
   - ☐ single family residential
   - ☐ two-family residential
   - ☐ mobile home — residential
   - ☐ multi-family — residential
   - ☐ Industrial specify
   - ☒ Commercial specify telecommunication facility
   - ☐ Professional and Business specify

9. PERMIT VOID IF ...
work or activity is not commenced within one year from the date of issue and diligently prosecuted to completion.
This permit, if issued, is based upon the plot plan submitted. Falsification, by misrepresentation or omission, or failure to comply with the conditions of approval of this permit shall constitute a violation of the Town of Killingly and/or Borough of Danielson Zoning Regulations.
Agents of the Town of Killingly are authorized to enter upon the property for the purpose of inspection and verification of compliance with the terms of this permit.

(Signature of Owner or authorized agent)

203-855-5427
(Agent's phone #)

FOR OFFICE USE ONLY:

Inland Wetlands NA - no impact to wetlands 6-18-98
Historic District? Yes (No)
Slope greater than 15%? Yes (No)
Flood Hazard Zone? NO
Aquifer Protection Zone? (Yes) No
Public Sewer (On-Site Septic)
Site Plan Review Necessary? (Yes) No
Applicant's Name
Application No.
P&Z Commission Approval Date

Driveway Permit
Special Permit necessary? (Yes) No
Applicant's Name Omni Point
Application No. 98-706
P&Z Commission Approval Date 5-13-98
Subdivision necessary? Yes (No)
Applicant's Name
Application No.
P&Z Commission Approval Date
Variance Necessary? Yes (No)
Applicant's Name
Application No.
ZBA Approval Date

Approved ✓ Disapproved Date 6-18-98
Reason for Disapproval:
Comments: Able to condition approval of SP #98-706 Condition 1-5

George C Dion
Zoning Enforcement Officer

Orig./White: Z.E.O. / Blue: P &Z / Green: Bldg. Official / Yellow: Applicant

SITE NAME: KILLINGLY/I-395/X93_1

79 PUTNAM PIKE
DAYVILLE, CT 06241
WINDHAM COUNTY

SITE NUMBER: CT11396B

RF DESIGN GUIDELINE: 67D04G

T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS
SECTOR A: ANTENNA/TMAS/RADIO	ACCESS NOT PERMITTED
SECTOR B: ANTENNA/TMAS/RADIO	ACCESS NOT PERMITTED
SECTOR C: ANTENNA/TMAS/RADIO	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED CAUTION: OSHA-APPROVED PORTABLE 8' STEP-LADDER REQUIRED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

GENERAL NOTES

THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

THE 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.

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE NORTHEAST, LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

PROJECT SUMMARY

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT MODERNIZATION
ZONING JURISDICTION:	BASED ON INFORMATION PROVIDED BY T-MOBILE, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW).
SITE ADDRESS:	79 PUTNAM PIKE DAYVILLE, CT 06241
LATITUDE:	41° 50' 50.68" N
LONGITUDE:	71° 52' 44.34" W
JURISDICTION:	TOWN OF KILLINGLY, CT
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

APPROVALS

PROJECT MANAGER	DATE
CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING / SITE ACQ.	DATE
OPERATIONS	DATE
TOWER OWNER	DATE

72 HOURS

CALL
BEFORE YOU DIG
CALL TOLL FREE 1-800-922-4455
OR CALL 811

UNDERGROUND SERVICE ALERT

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	3
GN-1	GENERAL NOTES	3
A-1	COMPOUND & EQUIPMENT PLANS	3
A-2	ANTENNA LAYOUTS & ELEVATION	3
A-3	DETAILS	3
SN-1	SPECIAL INSPECTIONS NOTES	3
S-1	STRUCTURAL MODIFICATION DETAILS	3
E-1	ONE-LINE DIAGRAM AND GROUNDING DETAILS	3

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER
Daniel P Hamm
CONSTRUCTION DRAWINGS ARE VALID FOR ONE YEAR AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: RP

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	02/22/21	REVISED FOR CONSTRUCTION	VP
2	02/01/21	ISSUED FOR CONSTRUCTION	VP
1	06/06/19	ISSUED FOR CONSTRUCTION	SG
0	05/15/19	ISSUED FOR REVIEW	VP

SITE NUMBER:
CT11396B
SITE NAME:
KILLINGLY/I-395/X93_1
SITE ADDRESS:
79 PUTNAM PIKE
DAYVILLE, CT 06241
WINDHAM COUNTY

SHEET TITLE
TITLE SHEET
(L600)

SHEET NUMBER
T-1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – TRANSCEND WIRELESS
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T-MOBILE

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. 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: IBC 2015 WITH 2018 CT STATE BUILDING CODE AMENDMENTS
    ELECTRICAL CODE: 2017 NATIONAL ELECTRIC CODE (NFPA 70)
    LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

    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, FOURTEENTH EDITION;

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

    EQUIPMENT 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.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

Daniel P. Hamm

CONSTRUCTION DRAWINGS ARE VALID FOR ONE YEAR AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY:	RP
APPROVED BY:	DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	02/22/21	REVISED FOR CONSTRUCTION	VP
2	02/01/21	ISSUED FOR CONSTRUCTION	VP
1	06/06/19	ISSUED FOR CONSTRUCTION	SG
0	05/15/19	ISSUED FOR REVIEW	VP

SITE NUMBER:
CT11396B

SITE NAME:
KILLINGLY/I-395/ X93_1

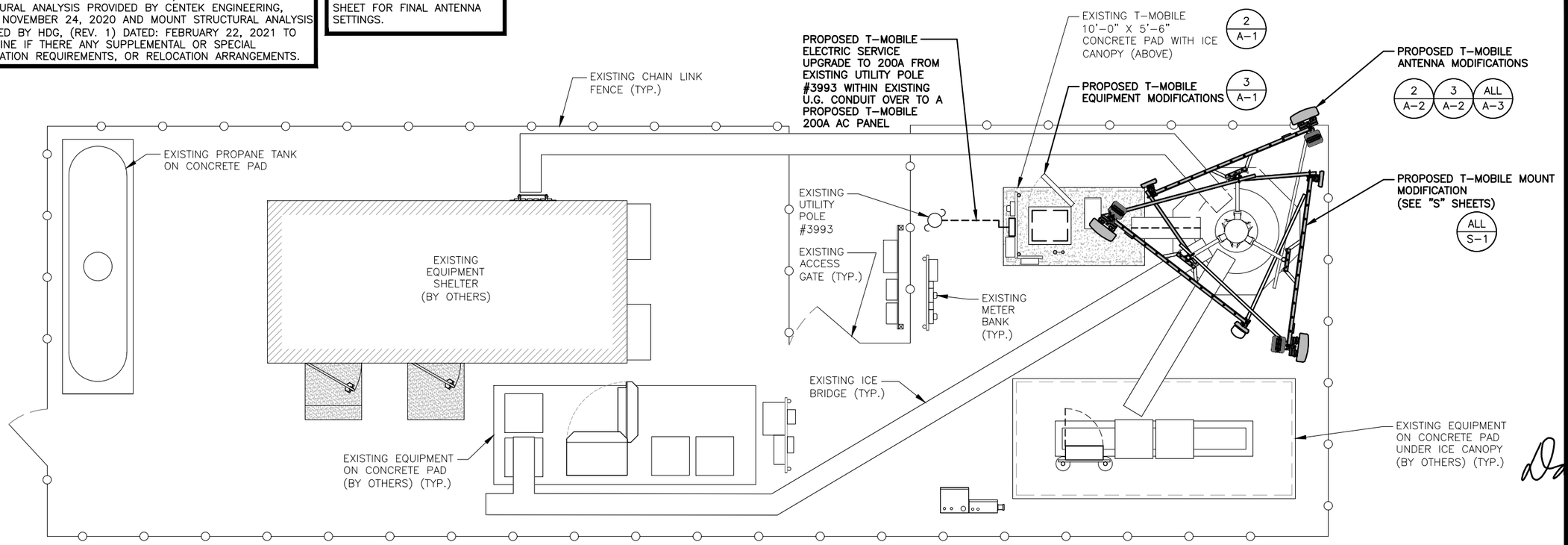
SITE ADDRESS:
79 PUTNAM PIKE
DAYVILLE, CT 06241
WINDHAM COUNTY

SHEET TITLE
GENERAL NOTES
(L600)

SHEET NUMBER
GN-1

STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENGINEERING, DATED: NOVEMBER 24, 2020 AND MOUNT STRUCTURAL ANALYSIS PROVIDED BY HDG, (REV. 1) DATED: FEBRUARY 22, 2021 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

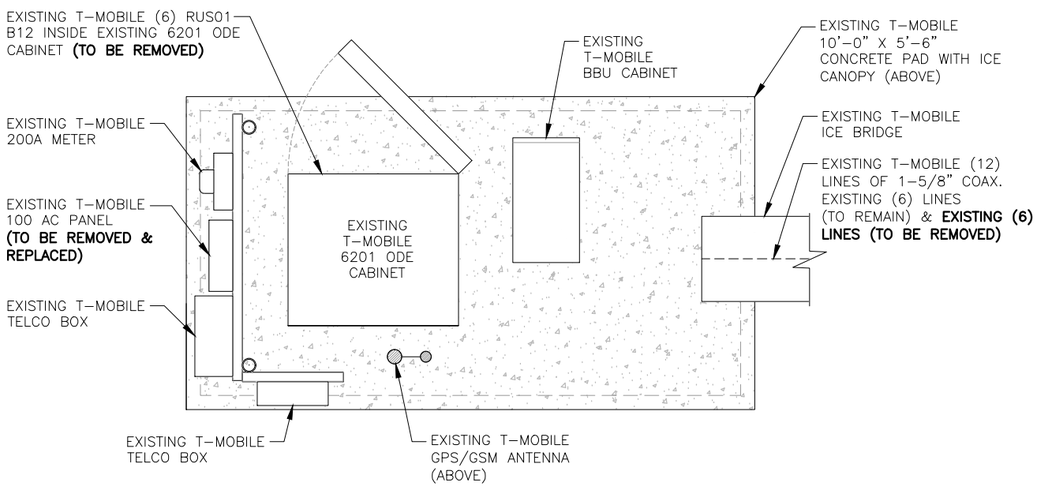
NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



TRUE NORTH
13°76'
MAGNETIC NORTH

COMPOUND PLAN 1 A–1
22x34 SCALE: 1/4"=1'–0"
11x17 SCALE: 1/8"=1'–0"

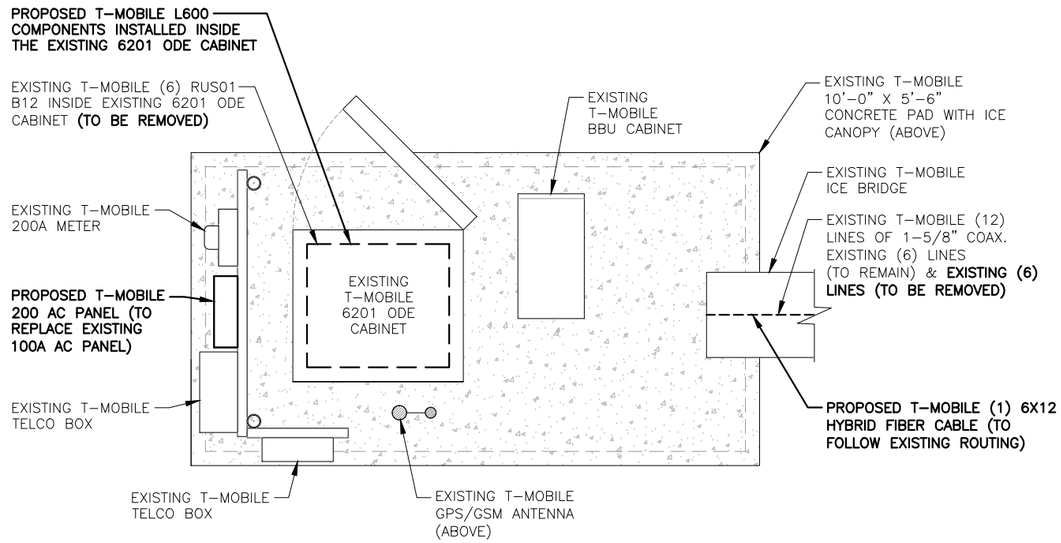
0 2'–0" 4'–0" 8'–0" 12'–0"



TRUE NORTH
13°76'
MAGNETIC NORTH

EXISTING EQUIPMENT PLAN 2 A–1
22x34 SCALE: 3/4"=1'–0"
11x17 SCALE: 3/8"=1'–0"

0 8" 1'–4" 2'–8" 4'–0"



TRUE NORTH
13°76'
MAGNETIC NORTH

PROPOSED EQUIPMENT PLAN 3 A–1
22x34 SCALE: 3/4"=1'–0"
11x17 SCALE: 3/8"=1'–0"

0 8" 1'–4" 2'–8" 4'–0"

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

Daniel P. Hamm

CONSTRUCTION DRAWINGS ARE VALID FOR ONE YEAR AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: RP

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	02/22/21	REVISED FOR CONSTRUCTION	VP
2	02/01/21	ISSUED FOR CONSTRUCTION	VP
1	06/06/19	ISSUED FOR CONSTRUCTION	SG
0	05/15/19	ISSUED FOR REVIEW	VP

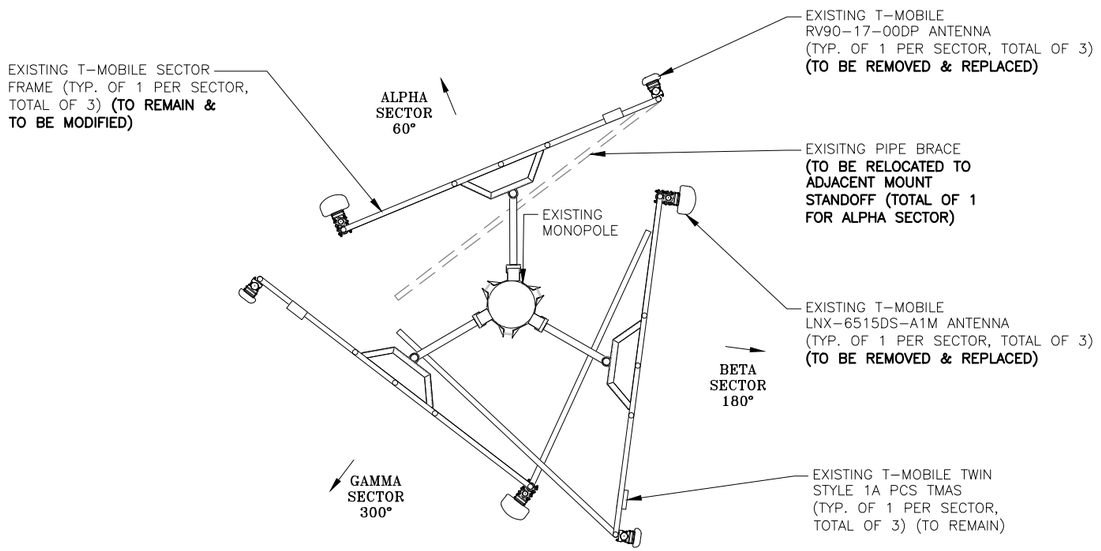
SITE NUMBER:
CT11396B

SITE NAME:
KILLINGLY/I–395/ X93_1

SITE ADDRESS:
79 PUTNAM PIKE
DAYVILLE, CT 06241
WINDHAM COUNTY

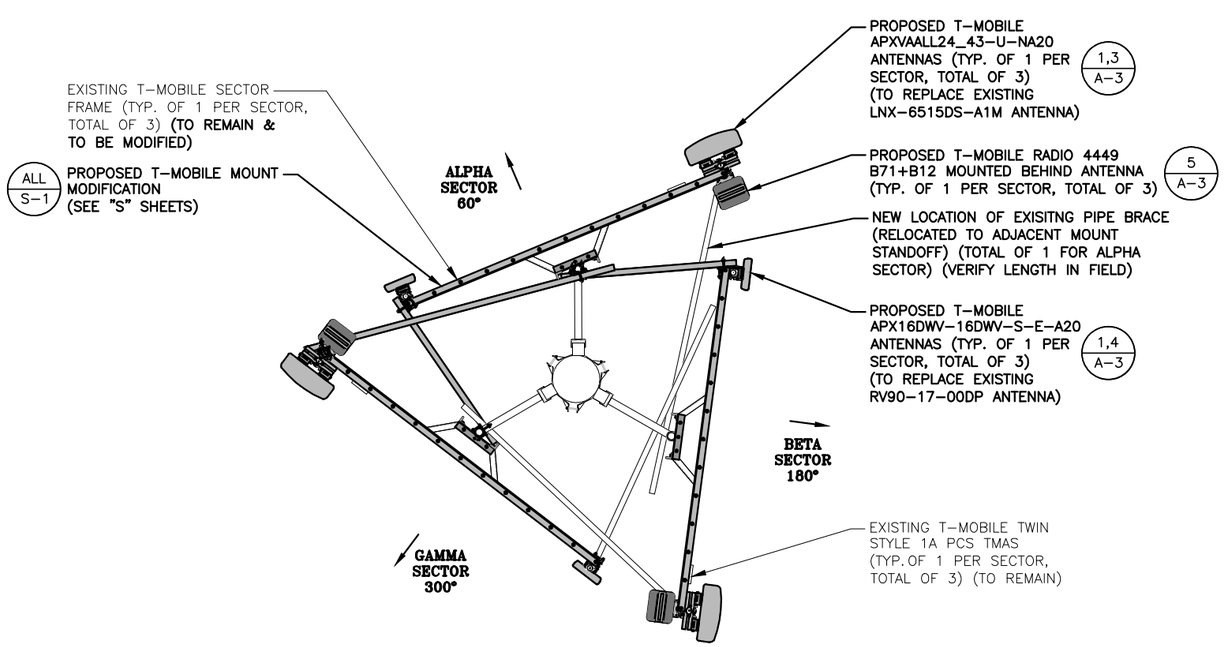
SHEET TITLE
COMPOUND & EQUIPMENT PLANS
(L600)

SHEET NUMBER
A-1



TRUE NORTH
13°76'
MAGNETIC NORTH

EXISTING ANTENNA PLAN 1 / A-2
SCALE: N.T.S

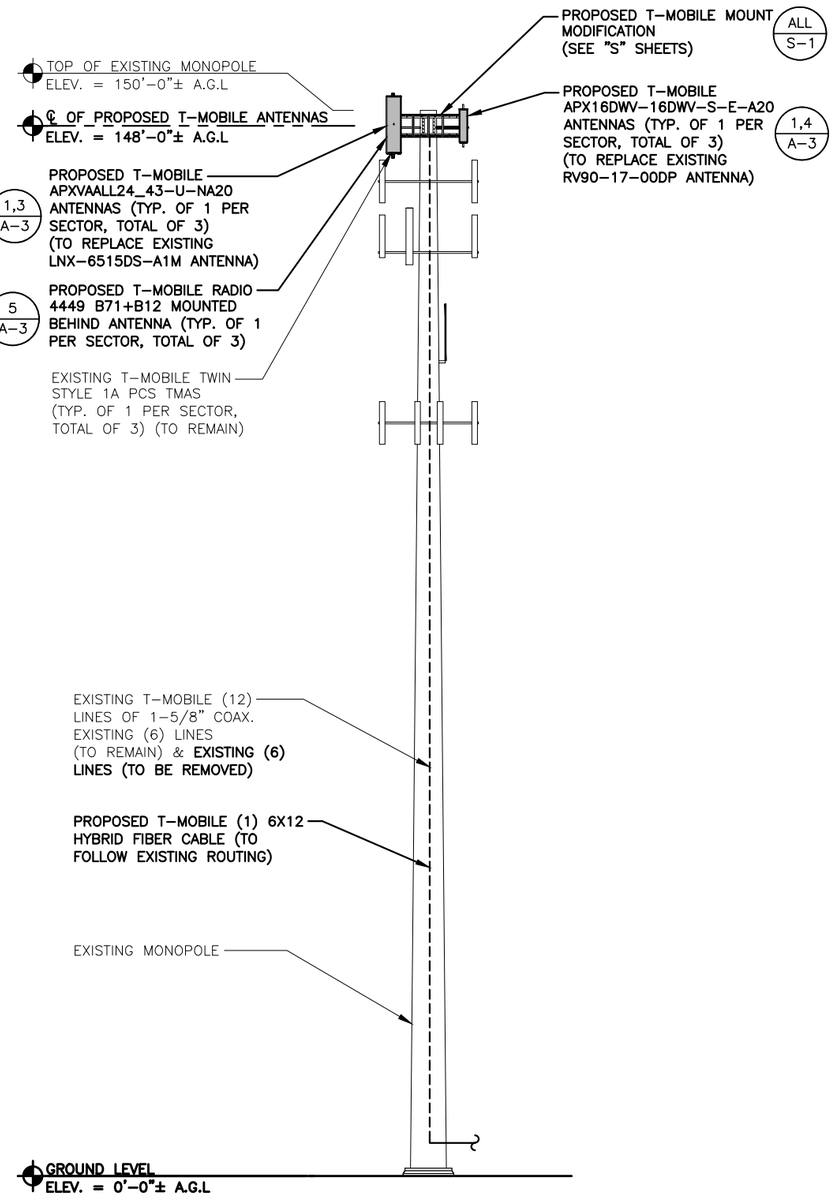


TRUE NORTH
13°76'
MAGNETIC NORTH

PROPOSED ANTENNA PLAN 2 / A-2
SCALE: N.T.S

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENGINEERING, DATED: NOVEMBER 24, 2020 AND MOUNT STRUCTURAL ANALYSIS PROVIDED BY HDG, (REV. 1) DATED: FEBRUARY 22, 2021 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.



ELEVATION 3 / A-2
22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"

0 5'-4" 10'-8" 21'-4" 32'-0"

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

Daniel P. Hamm

CONSTRUCTION DRAWINGS ARE VALID FOR ONE YEAR AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: RP

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	02/22/21	REVISED FOR CONSTRUCTION	VP
2	02/01/21	ISSUED FOR CONSTRUCTION	VP
1	06/06/19	ISSUED FOR CONSTRUCTION	SG
0	05/15/19	ISSUED FOR REVIEW	VP

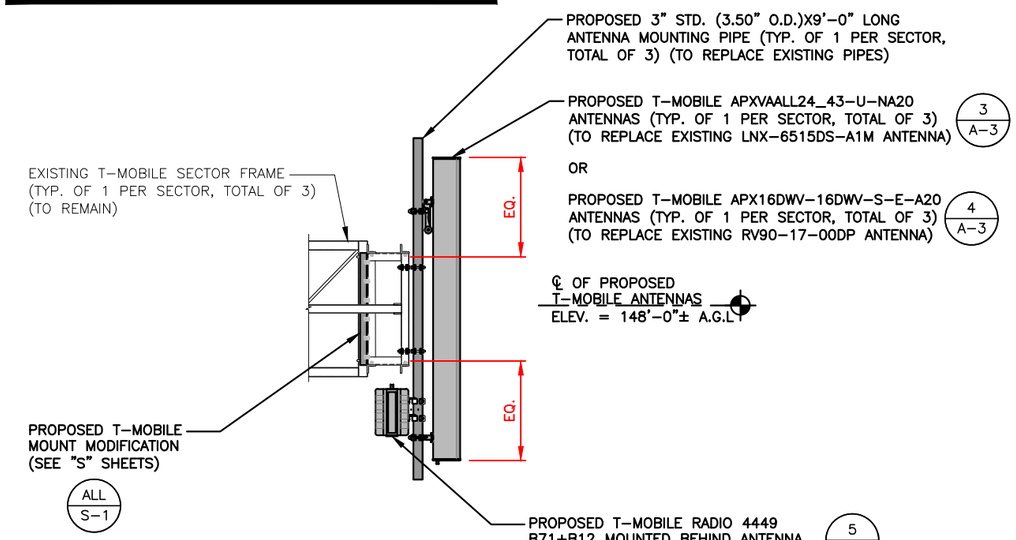
SITE NUMBER:
CT11396B
SITE NAME:
KILLINGLY/I-395/ X93_1
SITE ADDRESS:
79 PUTNAM PIKE
DAYVILLE, CT 06241
WINDHAM COUNTY

SHEET TITLE
ANTENNA LAYOUTS & ELEVATION
(L600)

SHEET NUMBER
A-2

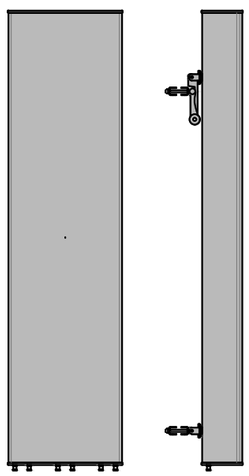
STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENGINEERING, DATED: NOVEMBER 24, 2020 AND MOUNT STRUCTURAL ANALYSIS PROVIDED BY HDG, (REV. 1) DATED: FEBRUARY 22, 2021 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



PROPOSED ANTENNA MOUNTING DETAIL (TYPICAL) 1 A-3
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

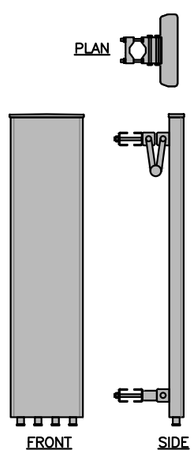


L600+L700 ANTENNA DETAIL 3 A-3
SCALE: N.T.S

L600+L700 ANTENNA DIMENSIONS	
MODEL #	**APXVAALL24_43-U-NA20 (OCTA)**
MANUF.	RFS
HEIGHT	95.9"
WIDTH	24"
DEPTH	8.5"
WEIGHT	122.8 LBS

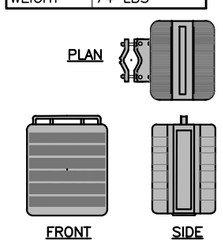
T-MOBILE ELEVATION PHOTO DETAIL 2 A-3
SCALE: N.T.S

L19+G19 ANTENNA DIMENSIONS	
MODEL #	**APX16DWV-16DWV-S-E-A20**
MANUF.	RFS
HEIGHT	55.9"
WIDTH	13"
DEPTH	3.15"
WEIGHT	40.7 LBS



L19+G19 ANTENNA DETAIL 4 A-3
SCALE: N.T.S

RADIO DIMENSIONS	
MODEL #	**RADIO 4449 B71+B12 (WITH FILTER)**
MANUF.	ERICSSON
HEIGHT	14.9"
WIDTH	13.1"
DEPTH	9.2"
WEIGHT	74 LBS



RADIO DETAIL 5 A-3
SCALE: N.T.S

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR ONE YEAR AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: RP

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	02/22/21	REVISED FOR CONSTRUCTION	VP
2	02/01/21	ISSUED FOR CONSTRUCTION	VP
1	06/06/19	ISSUED FOR CONSTRUCTION	SG
0	05/15/19	ISSUED FOR REVIEW	VP

SITE NUMBER:
CT11396B
SITE NAME:
KILLINGLY/I-395/ X93_1
SITE ADDRESS:
79 PUTNAM PIKE
DAYVILLE, CT 06241
WINDHAM COUNTY

SHEET TITLE
DETAILS
(L600)

SHEET NUMBER
A-3

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-G STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND DI.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
12. UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
15. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
16. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
17. ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
19. SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

SPECIAL INSPECTION CHECKLIST

BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
N/A	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
N/A	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTES:

1. REQUIRED FOR ANY NEW SHOP FABRICATED FRP OR STEEL.
2. PROVIDED BY MANUFACTURER, REQUIRED IF HIGH STRENGTH BOLTS OR STEEL.
3. PROVIDED BY GENERAL CONTRACTOR; PROOF OF MATERIALS.
4. HIGH WIND ZONE INSPECTION CATB 120MPH OR CAT C,D 110MPH INSPECT FRAMING OF WALLS, ANCHORING, FASTENING SCHEDULE.
5. ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY B WITH INSTALLATIONS INTO DRY HOLES DRILLED USING A CARBIDE BIT INTO CRACKED CONCRETE THAT HAS CURED FOR AT LEAST 21 DAYS. ADHESIVE ANCHORS REQUIRING CERTIFIED INSTALLATIONS SHALL BE INSTALLED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER PER ACI 318-11 D.9.2.2. INSTALLATIONS REQUIRING CERTIFIED INSTALLERS SHALL BE INSPECTED PER ACI 318-11 D.8.2.4.
6. AS REQUIRED; FOR ANY FIELD CHANGES TO THE ITEMS IN THIS TABLE.

NOTES:

1. ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4"ø A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
2. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.
3. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED PRIOR TO STEEL FABRICATION.
4. VERIFICATION OF EXISTING ROOF CONSTRUCTION IS REQUIRED PRIOR TO THE INSTALLATION OF THE ROOF PLATFORM. ENGINEER OF RECORD IS TO APPROVE EXISTING CONDITIONS IN ORDER TO MOVE FORWARD.
5. CENTERLINE OF PROPOSED STEEL PLATFORM SUPPORT COLUMNS TO BE CENTRALLY LOCATED OVER THE EXISTING BUILDING COLUMNS.
6. EXISTING BRICK MASONRY COLUMNS/BEARING TO BE REPAIRED/REPLACED AT ALL PROPOSED PLATFORM SUPPORT POINTS. ENGINEER OF RECORD TO REVIEW AND APPROVE.

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless

TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

HDG HUDSON Design Group LLC

45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

Daniel P. Hamm

CONSTRUCTION DRAWINGS ARE VALID FOR ONE YEAR AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: RP

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	02/22/21	REVISED FOR CONSTRUCTION	VP
2	02/01/21	ISSUED FOR CONSTRUCTION	VP
1	06/06/19	ISSUED FOR CONSTRUCTION	SG
0	05/15/19	ISSUED FOR REVIEW	VP

SITE NUMBER:
CT11396B

SITE NAME:
KILLINGLY/I-395/ X93_1

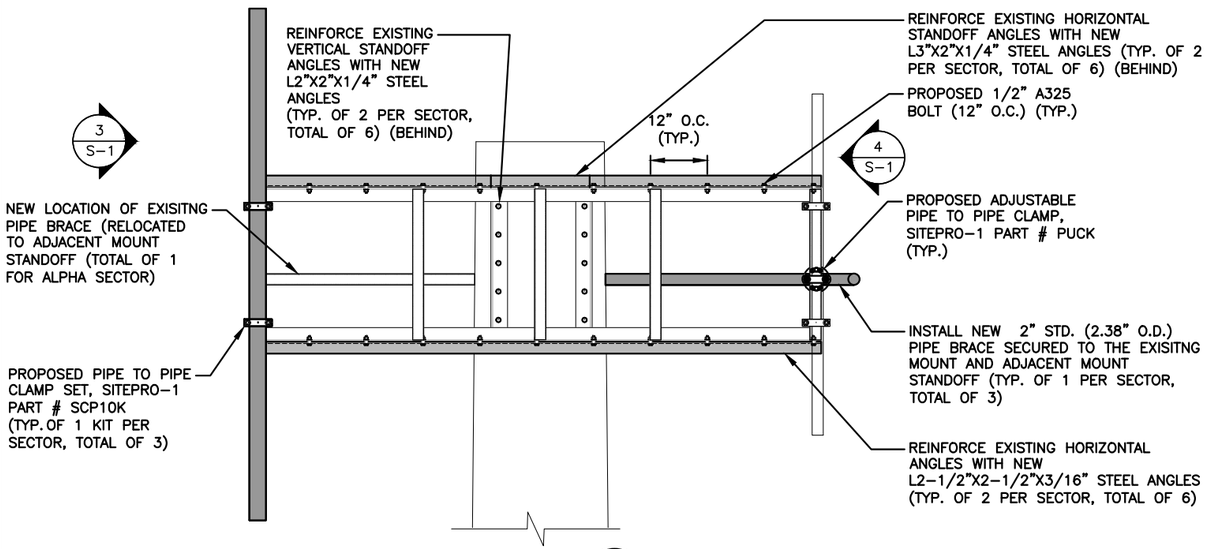
SITE ADDRESS:
79 PUTNAM PIKE
DAYVILLE, CT 06241
WINDHAM COUNTY

SHEET TITLE
SPECIAL INSPECTIONS NOTES
(L600)

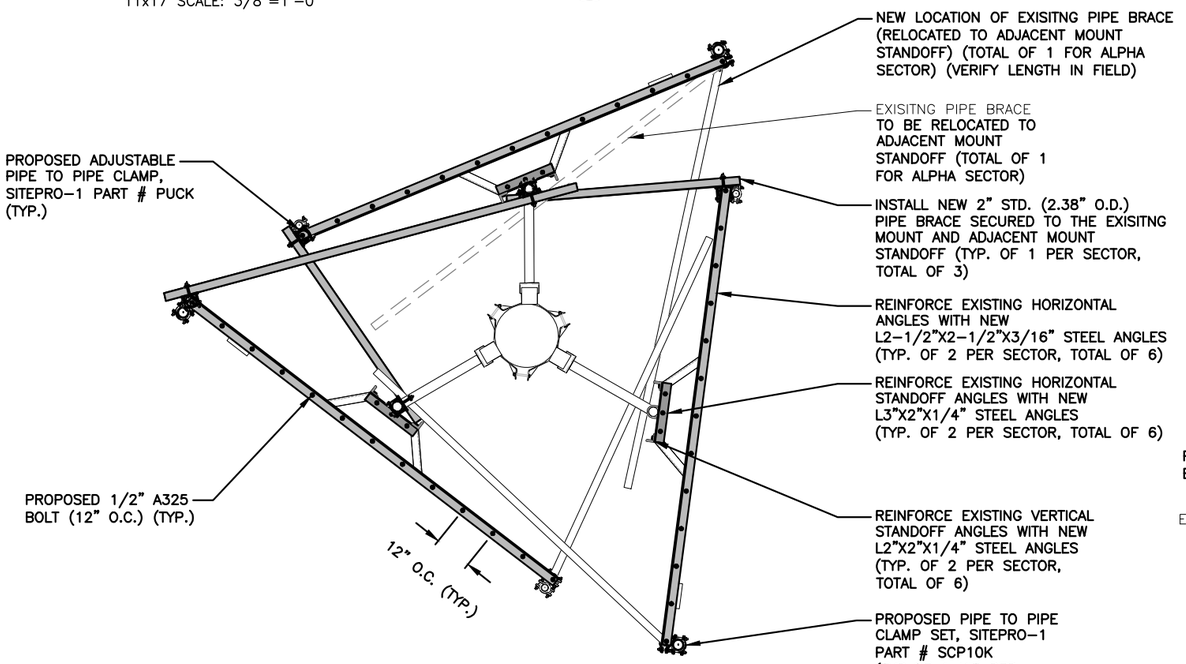
SHEET NUMBER
SN-1

STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENGINEERING, DATED: NOVEMBER 24, 2020 AND MOUNT STRUCTURAL ANALYSIS PROVIDED BY HDG, (REV. 1) DATED: FEBRUARY 22, 2021 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

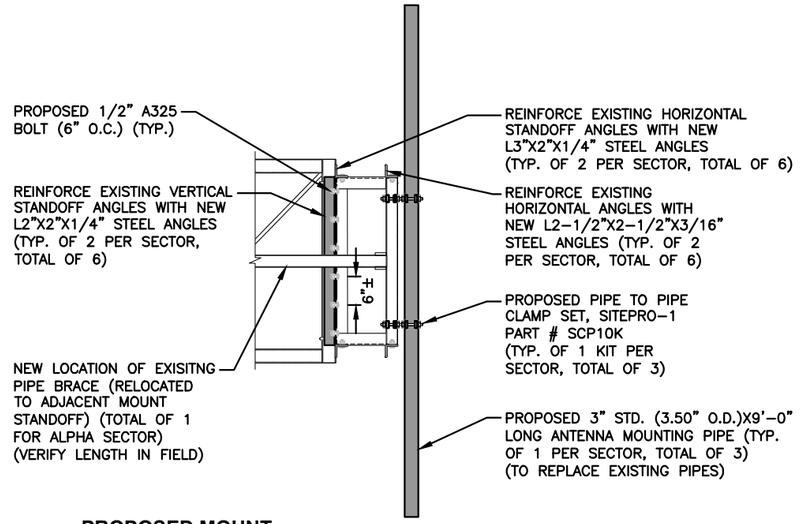


PROPOSED REINFORCEMENT FACE DETAIL 1 S-1
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"

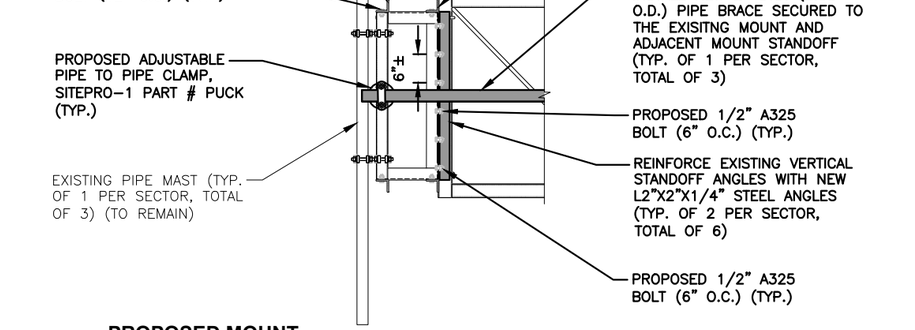


TRUE NORTH
13°76'
MAGNETIC NORTH

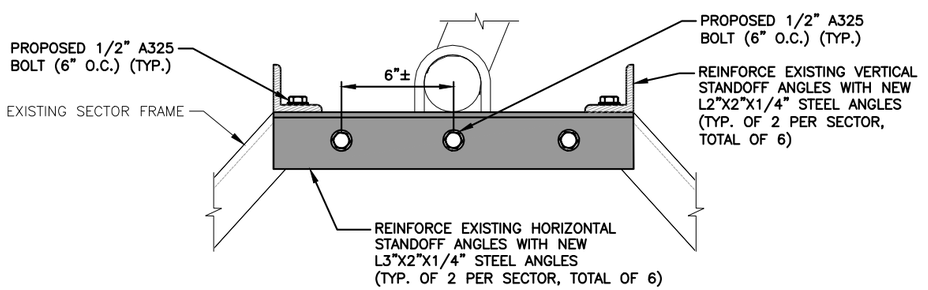
PROPOSED MOUNT MODIFICATION PLAN 2 S-1
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"
0 1'-0" 2'-0" 4'-0" 6'-0"



PROPOSED MOUNT MODIFICATION ELEVATION 3 S-1
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"



PROPOSED MOUNT MODIFICATION ELEVATION 4 S-1
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"



CONNECTION DETAIL 5 S-1
22x34 SCALE: 3"=1'-0"
11x17 SCALE: 1-1/2"=1'-0"
0 0'-2" 0'-4" 0'-8" 1'-0"

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER
CONSTRUCTION DRAWINGS ARE VALID FOR ONE YEAR AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: RP

APPROVED BY: DPH

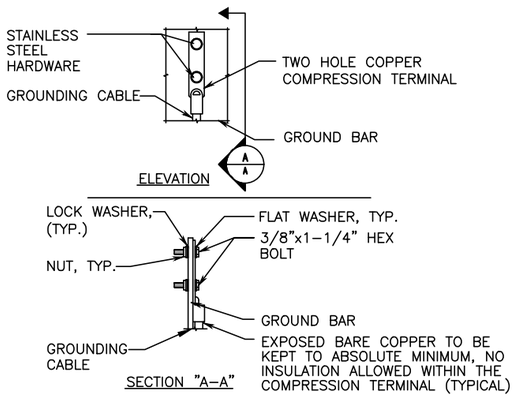
SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	02/22/21	REVISED FOR CONSTRUCTION	VP
2	02/01/21	ISSUED FOR CONSTRUCTION	VP
1	06/06/19	ISSUED FOR CONSTRUCTION	SG
0	05/15/19	ISSUED FOR REVIEW	VP

SITE NUMBER:
CT11396B
SITE NAME:
KILLINGLY/I-395/X93_1
SITE ADDRESS:
79 PUTNAM PIKE
DAYVILLE, CT 06241
WINDHAM COUNTY

SHEET TITLE
STRUCTURAL MODIFICATION DETAILS
(L600)

SHEET NUMBER
S-1

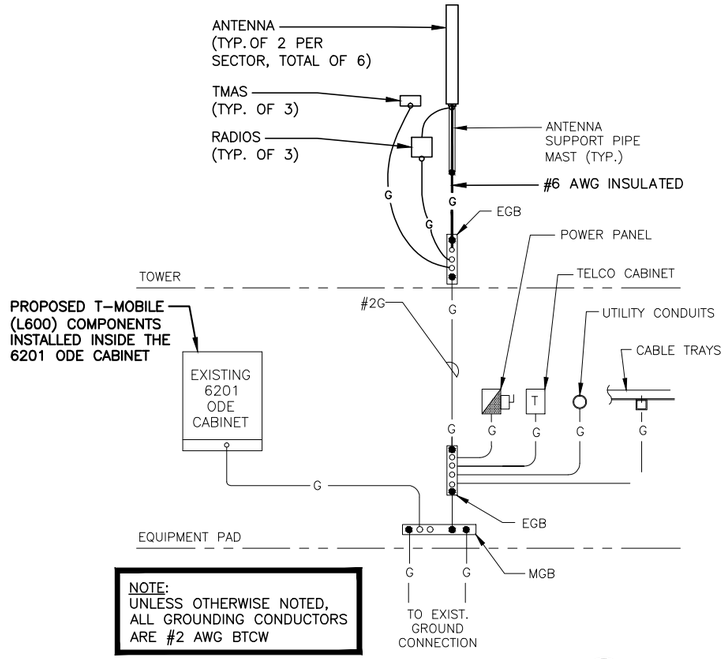


NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER AGB/EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL

1 / E-1

SCALE: N.T.S

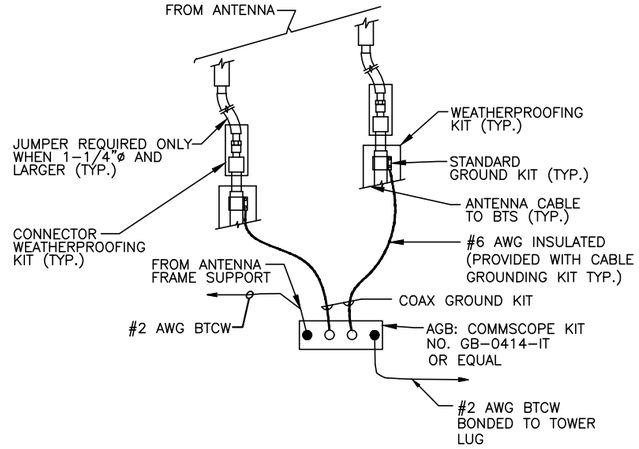


NOTE:
UNLESS OTHERWISE NOTED, ALL GROUNDING CONDUCTORS ARE #2 AWG BTCW

GROUNDING RISER DIAGRAM

2 / E-1

SCALE: N.T.S

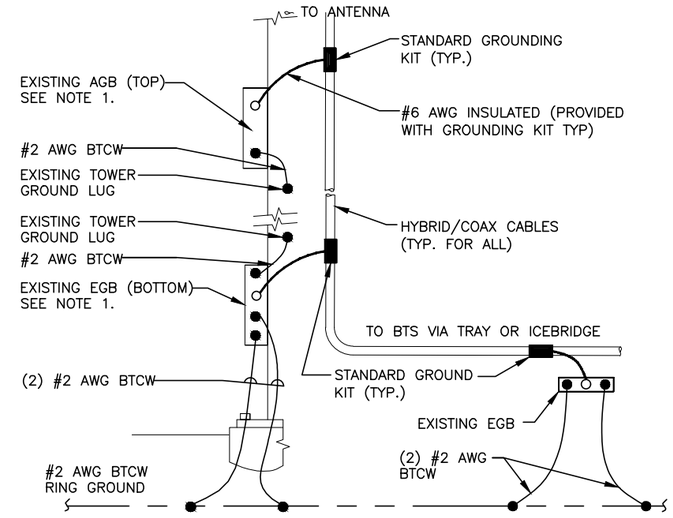


NOTE:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB.

TOWER TOP CABLE GROUNDING DETAIL

3 / E-1

SCALE: N.T.S

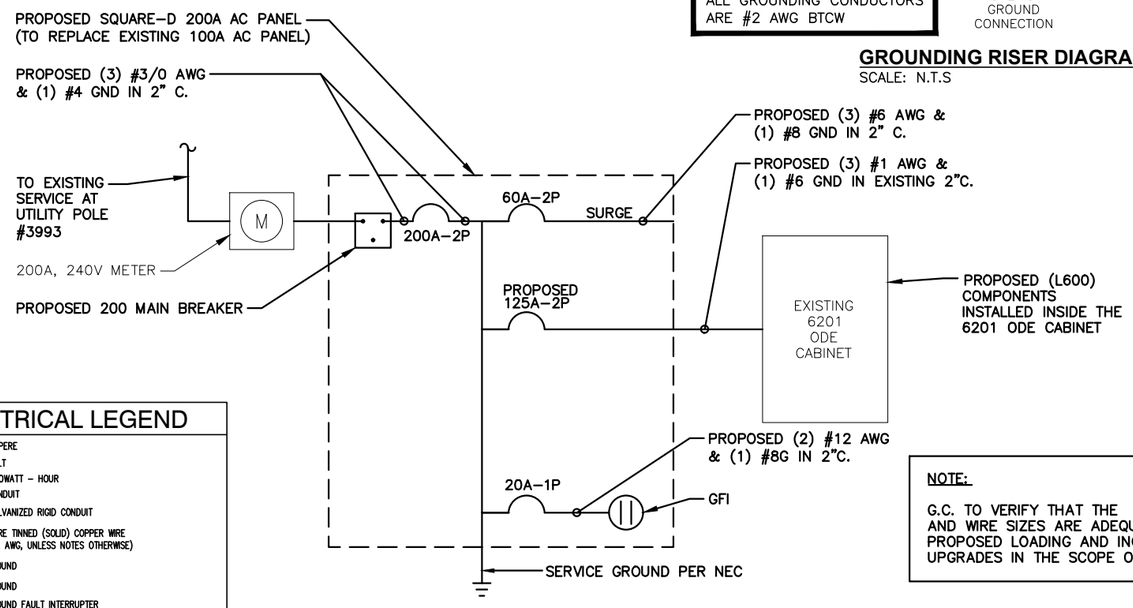


NOTE:
1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER. ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE ADDITIONAL AGB/EGB AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

TOWER BOTTOM CABLE GROUNDING DETAIL

5 / E-1

SCALE: N.T.S



NOTE:

G.C. TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

ONE LINE POWER DIAGRAM

4 / E-1

SCALE: N.T.S

ELECTRICAL LEGEND

A	AMPERE
V	VOLT
KWH	KILOWATT - HOUR
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
BTCW	BARE TINNED (SOLID) COPPER WIRE (#2 AWG, UNLESS NOTES OTHERWISE)
GND	GROUND
	GROUND
GFI	GROUND FAULT INTERRUPTER
H.P	HORSE POWER
MGB	MASTER GROUND BAR — ○ MECHANICAL CONNECTION ● CADWELD CONNECTION
AGB/EGB	EQUIPMENT GROUND BAR/ANTENNA GROUND BAR
G	GROUND COPPER WIRE, SIZE AS NOTED
	EXPOSED WIRING
	INSULATED GROUNDING CONDUCTOR(#6 AWG STRANDED, UNLESS NOTED OTHERWISE)
	5/8"x8' COPPER CLAD STAINLESS STEEL GROUND ROD
	● EXOTHERMIC (CAD WELD) OR ○ MECHANICAL (COMPRESSION TYPE) CONNECTION
NEC	NATIONAL ELECTRIC CODE
ø	PHASE
PPC	POWER PROTECTION CABINET
P	POLE
PVC	POLYVINYL CHLORIDE
UL	UNDERWRITER LABORATORIES
	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

ELECTRICAL & GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-1. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
12. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
13. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
14. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
15. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
16. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN BTS UNIT).
17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
20. BOND ANTENNA EGB'S AND MGB TO WATER MAIN.
21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
22. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
23. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

Daniel P. Hamm

CONSTRUCTION DRAWINGS ARE VALID FOR ONE YEAR AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: RP

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	02/22/21	REVISED FOR CONSTRUCTION	VP
2	02/01/21	ISSUED FOR CONSTRUCTION	VP
1	06/06/19	ISSUED FOR CONSTRUCTION	SG
0	05/15/19	ISSUED FOR REVIEW	VP

SITE NUMBER:
CT11396B

SITE NAME:
KILLINGLY/I-395/ X93_1

SITE ADDRESS:
79 PUTNAM PIKE
DAYVILLE, CT 06241
WINDHAM COUNTY

SHEET TITLE
ONE-LINE DIAGRAM & GROUNDING DETAILS
(L600)

SHEET NUMBER
E-1

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

150-ft Existing Nudd Monopole

Proposed T-Mobile
Antenna Upgrade

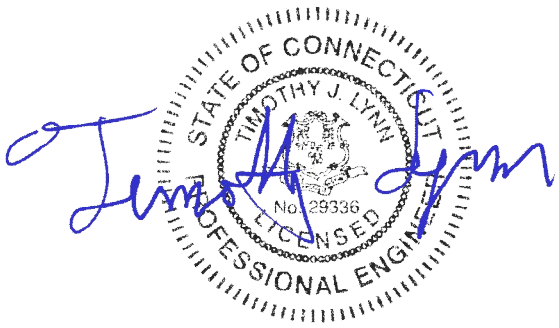
Site Ref: CT11396B

79 Putnam Pike
Dayville, CT

CENTEK Project No. 20148.00

Date: November 24, 2020

Max Stress Ratio = 90.9%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

Table of Contents

SECTION 1 - REPORT

- INTRODUCTION
- ANTENNA AND APPURTENANCE SUMMARY
- PRIMARY ASSUMPTIONS USED IN THE ANALYSIS
- ANALYSIS
- TOWER LOADING
- TOWER CAPACITY
- FOUNDATION AND ANCHORS
- CONCLUSION

SECTION 2 – CONDITIONS & SOFTWARE

- STANDARD ENGINEERING CONDITIONS
- GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

SECTION 3 – CALCULATIONS

- tnxTower INPUT/OUTPUT SUMMARY
- tnxTower DETAILED OUTPUT
- ANCHOR BOLT AND BASEPLATE ANALYSIS
- MathCAD CAISSON FOUNDATION ANALYSIS
- L-PILE CAISSON ANALYSIS
- L-PILE LATERAL DEFLECTION vs. DEPTH
- L-PILE BENDING MOMENT vs. DEPTH
- L-PILE SHEAR FORCE vs. DEPTH

SECTION 4 – REFERENCE MATERIAL

- RF DATA SHEET

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by T-Mobile on the existing monopole (tower) located in Dayville, Connecticut.

The host tower is a 150-ft tall, five-section, twelve sided, tapered monopole, originally designed and manufactured by Fred A. Nudd; dated July 24, 1998. The original manufacturers design documents were unavailable for use in this report. The tower geometry and structure member sizes were obtained from a previous structural report prepared by Centek dated August 8, 2014.

Antenna and appurtenance information were obtained from a previous structural report prepared by Hudson Design Group dated April 21, 2015, a previous structural report prepared by Infinigy dated May 4, 2018 and a T-Mobile RF data sheet.

The tower is made up of five (5) tapered vertical sections consisting of A36M-45 pole sections. The vertical tower sections are slip joint connected. The diameter of the pole (flat-flat) is 27.813-in at the top and 73.813-in at the base.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- TOWN (EXISTING):
  Antennas: Two (2) 4-ft omni-directional antennas mounted on the existing T-Mobile mount with an elevation of 153-ft above grade.
  Coax Cables: Two (2) 7/8" ∅ coax cables running on the inside of the existing tower.
- SPRINT (EXISTING):
  Antennas: Three (3) Commscope NNVV-65B-R4 panel antennas, three (3) RFS APXVTM14 panel antennas, three (3) ALU 1900 MHz RRHs, six (6) ALU 800 MHz RRHs and three (3) ALU TD-RRH-8x20-25 RRHs mounted on three (3) 12-ft T-Frames with a RAD center elevation of 140-ft above grade.
  Coax Cables: Four (4) 1-5/8" ∅ Hybriflex cables running on the inside of the existing tower.
- AT&T (EXISTING):
  Antennas: Three (3) Powerwave 7770.00 panel antennas, six (6) CCI OPA-65R-LCUU-H8 panel antennas, six (6) LGP21401 TMAs, six (6) LGP21901 diplexers, three (3) Ericsson RRUS-11 remote radio heads, three (3) Ericsson RRUS-12 remote radio heads, six (6) Ericsson RRUS-32 remote radio heads, three (3) Ericsson A2 units and three (3) Raycap DC6-48-60-18-8F surge arrestors mounted on an existing low profile platform with a RAD center elevation of 130-ft above grade.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables, one (1) fiber trunk and two (2) DC trunks running on the inside of the existing tower.
- TOWN (EXISTING):
  Antennas: Two (2) 4-ft omni-directional antennas mounted on the two (2) 6-ft side arms with an elevation of 124-ft above grade.
  Coax Cables: Two (2) 1/2" ∅ coax cables running on the inside of the existing tower.

- VERIZON (EXISTING):
  Antennas: Six (6) CSS X7C-FRO-660 panel antennas, six (6) Andrew HBXX-6517DS panel antennas, three (3) RRH2x40-AWS Remote Radio Heads, three (3) RRH2x40-07U Remote Radio Heads, three (3) RRH2x60-PCS Remote Radio Heads and two (2) RFS DB-T1-6Z-8AB-0Z main distribution boxes mounted on an existing low profile platform with a RAD center elevation of 108-ft above grade.
  Coax Cables: Two (2) 1-5/8" ∅ Hybriflex fiber line running on the interior of the monopole.

- T-MOBILE (EXISTING TO REMAIN):
  Antennas: Three (3) TMAs mounted on three (3) 12-ft T-Frames with a RAD center elevation of 150-ft above grade.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on the inside of the existing tower.

- T-MOBILE (EXISTING TO REMOVE):
  Antennas: Three (3) EMS RR90-17-02DP panel antennas and three (3) Andrew LNX-6515DS panel antennas mounted on three (3) 12-ft T-Frames with a RAD center elevation of 150-ft above grade.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on the inside of the existing tower.

- **T-MOBILE (PROPOSED):**
  Antennas: Three (3) RFS APX16DWV-16DWVS panel antennas, three (3) RFS APXVAALL24_43 panel antennas and three (3) Ericsson 4449 remote radio heads mounted on three (3) 12-ft T-Frames (as modified by mount analysis prepared by Hudson Design Group dated May 30, 2019) with a RAD center elevation of 150-ft above grade..
  Coax Cables: One (1) 6x12 fiber cable running on the inside of the existing tower.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.

- All members are assumed to be as specified in the original tower design documents or reinforcement drawings.
- All members are “hot dipped” galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables to be installed as indicated in this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 0.75" radial ice on the tower structure and its components.

Basic Wind Speed:	Dayville (Killingly); v = 101 mph	*[Appendix N of the 2018 CT Building Code]*
Load Cases:	Load Case 1; 101 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2018 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 0.75" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2015 International Building Code as amended by the 2018 Connecticut State Building Code (CSBC).

Tower Capacity

- Calculated stresses were found to be within allowable limits. This tower was found to be at **90.9%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L6)	40.00'-51.00'	90.9%	**PASS**

Foundation and Anchors

The existing foundation consists of a 7.5-ft ∅ x 27.75-ft long reinforced concrete caisson. The sub-grade conditions used in the analysis of the existing foundation were obtained from a previous structural analysis report prepared by Malouf Engineering; project no: CT01125M-08V1, dated July 7, 2008. The base of the tower is connected to the foundation by means of (24) 2.00"∅, ASTM A687 anchor bolts embedded the concrete foundation structure.

- The tower base reactions developed from the governing Load Case were used in the verification of the foundation and its anchors:

Location	Vector	Proposed Reactions
Base	Shear	57 kips
	Compression	62 kips
	Moment	5560 kip-ft

- The foundation was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading	Result
Reinforced Concrete Caisson	Moment Capacity	62.5%	**PASS**
	Lateral Deflection	0.37 in.(1)	**PASS**

(1) Lateral deflection limited to 0.75 in under service load combination per TIA-222-G section 9.5.

- The anchor bolts and base plate were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	52.9%	**PASS**
Base Plate	Bending	79.9%	**PASS**

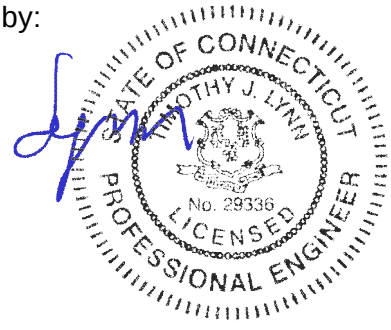
Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by T-Mobile. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

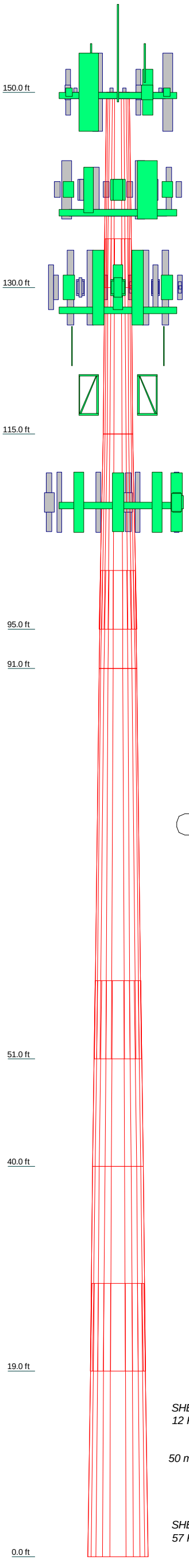
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	20.000	12	0.250	5.000	27.813	34.313	A36M-45	1.7
2	20.000	12	0.250		32.188	36.688		1.9
3	20.000	12	0.313	6.000	36.688	45.188		2.8
4	10.000	12	0.313		42.013	45.813		1.5
5	40.000	12	0.375	8.000	45.813	58.875		8.5
6	19.000	12	0.375		55.513	61.688		4.5
7	21.000	12	0.438	9.000	61.688	68.500		6.5
8	28.000	12	0.438		64.705	73.813		9.2
								36.7



ALL REACTIONS ARE FACTORED

AXIAL 99 K
SHEAR 12 K
MOMENT 1262 kip-ft
TORQUE 2 kip-ft
50 mph WIND - 0.750 in ICE

AXIAL 62 K
SHEAR 57 K
MOMENT 5560 kip-ft
TORQUE 8 kip-ft
REACTIONS - 101 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
4' x 3" DIA Omni	153	(2) LPG21401 TMA (AT⌶)	130
4' x 3" DIA Omni	153	(2) LPG21401 TMA (AT⌶)	130
Lightning Rod 3/4"x8'	150	(2) LPG21401 TMA (AT⌶)	130
APX16DWV-16DWVS-E-A20 (T-Mobile - Proposed)	150	(2) LGP21901 Diplexer (AT⌶)	130
		(2) LGP21901 Diplexer (AT⌶)	130
APXVAALL24-43 (T-Mobile - Proposed)	150	(2) LGP21901 Diplexer (AT⌶)	130
APX16DWV-16DWVS-E-A20 (T-Mobile - Proposed)	150	RRUS-11 (AT⌶)	130
		RRUS-11 (AT⌶)	130
APXVAALL24-43 (T-Mobile - Proposed)	150	RRUS-11 (AT⌶)	130
APX16DWV-16DWVS-E-A20 (T-Mobile - Proposed)	150	RRUS-12 (AT⌶)	130
		RRUS-12 (AT⌶)	130
APXVAALL24-43 (T-Mobile - Proposed)	150	RRUS-12 (AT⌶)	130
4449 B5/B12 (T-Mobile - Proposed)	150	(2) RRUS-32 (AT⌶)	130
4449 B5/B12 (T-Mobile - Proposed)	150	(2) RRUS-32 (AT⌶)	130
4449 B5/B12 (T-Mobile - Proposed)	150	(2) RRUS-32 (AT⌶)	130
(2) TMA 10"x8"x3" (T-Mobile - Existing)	150	A2 (AT⌶)	130
(2) TMA 10"x8"x3" (T-Mobile - Existing)	150	A2 (AT⌶)	130
(2) TMA 10"x8"x3" (T-Mobile - Existing)	150	A2 (AT⌶)	130
Pirod 12' T-Frame Sector Mount (1) (T-Mobile - Existing)	150	DC6-48-60-18-8F Surge Arrestor (AT⌶)	130
		DC6-48-60-18-8F Surge Arrestor (AT⌶)	130
Pirod 12' T-Frame Sector Mount (1) (T-Mobile - Existing)	150	DC6-48-60-18-8F Surge Arrestor (AT⌶)	130
		Valmont 13' Low Profile Platform (AT⌶)	128
NNVV-65B-R4 (Sprint)	140	4' x 3" DIA Omni	124
APXVTM14 (Sprint)	140	4' x 3" DIA Omni	124
NNVV-65B-R4 (Sprint)	140	Pirod 6' Side Mount Standoff (1)	119
APXVTM14 (Sprint)	140	Pirod 6' Side Mount Standoff (1)	119
NNVV-65B-R4 (Sprint)	140	2-ft Stand Off	119
APXVTM14 (Sprint)	140	X7C-FRO-660 (Verizon)	108
TD-RRH8x20-25 (Sprint)	140	HBXX-6517DS (Verizon)	108
TD-RRH8x20-25 (Sprint)	140	X7C-FRO-660 (Verizon)	108
TD-RRH8x20-25 (Sprint)	140	HBXX-6517DS (Verizon)	108
FD-RRH 4x45 1900 (Sprint)	140	X7C-FRO-660 (Verizon)	108
FD-RRH 4x45 1900 (Sprint)	140	HBXX-6517DS (Verizon)	108
FD-RRH 4x45 1900 (Sprint)	140	X7C-FRO-660 (Verizon)	108
(2) FD-RRH 2x50 800 (Sprint)	140	HBXX-6517DS (Verizon)	108
(2) FD-RRH 2x50 800 (Sprint)	140	X7C-FRO-660 (Verizon)	108
(2) FD-RRH 2x50 800 (Sprint)	140	HBXX-6517DS (Verizon)	108
Pirod 12' T-Frame Sector Mount (1) (Sprint)	138	RRH2x40-07-U (Verizon)	108
Pirod 12' T-Frame Sector Mount (1) (Sprint)	138	RRH2x40-07-U (Verizon)	108
Pirod 12' T-Frame Sector Mount (1) (Sprint)	138	RRH2x40-07-U (Verizon)	108
7770.00 (AT⌶)	130	RRH2x40-AWS (Verizon)	108
OPA-65R-LCUU-H8 (AT⌶)	130	RRH2x40-AWS (Verizon)	108
OPA-65R-LCUU-H8 (AT⌶)	130	RRH2x40-AWS (Verizon)	108
7770.00 (AT⌶)	130	RRH2x60-PCS (Verizon)	108
OPA-65R-LCUU-H8 (AT⌶)	130	RRH2x60-PCS (Verizon)	108
OPA-65R-LCUU-H8 (AT⌶)	130	RRH2x60-PCS (Verizon)	108
7770.00 (AT⌶)	130	DB-T1-6Z-8AB-0Z (Verizon)	108
OPA-65R-LCUU-H8 (AT⌶)	130	DB-T1-6Z-8AB-0Z (Verizon)	108
OPA-65R-LCUU-H8 (AT⌶)	130	Valmont 13' Low Profile Platform (Verizon)	108

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36M-45	45 ksi	60 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. Weld together tower sections have flange connections.
8. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
9. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
10. Welds are fabricated with ER-70S-6 electrodes.
11. TOWER RATING: 90.9%

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job:	***20148.00 - CT11396B***		
Project:	***150ft Nudd Monopole - 79 Putnam Pike Dayville, CT***		
Client: T-Mobile	Drawn by: TJL		App'd:
Code: TIA-222-G	Date: 11/24/20		Scale: NTS
Path: J:\Jobs\20148\00.WI\05_Structural\Tower Analysis\Backup Documentation\ER Files\150' Nudd Monopole _Dayville CT.eri			Dwg No. E-1

Tower Input Data

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

Basic wind speed of 101 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification		Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks		Consider Feed Line Torque
	Always Use Max Kz		Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					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	150.000-130.000	20.000	5.000	12	27.813	34.313	0.250	1.000	A36M-45 (45 ksi)
L2	130.000-115.000	20.000	0.000	12	32.188	36.688	0.250	1.000	A36M-45 (45 ksi)
L3	115.000-95.000	20.000	6.000	12	36.688	45.188	0.313	1.250	A36M-45 (45 ksi)
L4	95.000-91.000	10.000	0.000	12	42.013	45.813	0.313	1.250	A36M-45 (45 ksi)
L5	91.000-51.000	40.000	8.000	12	45.813	58.875	0.375	1.500	A36M-45 (45 ksi)
L6	51.000-40.000	19.000	0.000	12	55.513	61.688	0.375	1.500	A36M-45 (45 ksi)
L7	40.000-19.000	21.000	9.000	12	61.688	68.500	0.438	1.750	A36M-45 (45 ksi)
L8	19.000-0.000	28.000		12	64.705	73.813	0.438	1.750	A36M-45 (45 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	28.705	22.188	2151.482	9.867	14.407	149.337	4359.485	10.920	6.784	27.135
	35.435	27.420	4060.798	12.194	17.774	228.470	8228.278	13.495	8.526	34.103
L2	34.399	25.710	3347.223	11.434	16.673	200.756	6782.380	12.654	7.956	31.825
	37.894	29.332	4970.814	13.045	19.004	261.565	10072.218	14.436	9.162	36.649
L3	37.871	36.602	6181.599	13.022	19.004	325.277	12525.596	18.015	8.995	28.783
	46.671	45.155	11606.606	16.065	23.407	495.858	23518.130	22.224	11.273	36.073
L4	45.745	41.961	9313.223	14.929	21.762	427.949	18871.115	20.652	10.422	33.35
	47.318	45.784	12098.347	16.289	23.731	509.815	24514.531	22.534	11.440	36.609
L5	47.296	54.866	14458.271	16.267	23.731	609.260	29296.378	27.003	11.273	30.061
	60.820	70.639	30856.075	20.943	30.497	1011.766	62522.774	34.766	14.774	39.396
L6	60.030	66.579	25835.347	19.739	28.755	898.450	52349.418	32.768	13.872	36.993
	63.731	74.035	35523.861	21.950	31.954	1111.714	71980.974	36.438	15.527	41.406
L7	63.709	86.286	41317.892	21.927	31.954	1293.038	83721.251	42.467	15.360	35.108
	70.762	95.883	56694.845	24.366	35.483	1597.803	114879.126	47.191	17.186	39.281
L8	69.864	90.537	47731.088	23.008	33.517	1424.070	96716.126	44.560	16.169	36.957
	76.262	103.367	71033.665	26.268	38.235	1857.824	143933.463	50.874	18.609	42.535

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 150.000-130.000				1	1	1			
L2 130.000-115.000				1	1	1			
L3 115.000-95.000				1	1	1			
L4 95.000-91.000				1	1	1			

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
L5 91.000-51.000				1	1	1			
L6 51.000-40.000				1	1	1			
L7 40.000-19.000				1	1	1			
L8 19.000-0.000				1	1	1			

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
7/8	C	No	Yes	Inside Pole	150.000 - 7.000	2	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
1 5/8 (T-Mobile - Existing)	C	No	Yes	Inside Pole	149.000 - 7.000	6	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
HYBRIFLEX 1-1/4" (Sprint)	C	No	Yes	Inside Pole	138.000 - 7.000	4	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
1 5/8 (AT&T)	C	No	Yes	Inside Pole	130.000 - 7.000	12	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
Fiber Trunk (AT&T)	C	No	Yes	Inside Pole	130.000 - 7.000	1	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
DC Trunk (AT&T)	C	No	Yes	Inside Pole	130.000 - 7.000	2	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
1/2	C	No	Yes	Inside Pole	120.000 - 7.000	2	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
HYBRIFLEX 1-5/8" (Verizon)	C	No	Yes	Inside Pole	108.000 - 7.000	2	No Ice	0.000	0.002
							1/2" Ice	0.000	0.002
							1" Ice	0.000	0.002
HYBRIFLEX 1-5/8" (T-Mobile - Proposed)	C	No	Yes	Inside Pole	149.000 - 7.000	1	No Ice	0.000	0.002
							1/2" Ice	0.000	0.002
							1" Ice	0.000	0.002

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	150.000-130.000	A	0.000	0.000	0.000	0.000	0.000

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
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.218
L2	130.000-115.000	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	0.000	0.424
L3	115.000-95.000	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	0.000	0.622
L4	95.000-91.000	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	0.000	0.130
L5	91.000-51.000	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	0.000	1.297
L6	51.000-40.000	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	0.000	0.357
L7	40.000-19.000	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	0.000	0.681
L8	19.000-0.000	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	0.000	0.389

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	150.000-130.000	A	1.733	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	0.000	0.218
L2	130.000-115.000	A	1.710	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	0.000	0.424
L3	115.000-95.000	A	1.684	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	0.000	0.622
L4	95.000-91.000	A	1.664	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	0.000	0.130
L5	91.000-51.000	A	1.618	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	0.000	1.297
L6	51.000-40.000	A	1.549	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	0.000	0.357
L7	40.000-19.000	A	1.482	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	0.000	0.681
L8	19.000-0.000	A	1.322	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	0.000	0.389

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 3/4"x8'	C	From Face	3.500	0.000	150.000	No Ice	0.600	0.600	0.014
			0.000			1/2" Ice	1.415	1.415	0.020
			4.000			1" Ice	2.246	2.246	0.031
4' x 3" DIA Omni	C	From Leg	2.000	0.000	153.000	No Ice	1.000	1.000	0.015
			0.000			1/2" Ice	1.248	1.248	0.024
			0.000			1" Ice	1.505	1.505	0.036
4' x 3" DIA Omni	B	From Leg	2.000	0.000	153.000	No Ice	1.000	1.000	0.015
			0.000			1/2" Ice	1.248	1.248	0.024
			0.000			1" Ice	1.505	1.505	0.036
APX16DWV-16DWVS-E-A20	A	From Face	3.000	0.000	150.000	No Ice	6.460	2.150	0.041
			-3.000			1/2" Ice	6.833	2.490	0.074
(T-Mobile - Proposed)			0.000			1" Ice	7.214	2.837	0.112
APXVAALL24-43	A	From Face	3.000	0.000	150.000	No Ice	20.243	8.889	0.153
(T-Mobile - Proposed)			3.000			1/2" Ice	20.890	9.487	0.266
			0.000			1" Ice	21.544	10.092	0.387
APX16DWV-16DWVS-E-A20	B	From Face	3.000	0.000	150.000	No Ice	6.460	2.150	0.041
			-3.000			1/2" Ice	6.833	2.490	0.074
(T-Mobile - Proposed)			0.000			1" Ice	7.214	2.837	0.112
APXVAALL24-43	B	From Face	3.000	0.000	150.000	No Ice	20.243	8.889	0.153
(T-Mobile - Proposed)			3.000			1/2" Ice	20.890	9.487	0.266
			0.000			1" Ice	21.544	10.092	0.387
APX16DWV-16DWVS-E-A20	C	From Face	3.000	0.000	150.000	No Ice	6.460	2.150	0.041
			-3.000			1/2" Ice	6.833	2.490	0.074
(T-Mobile - Proposed)			0.000			1" Ice	7.214	2.837	0.112
APXVAALL24-43	C	From Face	3.000	0.000	150.000	No Ice	20.243	8.889	0.153
(T-Mobile - Proposed)			3.000			1/2" Ice	20.890	9.487	0.266
			0.000			1" Ice	21.544	10.092	0.387
4449 B5/B12	A	From Face	3.000	0.000	150.000	No Ice	1.968	1.408	0.071
(T-Mobile - Proposed)			-3.000			1/2" Ice	2.144	1.564	0.090
			0.000			1" Ice	2.328	1.727	0.111
4449 B5/B12	B	From Face	3.000	0.000	150.000	No Ice	1.968	1.408	0.071
(T-Mobile - Proposed)			-3.000			1/2" Ice	2.144	1.564	0.090
			0.000			1" Ice	2.328	1.727	0.111
4449 B5/B12	C	From Face	3.000	0.000	150.000	No Ice	1.968	1.408	0.071
(T-Mobile - Proposed)			-3.000			1/2" Ice	2.144	1.564	0.090
			0.000			1" Ice	2.328	1.727	0.111
(2) TMA 10"x8"x3"	A	From Face	1.000	0.000	150.000	No Ice	0.667	0.258	0.015
(T-Mobile - Existing)			0.000			1/2" Ice	0.770	0.331	0.020
			0.000			1" Ice	0.881	0.411	0.027
(2) TMA 10"x8"x3"	B	From Face	1.000	0.000	150.000	No Ice	0.667	0.258	0.015
(T-Mobile - Existing)			0.000			1/2" Ice	0.770	0.331	0.020
			0.000			1" Ice	0.881	0.411	0.027
(2) TMA 10"x8"x3"	C	From Face	1.000	0.000	150.000	No Ice	0.667	0.258	0.015
(T-Mobile - Existing)			0.000			1/2" Ice	0.770	0.331	0.020
			0.000			1" Ice	0.881	0.411	0.027
Pirod 12' T-Frame Sector Mount (1)	A	From Face	1.000	0.000	150.000	No Ice	13.600	13.600	0.465
			0.000			1/2" Ice	18.400	18.400	0.600

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(T-Mobile - Existing)			0.000			1" Ice	23.200	23.200	0.735
Pirod 12' T-Frame Sector	B	From Face	1.000	0.000	150.000	No Ice	13.600	13.600	0.465
Mount (1)			0.000			1/2" Ice	18.400	18.400	0.600
(T-Mobile - Existing)			0.000			1" Ice	23.200	23.200	0.735
Pirod 12' T-Frame Sector	C	From Face	1.000	0.000	150.000	No Ice	13.600	13.600	0.465
Mount (1)			0.000			1/2" Ice	18.400	18.400	0.600
(T-Mobile - Existing)			0.000			1" Ice	23.200	23.200	0.735
NNVV-65B-R4	A	From Face	3.000	0.000	140.000	No Ice	14.612	9.168	0.108
(Sprint)			-3.000			1/2" Ice	15.129	9.634	0.211
			0.000			1" Ice	15.652	10.107	0.320
APXVTM14	A	From Face	3.000	0.000	140.000	No Ice	6.342	3.607	0.056
(Sprint)			3.000			1/2" Ice	6.716	3.967	0.096
			0.000			1" Ice	7.097	4.333	0.140
NNVV-65B-R4	B	From Face	3.000	0.000	140.000	No Ice	14.612	9.168	0.108
(Sprint)			-3.000			1/2" Ice	15.129	9.634	0.211
			0.000			1" Ice	15.652	10.107	0.320
APXVTM14	B	From Face	3.000	0.000	140.000	No Ice	6.342	3.607	0.056
(Sprint)			3.000			1/2" Ice	6.716	3.967	0.096
			0.000			1" Ice	7.097	4.333	0.140
NNVV-65B-R4	C	From Face	3.000	0.000	140.000	No Ice	14.612	9.168	0.108
(Sprint)			-3.000			1/2" Ice	15.129	9.634	0.211
			0.000			1" Ice	15.652	10.107	0.320
APXVTM14	C	From Face	3.000	0.000	140.000	No Ice	6.342	3.607	0.056
(Sprint)			3.000			1/2" Ice	6.716	3.967	0.096
			0.000			1" Ice	7.097	4.333	0.140
TD-RRH8x20-25	A	From Face	3.000	0.000	140.000	No Ice	4.045	1.533	0.070
(Sprint)			0.000			1/2" Ice	4.298	1.712	0.097
			0.000			1" Ice	4.557	1.899	0.128
TD-RRH8x20-25	B	From Face	3.000	0.000	140.000	No Ice	4.045	1.533	0.070
(Sprint)			0.000			1/2" Ice	4.298	1.712	0.097
			0.000			1" Ice	4.557	1.899	0.128
TD-RRH8x20-25	C	From Face	3.000	0.000	140.000	No Ice	4.045	1.533	0.070
(Sprint)			0.000			1/2" Ice	4.298	1.712	0.097
			0.000			1" Ice	4.557	1.899	0.128
FD-RRH 4x45 1900	A	From Face	3.000	0.000	140.000	No Ice	2.319	2.384	0.060
(Sprint)			0.000			1/2" Ice	2.524	2.590	0.084
			0.000			1" Ice	2.736	2.804	0.111
FD-RRH 4x45 1900	B	From Face	3.000	0.000	140.000	No Ice	2.319	2.384	0.060
(Sprint)			0.000			1/2" Ice	2.524	2.590	0.084
			0.000			1" Ice	2.736	2.804	0.111
FD-RRH 4x45 1900	C	From Face	3.000	0.000	140.000	No Ice	2.319	2.384	0.060
(Sprint)			0.000			1/2" Ice	2.524	2.590	0.084
			0.000			1" Ice	2.736	2.804	0.111
(2) FD-RRH 2x50 800	A	From Face	3.000	0.000	140.000	No Ice	2.058	1.932	0.064
(Sprint)			0.000			1/2" Ice	2.240	2.109	0.086
			0.000			1" Ice	2.429	2.293	0.111
(2) FD-RRH 2x50 800	B	From Face	3.000	0.000	140.000	No Ice	2.058	1.932	0.064
(Sprint)			0.000			1/2" Ice	2.240	2.109	0.086
			0.000			1" Ice	2.429	2.293	0.111
(2) FD-RRH 2x50 800	C	From Face	3.000	0.000	140.000	No Ice	2.058	1.932	0.064
(Sprint)			0.000			1/2" Ice	2.240	2.109	0.086
			0.000			1" Ice	2.429	2.293	0.111
Pirod 12' T-Frame Sector	A	From Face	1.000	0.000	138.000	No Ice	13.600	13.600	0.465
Mount (1)			0.000			1/2" Ice	18.400	18.400	0.600
(Sprint)			0.000			1" Ice	23.200	23.200	0.735
Pirod 12' T-Frame Sector	B	From Face	1.000	0.000	138.000	No Ice	13.600	13.600	0.465
Mount (1)			0.000			1/2" Ice	18.400	18.400	0.600

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
(Sprint)			0.000			1" Ice	23.200	23.200	0.735
Pirod 12' T-Frame Sector	C	From Face	1.000	0.000	138.000	No Ice	13.600	13.600	0.465
Mount (1)			0.000			1/2" Ice	18.400	18.400	0.600
(Sprint)			0.000			1" Ice	23.200	23.200	0.735
7770.00	A	From Face	3.000	0.000	130.000	No Ice	5.508	2.928	0.035
(AT&T)			-6.000			1/2" Ice	5.867	3.273	0.068
			0.000			1" Ice	6.233	3.625	0.105
OPA-65R-LCUU-H8	A	From Face	3.000	0.000	130.000	No Ice	12.976	7.516	0.088
(AT&T)			-2.000			1/2" Ice	13.558	8.087	0.162
			0.000			1" Ice	14.147	8.666	0.243
OPA-65R-LCUU-H8	A	From Face	3.000	0.000	130.000	No Ice	12.976	7.516	0.088
(AT&T)			2.000			1/2" Ice	13.558	8.087	0.162
			0.000			1" Ice	14.147	8.666	0.243
7770.00	B	From Face	3.000	0.000	130.000	No Ice	5.508	2.928	0.035
(AT&T)			0.000			1/2" Ice	5.867	3.273	0.068
			0.000			1" Ice	6.233	3.625	0.105
OPA-65R-LCUU-H8	B	From Face	3.000	0.000	130.000	No Ice	12.976	7.516	0.088
(AT&T)			-2.000			1/2" Ice	13.558	8.087	0.162
			0.000			1" Ice	14.147	8.666	0.243
OPA-65R-LCUU-H8	B	From Face	3.000	0.000	130.000	No Ice	12.976	7.516	0.088
(AT&T)			2.000			1/2" Ice	13.558	8.087	0.162
			0.000			1" Ice	14.147	8.666	0.243
7770.00	C	From Face	3.000	0.000	130.000	No Ice	5.508	2.928	0.035
(AT&T)			0.000			1/2" Ice	5.867	3.273	0.068
			0.000			1" Ice	6.233	3.625	0.105
OPA-65R-LCUU-H8	C	From Face	3.000	0.000	130.000	No Ice	12.976	7.516	0.088
(AT&T)			-2.000			1/2" Ice	13.558	8.087	0.162
			0.000			1" Ice	14.147	8.666	0.243
OPA-65R-LCUU-H8	C	From Face	3.000	0.000	130.000	No Ice	12.976	7.516	0.088
(AT&T)			2.000			1/2" Ice	13.558	8.087	0.162
			0.000			1" Ice	14.147	8.666	0.243
(2) LPG21401 TMA	A	From Face	3.000	0.000	130.000	No Ice	0.817	0.346	0.018
(AT&T)			0.000			1/2" Ice	0.937	0.440	0.023
			0.000			1" Ice	1.065	0.540	0.031
(2) LPG21401 TMA	B	From Face	3.000	0.000	130.000	No Ice	0.817	0.346	0.018
(AT&T)			0.000			1/2" Ice	0.937	0.440	0.023
			0.000			1" Ice	1.065	0.540	0.031
(2) LPG21401 TMA	C	From Face	3.000	0.000	130.000	No Ice	0.817	0.346	0.018
(AT&T)			0.000			1/2" Ice	0.937	0.440	0.023
			0.000			1" Ice	1.065	0.540	0.031
(2) LGP21901 Diplexer	A	From Face	3.000	0.000	130.000	No Ice	0.200	0.100	0.006
(AT&T)			0.000			1/2" Ice	0.259	0.143	0.008
			0.000			1" Ice	0.326	0.193	0.011
(2) LGP21901 Diplexer	B	From Face	3.000	0.000	130.000	No Ice	0.200	0.100	0.006
(AT&T)			0.000			1/2" Ice	0.259	0.143	0.008
			0.000			1" Ice	0.326	0.193	0.011
(2) LGP21901 Diplexer	C	From Face	3.000	0.000	130.000	No Ice	0.200	0.100	0.006
(AT&T)			0.000			1/2" Ice	0.259	0.143	0.008
			0.000			1" Ice	0.326	0.193	0.011
RRUS-11	A	From Face	3.000	0.000	130.000	No Ice	2.566	1.068	0.050
(AT&T)			0.000			1/2" Ice	2.765	1.211	0.070
			0.000			1" Ice	2.971	1.361	0.092
RRUS-11	B	From Face	3.000	0.000	130.000	No Ice	2.566	1.068	0.050
(AT&T)			0.000			1/2" Ice	2.765	1.211	0.070
			0.000			1" Ice	2.971	1.361	0.092
RRUS-11	C	From Face	3.000	0.000	130.000	No Ice	2.566	1.068	0.050
(AT&T)			0.000			1/2" Ice	2.765	1.211	0.070

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
			0.000			1" Ice	2.971	1.361	0.092
RRUS-12	A	From Face	3.000	0.000	130.000	No Ice	3.145	1.285	0.058
(AT&T)			0.000			1/2" Ice	3.365	1.438	0.081
			0.000			1" Ice	3.592	1.600	0.108
RRUS-12	B	From Face	3.000	0.000	130.000	No Ice	3.145	1.285	0.058
(AT&T)			0.000			1/2" Ice	3.365	1.438	0.081
			0.000			1" Ice	3.592	1.600	0.108
RRUS-12	C	From Face	3.000	0.000	130.000	No Ice	3.145	1.285	0.058
(AT&T)			0.000			1/2" Ice	3.365	1.438	0.081
			0.000			1" Ice	3.592	1.600	0.108
(2) RRUS-32	A	From Face	3.000	0.000	130.000	No Ice	3.314	2.424	0.077
(AT&T)			0.000			1/2" Ice	3.558	2.638	0.105
			0.000			1" Ice	3.809	2.860	0.136
(2) RRUS-32	B	From Face	3.000	0.000	130.000	No Ice	3.314	2.424	0.077
(AT&T)			0.000			1/2" Ice	3.558	2.638	0.105
			0.000			1" Ice	3.809	2.860	0.136
(2) RRUS-32	C	From Face	3.000	0.000	130.000	No Ice	3.314	2.424	0.077
(AT&T)			0.000			1/2" Ice	3.558	2.638	0.105
			0.000			1" Ice	3.809	2.860	0.136
A2	A	From Face	3.000	0.000	130.000	No Ice	2.077	0.505	0.022
(AT&T)			0.000			1/2" Ice	2.257	0.615	0.035
			0.000			1" Ice	2.443	0.732	0.050
A2	B	From Face	3.000	0.000	130.000	No Ice	2.077	0.505	0.022
(AT&T)			0.000			1/2" Ice	2.257	0.615	0.035
			0.000			1" Ice	2.443	0.732	0.050
A2	C	From Face	3.000	0.000	130.000	No Ice	2.077	0.505	0.022
(AT&T)			0.000			1/2" Ice	2.257	0.615	0.035
			0.000			1" Ice	2.443	0.732	0.050
DC6-48-60-18-8F Surge	A	From Face	3.000	0.000	130.000	No Ice	1.909	1.909	0.020
Arrestor			0.000			1/2" Ice	2.098	2.098	0.039
(AT&T)			0.000			1" Ice	2.294	2.294	0.062
DC6-48-60-18-8F Surge	B	From Face	3.000	0.000	130.000	No Ice	1.909	1.909	0.020
Arrestor			0.000			1/2" Ice	2.098	2.098	0.039
(AT&T)			0.000			1" Ice	2.294	2.294	0.062
DC6-48-60-18-8F Surge	C	From Face	3.000	0.000	130.000	No Ice	1.909	1.909	0.020
Arrestor			0.000			1/2" Ice	2.098	2.098	0.039
(AT&T)			0.000			1" Ice	2.294	2.294	0.062
Valmont 13' Low Profile	C	From Face	1.000	0.000	128.000	No Ice	15.700	15.700	1.300
Platform			0.000			1/2" Ice	20.100	20.100	1.765
(AT&T)			0.000			1" Ice	24.500	24.500	2.230
4' x 3" DIA Omni	C	From Leg	4.000	0.000	124.000	No Ice	1.000	1.000	0.015
			0.000			1/2" Ice	1.248	1.248	0.024
			0.000			1" Ice	1.505	1.505	0.036
4' x 3" DIA Omni	B	From Leg	4.000	0.000	124.000	No Ice	1.000	1.000	0.015
			0.000			1/2" Ice	1.248	1.248	0.024
			0.000			1" Ice	1.505	1.505	0.036
Pirod 6' Side Mount Standoff	C	From Leg	2.000	0.000	119.000	No Ice	4.970	4.970	0.070
(1)			0.000			1/2" Ice	6.120	6.120	0.130
			0.000			1" Ice	7.270	7.270	0.190
Pirod 6' Side Mount Standoff	B	From Leg	2.000	0.000	119.000	No Ice	4.970	4.970	0.070
(1)			0.000			1/2" Ice	6.120	6.120	0.130
			0.000			1" Ice	7.270	7.270	0.190
2-ft Stand Off	A	From Leg	2.000	0.000	119.000	No Ice	1.070	1.070	0.020
			0.000			1/2" Ice	1.620	1.620	0.028
			0.000			1" Ice	2.170	2.170	0.036
X7C-FRO-660	A	From Face	3.000	0.000	108.000	No Ice	9.549	5.867	0.040
(Verizon)			-6.000			1/2" Ice	10.019	6.325	0.100

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
			0.000			1" Ice	10.495	6.790	0.166
HBXX-6517DS	A	From Face	3.000	0.000	108.000	No Ice	8.528	5.243	0.050
(Verizon)			-4.000			1/2" Ice	9.000	5.709	0.100
			0.000			1" Ice	9.480	6.183	0.157
X7C-FRO-660	A	From Face	3.000	0.000	108.000	No Ice	9.549	5.867	0.040
(Verizon)			0.000			1/2" Ice	10.019	6.325	0.100
			0.000			1" Ice	10.495	6.790	0.166
HBXX-6517DS	A	From Face	3.000	0.000	108.000	No Ice	8.528	5.243	0.050
(Verizon)			4.000			1/2" Ice	9.000	5.709	0.100
			0.000			1" Ice	9.480	6.183	0.157
X7C-FRO-660	B	From Face	3.000	0.000	108.000	No Ice	9.549	5.867	0.040
(Verizon)			-6.000			1/2" Ice	10.019	6.325	0.100
			0.000			1" Ice	10.495	6.790	0.166
HBXX-6517DS	B	From Face	3.000	0.000	108.000	No Ice	8.528	5.243	0.050
(Verizon)			-4.000			1/2" Ice	9.000	5.709	0.100
			0.000			1" Ice	9.480	6.183	0.157
X7C-FRO-660	B	From Face	3.000	0.000	108.000	No Ice	9.549	5.867	0.040
(Verizon)			0.000			1/2" Ice	10.019	6.325	0.100
			0.000			1" Ice	10.495	6.790	0.166
HBXX-6517DS	B	From Face	3.000	0.000	108.000	No Ice	8.528	5.243	0.050
(Verizon)			4.000			1/2" Ice	9.000	5.709	0.100
			0.000			1" Ice	9.480	6.183	0.157
X7C-FRO-660	C	From Face	3.000	0.000	108.000	No Ice	9.549	5.867	0.040
(Verizon)			-6.000			1/2" Ice	10.019	6.325	0.100
			0.000			1" Ice	10.495	6.790	0.166
HBXX-6517DS	C	From Face	3.000	0.000	108.000	No Ice	8.528	5.243	0.050
(Verizon)			-4.000			1/2" Ice	9.000	5.709	0.100
			0.000			1" Ice	9.480	6.183	0.157
X7C-FRO-660	C	From Face	3.000	0.000	108.000	No Ice	9.549	5.867	0.040
(Verizon)			0.000			1/2" Ice	10.019	6.325	0.100
			0.000			1" Ice	10.495	6.790	0.166
HBXX-6517DS	C	From Face	3.000	0.000	108.000	No Ice	8.528	5.243	0.050
(Verizon)			4.000			1/2" Ice	9.000	5.709	0.100
			0.000			1" Ice	9.480	6.183	0.157
RRH2x40-07-U	A	From Face	3.000	0.000	108.000	No Ice	1.925	1.052	0.050
(Verizon)			-6.000			1/2" Ice	2.098	1.187	0.067
			0.000			1" Ice	2.278	1.329	0.086
RRH2x40-07-U	B	From Face	3.000	0.000	108.000	No Ice	1.925	1.052	0.050
(Verizon)			-6.000			1/2" Ice	2.098	1.187	0.067
			0.000			1" Ice	2.278	1.329	0.086
RRH2x40-07-U	C	From Face	3.000	0.000	108.000	No Ice	1.925	1.052	0.050
(Verizon)			-6.000			1/2" Ice	2.098	1.187	0.067
			0.000			1" Ice	2.278	1.329	0.086
RRH2x40-AWS	A	From Face	3.000	0.000	108.000	No Ice	2.161	1.420	0.044
(Verizon)			-6.000			1/2" Ice	2.360	1.590	0.061
			0.000			1" Ice	2.565	1.768	0.082
RRH2x40-AWS	B	From Face	3.000	0.000	108.000	No Ice	2.161	1.420	0.044
(Verizon)			-6.000			1/2" Ice	2.360	1.590	0.061
			0.000			1" Ice	2.565	1.768	0.082
RRH2x40-AWS	C	From Face	3.000	0.000	108.000	No Ice	2.161	1.420	0.044
(Verizon)			-6.000			1/2" Ice	2.360	1.590	0.061
			0.000			1" Ice	2.565	1.768	0.082
RRH2x60-PCS	A	From Face	3.000	0.000	108.000	No Ice	2.150	1.346	0.055
(Verizon)			-6.000			1/2" Ice	2.340	1.504	0.073
			0.000			1" Ice	2.537	1.669	0.093
RRH2x60-PCS	B	From Face	3.000	0.000	108.000	No Ice	2.150	1.346	0.055
(Verizon)			-6.000			1/2" Ice	2.340	1.504	0.073

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	2.537	1.669	0.093
RRH2x60-PCS	C	From Face	3.000	0.000	108.000	No Ice	2.150	1.346	0.055
(Verizon)			-6.000			1/2" Ice	2.340	1.504	0.073
			0.000			1" Ice	2.537	1.669	0.093
DB-T1-6Z-8AB-0Z	A	From Face	3.000	0.000	108.000	No Ice	4.800	2.000	0.044
(Verizon)			-6.000			1/2" Ice	5.070	2.193	0.080
			0.000			1" Ice	5.348	2.393	0.120
DB-T1-6Z-8AB-0Z	B	From Face	3.000	0.000	108.000	No Ice	4.800	2.000	0.044
(Verizon)			-6.000			1/2" Ice	5.070	2.193	0.080
			0.000			1" Ice	5.348	2.393	0.120
Valmont 13' Low Profile	C	From Face	2.000	0.000	108.000	No Ice	15.700	15.700	1.300
Platform			0.000			1/2" Ice	20.100	20.100	1.765
(Verizon)			0.000			1" Ice	24.500	24.500	2.230

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	139.651	1.358	0.034	53.450	A	0.000	53.450	53.450	100.00	0.000	0.000
150.000-130.0					B	0.000	53.450		100.00	0.000	0.000
00					C	0.000	53.450		100.00	0.000	0.000
L2	122.379	1.321	0.033	45.183	A	0.000	45.183	45.183	100.00	0.000	0.000
130.000-115.0					B	0.000	45.183		100.00	0.000	0.000
00					C	0.000	45.183		100.00	0.000	0.000
L3	104.654	1.278	0.032	70.452	A	0.000	70.452	70.452	100.00	0.000	0.000
115.000-95.00					B	0.000	70.452		100.00	0.000	0.000
0					C	0.000	70.452		100.00	0.000	0.000
L4	92.989	1.246	0.031	15.511	A	0.000	15.511	15.511	100.00	0.000	0.000
95.000-91.000					B	0.000	15.511		100.00	0.000	0.000
					C	0.000	15.511		100.00	0.000	0.000
L5	70.464	1.176	0.029	180.193	A	0.000	180.193	180.193	100.00	0.000	0.000
91.000-51.000					B	0.000	180.193		100.00	0.000	0.000
					C	0.000	180.193		100.00	0.000	0.000
L6	45.445	1.072	0.027	56.724	A	0.000	56.724	56.724	100.00	0.000	0.000
51.000-40.000					B	0.000	56.724		100.00	0.000	0.000
					C	0.000	56.724		100.00	0.000	0.000
L7	29.317	0.978	0.024	117.662	A	0.000	117.662	117.662	100.00	0.000	0.000
40.000-19.000					B	0.000	117.662		100.00	0.000	0.000
					C	0.000	117.662		100.00	0.000	0.000
L8	9.362	0.85	0.021	115.683	A	0.000	115.683	115.683	100.00	0.000	0.000
19.000-0.000					B	0.000	115.683		100.00	0.000	0.000
					C	0.000	115.683		100.00	0.000	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	139.651	1.358	0.008	1.733	59.226	A	0.000	59.226	59.226	100.00	0.000	0.000
150.000-130.000						B	0.000	59.226		100.00	0.000	0.000
						C	0.000	59.226		100.00	0.000	0.000
L2	122.379	1.321	0.008	1.710	49.515	A	0.000	49.515	49.515	100.00	0.000	0.000
130.000-115.000						B	0.000	49.515		100.00	0.000	0.000
						C	0.000	49.515		100.00	0.000	0.000
L3	104.654	1.278	0.008	1.684	76.064	A	0.000	76.064	76.064	100.00	0.000	0.000
115.000-95.000						B	0.000	76.064		100.00	0.000	0.000
						C	0.000	76.064		100.00	0.000	0.000
L4	92.989	1.246	0.008	1.664	16.633	A	0.000	16.633	16.633	100.00	0.000	0.000
95.000-91.000						B	0.000	16.633		100.00	0.000	0.000
						C	0.000	16.633		100.00	0.000	0.000
L5	70.464	1.176	0.007	1.618	190.981	A	0.000	190.981	190.981	100.00	0.000	0.000
91.000-51.000						B	0.000	190.981		100.00	0.000	0.000
						C	0.000	190.981		100.00	0.000	0.000
L6	45.445	1.072	0.007	1.549	59.691	A	0.000	59.691	59.691	100.00	0.000	0.000
51.000-40.000						B	0.000	59.691		100.00	0.000	0.000
						C	0.000	59.691		100.00	0.000	0.000
L7	29.317	0.978	0.006	1.482	122.851	A	0.000	122.851	122.851	100.00	0.000	0.000
40.000-19.000						B	0.000	122.851		100.00	0.000	0.000
						C	0.000	122.851		100.00	0.000	0.000
L8 19.000-0.000	9.362	0.85	0.005	1.322	120.377	A	0.000	120.377	120.377	100.00	0.000	0.000
						B	0.000	120.377		100.00	0.000	0.000
						C	0.000	120.377		100.00	0.000	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	139.651	1.358	0.011	53.450	A	0.000	53.450	53.450	100.00	0.000	0.000
150.000-130.0					B	0.000	53.450		100.00	0.000	0.000
00					C	0.000	53.450		100.00	0.000	0.000
L2	122.379	1.321	0.010	45.183	A	0.000	45.183	45.183	100.00	0.000	0.000
130.000-115.0					B	0.000	45.183		100.00	0.000	0.000
00					C	0.000	45.183		100.00	0.000	0.000
L3	104.654	1.278	0.010	70.452	A	0.000	70.452	70.452	100.00	0.000	0.000
115.000-95.00					B	0.000	70.452		100.00	0.000	0.000
0					C	0.000	70.452		100.00	0.000	0.000
L4	92.989	1.246	0.010	15.511	A	0.000	15.511	15.511	100.00	0.000	0.000
95.000-91.000					B	0.000	15.511		100.00	0.000	0.000
					C	0.000	15.511		100.00	0.000	0.000
L5	70.464	1.176	0.009	180.193	A	0.000	180.193	180.193	100.00	0.000	0.000
91.000-51.000					B	0.000	180.193		100.00	0.000	0.000
					C	0.000	180.193		100.00	0.000	0.000
L6	45.445	1.072	0.008	56.724	A	0.000	56.724	56.724	100.00	0.000	0.000
51.000-40.000					B	0.000	56.724		100.00	0.000	0.000
					C	0.000	56.724		100.00	0.000	0.000
L7	29.317	0.978	0.008	117.662	A	0.000	117.662	117.662	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
40.000-19.000					B	0.000	117.662		100.00	0.000	0.000
					C	0.000	117.662		100.00	0.000	0.000
L8	9.362	0.85	0.007	115.683	A	0.000	115.683	115.683	100.00	0.000	0.000
19.000-0.000					B	0.000	115.683		100.00	0.000	0.000
					C	0.000	115.683		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	0.218	1.688	A	1	1	0.034	1	1	53.450	1.981	0.099	C
150.000-130.0			B	1	1		1	1	53.450			
00			C	1	1		1	1	53.450			
L2	0.424	1.873	A	1	1	0.033	1	1	45.183	1.628	0.109	C
130.000-115.0			B	1	1		1	1	45.183			
00			C	1	1		1	1	45.183			
L3	0.622	2.782	A	1	1	0.032	1	1	70.452	2.457	0.123	C
115.000-95.00			B	1	1		1	1	70.452			
0			C	1	1		1	1	70.452			
L4	0.130	1.493	A	1	1	0.031	1	1	15.511	0.528	0.132	C
95.000-91.000			B	1	1		1	1	15.511			
			C	1	1		1	1	15.511			
L5	1.297	8.541	A	1	1	0.029	1	1	180.193	5.767	0.144	C
91.000-51.000			B	1	1		1	1	180.193			
			C	1	1		1	1	180.193			
L6	0.357	4.546	A	1	1	0.027	1	1	56.724	1.659	0.151	C
51.000-40.000			B	1	1		1	1	56.724			
			C	1	1		1	1	56.724			
L7	0.681	6.509	A	1	1	0.024	1	1	117.662	3.139	0.149	C
40.000-19.000			B	1	1		1	1	117.662			
			C	1	1		1	1	117.662			
L8	0.389	9.237	A	1	1	0.021	1	1	115.683	2.683	0.141	C
19.000-0.000			B	1	1		1	1	115.683			
			C	1	1		1	1	115.683			
Sum Weight:	4.117	36.669						OTM	1380.914 kip-ft	19.841		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	0.218	1.688	A	1	1	0.034	1	1	53.450	1.981	0.099	C
150.000-130.0			B	1	1		1	1	53.450			
00			C	1	1		1	1	53.450			
L2	0.424	1.873	A	1	1	0.033	1	1	45.183	1.628	0.109	C
130.000-115.0			B	1	1		1	1	45.183			
00			C	1	1		1	1	45.183			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L3	0.622	2.782	A	1	1	0.032	1	1	70.452	2.457	0.123	C
115.000-95.00			B	1	1		1	1	70.452			
0			C	1	1		1	1	70.452			
L4	0.130	1.493	A	1	1	0.031	1	1	15.511	0.528	0.132	C
95.000-91.000			B	1	1		1	1	15.511			
			C	1	1		1	1	15.511			
L5	1.297	8.541	A	1	1	0.029	1	1	180.193	5.767	0.144	C
91.000-51.000			B	1	1		1	1	180.193			
			C	1	1		1	1	180.193			
L6	0.357	4.546	A	1	1	0.027	1	1	56.724	1.659	0.151	C
51.000-40.000			B	1	1		1	1	56.724			
			C	1	1		1	1	56.724			
L7	0.681	6.509	A	1	1	0.024	1	1	117.662	3.139	0.149	C
40.000-19.000			B	1	1		1	1	117.662			
			C	1	1		1	1	117.662			
L8	0.389	9.237	A	1	1	0.021	1	1	115.683	2.683	0.141	C
19.000-0.000			B	1	1		1	1	115.683			
			C	1	1		1	1	115.683			
Sum Weight:	4.117	36.669						OTM	1380.914 kip-ft	19.841		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	0.218	1.688	A	1	1	0.034	1	1	53.450	1.981	0.099	C
150.000-130.0			B	1	1		1	1	53.450			
00			C	1	1		1	1	53.450			
L2	0.424	1.873	A	1	1	0.033	1	1	45.183	1.628	0.109	C
130.000-115.0			B	1	1		1	1	45.183			
00			C	1	1		1	1	45.183			
L3	0.622	2.782	A	1	1	0.032	1	1	70.452	2.457	0.123	C
115.000-95.00			B	1	1		1	1	70.452			
0			C	1	1		1	1	70.452			
L4	0.130	1.493	A	1	1	0.031	1	1	15.511	0.528	0.132	C
95.000-91.000			B	1	1		1	1	15.511			
			C	1	1		1	1	15.511			
L5	1.297	8.541	A	1	1	0.029	1	1	180.193	5.767	0.144	C
91.000-51.000			B	1	1		1	1	180.193			
			C	1	1		1	1	180.193			
L6	0.357	4.546	A	1	1	0.027	1	1	56.724	1.659	0.151	C
51.000-40.000			B	1	1		1	1	56.724			
			C	1	1		1	1	56.724			
L7	0.681	6.509	A	1	1	0.024	1	1	117.662	3.139	0.149	C
40.000-19.000			B	1	1		1	1	117.662			
			C	1	1		1	1	117.662			
L8	0.389	9.237	A	1	1	0.021	1	1	115.683	2.683	0.141	C
19.000-0.000			B	1	1		1	1	115.683			
			C	1	1		1	1	115.683			
Sum Weight:	4.117	36.669						OTM	1380.914 kip-ft	19.841		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.218	1.688	A	1	1	0.034	1	1	53.450	1.981	0.099	C
150.000-130.0			B	1	1		1	1	53.450			
00			C	1	1		1	1	53.450			
L2	0.424	1.873	A	1	1	0.033	1	1	45.183	1.628	0.109	C
130.000-115.0			B	1	1		1	1	45.183			
00			C	1	1		1	1	45.183			
L3	0.622	2.782	A	1	1	0.032	1	1	70.452	2.457	0.123	C
115.000-95.00			B	1	1		1	1	70.452			
0			C	1	1		1	1	70.452			
L4	0.130	1.493	A	1	1	0.031	1	1	15.511	0.528	0.132	C
95.000-91.000			B	1	1		1	1	15.511			
			C	1	1		1	1	15.511			
L5	1.297	8.541	A	1	1	0.029	1	1	180.193	5.767	0.144	C
91.000-51.000			B	1	1		1	1	180.193			
			C	1	1		1	1	180.193			
L6	0.357	4.546	A	1	1	0.027	1	1	56.724	1.659	0.151	C
51.000-40.000			B	1	1		1	1	56.724			
			C	1	1		1	1	56.724			
L7	0.681	6.509	A	1	1	0.024	1	1	117.662	3.139	0.149	C
40.000-19.000			B	1	1		1	1	117.662			
			C	1	1		1	1	117.662			
L8	0.389	9.237	A	1	1	0.021	1	1	115.683	2.683	0.141	C
19.000-0.000			B	1	1		1	1	115.683			
			C	1	1		1	1	115.683			
Sum Weight:	4.117	36.669						OTM	1380.914 kip-ft	19.841		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.218	3.111	A	1	1.2	0.008	1	1	59.226	0.645	0.032	C
150.000-130.0			B	1	1.2		1	1	59.226			
00			C	1	1.2		1	1	59.226			
L2	0.424	3.052	A	1	1.2	0.008	1	1	49.515	0.525	0.035	C
130.000-115.0			B	1	1.2		1	1	49.515			
00			C	1	1.2		1	1	49.515			
L3	0.622	4.579	A	1	1.2	0.008	1	1	76.064	0.780	0.039	C
115.000-95.00			B	1	1.2		1	1	76.064			
0			C	1	1.2		1	1	76.064			
L4	0.130	1.882	A	1	1.2	0.008	1	1	16.633	0.166	0.042	C
95.000-91.000			B	1	1.2		1	1	16.633			
			C	1	1.2		1	1	16.633			
L5	1.297	12.915	A	1	1.2	0.007	1	1	190.981	1.797	0.045	C
91.000-51.000			B	1	1.2		1	1	190.981			
			C	1	1.2		1	1	190.981			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L6	0.357	5.856	A	1	1.2	0.007	1	1	59.691	0.514	0.047	C
51.000-40.000			B	1	1.2		1	1	59.691			
			C	1	1.2		1	1	59.691			
L7	0.681	9.104	A	1	1.2	0.006	1	1	122.851	0.964	0.046	C
40.000-19.000			B	1	1.2		1	1	122.851			
			C	1	1.2		1	1	122.851			
L8	0.389	11.504	A	1	1.2	0.005	1	1	120.377	0.821	0.043	C
19.000-0.000			B	1	1.2		1	1	120.377			
			C	1	1.2		1	1	120.377			
Sum Weight:	4.117	52.004						OTM	437.394 kip-ft	6.213		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.218	3.111	A	1	1.2	0.008	1	1	59.226	0.645	0.032	C
150.000-130.0			B	1	1.2		1	1	59.226			
00			C	1	1.2		1	1	59.226			
L2	0.424	3.052	A	1	1.2	0.008	1	1	49.515	0.525	0.035	C
130.000-115.0			B	1	1.2		1	1	49.515			
00			C	1	1.2		1	1	49.515			
L3	0.622	4.579	A	1	1.2	0.008	1	1	76.064	0.780	0.039	C
115.000-95.00			B	1	1.2		1	1	76.064			
0			C	1	1.2		1	1	76.064			
L4	0.130	1.882	A	1	1.2	0.008	1	1	16.633	0.166	0.042	C
95.000-91.000			B	1	1.2		1	1	16.633			
			C	1	1.2		1	1	16.633			
L5	1.297	12.915	A	1	1.2	0.007	1	1	190.981	1.797	0.045	C
91.000-51.000			B	1	1.2		1	1	190.981			
			C	1	1.2		1	1	190.981			
L6	0.357	5.856	A	1	1.2	0.007	1	1	59.691	0.514	0.047	C
51.000-40.000			B	1	1.2		1	1	59.691			
			C	1	1.2		1	1	59.691			
L7	0.681	9.104	A	1	1.2	0.006	1	1	122.851	0.964	0.046	C
40.000-19.000			B	1	1.2		1	1	122.851			
			C	1	1.2		1	1	122.851			
L8	0.389	11.504	A	1	1.2	0.005	1	1	120.377	0.821	0.043	C
19.000-0.000			B	1	1.2		1	1	120.377			
			C	1	1.2		1	1	120.377			
Sum Weight:	4.117	52.004						OTM	437.394 kip-ft	6.213		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	0.218	3.111	A	1	1.2	0.008	1	1	59.226	0.645	0.032	C
150.000-130.0			B	1	1.2		1	1	59.226			
00			C	1	1.2		1	1	59.226			
L2	0.424	3.052	A	1	1.2	0.008	1	1	49.515	0.525	0.035	C
130.000-115.0			B	1	1.2		1	1	49.515			
00			C	1	1.2		1	1	49.515			
L3	0.622	4.579	A	1	1.2	0.008	1	1	76.064	0.780	0.039	C
115.000-95.00			B	1	1.2		1	1	76.064			
0			C	1	1.2		1	1	76.064			
L4	0.130	1.882	A	1	1.2	0.008	1	1	16.633	0.166	0.042	C
95.000-91.000			B	1	1.2		1	1	16.633			
			C	1	1.2		1	1	16.633			
L5	1.297	12.915	A	1	1.2	0.007	1	1	190.981	1.797	0.045	C
91.000-51.000			B	1	1.2		1	1	190.981			
			C	1	1.2		1	1	190.981			
L6	0.357	5.856	A	1	1.2	0.007	1	1	59.691	0.514	0.047	C
51.000-40.000			B	1	1.2		1	1	59.691			
			C	1	1.2		1	1	59.691			
L7	0.681	9.104	A	1	1.2	0.006	1	1	122.851	0.964	0.046	C
40.000-19.000			B	1	1.2		1	1	122.851			
			C	1	1.2		1	1	122.851			
L8	0.389	11.504	A	1	1.2	0.005	1	1	120.377	0.821	0.043	C
19.000-0.000			B	1	1.2		1	1	120.377			
			C	1	1.2		1	1	120.377			
Sum Weight:	4.117	52.004						OTM	437.394 kip-ft	6.213		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	0.218	3.111	A	1	1.2	0.008	1	1	59.226	0.645	0.032	C
150.000-130.0			B	1	1.2		1	1	59.226			
00			C	1	1.2		1	1	59.226			
L2	0.424	3.052	A	1	1.2	0.008	1	1	49.515	0.525	0.035	C
130.000-115.0			B	1	1.2		1	1	49.515			
00			C	1	1.2		1	1	49.515			
L3	0.622	4.579	A	1	1.2	0.008	1	1	76.064	0.780	0.039	C
115.000-95.00			B	1	1.2		1	1	76.064			
0			C	1	1.2		1	1	76.064			
L4	0.130	1.882	A	1	1.2	0.008	1	1	16.633	0.166	0.042	C
95.000-91.000			B	1	1.2		1	1	16.633			
			C	1	1.2		1	1	16.633			
L5	1.297	12.915	A	1	1.2	0.007	1	1	190.981	1.797	0.045	C
91.000-51.000			B	1	1.2		1	1	190.981			
			C	1	1.2		1	1	190.981			
L6	0.357	5.856	A	1	1.2	0.007	1	1	59.691	0.514	0.047	C
51.000-40.000			B	1	1.2		1	1	59.691			
			C	1	1.2		1	1	59.691			
L7	0.681	9.104	A	1	1.2	0.006	1	1	122.851	0.964	0.046	C
40.000-19.000			B	1	1.2		1	1	122.851			
			C	1	1.2		1	1	122.851			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L8	0.389	11.504	A	1	1.2	0.005	1	1	120.377	0.821	0.043	C
19.000-0.000			B	1	1.2		1	1	120.377			
			C	1	1.2		1	1	120.377			
Sum Weight:	4.117	52.004						OTM	437.394 kip-ft	6.213		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.218	1.688	A	1	1	0.011	1	1	53.450	0.625	0.031	C
150.000-130.0			B	1	1		1	1	53.450			
00			C	1	1		1	1	53.450			
L2	0.424	1.873	A	1	1	0.010	1	1	45.183	0.514	0.034	C
130.000-115.0			B	1	1		1	1	45.183			
00			C	1	1		1	1	45.183			
L3	0.622	2.782	A	1	1	0.010	1	1	70.452	0.776	0.039	C
115.000-95.00			B	1	1		1	1	70.452			
0			C	1	1		1	1	70.452			
L4	0.130	1.493	A	1	1	0.010	1	1	15.511	0.167	0.042	C
95.000-91.000			B	1	1		1	1	15.511			
			C	1	1		1	1	15.511			
L5	1.297	8.541	A	1	1	0.009	1	1	180.193	1.821	0.046	C
91.000-51.000			B	1	1		1	1	180.193			
			C	1	1		1	1	180.193			
L6	0.357	4.546	A	1	1	0.008	1	1	56.724	0.524	0.048	C
51.000-40.000			B	1	1		1	1	56.724			
			C	1	1		1	1	56.724			
L7	0.681	6.509	A	1	1	0.008	1	1	117.662	0.991	0.047	C
40.000-19.000			B	1	1		1	1	117.662			
			C	1	1		1	1	117.662			
L8	0.389	9.237	A	1	1	0.007	1	1	115.683	0.847	0.045	C
19.000-0.000			B	1	1		1	1	115.683			
			C	1	1		1	1	115.683			
Sum Weight:	4.117	36.669						OTM	436.035 kip-ft	6.265		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.218	1.688	A	1	1	0.011	1	1	53.450	0.625	0.031	C
150.000-130.0			B	1	1		1	1	53.450			
00			C	1	1		1	1	53.450			
L2	0.424	1.873	A	1	1	0.010	1	1	45.183	0.514	0.034	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
130.000-115.0			B	1	1		1	1	45.183			
00			C	1	1		1	1	45.183			
L3	0.622	2.782	A	1	1	0.010	1	1	70.452	0.776	0.039	C
115.000-95.00			B	1	1		1	1	70.452			
0			C	1	1		1	1	70.452			
L4	0.130	1.493	A	1	1	0.010	1	1	15.511	0.167	0.042	C
95.000-91.000			B	1	1		1	1	15.511			
			C	1	1		1	1	15.511			
L5	1.297	8.541	A	1	1	0.009	1	1	180.193	1.821	0.046	C
91.000-51.000			B	1	1		1	1	180.193			
			C	1	1		1	1	180.193			
L6	0.357	4.546	A	1	1	0.008	1	1	56.724	0.524	0.048	C
51.000-40.000			B	1	1		1	1	56.724			
			C	1	1		1	1	56.724			
L7	0.681	6.509	A	1	1	0.008	1	1	117.662	0.991	0.047	C
40.000-19.000			B	1	1		1	1	117.662			
			C	1	1		1	1	117.662			
L8	0.389	9.237	A	1	1	0.007	1	1	115.683	0.847	0.045	C
19.000-0.000			B	1	1		1	1	115.683			
			C	1	1		1	1	115.683			
Sum Weight:	4.117	36.669						OTM	436.035 kip-ft	6.265		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.218	1.688	A	1	1	0.011	1	1	53.450	0.625	0.031	C
150.000-130.0			B	1	1		1	1	53.450			
00			C	1	1		1	1	53.450			
L2	0.424	1.873	A	1	1	0.010	1	1	45.183	0.514	0.034	C
130.000-115.0			B	1	1		1	1	45.183			
00			C	1	1		1	1	45.183			
L3	0.622	2.782	A	1	1	0.010	1	1	70.452	0.776	0.039	C
115.000-95.00			B	1	1		1	1	70.452			
0			C	1	1		1	1	70.452			
L4	0.130	1.493	A	1	1	0.010	1	1	15.511	0.167	0.042	C
95.000-91.000			B	1	1		1	1	15.511			
			C	1	1		1	1	15.511			
L5	1.297	8.541	A	1	1	0.009	1	1	180.193	1.821	0.046	C
91.000-51.000			B	1	1		1	1	180.193			
			C	1	1		1	1	180.193			
L6	0.357	4.546	A	1	1	0.008	1	1	56.724	0.524	0.048	C
51.000-40.000			B	1	1		1	1	56.724			
			C	1	1		1	1	56.724			
L7	0.681	6.509	A	1	1	0.008	1	1	117.662	0.991	0.047	C
40.000-19.000			B	1	1		1	1	117.662			
			C	1	1		1	1	117.662			
L8	0.389	9.237	A	1	1	0.007	1	1	115.683	0.847	0.045	C
19.000-0.000			B	1	1		1	1	115.683			
			C	1	1		1	1	115.683			
Sum Weight:	4.117	36.669						OTM	436.035	6.265		

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
									kip-ft			

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	0.218	1.688	A	1	1	0.011	1	1	53.450	0.625	0.031	C
150.000-130.0			B	1	1		1	1	53.450			
00			C	1	1		1	1	53.450			
L2	0.424	1.873	A	1	1	0.010	1	1	45.183	0.514	0.034	C
130.000-115.0			B	1	1		1	1	45.183			
00			C	1	1		1	1	45.183			
L3	0.622	2.782	A	1	1	0.010	1	1	70.452	0.776	0.039	C
115.000-95.00			B	1	1		1	1	70.452			
0			C	1	1		1	1	70.452			
L4	0.130	1.493	A	1	1	0.010	1	1	15.511	0.167	0.042	C
95.000-91.000			B	1	1		1	1	15.511			
			C	1	1		1	1	15.511			
L5	1.297	8.541	A	1	1	0.009	1	1	180.193	1.821	0.046	C
91.000-51.000			B	1	1		1	1	180.193			
			C	1	1		1	1	180.193			
L6	0.357	4.546	A	1	1	0.008	1	1	56.724	0.524	0.048	C
51.000-40.000			B	1	1		1	1	56.724			
			C	1	1		1	1	56.724			
L7	0.681	6.509	A	1	1	0.008	1	1	117.662	0.991	0.047	C
40.000-19.000			B	1	1		1	1	117.662			
			C	1	1		1	1	117.662			
L8	0.389	9.237	A	1	1	0.007	1	1	115.683	0.847	0.045	C
19.000-0.000			B	1	1		1	1	115.683			
			C	1	1		1	1	115.683			
Sum Weight:	4.117	36.669						OTM	436.035 kip-ft	6.265		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	36.669					
Bracing Weight	0.000					
Total Member Self-Weight	36.669			8.223	0.369	
Total Weight	51.325			8.223	0.369	
Wind 0 deg - No Ice		0.000	-35.287	-3402.765	0.369	-1.291
Wind 30 deg - No Ice		17.683	-30.559	-2945.779	-1709.371	1.318
Wind 45 deg - No Ice		25.007	-24.952	-2403.710	-2417.569	2.532
Wind 60 deg - No Ice		30.627	-17.643	-1697.271	-2960.988	3.573

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 90 deg - No Ice		35.365	0.000	8.223	-3419.111	4.872
Wind 120 deg - No Ice		30.627	17.643	1713.717	-2960.988	4.865
Wind 135 deg - No Ice		25.007	24.952	2420.156	-2417.569	4.358
Wind 150 deg - No Ice		17.683	30.559	2962.226	-1709.371	3.554
Wind 180 deg - No Ice		0.000	35.287	3419.211	0.369	1.291
Wind 210 deg - No Ice		-17.683	30.559	2962.226	1710.109	-1.318
Wind 225 deg - No Ice		-25.007	24.952	2420.156	2418.307	-2.532
Wind 240 deg - No Ice		-30.627	17.643	1713.717	2961.726	-3.573
Wind 270 deg - No Ice		-35.365	0.000	8.223	3419.849	-4.872
Wind 300 deg - No Ice		-30.627	-17.643	-1697.271	2961.726	-4.865
Wind 315 deg - No Ice		-25.007	-24.952	-2403.710	2418.307	-4.358
Wind 330 deg - No Ice		-17.683	-30.559	-2945.779	1710.109	-3.554
Member Ice	15.335					
Total Weight Ice	85.751			19.073	1.615	
Wind 0 deg - Ice		0.000	-11.962	-1180.384	1.615	-0.383
Wind 30 deg - Ice		5.992	-10.360	-1019.687	-599.252	0.799
Wind 45 deg - Ice		8.473	-8.459	-829.071	-848.139	1.327
Wind 60 deg - Ice		10.378	-5.981	-580.655	-1039.117	1.766
Wind 90 deg - Ice		11.983	0.000	19.073	-1200.119	2.260
Wind 120 deg - Ice		10.378	5.981	618.802	-1039.117	2.149
Wind 135 deg - Ice		8.473	8.459	867.217	-848.139	1.869
Wind 150 deg - Ice		5.992	10.360	1057.833	-599.252	1.461
Wind 180 deg - Ice		0.000	11.962	1218.530	1.615	0.383
Wind 210 deg - Ice		-5.992	10.360	1057.833	602.481	-0.799
Wind 225 deg - Ice		-8.473	8.459	867.217	851.369	-1.327
Wind 240 deg - Ice		-10.378	5.981	618.802	1042.346	-1.766
Wind 270 deg - Ice		-11.983	0.000	19.073	1203.348	-2.260
Wind 300 deg - Ice		-10.378	-5.981	-580.655	1042.346	-2.149
Wind 315 deg - Ice		-8.473	-8.459	-829.071	851.369	-1.869
Wind 330 deg - Ice		-5.992	-10.360	-1019.687	602.481	-1.461
Total Weight	51.325			8.223	0.369	
Wind 0 deg - Service		0.000	-11.142	-1068.825	0.369	-0.408
Wind 30 deg - Service		5.583	-9.649	-924.528	-539.496	0.416
Wind 45 deg - Service		7.896	-7.879	-753.365	-763.115	0.799
Wind 60 deg - Service		9.671	-5.571	-530.301	-934.705	1.128
Wind 90 deg - Service		11.167	0.000	8.223	-1079.361	1.538
Wind 120 deg - Service		9.671	5.571	546.747	-934.705	1.536
Wind 135 deg - Service		7.896	7.879	769.812	-763.115	1.376
Wind 150 deg - Service		5.583	9.649	940.975	-539.496	1.122
Wind 180 deg - Service		0.000	11.142	1085.272	0.369	0.408
Wind 210 deg - Service		-5.583	9.649	940.975	540.234	-0.416
Wind 225 deg - Service		-7.896	7.879	769.812	763.853	-0.799
Wind 240 deg - Service		-9.671	5.571	546.747	935.443	-1.128
Wind 270 deg - Service		-11.167	0.000	8.223	1080.099	-1.538
Wind 300 deg - Service		-9.671	-5.571	-530.301	935.443	-1.536
Wind 315 deg - Service		-7.896	-7.879	-753.365	763.853	-1.376
Wind 330 deg - Service		-5.583	-9.649	-924.528	540.234	-1.122

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice

Comb. No.	Description
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	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	150 - 130	Pole	Max Tension	34	0.000	-0.000	0.000
			Max. Compression	34	-16.617	0.007	-0.592
			Max. Mx	26	-6.878	132.353	-0.178
			Max. My	18	-6.875	0.011	-132.500
			Max. Vy	26	-14.539	132.353	-0.178
			Max. Vx	18	14.540	0.011	-132.500
			Max. Torque	26			0.367
L2	130 - 115	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-31.858	0.562	-10.592
			Max. Mx	26	-13.648	559.078	-4.390
			Max. My	18	-13.644	0.125	-563.416
			Max. Vy	26	-25.428	559.078	-4.390
			Max. Vx	18	25.430	0.125	-563.416
			Max. Torque	26			5.217
L3	115 - 95	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-43.820	1.738	-21.361
			Max. Mx	26	-19.099	975.546	-9.836
			Max. My	18	-19.102	0.406	-984.162
			Max. Vy	26	-34.088	975.546	-9.836
			Max. Vx	18	33.963	0.406	-984.162
			Max. Torque	26			8.255
L4	95 - 91	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-48.578	1.751	-21.518
			Max. Mx	26	-22.390	1327.280	-9.917
			Max. My	18	-22.393	0.419	-1334.651
			Max. Vy	26	-36.245	1327.280	-9.917
			Max. Vx	18	36.121	0.419	-1334.651
			Max. Torque	10			-8.253
L5	91 - 51	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-61.316	1.779	-21.868
			Max. Mx	26	-32.010	2598.938	-10.083
			Max. My	18	-32.013	0.444	-2602.300
			Max. Vy	26	-43.368	2598.938	-10.083
			Max. Vx	18	43.243	0.444	-2602.300
			Max. Torque	10			-8.252
L6	51 - 40	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-72.905	1.785	-21.942
			Max. Mx	26	-40.715	3466.289	-10.139
			Max. My	18	-40.717	0.452	-3467.259
			Max. Vy	26	-47.869	3466.289	-10.139
			Max. Vx	18	47.743	0.452	-3467.259
			Max. Torque	10			-8.245
L7	40 - 19	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-79.217	1.785	-21.942
			Max. Mx	26	-45.755	4056.366	-10.157
			Max. My	18	-45.756	0.453	-4055.823
			Max. Vy	26	-50.518	4056.366	-10.157
			Max. Vx	18	50.392	0.453	-4055.823
			Max. Torque	10			-8.243
L8	19 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-99.020	1.785	-21.942
			Max. Mx	26	-61.579	5558.477	-10.167
			Max. My	18	-61.579	0.453	-5554.407
			Max. Vy	26	-56.597	5558.477	-10.167
			Max. Vx	18	56.471	0.453	-5554.407

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	10			-8.242

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	34	99.020	0.000	-0.000
	Max. H_x	27	46.192	56.585	-0.000
	Max. H_z	2	61.590	0.000	56.459
	Max. M_x	2	5534.077	0.000	56.459
	Max. M_z	10	5557.565	-56.585	0.000
	Max. Torsion	26	8.241	56.585	0.000
	Min. Vert	31	46.192	40.011	39.922
	Min. H_x	11	46.192	-56.585	-0.000
	Min. H_z	18	61.590	0.000	-56.459
	Min. M_x	18	-5554.407	0.000	-56.459
	Min. M_z	26	-5558.477	56.585	0.000
	Min. Torsion	10	-8.241	-56.585	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	51.325	0.000	0.000	8.352	0.375	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	61.590	0.000	-56.459	-5534.077	0.453	-2.080
0.9 Dead+1.6 Wind 0 deg - No Ice	46.192	0.000	-56.459	-5514.143	0.337	-2.075
1.2 Dead+1.6 Wind 30 deg - No Ice	61.590	28.292	-48.895	-4791.286	-2778.562	2.319
0.9 Dead+1.6 Wind 30 deg - No Ice	46.192	28.292	-48.895	-4774.371	-2767.384	2.264
1.2 Dead+1.6 Wind 45 deg - No Ice	61.590	40.011	-39.922	-3910.200	-3929.665	4.357
0.9 Dead+1.6 Wind 45 deg - No Ice	46.192	40.011	-39.922	-3896.868	-3913.809	4.276
1.2 Dead+1.6 Wind 60 deg - No Ice	61.590	49.004	-28.229	-2761.950	-4812.935	6.097
0.9 Dead+1.6 Wind 60 deg - No Ice	46.192	49.004	-28.229	-2753.284	-4793.490	5.996
1.2 Dead+1.6 Wind 90 deg - No Ice	61.590	56.585	0.000	10.167	-5557.565	8.241
0.9 Dead+1.6 Wind 90 deg - No Ice	46.192	56.585	0.000	7.565	-5535.094	8.122
1.2 Dead+1.6 Wind 120 deg - No Ice	61.590	49.004	28.229	2782.283	-4812.934	8.177
0.9 Dead+1.6 Wind 120 deg - No Ice	46.192	49.004	28.229	2768.414	-4793.489	8.071
1.2 Dead+1.6 Wind 135 deg - No Ice	61.590	40.011	39.922	3930.533	-3929.663	7.298
0.9 Dead+1.6 Wind 135 deg -	46.192	40.011	39.922	3911.997	-3913.808	7.210

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
No Ice						
1.2 Dead+1.6 Wind 150 deg - No Ice	61.590	28.292	48.895	4811.617	-2778.560	5.922
0.9 Dead+1.6 Wind 150 deg - No Ice	46.192	28.292	48.895	4789.500	-2767.383	5.858
1.2 Dead+1.6 Wind 180 deg - No Ice	61.590	0.000	56.459	5554.407	0.452	2.080
0.9 Dead+1.6 Wind 180 deg - No Ice	46.192	0.000	56.459	5529.271	0.337	2.075
1.2 Dead+1.6 Wind 210 deg - No Ice	61.590	-28.292	48.895	4811.620	2779.467	-2.319
0.9 Dead+1.6 Wind 210 deg - No Ice	46.192	-28.292	48.895	4789.502	2768.057	-2.264
1.2 Dead+1.6 Wind 225 deg - No Ice	61.590	-40.011	39.922	3930.536	3930.571	-4.357
0.9 Dead+1.6 Wind 225 deg - No Ice	46.192	-40.011	39.922	3911.999	3914.484	-4.276
1.2 Dead+1.6 Wind 240 deg - No Ice	61.590	-49.004	28.229	2782.286	4813.844	-6.097
0.9 Dead+1.6 Wind 240 deg - No Ice	46.192	-49.004	28.229	2768.416	4794.166	-5.996
1.2 Dead+1.6 Wind 270 deg - No Ice	61.590	-56.585	0.000	10.167	5558.477	-8.241
0.9 Dead+1.6 Wind 270 deg - No Ice	46.192	-56.585	0.000	7.565	5535.773	-8.121
1.2 Dead+1.6 Wind 300 deg - No Ice	61.590	-49.004	-28.229	-2761.953	4813.845	-8.177
0.9 Dead+1.6 Wind 300 deg - No Ice	46.192	-49.004	-28.229	-2753.286	4794.168	-8.071
1.2 Dead+1.6 Wind 315 deg - No Ice	61.590	-40.011	-39.922	-3910.204	3930.573	-7.299
0.9 Dead+1.6 Wind 315 deg - No Ice	46.192	-40.011	-39.922	-3896.870	3914.485	-7.210
1.2 Dead+1.6 Wind 330 deg - No Ice	61.590	-28.292	-48.895	-4791.289	2779.468	-5.922
0.9 Dead+1.6 Wind 330 deg - No Ice	46.192	-28.292	-48.895	-4774.374	2768.058	-5.858
1.2 Dead+1.0 Ice+1.0 Temp	99.020	-0.000	0.000	21.942	1.785	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	99.020	-0.000	-11.962	-1217.497	1.799	-0.401
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	99.020	5.992	-10.360	-1051.422	-619.175	0.899
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	99.020	8.473	-8.459	-854.426	-876.391	1.479
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	99.020	10.378	-5.981	-597.696	-1073.759	1.959
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	99.020	11.983	0.000	22.105	-1240.148	2.493
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	99.020	10.378	5.981	641.906	-1073.759	2.360
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	99.020	8.473	8.459	898.636	-876.391	2.047
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	99.020	5.992	10.360	1095.632	-619.175	1.594
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	99.020	-0.000	11.962	1261.708	1.798	0.401
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	99.020	-5.992	10.360	1095.632	622.772	-0.899
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	99.020	-8.473	8.459	898.636	879.988	-1.479
1.2 Dead+1.0 Wind 240	99.020	-10.378	5.981	641.906	1077.357	-1.959

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	99.020	-11.983	0.000	22.105	1243.746	-2.493
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	99.020	-10.378	-5.981	-597.696	1077.356	-2.360
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	99.020	-8.473	-8.459	-854.426	879.988	-2.047
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	99.020	-5.992	-10.360	-1051.422	622.772	-1.594
Dead+Wind 0 deg - Service	51.325	0.000	-11.142	-1083.152	0.378	-0.411
Dead+Wind 30 deg - Service	51.325	5.583	-9.649	-936.906	-546.775	0.452
Dead+Wind 45 deg - Service	51.325	7.896	-7.879	-763.431	-773.414	0.852
Dead+Wind 60 deg - Service	51.325	9.671	-5.571	-537.355	-947.320	1.194
Dead+Wind 90 deg - Service	51.325	11.167	0.000	8.441	-1093.929	1.616
Dead+Wind 120 deg - Service	51.325	9.671	5.571	554.238	-947.320	1.605
Dead+Wind 135 deg - Service	51.325	7.896	7.879	780.314	-773.414	1.433
Dead+Wind 150 deg - Service	51.325	5.583	9.649	953.789	-546.775	1.164
Dead+Wind 180 deg - Service	51.325	0.000	11.142	1100.034	0.378	0.411
Dead+Wind 210 deg - Service	51.325	-5.583	9.649	953.789	547.532	-0.452
Dead+Wind 225 deg - Service	51.325	-7.896	7.879	780.314	774.171	-0.852
Dead+Wind 240 deg - Service	51.325	-9.671	5.571	554.238	948.077	-1.194
Dead+Wind 270 deg - Service	51.325	-11.167	0.000	8.441	1094.686	-1.616
Dead+Wind 300 deg - Service	51.325	-9.671	-5.571	-537.355	948.077	-1.605
Dead+Wind 315 deg - Service	51.325	-7.896	-7.879	-763.431	774.171	-1.433
Dead+Wind 330 deg - Service	51.325	-5.583	-9.649	-936.906	547.532	-1.164

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-51.325	0.000	0.000	51.325	0.000	0.000%
2	0.000	-61.590	-56.459	0.000	61.590	56.459	0.000%
3	0.000	-46.192	-56.459	0.000	46.192	56.459	0.000%
4	28.292	-61.590	-48.895	-28.292	61.590	48.895	0.000%
5	28.292	-46.192	-48.895	-28.292	46.192	48.895	0.000%
6	40.011	-61.590	-39.922	-40.011	61.590	39.922	0.000%
7	40.011	-46.192	-39.922	-40.011	46.192	39.922	0.000%
8	49.004	-61.590	-28.229	-49.004	61.590	28.229	0.000%
9	49.004	-46.192	-28.229	-49.004	46.192	28.229	0.000%
10	56.585	-61.590	0.000	-56.585	61.590	0.000	0.000%
11	56.585	-46.192	0.000	-56.585	46.192	-0.000	0.000%
12	49.004	-61.590	28.229	-49.004	61.590	-28.229	0.000%
13	49.004	-46.192	28.229	-49.004	46.192	-28.229	0.000%
14	40.011	-61.590	39.922	-40.011	61.590	-39.922	0.000%
15	40.011	-46.192	39.922	-40.011	46.192	-39.922	0.000%
16	28.292	-61.590	48.895	-28.292	61.590	-48.895	0.000%
17	28.292	-46.192	48.895	-28.292	46.192	-48.895	0.000%
18	0.000	-61.590	56.459	0.000	61.590	-56.459	0.000%
19	0.000	-46.192	56.459	0.000	46.192	-56.459	0.000%
20	-28.292	-61.590	48.895	28.292	61.590	-48.895	0.000%
21	-28.292	-46.192	48.895	28.292	46.192	-48.895	0.000%
22	-40.011	-61.590	39.922	40.011	61.590	-39.922	0.000%
23	-40.011	-46.192	39.922	40.011	46.192	-39.922	0.000%
24	-49.004	-61.590	28.229	49.004	61.590	-28.229	0.000%
25	-49.004	-46.192	28.229	49.004	46.192	-28.229	0.000%
26	-56.585	-61.590	0.000	56.585	61.590	0.000	0.000%
27	-56.585	-46.192	0.000	56.585	46.192	-0.000	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
28	-49.004	-61.590	-28.229	49.004	61.590	28.229	0.000%
29	-49.004	-46.192	-28.229	49.004	46.192	28.229	0.000%
30	-40.011	-61.590	-39.922	40.011	61.590	39.922	0.000%
31	-40.011	-46.192	-39.922	40.011	46.192	39.922	0.000%
32	-28.292	-61.590	-48.895	28.292	61.590	48.895	0.000%
33	-28.292	-46.192	-48.895	28.292	46.192	48.895	0.000%
34	0.000	-99.020	0.000	0.000	99.020	-0.000	0.000%
35	0.000	-99.020	-11.962	0.000	99.020	11.962	0.000%
36	5.992	-99.020	-10.360	-5.992	99.020	10.360	0.000%
37	8.473	-99.020	-8.459	-8.473	99.020	8.459	0.000%
38	10.378	-99.020	-5.981	-10.378	99.020	5.981	0.000%
39	11.983	-99.020	0.000	-11.983	99.020	-0.000	0.000%
40	10.378	-99.020	5.981	-10.378	99.020	-5.981	0.000%
41	8.473	-99.020	8.459	-8.473	99.020	-8.459	0.000%
42	5.992	-99.020	10.360	-5.992	99.020	-10.360	0.000%
43	0.000	-99.020	11.962	0.000	99.020	-11.962	0.000%
44	-5.992	-99.020	10.360	5.992	99.020	-10.360	0.000%
45	-8.473	-99.020	8.459	8.473	99.020	-8.459	0.000%
46	-10.378	-99.020	5.981	10.378	99.020	-5.981	0.000%
47	-11.983	-99.020	0.000	11.983	99.020	-0.000	0.000%
48	-10.378	-99.020	-5.981	10.378	99.020	5.981	0.000%
49	-8.473	-99.020	-8.459	8.473	99.020	8.459	0.000%
50	-5.992	-99.020	-10.360	5.992	99.020	10.360	0.000%
51	0.000	-51.325	-11.142	0.000	51.325	11.142	0.000%
52	5.583	-51.325	-9.649	-5.583	51.325	9.649	0.000%
53	7.896	-51.325	-7.879	-7.896	51.325	7.879	0.000%
54	9.671	-51.325	-5.571	-9.671	51.325	5.571	0.000%
55	11.167	-51.325	0.000	-11.167	51.325	0.000	0.000%
56	9.671	-51.325	5.571	-9.671	51.325	-5.571	0.000%
57	7.896	-51.325	7.879	-7.896	51.325	-7.879	0.000%
58	5.583	-51.325	9.649	-5.583	51.325	-9.649	0.000%
59	0.000	-51.325	11.142	0.000	51.325	-11.142	0.000%
60	-5.583	-51.325	9.649	5.583	51.325	-9.649	0.000%
61	-7.896	-51.325	7.879	7.896	51.325	-7.879	0.000%
62	-9.671	-51.325	5.571	9.671	51.325	-5.571	0.000%
63	-11.167	-51.325	0.000	11.167	51.325	0.000	0.000%
64	-9.671	-51.325	-5.571	9.671	51.325	5.571	0.000%
65	-7.896	-51.325	-7.879	7.896	51.325	7.879	0.000%
66	-5.583	-51.325	-9.649	5.583	51.325	9.649	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	0.00025179
3	Yes	4	0.00000001	0.00014883
4	Yes	5	0.00000001	0.00007521
5	Yes	5	0.00000001	0.00003253
6	Yes	5	0.00000001	0.00008146
7	Yes	5	0.00000001	0.00003479
8	Yes	5	0.00000001	0.00006513
9	Yes	5	0.00000001	0.00002796
10	Yes	5	0.00000001	0.00002122
11	Yes	4	0.00000001	0.00060683
12	Yes	5	0.00000001	0.00008594

13	Yes	5	0.00000001	0.00003730
14	Yes	5	0.00000001	0.00008431
15	Yes	5	0.00000001	0.00003593
16	Yes	5	0.00000001	0.00006675
17	Yes	5	0.00000001	0.00002850
18	Yes	4	0.00000001	0.00025379
19	Yes	4	0.00000001	0.00014969
20	Yes	5	0.00000001	0.00007017
21	Yes	5	0.00000001	0.00003005
22	Yes	5	0.00000001	0.00008294
23	Yes	5	0.00000001	0.00003524
24	Yes	5	0.00000001	0.00008256
25	Yes	5	0.00000001	0.00003572
26	Yes	5	0.00000001	0.00002122
27	Yes	4	0.00000001	0.00060698
28	Yes	5	0.00000001	0.00006381
29	Yes	5	0.00000001	0.00002736
30	Yes	5	0.00000001	0.00008293
31	Yes	5	0.00000001	0.00003551
32	Yes	5	0.00000001	0.00008063
33	Yes	5	0.00000001	0.00003505
34	Yes	4	0.00000001	0.00007203
35	Yes	5	0.00000001	0.00008081
36	Yes	5	0.00000001	0.00008616
37	Yes	5	0.00000001	0.00008804
38	Yes	5	0.00000001	0.00008685
39	Yes	5	0.00000001	0.00008504
40	Yes	5	0.00000001	0.00009276
41	Yes	5	0.00000001	0.00009425
42	Yes	5	0.00000001	0.00009235
43	Yes	5	0.00000001	0.00008754
44	Yes	5	0.00000001	0.00009268
45	Yes	5	0.00000001	0.00009451
46	Yes	5	0.00000001	0.00009301
47	Yes	5	0.00000001	0.00008558
48	Yes	5	0.00000001	0.00008747
49	Yes	5	0.00000001	0.00008872
50	Yes	5	0.00000001	0.00008685
51	Yes	4	0.00000001	0.00002423
52	Yes	4	0.00000001	0.00005656
53	Yes	4	0.00000001	0.00006180
54	Yes	4	0.00000001	0.00004963
55	Yes	4	0.00000001	0.00005532
56	Yes	4	0.00000001	0.00008414
57	Yes	4	0.00000001	0.00007386
58	Yes	4	0.00000001	0.00005190
59	Yes	4	0.00000001	0.00002509
60	Yes	4	0.00000001	0.00004988
61	Yes	4	0.00000001	0.00006571
62	Yes	4	0.00000001	0.00007512
63	Yes	4	0.00000001	0.00005541
64	Yes	4	0.00000001	0.00005505
65	Yes	4	0.00000001	0.00007026
66	Yes	4	0.00000001	0.00006989

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 130	10.673	59	0.640	0.004
L2	135 - 115	8.680	59	0.624	0.004
L3	115 - 95	6.193	59	0.543	0.003
L4	101 - 91	4.714	59	0.465	0.002
L5	91 - 51	3.777	59	0.422	0.002
L6	59 - 40	1.533	59	0.247	0.001
L7	40 - 19	0.692	59	0.163	0.000
L8	28 - 0	0.352	59	0.107	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.000	4' x 3" DIA Omni	59	10.673	0.640	0.004	105263
150.000	Lightning Rod 3/4"x8'	59	10.673	0.640	0.004	105263
140.000	NNVV-65B-R4	59	9.340	0.633	0.004	52631
138.000	Pirod 12' T-Frame Sector Mount (1)	59	9.075	0.630	0.004	43616
130.000	7770.00	59	8.029	0.611	0.004	20025
128.000	Valmont 13' Low Profile Platform	59	7.773	0.604	0.004	17090
124.000	4' x 3" DIA Omni	59	7.269	0.588	0.003	13217
119.000	Pirod 6' Side Mount Standoff (1)	59	6.660	0.564	0.003	10304
108.000	X7C-FRO-660	59	5.427	0.502	0.002	10857

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 130	53.502	18	3.196	0.020
L2	135 - 115	43.548	18	3.119	0.020
L3	115 - 95	31.129	22	2.715	0.014
L4	101 - 91	23.726	24	2.332	0.010
L5	91 - 51	19.025	24	2.118	0.008
L6	59 - 40	7.739	24	1.244	0.003
L7	40 - 19	3.494	24	0.824	0.002
L8	28 - 0	1.781	24	0.541	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
153.000	4' x 3" DIA Omni	18	53.502	3.196	0.020	21100
150.000	Lightning Rod 3/4"x8'	18	53.502	3.196	0.020	21100
140.000	NNVV-65B-R4	18	46.842	3.161	0.020	10549
138.000	Pirod 12' T-Frame Sector Mount (1)	18	45.520	3.147	0.020	8744
130.000	7770.00	18	40.299	3.051	0.019	4049
128.000	Valmont 13' Low Profile Platform	18	39.019	3.017	0.018	3462

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
124.000	4' x 3" DIA Omni	18	36.502	2.938	0.017	2683
119.000	Pirod 6' Side Mount Standoff (1)	22	33.460	2.821	0.016	2094
108.000	X7C-FRO-660	22	27.294	2.517	0.012	2212

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	150 - 130 (1)	TP34.313x27.813x0.25	20.000	0.000	0.0	26.112	-6.875	1225.900	0.006
L2	130 - 115 (2)	TP36.688x32.188x0.25	20.000	0.000	0.0	29.332	-13.644	1305.960	0.010
L3	115 - 95 (3)	TP45.188x36.688x0.313	20.000	0.000	0.0	42.590	-19.102	1962.750	0.010
L4	95 - 91 (4)	TP45.813x42.013x0.313	10.000	0.000	0.0	45.784	-22.393	2039.500	0.011
L5	91 - 51 (5)	TP58.875x45.813x0.375	40.000	0.000	0.0	67.484	-32.011	2971.020	0.011
L6	51 - 40 (6)	TP61.688x55.513x0.375	19.000	0.000	0.0	74.035	-40.715	3097.120	0.013
L7	40 - 19 (7)	TP68.5x61.688x0.438	21.000	0.000	0.0	91.770	-45.755	4042.100	0.011
L8	19 - 0 (8)	TP73.813x64.705x0.438	28.000	0.000	0.0	103.367	-61.579	4258.160	0.014

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	150 - 130 (1)	TP34.313x27.813x0.25	132.499	810.297	0.164	0.000	810.297	0.000
L2	130 - 115 (2)	TP36.688x32.188x0.25	563.416	970.475	0.581	0.000	970.475	0.000
L3	115 - 95 (3)	TP45.188x36.688x0.313	984.167	1693.333	0.581	0.000	1693.333	0.000
L4	95 - 91 (4)	TP45.813x42.013x0.313	1334.650	1892.508	0.705	0.000	1892.508	0.000
L5	91 - 51 (5)	TP58.875x45.813x0.375	2602.808	3386.808	0.769	0.000	3386.808	0.000
L6	51 - 40 (6)	TP61.688x55.513x0.375	3469.125	3875.550	0.895	0.000	3875.550	0.000
L7	40 - 19 (7)	TP68.5x61.688x0.438	4058.825	5370.833	0.756	0.000	5370.833	0.000
L8	19 - 0 (8)	TP73.813x64.705x0.438	5560.058	6377.691	0.872	0.000	6377.691	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	150 - 130 (1)	TP34.313x27.813x0.25	14.540	612.952	0.024	0.000	1647.325	0.000
L2	130 - 115 (2)	TP36.688x32.188x0.25	25.430	652.978	0.039	0.777	1972.392	0.000
L3	115 - 95 (3)	TP45.188x36.688x0.313	33.963	981.376	0.035	2.083	3442.150	0.001
L4	95 - 91 (4)	TP45.813x42.013x0.313	36.121	1019.750	0.035	2.083	3846.350	0.001
L5	91 - 51 (5)	TP58.875x45.813x0.375	43.306	1485.510	0.029	4.359	6883.025	0.001
L6	51 - 40 (6)	TP61.688x55.513x0.375	47.838	1548.560	0.031	6.099	7874.717	0.001
L7	40 - 19 (7)	TP68.5x61.688x0.438	50.487	2021.050	0.025	6.098	10915.167	0.001

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 $\frac{T_u}{\phi T_n}$
L8	19 - 0 (8)	TP73.813x64.705x0.438	56.565	2129.080	0.027	6.097	12958.167	0.000

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	150 - 130 (1)	0.006	0.164	0.000	0.024	0.000	0.170 ✔	1.000	4.8.2 ✔
L2	130 - 115 (2)	0.010	0.581	0.000	0.039	0.000	0.593 ✔	1.000	4.8.2 ✔
L3	115 - 95 (3)	0.010	0.581	0.000	0.035	0.001	0.592 ✔	1.000	4.8.2 ✔
L4	95 - 91 (4)	0.011	0.705	0.000	0.035	0.001	0.718 ✔	1.000	4.8.2 ✔
L5	91 - 51 (5)	0.011	0.769	0.000	0.029	0.001	0.780 ✔	1.000	4.8.2 ✔
L6	51 - 40 (6)	0.013	0.895	0.000	0.031	0.001	0.909 ✔	1.000	4.8.2 ✔
L7	40 - 19 (7)	0.011	0.756	0.000	0.025	0.001	0.768 ✔	1.000	4.8.2 ✔
L8	19 - 0 (8)	0.014	0.872	0.000	0.027	0.000	0.887 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 130	Pole	TP34.313x27.813x0.25	1	-6.875	1225.900	17.0	Pass
L2	130 - 115	Pole	TP36.688x32.188x0.25	2	-13.644	1305.960	59.3	Pass
L3	115 - 95	Pole	TP45.188x36.688x0.313	3	-19.102	1962.750	59.2	Pass
L4	95 - 91	Pole	TP45.813x42.013x0.313	4	-22.393	2039.500	71.8	Pass
L5	91 - 51	Pole	TP58.875x45.813x0.375	5	-32.011	2971.020	78.0	Pass
L6	51 - 40	Pole	TP61.688x55.513x0.375	6	-40.715	3097.120	90.9	Pass
L7	40 - 19	Pole	TP68.5x61.688x0.438	7	-45.755	4042.100	76.8	Pass
L8	19 - 0	Pole	TP73.813x64.705x0.438	8	-61.579	4258.160	88.7	Pass
							Summary	
						Pole (L6)	90.9	Pass
						RATING =	**90.9**	**Pass**

tnxTower	Job	Page
	20148.00 - CT11396B	31 of 31
Centek Engineering Inc. *63-2 North Branford Rd.* *Branford, CT 06405* *Phone: (203) 488-0580* *FAX: (203) 488-8587*	**Project** 150ft Nudd Monopole - 79 Putnam Pike Dayville, CT	**Date** 09:07:58 11/24/20
	Client T-Mobile	**Designed by** TJL

Program Version 8.0.5.0 - 11/28/2018 File: J:\Jobs\2014800.WI\05_Structural/Tower Analysis/Backup Documentation/ERI Files/150' Nudd Monopole_ Dayville CT.eri

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	Anchor Bolt and Baseplate Analysis
Location:	150-FT Nudd Monopole Dayville, CT
Rev. 0: 11/24/20	Prepared by: T.J.L. Checked by: C.F.C. Job No. 20148.00

Anchor Bolt and Base Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	$M_u := 5560 \cdot ft \cdot kips$	(Input From tnxTower)
Shear Force =	$Shear := 57 \cdot kips$	(Input From tnxTower)
Axial Force =	$R_u := 62 \cdot kips$	(Input From tnxTower)

Anchor Bolt Data:

ASTM A687

Number of Anchor Bolts =	$N := 24$	(User Input)
Diameter of Bolt Circle =	$D_{BC} := 70.0 \cdot in$	(User Input)
Bolt "Column" Distance =	$l := 3.0 \cdot in$	(User Input)
Bolt Ultimate Strength =	$F_u := 125 \cdot ksi$	(User Input)
Bolt Yield Strength =	$F_y := 105 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Anchor Bolts =	$D := 2.00 \cdot in$	(User Input)
Threads per Inch =	$n := 4.5$	(User Input)
Top of Concrete to Bot Leveling Nut =	$l_{ar} := 2 \cdot in$	(User Input)
Anchor Rod Force Correction Factor =	$n_c = 1$	Table 2-1 Addendum 3
	$\eta := 0.5$	For Ungrouted Base Plate per TIA-222-G Section 4.9.9
Nut Outside Diameter (Across Flats) =	$Nut_{OD} := 3.00in$	(User Input)

Stiffened Base Plate Data:

Use ASTM A36 Mod 42

Plate Yield Strength =	$Fy_{bp} := 42 \cdot ksi$	(User Input)
Base Plate Thickness =	$t_{bp} := 2.00 \cdot in$	(User Input)
Base Plate Inside Diameter =	$D_{bpi} := 64.00 \cdot in$	(User Input)
Outer Pole Diameter =	$D_{pole} := 73.813 \cdot in$	(User Input)
Thickness of Monopole Shell at Base Plate =	$Wall_{thk} := 0.4375in$	(User Input)
Base Plate Outside Diameter =	$D_{bp} := D_{pole} - (Wall_{thk}) = 73.38 \cdot in$	(User Input)
Gussets Yield Strength =	$F_{yg} := 36ksi$	(User Input)
Gussets Per Bolt =	$n_g := 1$	(User Input)
Gusset Height =	$h_g := 20.0in$	(User Input)
Gusset Thickness =	$t_g := 0.75in$	(User Input)
Gusset Depth =	$t_{gl} := 3.5 \cdot in$	(User Input)

Anchor Bolt Analysis:

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 3.142 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 = 2.498 \cdot in^2$

Tensile Root Diameter = $d_{rt} := D - \frac{0.9743 \cdot in}{n} = 1.783 \cdot in$

Plastic Section Modulus = $Z := \frac{d_{rt}^3}{6} = 0.945 \cdot in^3$

Maximum Anchor Rod Force = $P_u := \frac{n_c \cdot \pi \cdot M_u}{N \cdot D_{BC}} + \frac{R_u}{N} = 127.3 \cdot kips$

Maximum Shear Force = $V_u := \frac{Shear}{N} = 2.4 \cdot kips$

Design Tensile Strength = $\Phi R_{nt} := 0.8 \cdot F_u \cdot A_n = 249.822 \cdot k$

Bolt % of Capacity = $\frac{\left(P_u + \frac{V_u}{\eta} \right)}{\Phi R_{nt}} \cdot 100 = 52.9$

Condition1 = $Condition1 := if\left[\frac{\left(P_u + \frac{V_u}{\eta} \right)}{\Phi R_{nt}} \le 1.00 , "OK" , "Overstressed" \right]$

Condition1 = "OK"

BASE PLATE ANALYSIS

Internally Located NUDD Base Plate Assembly w/ Gussets
Analayis Based on Theory Developed For Monopole Compression Ring Plate
Required Thickness Calculations per Process Equipment Design by Brownell
And Young Chapter 10 ' Design of Vertical Vessels:

Anchor Bolt Forces = $C_i := \frac{M_u \cdot d_i}{I_p} + \frac{R_u}{N}$

$C_1 = 43.7 \cdot kips$ $C_7 = 156.0 \cdot kips$

$C_2 = 82.0 \cdot kips$ $C_8 = 140.2 \cdot kips$

$C_3 = 114.9 \cdot kips$ $C_9 = 114.9 \cdot kips$

$C_4 = 140.2 \cdot kips$ $C_{10} = 82.0 \cdot kips$

$C_5 = 156.0 \cdot kips$ $C_{11} = 43.7 \cdot kips$

$C_6 = 161.4 \cdot kips$ etc.

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 36.91 \cdot in$

Angle Between Bolts = $\alpha := \left(\frac{2 \cdot \pi}{N}\right) = 15 \cdot deg$

Input Data:

Maximum Bolt Force (P) = $P := (C_6) = 161.44 \cdot kips$ (User Input)

Poissons ratio (μ) = $\mu := 0.30$ (User Input)

Radial Distance From Face of Monopole Shell to Bolt Circle in inches (a) = $a := \frac{\left(\left|D_{BC} - D_{pole}\right| - Wall_{thk}\right)}{2} = 1.688 \cdot in$

Radial Distance From Face of Monopole Shell to Edge of Base Plate in inches (l) = $l := \frac{\left(\left|D_{bpi} - D_{bp}\right|\right)}{2} = 4.69 \cdot in$

Gusset Spacing in inches (b) = $b := \alpha \cdot \left(\frac{D_{BC}}{2}\right) = 9.16 \cdot in$ $b := 5.715in$

Radius of Action of Concentrated Load, (One Half Distance Across Flats of Anchor Bolt Nut (e) = $e := (0.5 \cdot Nut_{OD}) = 1.5 \cdot in$

Design Bending Stress = $f_b := 0.9 \cdot Fy_{bp} = 37.8 \cdot ksi$

Plate Thickness Provided (t) = $t := t_{bp} = 2 \cdot in$

Gusset L/b Ratio per *Theory of Plates and Shells* byTimenshenko $\frac{b}{l} = 1.219$

If b/l ratio >1 then My controls, otherwise Mx and My are equal. Use My equation 10.38 for simplicity.

Note: If b/l if <1 invert b/l and flip axes 90 degrees

γ1,γ2 constants from Table 10.6

$\gamma 1 := 0.5113$ (User Input)

$\gamma 2 := 0.1290$ (User Input)

$$My := \left[\left(\frac{P}{4\cdot\pi}\right)\cdot\left[(1+\mu)\cdot\ln\left[\frac{\left(2\cdot l\cdot\sin\left(\pi\cdot\frac{a}{l}\right)\right)}{\pi\cdot e}\right]+1\right]-\left(\frac{\gamma 1\cdot P}{4\cdot\pi}\right)\right]\cdot in \qquad \text{Eq} - 10.38$$

$$Mx := \left[\left(\frac{P}{4\cdot\pi}\right)\cdot\left[(1+\mu)\cdot\ln\left[\frac{\left(2\cdot l\cdot\sin\left(\pi\cdot\frac{a}{l}\right)\right)}{\pi\cdot e}\right]+1\right]-(1-\mu-\gamma 2)\cdot\left(\frac{P}{4\cdot\pi}\right)\right]\cdot in \qquad \text{Eq} - 10.39$$

Maximum Moments in Plate =

$Mx = 15330.7\cdot in\cdot lb$

$My = 16097.67\cdot in\cdot lb$

Minimum Thicknesss Required (t) = $t_{reqd} := \left(\frac{6\cdot My}{f_b\cdot in}\right)^{0.5} = 1.598\cdot in$

Base Plate Ratio = $ThicknessRatio := \frac{t_{reqd}}{t} = 0.799$

Condition 3 = $Condition3 := if\left(\frac{t_{reqd}}{t}\le 1.0, "Okay", "No Good"\right)$

$Condition3 = "Okay"$

CENTEK engineering
Centered on Solutions℠
63-2 North Branford Road
Branford, CT 06405
www.centekeng.com
P: (203) 488-0580
F: (203) 488-8587

Subject:	CAISSON FOUNDATION
Location:	150-ft Nudd Monopole Dayville (Killingly), CT
Rev. 0: 11/24/20	Prepared by: TJL Checked by: C.F.C. Job No. 20148.00

Caisson Foundation:

Input Data:

Shear Force =	$S := 57k$	*USER INPUT-FROM tnxTower*
Overturning Moment =	$M := 5560ft \cdot k$	*USER INPUT-FROM tnxTower*
Applied Axial Load =	$A1 := 62k$	*USER INPUT-FROM tnxTower*
Bending Moment =	$Mu := 5762ft \cdot k$	*USER INPUT--FROM LPILE*
Moment Capacity =	$Mn := 10122ft \cdot k$	*USER INPUT--FROM LPILE*
Foundation Diameter =	$d := 7.5ft$	*USER INPUT*
Overall Length of Caisson =	$L_c := 27.75ft$	*USER INPUT*
Depth From Top of Caisson to Grade =	$L_{pag} := 0.25ft$	*USER INPUT*
Number of Rebar =	$n := 66$	*USER INPUT*
Area of Rebar =	$Ar := 0.785in^2$	*USER INPUT*
Rebar Yield Strength =	$fy := 60ksi$	*USER INPUT*
Concrete Comp Strength =	$f'c := 4ksi$	*USER INPUT*

Check Moment Capacity:

Factor of Safety = $FS := \frac{0.9Mn}{Mu} = 1.6$

Factor of Safety Required = $FS_{reqd} := 1$

$FOSCheck := if(FS \geq FS_{reqd}, "OK", "NO GOOD")$

FOSCheck = "OK"

This program is licensed to:

TJL
Centek Engineering

Files Used for Analysis

Path to file locations: J:\Jobs\2014800.WI\05_Structural\Tower Analysis\Backup Documentation\LPile\
Name of input data file: Killingly Center Drilled Foundation.lpd
Name of output file: Killingly Center Drilled Foundation.lpo
Name of plot output file: Killingly Center Drilled Foundation.lpp
Name of runtime file: Killingly Center Drilled Foundation.lpr

---

Time and Date of Analysis

Date: November 24, 2020 Time: 10:33:03

Problem Title

20148.00 - CT11396B

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment
  Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- No computation of foundation stiffness matrix elements
- Output summary table of values for pile-head deflection, maximum
bending moment, and shear force only
- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 100
- Deflection tolerance for convergence = 1.0000E-05 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Only summary tables of pile-head deflection, maximum bending moment,
  and maximum shear force are to be printed in output file.

Pile Structural Properties and Geometry

Pile Length = 333.00 in

Depth of ground surface below top of pile = 3.00 in

Slope angle of ground surface = 0.00 deg.

Structural properties of pile defined using 2 points

Point No.	Point Depth in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	90.00000000	3220623.	6361.7000	3604996.
2	333.0000	90.00000000	3220623.	6361.7000	3604996.

Please note that because this analysis makes computations of ultimate
moment capacity and pile response using nonlinear bending stiffness
that the above values of moment of inertia and modulus of are not used
for any computations other than total stress due to combined axial
loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 3 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   3.000 in
Distance from top of pile to bottom of layer =   90.000 in
p-y subgrade modulus k for top of soil layer =   25.000 lbs/in**3
p-y subgrade modulus k for bottom of layer   =   25.000 lbs/in**3

Layer 2 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   90.000 in
Distance from top of pile to bottom of layer =   180.000 in
p-y subgrade modulus k for top of soil layer =   90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer   =   90.000 lbs/in**3

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   180.000 in
Distance from top of pile to bottom of layer =   333.000 in
p-y subgrade modulus k for top of soil layer =   60.000 lbs/in**3
p-y subgrade modulus k for bottom of layer   =   60.000 lbs/in**3

(Depth of lowest layer extends   0.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 6 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	3.00	0.05800
2	90.00	0.05800
3	90.00	0.06100
4	180.00	0.06100
5	180.00	0.02500
6	333.00	0.02500

Shear Strength of Soils

Shear strength parameters with depth defined using 6 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	3.000	0.00000	30.00	------	------
2	90.000	0.00000	30.00	------	------
3	90.000	0.00000	30.00	------	------
4	180.000	0.00000	30.00	------	------
5	180.000	0.00000	33.00	------	------
6	333.000	0.00000	33.00	------	------

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.
(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Loading Type

Static loading criteria was used for computation of p-y curves.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 2

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head   =   57000.000 lbs
Bending moment at pile head =   66720000.000 in-lbs
Axial load at pile head   =   62000.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head
may rotate under the applied pile-head loading, but is not a free-head
(zero moment) condition.

Load Case Number 2

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head   =   20000.000 lbs

Bending moment at pile head = 23616000.000 in-lbs
Axial load at pile head = 62000.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment) condition.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

---

Number of sections = 1

Pile Section No. 1

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 90.0000 in

Material Properties:

Compressive Strength of Concrete	= 4.000	kip/in**2
Yield Stress of Reinforcement	= 60.	kip/in**2
Modulus of Elasticity of Reinforcement	= 29000.	kip/in**2
Number of Reinforcing Bars	= 66	
Area of Single Bar	= 0.79000	in**2
Number of Rows of Reinforcing Bars	= 33	
Area of Steel	= 52.140	in**2
Area of Shaft	= 6361.725	in**2
Percentage of Steel Reinforcement	= 0.820	percent
Cover Thickness (edge to bar center)	= 3.000	in

Unfactored Axial Squash Load Capacity = 24580.99 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	1.580	41.952
2	1.580	41.573
3	1.580	40.816
4	1.580	39.690
5	1.580	38.205
6	1.580	36.373
7	1.580	34.212

8	1.580	31.741
9	1.580	28.983
10	1.580	25.963
11	1.580	22.707
12	1.580	19.246
13	1.580	15.610
14	1.580	11.833
15	1.580	7.949
16	1.580	3.992
17	1.580	0.000
18	1.580	-3.992
19	1.580	-7.949
20	1.580	-11.833
21	1.580	-15.610
22	1.580	-19.246
23	1.580	-22.707
24	1.580	-25.963
25	1.580	-28.983
26	1.580	-31.741
27	1.580	-34.212
28	1.580	-36.373
29	1.580	-38.205
30	1.580	-39.690
31	1.580	-40.816
32	1.580	-41.573
33	1.580	-41.952

Axial Thrust Force = 50000.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
8134337.	1.301494E+13	6.250000E-07	0.00003027	48.42922434	107.50597	822.54245
16194222.	1.295538E+13	0.00000125	0.00005850	46.79859951	206.10465	1585.97476
24180272.	1.289615E+13	0.00000188	0.00008677	46.27568677	303.33870	2350.52875
32090169.	1.283607E+13	0.00000250	0.00011500	45.99866554	398.93676	3113.95430
32090169.	1.026885E+13	0.00000313	0.00007565	24.20889035	261.37101	5686.13312
32090169.	8.557378E+12	0.00000375	0.00008941	23.84272859	307.63060	6863.17984
32090169.	7.334896E+12	0.00000438	0.00010296	23.53470907	352.84676	

```
 8046.12312
   32090169.  6.418034E+12    0.00000500    0.00011653   23.30686614     397.78411
 9228.60651
   32090169.  5.704919E+12    0.00000563    0.00013012   23.13249305     442.44179
10410.62693
   32090169.  5.134427E+12    0.00000625    0.00014372   22.99556360     486.81889
11592.18172
   32090169.  4.667661E+12    0.00000688    0.00015734   22.88588002     530.91449
12773.26805
   32090169.  4.278689E+12    0.00000750    0.00017097   22.79664829     574.72780
13953.88214
   32090169.  3.949559E+12    0.00000813    0.00018463   22.72315577     618.25775
15134.02233
   32090169.  3.667448E+12    0.00000875    0.00019829   22.66204700     661.50358
16313.68424
   32090169.  3.422951E+12    0.00000938    0.00021198   22.61085704     704.46438
17492.86467
   32090169.  3.209017E+12    0.00001000    0.00022568   22.56773248     747.13907
18671.56177
   32090169.  3.020251E+12    0.00001063    0.00023939   22.53126249     789.52678
19849.77170
   32090169.  2.852459E+12    0.00001125    0.00025313   22.50035003     831.62664
21027.49052
   32675293.  2.751604E+12    0.00001188    0.00026719   22.49999866     874.40074
22195.80544
   34351972.  2.748158E+12    0.00001250    0.00028125   22.49999866     916.82793
23364.00573
   36004208.  2.743178E+12    0.00001313    0.00029515   22.48759344     958.39400
24536.92775
   37642656.  2.737648E+12    0.00001375    0.00030897   22.47062579     999.37016
25712.11873
   39279364.  2.732477E+12    0.00001438    0.00032281   22.45645568    1040.05715
26886.75856
   40914316.  2.727621E+12    0.00001500    0.00033667   22.44473979    1080.45376
28060.84448
   42547510.  2.723041E+12    0.00001563    0.00035055   22.43519649    1120.55911
29234.37064
   44178925.  2.718703E+12    0.00001625    0.00036445   22.42757902    1160.37188
30407.33520
   45808553.  2.714581E+12    0.00001688    0.00037837   22.42168352    1199.89104
31579.73320
   47436388.  2.710651E+12    0.00001750    0.00039230   22.41733566    1239.11558
32751.55949
   49062410.  2.706892E+12    0.00001813    0.00040626   22.41437986    1278.04419
33922.81168
   50686620.  2.703286E+12    0.00001875    0.00042024   22.41269007    1316.67600
35093.48263
   52308998.  2.699819E+12    0.00001938    0.00043424   22.41214827    1355.00969
36263.56981
   53929536.  2.696477E+12    0.00002000    0.00044825   22.41265520    1393.04414
37433.06836
```

```
   55548220.  2.693247E+12    0.00002063    0.00046229   22.41412237    1430.77812
38601.97420
   57165042.  2.690120E+12    0.00002125    0.00047635   22.41647467    1468.21059
39770.28139
   58779989.  2.687085E+12    0.00002188    0.00049043   22.41964236    1505.34027
40937.98605
   60393046.  2.684135E+12    0.00002250    0.00050453   22.42356375    1542.16588
42105.08408
   62004208.  2.681263E+12    0.00002313    0.00051865   22.42818788    1578.68640
43271.56870
   63613456.  2.678461E+12    0.00002375    0.00053279   22.43346378    1614.90041
44437.43677
   65220779.  2.675724E+12    0.00002438    0.00054696   22.43934855    1650.80668
45602.68321
   68429600.  2.670423E+12    0.00002563    0.00057535   22.45279446    1721.69098
47931.29036
   71630579.  2.665324E+12    0.00002688    0.00060383   22.46826276    1791.32922
50257.34647
   74823594.  2.660394E+12    0.00002813    0.00063241   22.48553082    1859.71049
52580.81321
   77994152.  2.655120E+12    0.00002938    0.00066094   22.49999866    1926.51307
54905.41345
   81101994.  2.648228E+12    0.00003063    0.00068906   22.49999866    1990.88227
57241.81403
   84192607.  2.641337E+12    0.00003188    0.00071719   22.49999866    2053.81391
59578.21460
   86984218.  2.625939E+12    0.00003313    0.00074531   22.49999866    2115.30800
60000.00000
   89269238.  2.596923E+12    0.00003438    0.00077206   22.46005252    2172.36574
60000.00000
   91149678.  2.558587E+12    0.00003563    0.00079694   22.37011805    2224.10874
60000.00000
   92815535.  2.517031E+12    0.00003688    0.00082111   22.26726338    2273.27007
60000.00000
   94323024.  2.474047E+12    0.00003813    0.00084475   22.15741619    2320.30866
60000.00000
   95664679.  2.429579E+12    0.00003938    0.00086782   22.03982010    2365.18156
60000.00000
   96884588.  2.384851E+12    0.00004063    0.00089045   21.91868886    2408.24277
60000.00000
   98040024.  2.341254E+12    0.00004188    0.00091287   21.79983750    2449.99034
60000.00000
   99053881.  2.296902E+12    0.00004313    0.00093473   21.67486534    2489.78479
60000.00000
1.000396E+08  2.254413E+12    0.00004438    0.00095652   21.55534878    2528.59837
60000.00000
1.009244E+08  2.212041E+12    0.00004563    0.00097789   21.43319830    2565.81175
60000.00000
1.017574E+08  2.170825E+12    0.00004688    0.00099907   21.31345376    2601.87378
60000.00000
1.025824E+08  2.131582E+12    0.00004813    0.00102026   21.20012239    2637.15498
```

60000.00000
1.032801E+08 2.091749E+12 0.00004938 0.00104085 21.08046904 2670.63602
60000.00000
1.041700E+08 2.057678E+12 0.00005063 0.00106313 21.00000009 2706.13599
60000.00000
1.047281E+08 2.018855E+12 0.00005188 0.00108566 20.92836097 2741.16161
60000.00000
1.053164E+08 1.982426E+12 0.00005313 0.00110528 20.80536023 2770.73933
60000.00000
1.058810E+08 1.947236E+12 0.00005438 0.00112481 20.68616554 2799.48413
60000.00000
1.064438E+08 1.913597E+12 0.00005563 0.00114437 20.57291731 2827.60587
60000.00000
1.070048E+08 1.881404E+12 0.00005688 0.00116396 20.46522930 2855.10149
60000.00000
1.074660E+08 1.848877E+12 0.00005813 0.00118292 20.35135075 2881.02700
60000.00000
1.079244E+08 1.817674E+12 0.00005938 0.00120191 20.24265960 2906.35293
60000.00000
1.083812E+08 1.787731E+12 0.00006063 0.00122092 20.13895735 2931.08685
60000.00000
1.088364E+08 1.758972E+12 0.00006188 0.00123997 20.03994897 2955.22611
60000.00000
1.092646E+08 1.730924E+12 0.00006313 0.00125886 19.94232729 2978.52269
60000.00000
1.096334E+08 1.703043E+12 0.00006438 0.00127734 19.84218702 3000.68657
60000.00000
1.100008E+08 1.676202E+12 0.00006563 0.00129585 19.74630877 3022.28741
60000.00000
1.103666E+08 1.650342E+12 0.00006688 0.00131439 19.65445384 3043.32223
60000.00000
1.107311E+08 1.625410E+12 0.00006813 0.00133296 19.56640497 3063.78835
60000.00000
1.107311E+08 1.596123E+12 0.00006938 0.00135281 19.49999884 3085.06960
60000.00000
1.115165E+08 1.578994E+12 0.00007063 0.00137599 19.48309556 3109.20760
60000.00000
1.117969E+08 1.555436E+12 0.00007188 0.00139338 19.38608810 3126.43330
60000.00000
1.120762E+08 1.532666E+12 0.00007313 0.00141078 19.29276332 3143.15988
60000.00000
1.123543E+08 1.510646E+12 0.00007438 0.00142822 19.20293882 3159.38498
60000.00000
1.129069E+08 1.468707E+12 0.00007688 0.00146317 19.03311476 3190.32087
60000.00000
1.134478E+08 1.429264E+12 0.00007938 0.00149816 18.87443259 3219.15849
60000.00000
1.138784E+08 1.390881E+12 0.00008188 0.00153209 18.71251032 3245.04287
60000.00000
1.143047E+08 1.354722E+12 0.00008438 0.00156612 18.56141612 3269.00329
60000.00000

1.147265E+08 1.320593E+12 0.00008688 0.00160026 18.42022732 3291.02091
60000.00000
1.151439E+08 1.288323E+12 0.00008938 0.00163450 18.28812853 3311.07679
60000.00000
1.155188E+08 1.257347E+12 0.00009188 0.00166836 18.15900698 3328.89156
60000.00000
1.158404E+08 1.227448E+12 0.00009438 0.00170168 18.03105757 3344.46864
60000.00000
1.169061E+08 1.206773E+12 0.00009688 0.00174375 18.00000027 3361.57814
60000.00000
1.169061E+08 1.176414E+12 0.00009938 0.00177749 17.88671449 3372.91010
60000.00000
1.169061E+08 1.147545E+12 0.00010188 0.00180964 17.76332483 3381.84545
60000.00000
1.171459E+08 1.122356E+12 0.00010438 0.00184189 17.64681771 3389.01958
60000.00000
1.174114E+08 1.098587E+12 0.00010688 0.00187390 17.53355339 3394.36467
60000.00000
1.176243E+08 1.075422E+12 0.00010938 0.00190512 17.41827741 3397.87246
60000.00000
1.178338E+08 1.053263E+12 0.00011188 0.00193645 17.30901495 3399.70809
60000.00000
1.180367E+08 1.032015E+12 0.00011438 0.00196787 17.20538512 3396.77233
60000.00000
1.182326E+08 1.011616E+12 0.00011688 0.00199938 17.10703656 3388.93948
60000.00000
1.184270E+08 9.920584E+11 0.00011938 0.00203100 17.01364741 3388.77124
60000.00000
1.186197E+08 9.732896E+11 0.00012188 0.00206272 16.92492262 3393.56279
60000.00000
1.188107E+08 9.552621E+11 0.00012438 0.00209455 16.84059665 3397.04103
60000.00000
1.189881E+08 9.378372E+11 0.00012688 0.00212621 16.75827429 3399.17486
60000.00000
1.191276E+08 9.207933E+11 0.00012938 0.00215714 16.67355135 3399.98589
60000.00000
1.192634E+08 9.043672E+11 0.00013188 0.00218828 16.59359470 3394.26825
60000.00000
1.193978E+08 8.885419E+11 0.00013438 0.00221952 16.51733950 3387.50072
60000.00000
1.193978E+08 8.723128E+11 0.00013688 0.00225844 16.49999902 3384.87575
60000.00000
1.197216E+08 8.589889E+11 0.00013938 0.00229969 16.49999902 3391.61895
60000.00000
1.198997E+08 8.451078E+11 0.00014188 0.00233063 16.42735139 3395.06083
60000.00000
1.200191E+08 8.313011E+11 0.00014438 0.00236062 16.35059461 3397.50465
60000.00000
1.201377E+08 8.179591E+11 0.00014688 0.00239068 16.27697602 3399.12672
60000.00000
1.202555E+08 8.050580E+11 0.00014938 0.00242082 16.20634004 3399.91774

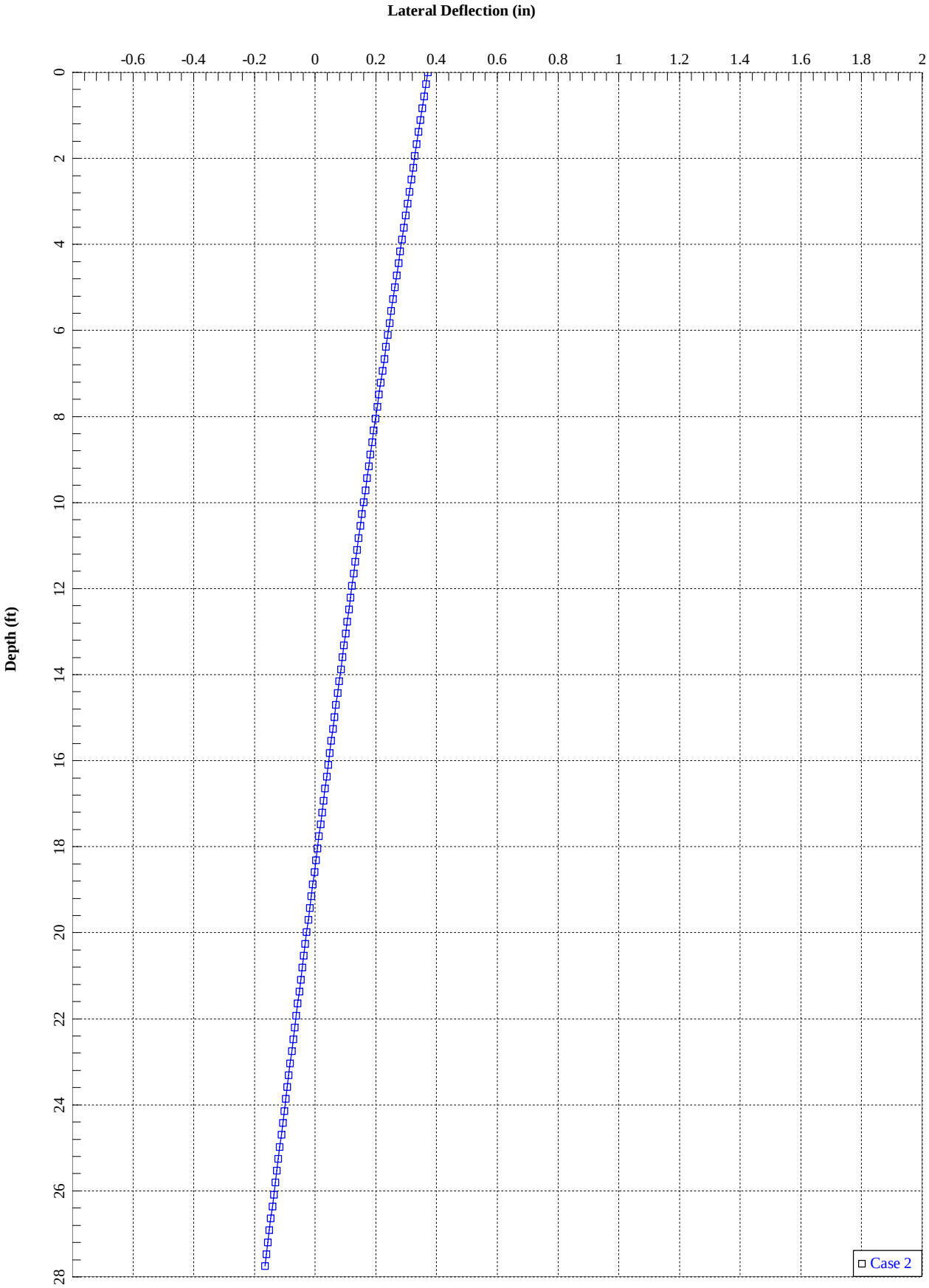
60000.00000
1.203712E+08 7.925673E+11 0.00015188 0.00245114 16.13918021 3396.89861
60000.00000
1.204851E+08 7.804706E+11 0.00015438 0.00248159 16.07507542 3391.32948
60000.00000
1.205750E+08 7.686056E+11 0.00015688 0.00251125 16.00796387 3385.96968
60000.00000
1.206537E+08 7.570429E+11 0.00015938 0.00254057 15.94085231 3380.69854
60000.00000
1.207289E+08 7.458154E+11 0.00016188 0.00257017 15.87752268 3378.25497
60000.00000
1.207977E+08 7.348908E+11 0.00016438 0.00260025 15.81899151 3382.90458
60000.00000
1.208660E+08 7.242909E+11 0.00016688 0.00263038 15.76254979 3387.00817
60000.00000
1.209294E+08 7.139740E+11 0.00016938 0.00266090 15.71012601 3390.62567
60000.00000
1.209877E+08 7.039287E+11 0.00017188 0.00269182 15.66149220 3393.71521
60000.00000
1.210456E+08 6.941683E+11 0.00017438 0.00272280 15.61462328 3396.19701
60000.00000
1.211597E+08 6.754546E+11 0.00017938 0.00278496 15.52590385 3399.31058
60000.00000
1.212675E+08 6.577220E+11 0.00018438 0.00284773 15.44532493 3397.38578
60000.00000
1.213561E+08 6.408245E+11 0.00018938 0.00291219 15.37789151 3387.29047
60000.00000
1.214434E+08 6.247892E+11 0.00019438 0.00297685 15.31496152 3377.14204
60000.00000
1.215149E+08 6.094791E+11 0.00019938 0.00304086 15.25196448 3370.29117
60000.00000
1.215615E+08 5.947963E+11 0.00020438 0.00310367 15.18615380 3379.34855
60000.00000
1.216070E+08 5.808096E+11 0.00020938 0.00316667 15.12438253 3386.80610
60000.00000
1.216432E+08 5.674320E+11 0.00021438 0.00323070 15.07030651 3392.77406
60000.00000
1.216730E+08 5.546348E+11 0.00021938 0.00329547 15.02209112 3397.03937
60000.00000
1.218982E+08 5.432790E+11 0.00022438 0.00336563 15.00000045 3399.65732
60000.00000
1.222746E+08 5.330773E+11 0.00022938 0.00344063 15.00000045 3394.06154
60000.00000
1.226234E+08 5.231930E+11 0.00023438 0.00351563 15.00000045 3383.16202
60000.00000
1.229589E+08 5.136665E+11 0.00023938 0.00359063 15.00000045 3372.26250
60000.00000
1.232813E+08 5.044758E+11 0.00024438 0.00366563 15.00000045 3361.36299
60000.00000
1.235904E+08 4.956008E+11 0.00024938 0.00374063 15.00000045 3366.14527
60000.00000

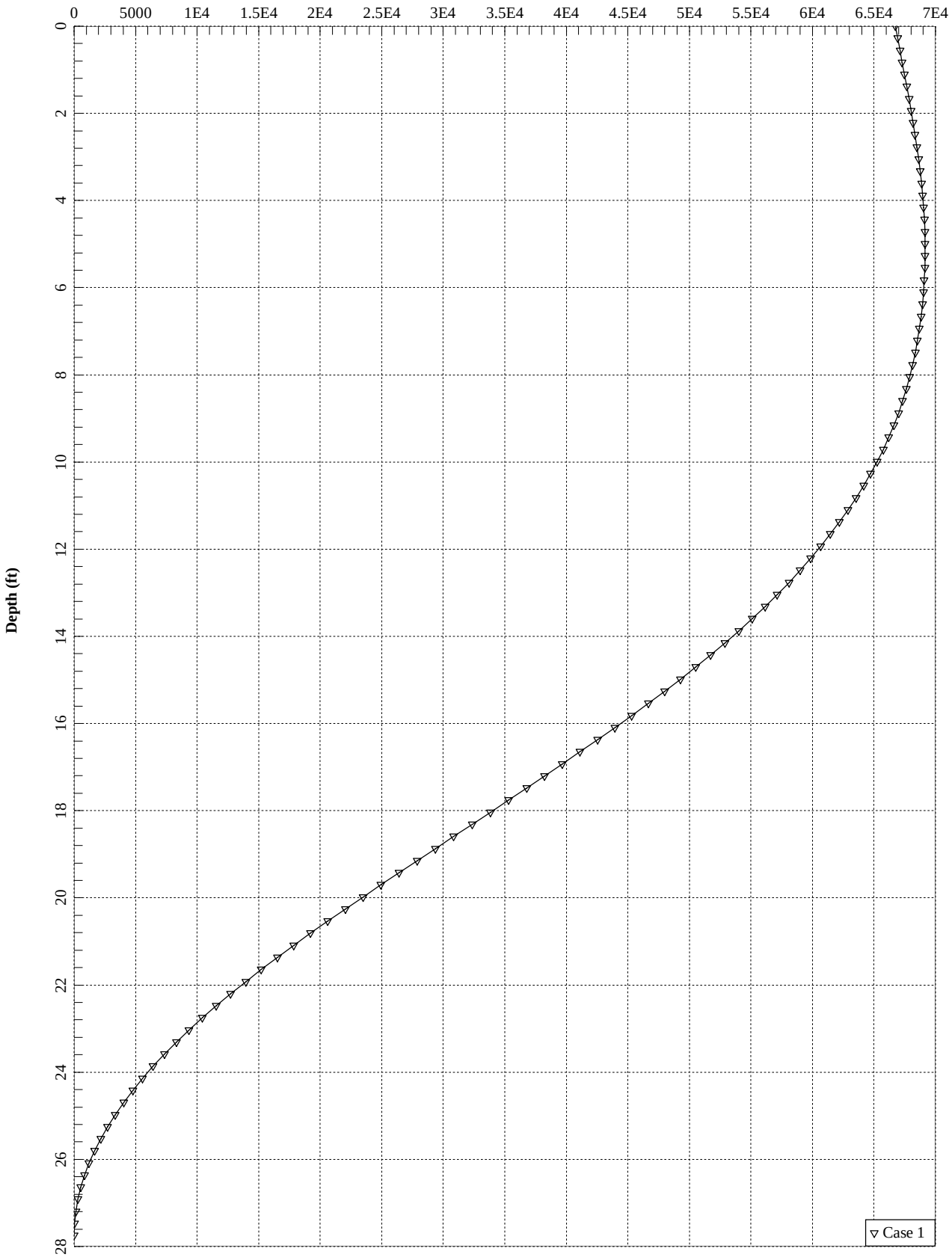
```
  1.238548E+08  4.868984E+11    0.00025438    0.00381563   15.00000045    3377.28498
  60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 =  121469.26200
in-kip




---------------------------------------------------------------------------
             Computed Values of Load Distribution and Deflection
                 for Lateral Loading for Load Case Number  1
---------------------------------------------------------------------------

Pile-head boundary conditions are Shear and Moment (Pile-head Condition Type 1)
Specified shear force at pile head  =       57000.000 lbs
Specified moment at pile head       =    66720000.000 in-lbs
Specified axial load at pile head   =       62000.000 lbs


Output Verification:

Computed forces and moments are within specified convergence limits.



---------------------------------------------------------------------------
             Computed Values of Load Distribution and Deflection
                 for Lateral Loading for Load Case Number  2
---------------------------------------------------------------------------

Pile-head boundary conditions are Shear and Moment (Pile-head Condition Type 1)
Specified shear force at pile head  =       20000.000 lbs
Specified moment at pile head       =    23616000.000 in-lbs
Specified axial load at pile head   =       62000.000 lbs


Output Verification:

Computed forces and moments are within specified convergence limits.




---------------------------------------------------------------------------
                          Summary of Pile Response(s)
---------------------------------------------------------------------------

Definition of Symbols for Pile-Head Loading Conditions:

Type 1 = Shear and Moment,          y = pile-head displacment in
```

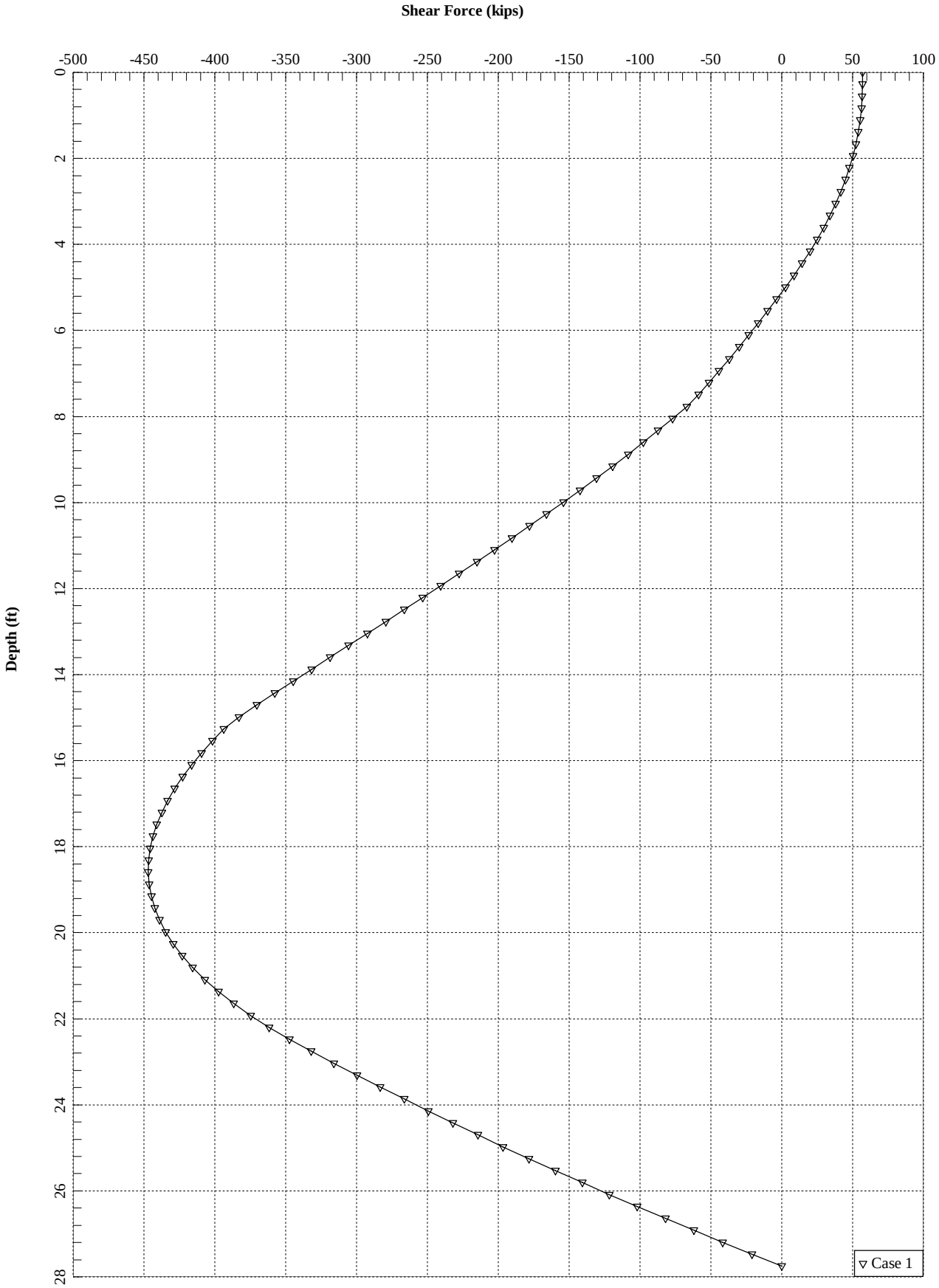
Type 2 = Shear and Slope, M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness, V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment, S = Pile-head Slope, radians
Type 5 = Deflection and Slope, R = Rot. Stiffness of Pile-head in-lbs/rad

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 57000.	M= 6.67E+07	62000.0000	1.9273	6.9148E+07	-446903.
1	V= 20000.	M= 2.36E+07	62000.0000	0.3719370	2.4663E+07	-152668.

The analysis ended normally.


Lateral Deflection (in)
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
Case 2


Bending Moment (in-kips)
0
5000
1E4
1.5E4
2E4
2.5E4
3E4
3.5E4
4E4
4.5E4
5E4
5.5E4
6E4
6.5E4
7E4
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
Case 1


Shear Force (kips)
-500
-450
-400
-350
-300
-250
-200
-150
-100
-50
0
50
100
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
Case 1

RAN Template:	A&L Template:
67D04G	67D04G_1DP+1OP

CT11396B_L600_3_draft

Print Name: Standard (2)
PORs: L600_Phase 3

Section 1 - Site Information

Site ID: CT11396B
Status: Draft
Version: 3
Project Type: L600
Approved: Not Approved
Approved By: Not Approved
Last Modified: 9/10/2020 11:28:22 PM
Last Modified By: Michael.Low1@T-Mobile.com

Site Name: Killingly/I-395/X93_1
Site Class: Monopole
Site Type: Structure Non Building
Plan Year:
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Town of Killingly

Latitude: 41.84743600
Longitude: -71.87888300
Address: 79 Putnam Pike
City, State: Killingly, CT
Region: NORTHEAST

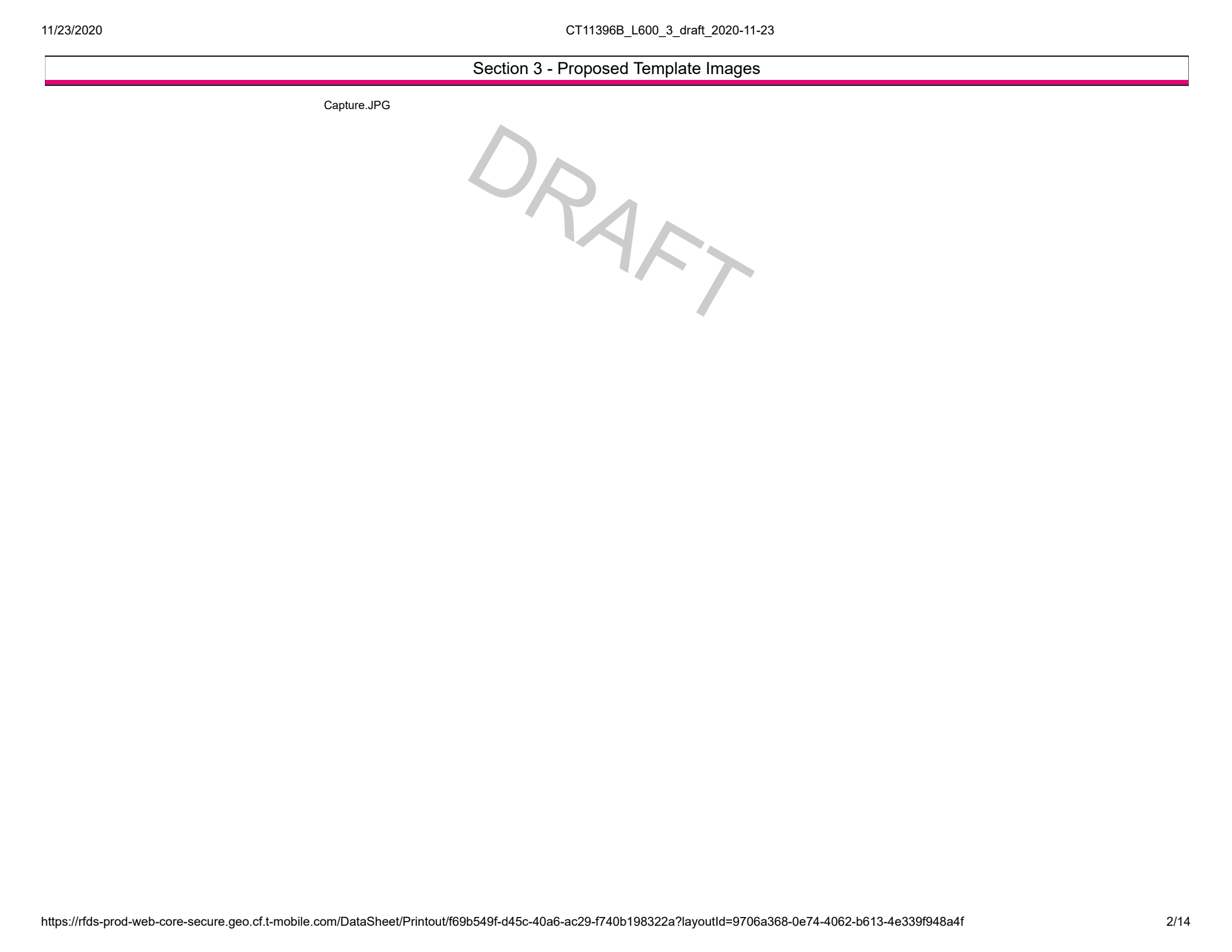
RAN Template: 67D04G			AL Template: 67D04G_1DP+1OP	
Sector Count: 3	**Antenna Count:** 6	**Coax Line Count:** 6	**TMA Count:** 3	**RRU Count:** 3

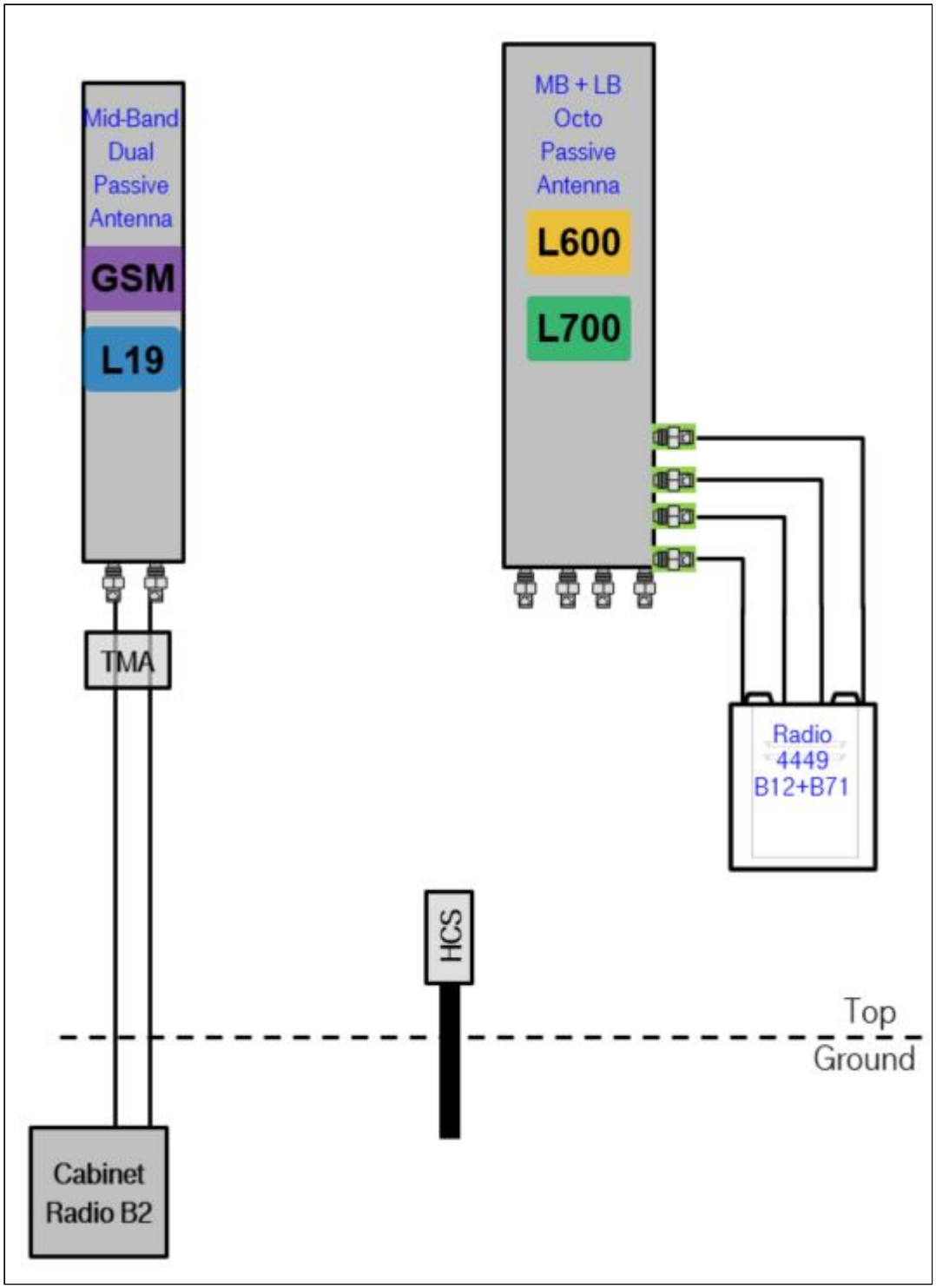
Section 2 - Existing Template Images

----- This section is intentionally blank. -----

Section 3 - Proposed Template Images

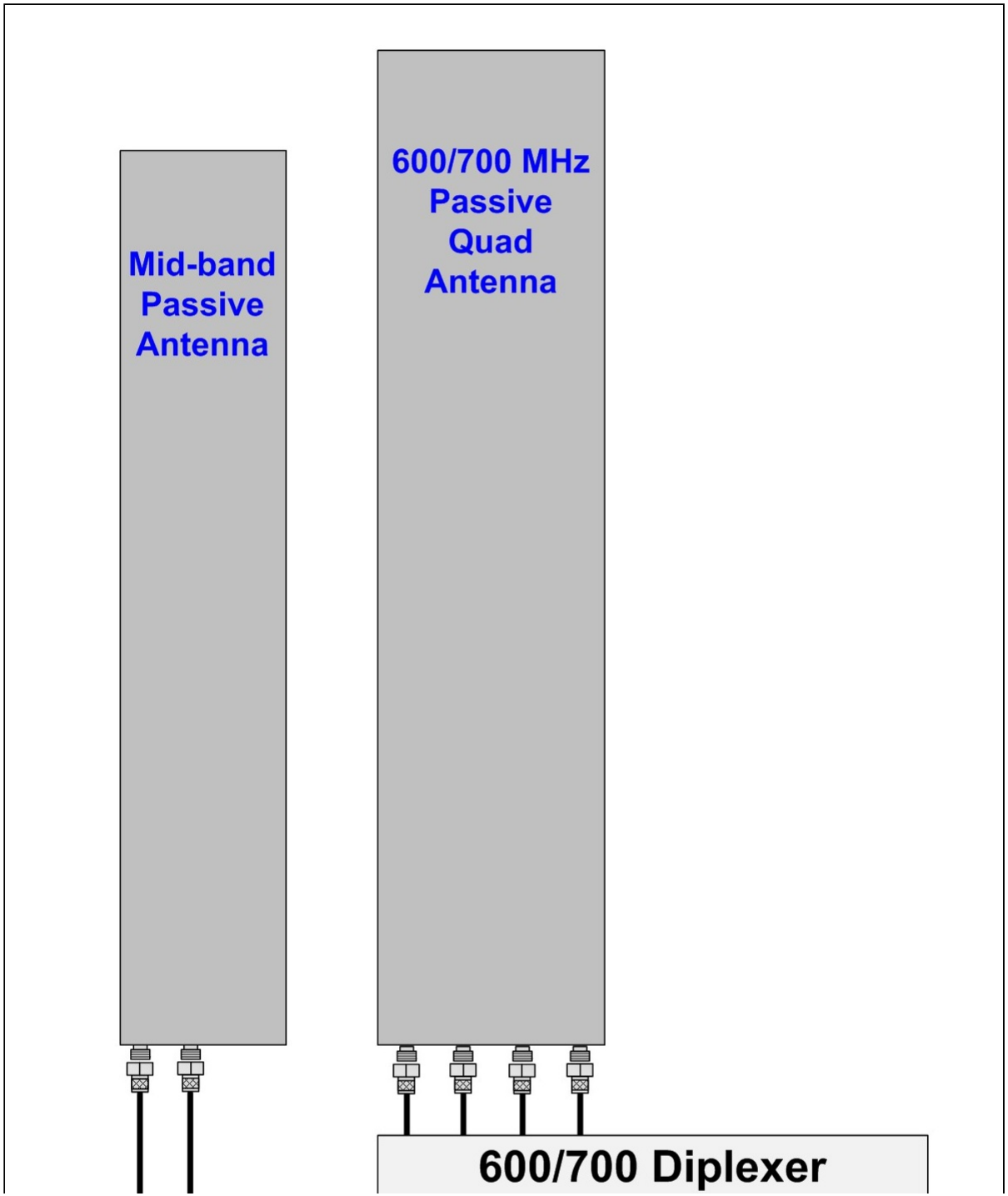
Capture.JPG

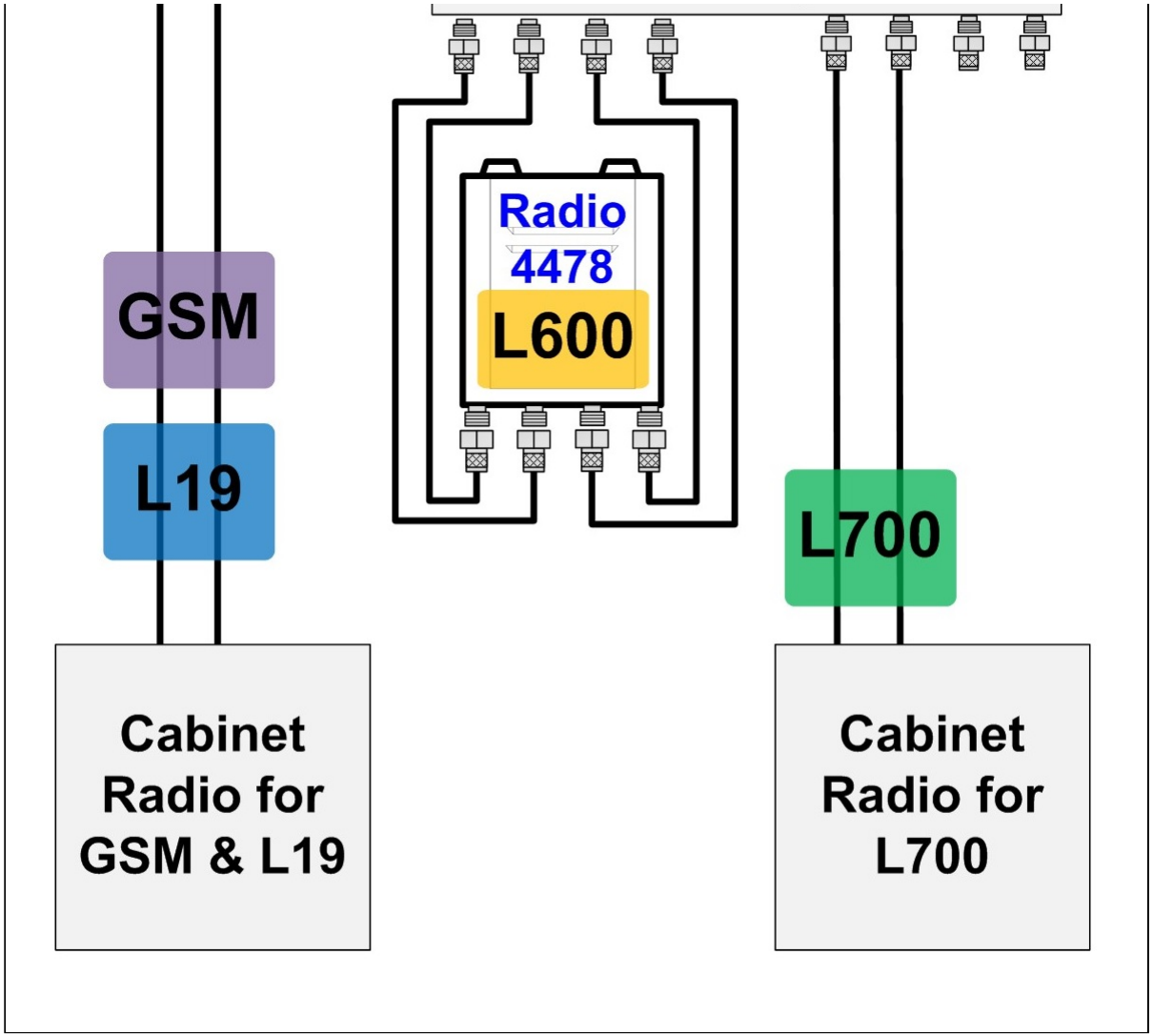



Mid-Band
Dual
Passive
Antenna
GSM
L19
MB + LB
Octo
Passive
Antenna
L600
L700
TMA
Radio
4449
B12+B71
HCS
Top
Ground
Cabinet
Radio B2

Notes:

6704G Antenna.jpg




Radio
4478
L600
GSM
L19
L700
Cabinet
Radio for
GSM & L19
Cabinet
Radio for
L700

Notes:

Section 4 - Siteplan Images

----- This section is intentionally blank. -----

RAN Template:	A&L Template:
67D04G	67D04G_1DP+1OP

CT11396B_L600_3_draft

Print Name: Standard (2)
PORs: L600_Phase 3

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 704G

Enclosure	1
Enclosure Type	RBS 6201 ODE
Baseband	DUG20 BB 6630 L1900 L700
Radio	RUS01 B2 **(x 6)** RUS01 B12 **(x 6)**

Proposed RAN Equipment

Template: 67D04G

Enclosure	1
Enclosure Type	RBS 6201 ODE
Baseband	DUG20 G1900 BB 6630 L1900 BB 6630 L700 L600 N600
Hybrid Cable System	Ericsson 6x12 HCS *Select Length & AWG*
Radio	RUS01 B2 **(x 3)** G1900 RUS01 B2 **(x 3)** L1900

RAN Scope of Work:

*** Existing RBS6201 ODE on site ***

Remove all (6) RUS01 B12 for L700 from cabinet.

Add (1) BB6630

Add (1) 6X12 HCS
Existing: (12) Coaxial Lines.
Remove (6) Coaxial Lines

RAN Template:	A&L Template:
67D04G	67D04G_1DP+1OP

CT11396B_L600_3_draft

Print Name: Standard (2)
PORs: L600_Phase 3

Section 6 - A&L Equipment

Existing Template: 704G_Unconstrained
Proposed Template: 67D04G_1DP+1OP

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro	
Antenna	**1**	**2**
Antenna Model	EMS - RV90-17-XXDP (Dual)	Andrew - LNX-6515DS-A1M (Dual)
Azimuth	80	80
M. Tilt	0	0
Height	150	148
Ports	**P1**	**P2**
Active Tech.	L1900, G1900	L700
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	1-5/8" Coax - 170 ft.	1-5/8" Coax - 170 ft.
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	
Diplexers / Combiners		
Radio		
Sector Equipment		

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67D04G	67D04G_1DP+1OP

CT11396B_L600_3_draft

Print Name: Standard (2)
PORs: L600_Phase 3

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	**1**		**2**			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)			
Azimuth	80		80			
M. Tilt	0		0			
Height	150		148			
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L1900 G1900		L700 L600 N600	L700 L600 N600		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2		2	2		
Cables	1-5/8" Coax - 170 ft. **(x2)**		Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs	Generic Twin Style 1A - PCS (AtAntenna)					
Diplexers / Combiners						
Radio			Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*** Existing Two Mounts per Sector ***
Replace EMS antenna in Position 1 with RFS APX16 Quad.
Replace LB Dual in Position 2 with (1) LB/MB Octo.
Add (1) Radio 4449 B71+B12 for L600 and L700 to Postion 2 at antenna.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D04G	67D04G_1DP+1OP

CT11396B_L600_3_draft

Print Name: Standard (2)
PORs: L600_Phase 3

Sector 2 (Existing) view from behind		
Coverage Type	A - Outdoor Macro	
Antenna	**1**	**2**
Antenna Model	EMS - RV90-17-XXDP (Dual)	Andrew - LNX-6515DS-A1M (Dual)
Azimuth	200	200
M. Tilt	0	0
Height	150	148
Ports	**P1**	**P2**
Active Tech.	L1900 G1900	L700
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	1-5/8" Coax - 170 ft.	1-5/8" Coax - 170 ft.
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	
Diplexers / Combiners		
Radio		
Sector Equipment		

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67D04G	67D04G_1DP+1OP

CT11396B_L600_3_draft

Print Name: Standard (2)
PORs: L600_Phase 3

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	1		2				
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				
Azimuth	200		200				
M. Tilt	0		0				
Height	150		148				
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	
Active Tech.	L1900 G1900		L700 L600 N600	L700 L600 N600			
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							
E. Tilt	2		2	2			
Cables	1-5/8" Coax - 170 ft. **(x2)**		Coax Jumper **(x2)**	Coax Jumper **(x2)**			
TMAs	Generic Twin Style 1A - PCS (AtAntenna)						
Diplexers / Combiners							
Radio			Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)			
Sector Equipment							

Unconnected Equipment:

Scope of Work:

*** Existing Two Mounts per Sector ***
Replace EMS antenna in Position 1 with RFS APX16 Quad.
Replace LB Dual in Position 2 with (1) LB/MB Octo.
Add (1) Radio 4449 B71+B12 for L600 and L700 to Postion 2 at antenna.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D04G	67D04G_1DP+1OP

CT11396B_L600_3_draft

Print Name: Standard (2)
PORs: L600_Phase 3

Sector 3 (Existing) view from behind		
Coverage Type	A - Outdoor Macro	
Antenna	**1**	**2**
Antenna Model	EMS - RV90-17-XXDP (Dual)	Andrew - LNX-6515DS-A1M (Dual)
Azimuth	320	320
M. Tilt	0	0
Height	150	148
Ports	**P1**	**P2**
Active Tech.	L1900 G1900	L700
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	1-5/8" Coax - 170 ft.	1-5/8" Coax - 170 ft.
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	
Diplexers / Combiners		
Radio		
Sector Equipment		

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67D04G	67D04G_1DP+1OP

CT11396B_L600_3_draft

Print Name: Standard (2)
PORs: L600_Phase 3

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	**1**		**2**				
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				
Azimuth	320		320				
M. Tilt	0		0				
Height	150		148				
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	
Active Tech.	L1900 G1900		L700 L600 N600	L700 L600 N600			
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							
E. Tilt	2		2	2			
Cables	1-5/8" Coax - 170 ft. **(x2)**		Coax Jumper **(x2)**	Coax Jumper **(x2)**			
TMAs	Generic Twin Style 1A - PCS (AtAntenna)						
Diplexers / Combiners							
Radio			Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)			
Sector Equipment							

Unconnected Equipment:

Scope of Work:

*** Existing Two Mounts per Sector ***
Replace EMS antenna in Position 1 with RFS APX16 Quad.
Replace LB Dual in Position 2 with (1) LB/MB Octo.
Add (1) Radio 4449 B71+B12 for L600 and L700 to Postion 2 at antenna.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D04G	67D04G_1DP+1OP

CT11396B_L600_3_draft

Print Name: Standard (2)
PORs: L600_Phase 3

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

----- This section is intentionally blank. -----

Proposed Power Systems Equipment

February 22, 2021 (Rev. 1)
May 30, 2019

Transcend Wireless
10 Industrial Avenue
Mahwah, NJ 07430

RE: Site Number: CT11396B (L600)
Site Name: KILLINGLY/ I-395/ X93_1
Site Address: 79 Putnam Street
Killingly, CT 06241

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by T-Mobile to perform a mount analysis on the existing T-Mobile antenna mounts to determine their capability of supporting the following equipment loading:

- (3) Twin Style 1A - PCS TMA's (11.2"x8.0"x4.9" – Wt. = 16 lbs. /each)
- **(3) APX16DWV-16DWVS-E-A20 Antennas (55.9"x13.0"x3.2" – Wt. = 54 lbs. /each)**
- **(3) APXVAALL24_43-U-NA20 Antennas (95.9"x24.0"x8.5" – Wt. = 150 lbs. /each)**
- **(3) 4449 B71+B12 RRH's (14.9"x13.1"x9.2" – Wt. = 74 lbs. /each)**

**Proposed equipment shown in bold.*

No original structural design documents were available for the existing mounts. HDG reviewed field photographs dated April 30, 2019 and used field data from similar mounts to complete this analysis.

Based on our analysis, we have determined that the existing antenna mounts **ARE CAPABLE** of supporting the proposed installation with the following modifications:

- **Install new 2" std. (2.38" O.D.) pipe brace secured to the existing mount and adjacent mount standoff (typ. of 1 per sector, total of 3).**
- **Reinforce existing horizontal angles with new L2-1/2x2-1/2x3-16 steel angles (typ. of 2 per sector, total of 6).**
- **Reinforce existing horizontal standoff angles with new L3x2x1/4 steel angles (typ. of 2 per sector, total of 6).**
- **Reinforce existing vertical standoff angles with new L2x2x1/4 steel angles (typ. of 2 per sector, total of 6).**
- **Relocate existing pipe brace to adjacent mount standoff (typ. of 1 per sector, total of 3).**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	2	LC3	232%	**FAIL**
Modified Mount Rating	2	LC3	97%	**PASS**

This analysis was conducted in accordance with EIA/TIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the International Building Code 2015. (See the attached analysis).

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mounts have been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to T-Mobile's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting structure.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Hudson Design Group LLC

Michael Cabral
Vice President

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:

HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 2/19/2021
Project Name: KILLINGLY/ I-395/ X93_1
Project No.: CT11396B
Designed By: LBW **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01\ (z/z_g)^{2/\alpha}$

z=	148 (ft)
z_g=	1200 (ft)
α=	7.0

K_z= 1.105

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_e
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.4 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_e\ K_t/K_h)]^2$

$K_h = e^{(f*z/H)}$

K_{zt}= 1

(If Category 1 then K_{zt} =1.0)

Category= **1**

K_h=	1
K_e=	0.9 (from Table 2-4)
K_t=	0 (from Table 2-5)
f=	0 (from Table 2-5)
z=	148
H=	0 (Ht. of the crest above surrounding terrain)
K_{zt}=	1.00
K_{iz} =	1.16 (from Sec. 2.6.8)

2.6.8 Design Ice Thickness

Max Ice Thickness = t_i = 1.00 in

Importance Factor, I_{ice} = I_{ice}= 1.00 (from Table 2-3)

$t_{iz} = 2.0*t_i*I_{ice}*K_{iz}*(Kzt)^{0.35}$ t_{iz} = 2.32 in

Date: 2/19/2021
Project Name: KILLINGLY/ I-395/ X93_1
Project No.: CT11396B
Designed By: LBW Checked By: MSC

HUDSON Design Group LLC

2.6.7 Gust Effect Factor

2.6.7.1 Self Supporting Lattice Structures

Gh = 1.0 Latticed Structures > 600 ft

Gh = 0.85 Latticed Structures 450 ft or less

Gh = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	150	Gh=	0.85

2.6.7.2 Guyed Masts	Gh=	0.85
2.6.7.3 Pole Structures	Gh=	1.1
2.6.9 Appurtenances	Gh=	1.0

2.6.7.4 Structures Supported on Other Structures
(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

Gh=	1.35	**Gh=**	**1.00**

2.6.9.2 Design Wind Force on Appurtenances

$F = q_z * Gh * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_d * V_{max}^2 * I$

		K_z=	1.105	
		K_{zt}=	1.0	
q_z=	**32.53**	K_d=	0.95	(from Table 2-2)
$q_{z\ (ice)}$=	**6.72**	V_{max}=	110	
		$V_{max\ (ice)}$=	50	
		I=	1.0	(from Table 2-3)
		I_{wice}=	1.0	(from Table 2-3)

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95

Date: 2/19/2021
Project Name: KILLINGLY/ I-395/ X93_1
Project No.: CT11396B
Designed By: LBW Checked By: MSC

HUDSON Design Group LLC

Determine Ca:

Table 2-8

Force Coefficients (Ca) for Appurtenances				
Member Type		**Aspect Ratio ≤ 2.5**	**Aspect Ratio = 7**	**Aspect Ratio ≥ 25**
		Ca	**Ca**	**Ca**
Flat		1.2	1.4	2.0
Round	**C < 32** (Subcritical)	0.7	0.8	1.2
	32 ≤ C ≤ 64 (Transitional)	$3.76/(C^{0.485})$	$3.37/(C^{0.415})$	$38.4/(C^{1.0})$
	C > 64 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
(Aspect ratio is independent of the spacing between support points of a linear appurtenance, and the section length considered to have uniform wind load).

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = **2.32** **in**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/Ice)
APX16DWV-16DWVS-E-A20 Antenna	55.9	13.0	3.2	5.05	4.30	1.28	**210**	**64**
APXVAALL24_43-U-NA20 Antenna	95.9	24.0	8.5	15.98	4.00	1.27	**658**	**170**
4449 B71+B12 RRH	14.9	13.1	9.2	1.36	1.14	1.20	**53**	**19**
Twin Style 1A- PCS TMA	11.2	8.0	4.9	0.62	1.40	1.20	**24**	**11**
2" Pipe	2.4	12.0		0.20	0.20	1.20	**8**	**7**
2-1/2" Pipe	2.9	12.0		0.24	0.24	1.20	**9**	**7**
2x2 Angle	2.0	12.0		0.17	0.17	2.00	**11**	**10**
2-1/2x2-1/2 Angle	2.5	12.0		0.21	0.21	2.00	**14**	**11**
3x2 Angle	3.0	12.0		0.25	0.25	2.00	**16**	**12**

Date: 2/19/2021
Project Name: KILLINGLY/ I-395/ X93_1
Project No.: CT11396B
Designed By: LBW **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 2.32 in.
Density of ice: 56 pcf

APX16DWV-16DWVS-E-A20 Antenna

Weight of ice based on total radial SF area:

Height (in):	55.9	
Width (in):	13.0	
Depth (in):	3.2	
Total weight of ice on object:		207 lbs
Weight of object:	54.0 lbs	
Combined weight of ice and object:		261 lbs

APXVAALL24_43-U-NA20 Antenna

Weight of ice based on total radial SF area:

Height (in):	95.9	
Width (in):	24.0	
Depth (in):	8.5	
Total weight of ice on object:		629 lbs
Weight of object:	150.0 lbs	
Combined weight of ice and object:		779 lbs

4449 B71+B12 RRH

Weight of ice based on total radial SF area:

Height (in):	14.9	
Width (in):	13.1	
Depth (in):	9.2	
Total weight of ice on object:		65 lbs
Weight of object:	74.0 lbs	
Combined weight of ice and object:		139 lbs

Twin Style 1A- PCS TMA

Weight of ice based on total radial SF area:

Height (in):	11.2	
Width (in):	8.0	
Depth (in):	4.9	
Total weight of ice on object:		31 lbs
Weight of object:	16.0 lbs	
Combined weight of ice and object:		47 lbs

2" pipe

Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		13 plf

2-1/2" pipe

Per foot weight of ice:

diameter (in):	2.88	
Per foot weight of ice on object:		15 plf

L 2x2 Angles

Weight of ice based on total radial SF area:

Height (in):	2	
Width (in):	2	
Per foot weight of ice on object:		15 plf

L 2-1/2x2-1/2 Angles

Weight of ice based on total radial SF area:

Height (in):	2.5	
Width (in):	2.5	
Per foot weight of ice on object:		17 plf

L 3x2 Angles

Weight of ice based on total radial SF area:

Height (in):	3	
Width (in):	2	
Per foot weight of ice on object:		17 plf

HSS 4x3

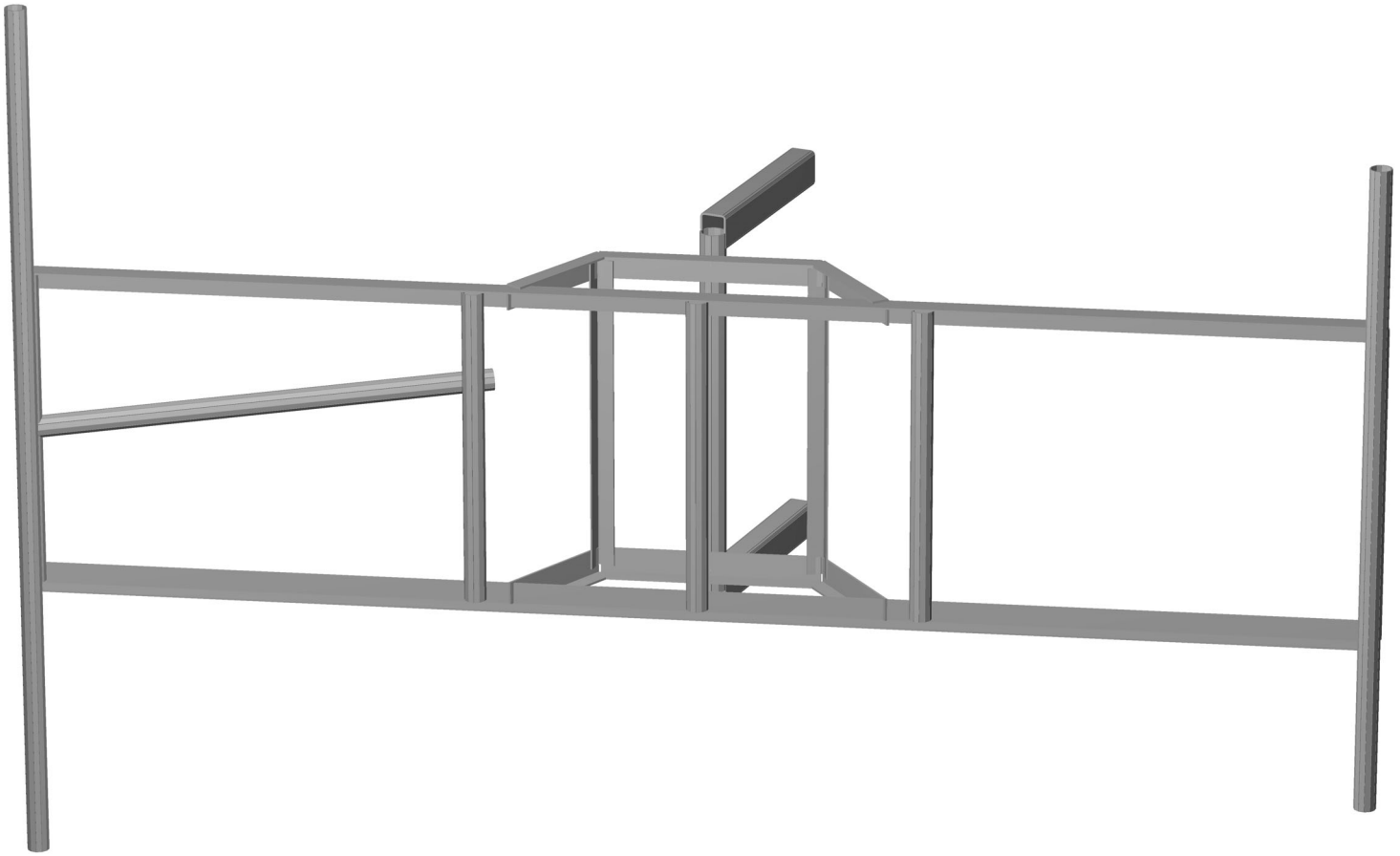
Weight of ice based on total radial SF area:

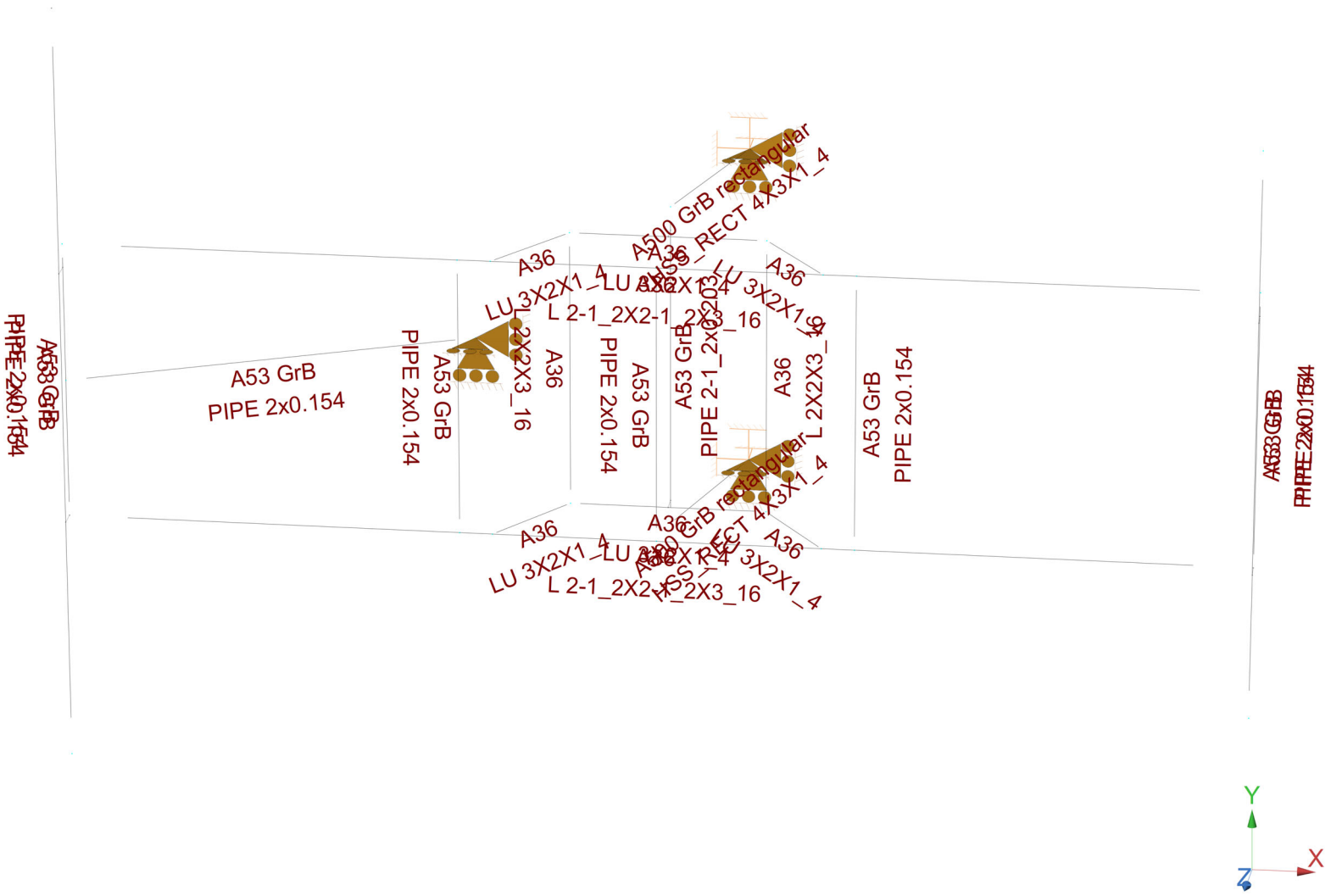
Height (in):	4	
Width (in):	3	
Per foot weight of ice on object:		21 plf

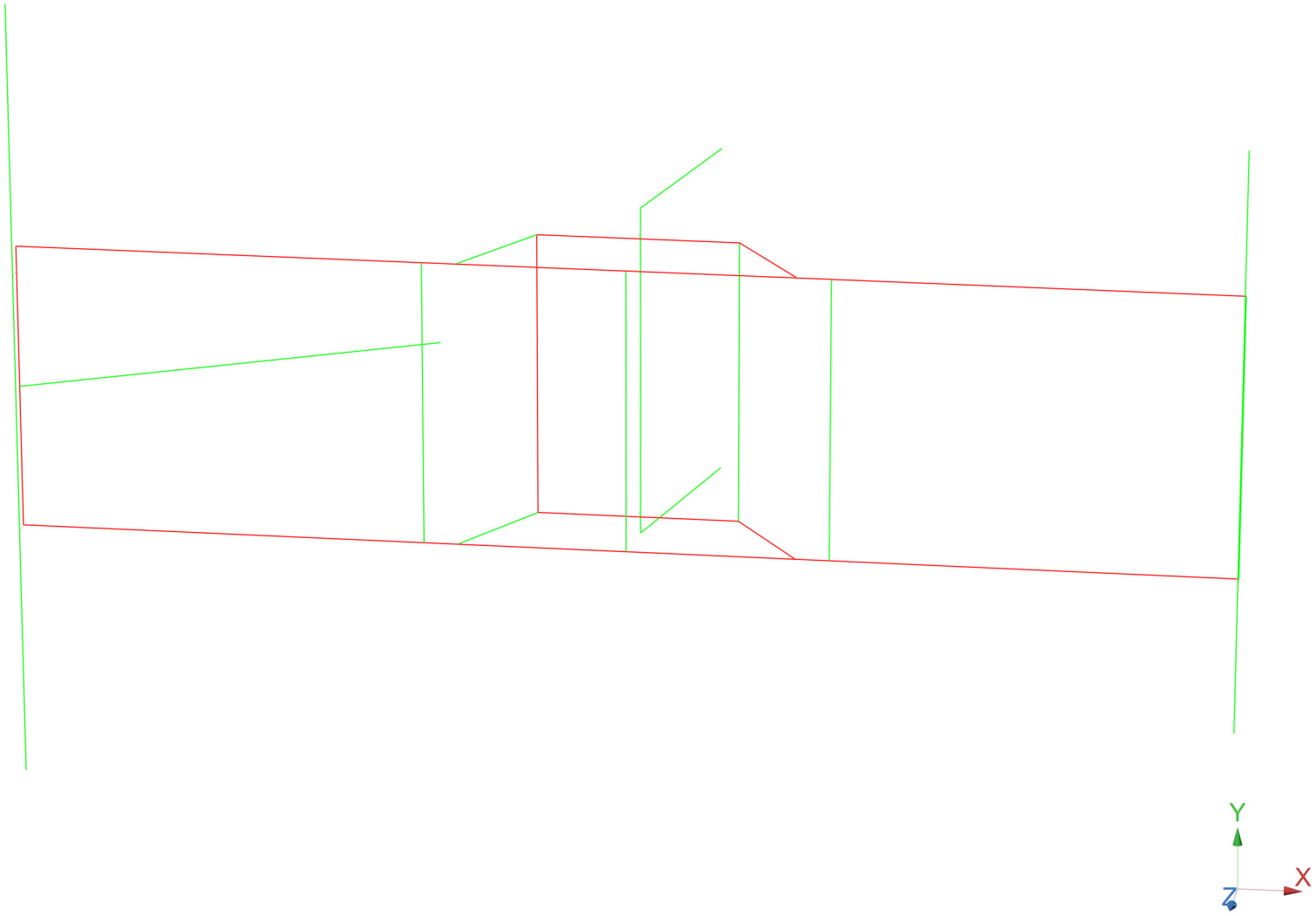
HUDSON
Design Group LLC

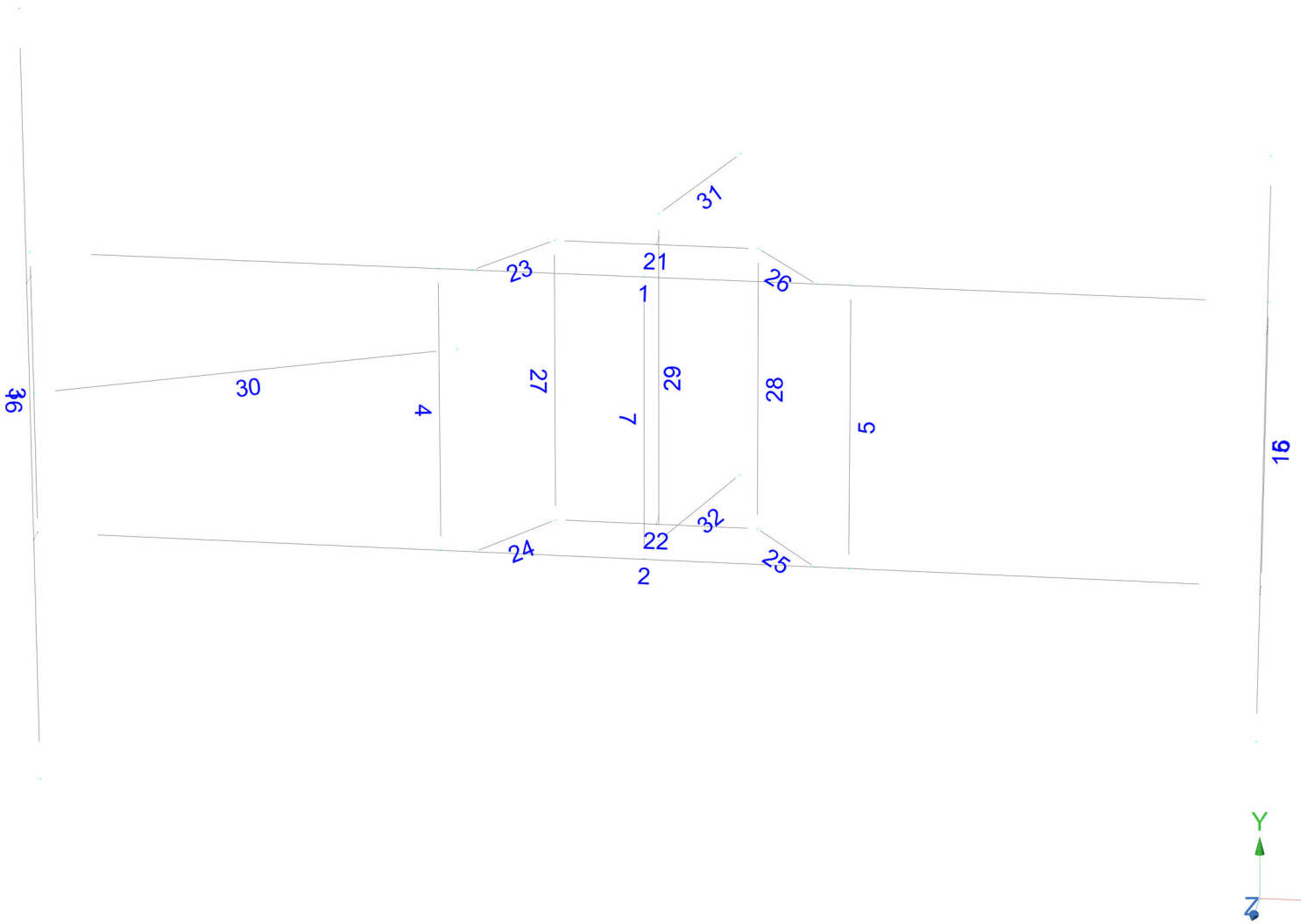
Mount Calculations
(Existing Conditions)

Current Date: 2/19/2021 4:53 PM
Units system: English
File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\T-MOBILE\CT\CT11396B\L600\Rev. 1\CT11396B (L




A500 GrB rectangular
HSS_RECT 4X3X1_4
A36
LU 3X2X1_4
L 2-1_2X2-1_2X3_16
A53 GrB
PIPE 2x0.154
L 2X2X3_16
Y
X
Z


Y
X
Z


31
23
21
26
1
30
27
29
28
36
4
7
5
16
32
24
22
25
2
Y
X
Z

Current Date: 2/19/2021 4:54 PM
Units system: English
File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\T-MOBILE\CT\CT11396B\L600\Rev. 1\CT11396B (L600) (Rev. 1)..retx

Load data

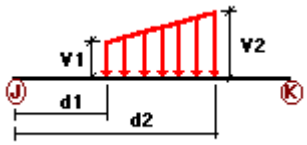
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wo	Wind Load (No Ice)	No	WIND
Wi	Wind Load (With Ice)	No	WIND
Di	Ice Load	No	LL

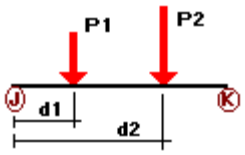
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	1	z	-0.014	0.00	0.00	No	0.00	No
	2	z	-0.014	0.00	0.00	No	0.00	No
	4	z	-0.008	0.00	0.00	No	0.00	No
	5	z	-0.008	0.00	0.00	No	0.00	No
	7	z	-0.008	0.00	0.00	No	0.00	No
	21	z	-0.016	0.00	0.00	No	0.00	No
	22	z	-0.016	0.00	0.00	No	0.00	No
	23	z	-0.016	0.00	0.00	No	0.00	No
	24	z	-0.016	0.00	0.00	No	0.00	No
	25	z	-0.016	0.00	0.00	No	0.00	No
	26	z	-0.016	0.00	0.00	No	0.00	No
	27	z	-0.011	0.00	0.00	No	0.00	No
	28	z	-0.011	0.00	0.00	No	0.00	No
	29	z	-0.009	0.00	0.00	No	0.00	No
	30	z	-0.008	0.00	0.00	No	0.00	No
Di	1	y	-0.017	0.00	0.00	No	0.00	No
	2	y	-0.017	0.00	0.00	No	0.00	No
	3	y	-0.013	0.00	0.00	No	0.00	No
	4	y	-0.013	0.00	0.00	No	0.00	No
	5	y	-0.013	0.00	0.00	No	0.00	No
	6	y	-0.013	0.00	0.00	No	0.00	No
	7	y	-0.013	0.00	0.00	No	0.00	No
	15	y	-0.013	0.00	0.00	No	0.00	No
	16	y	-0.013	0.00	0.00	No	0.00	No

21	y	-0.017	0.00	0.00	No	0.00	No
22	y	-0.017	0.00	0.00	No	0.00	No
23	y	-0.017	0.00	0.00	No	0.00	No
24	y	-0.017	0.00	0.00	No	0.00	No
25	y	-0.017	0.00	0.00	No	0.00	No
26	y	-0.017	0.00	0.00	No	0.00	No
27	y	-0.015	0.00	0.00	No	0.00	No
28	y	-0.015	0.00	0.00	No	0.00	No
29	y	-0.015	0.00	0.00	No	0.00	No
30	y	-0.013	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	1	y	-0.016	10.50	No
	15	y	-0.027	1.00	No
		y	-0.027	5.00	No
	16	y	-0.075	0.50	No
		y	-0.075	7.50	No
		y	-0.074	1.50	No
Wo	1	z	-0.024	10.50	No
	15	z	-0.105	1.00	No
		z	-0.105	5.00	No
	16	z	-0.329	0.50	No
		z	-0.329	7.50	No
		z	-0.019	1.50	No
Wi	1	z	-0.011	10.50	No
	15	z	-0.032	1.00	No
		z	-0.032	5.00	No
	16	z	-0.085	0.50	No
		z	-0.085	7.50	No
		z	-0.019	1.50	No
Di	1	y	-0.031	10.50	No
	15	y	-0.104	1.00	No
		y	-0.104	5.00	No
	16	y	-0.315	0.50	No
		y	-0.315	7.50	No
		y	-0.065	1.50	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (No Ice)	No	0.00	0.00	0.00
Wi	Wind Load (With Ice)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wo	0.00	0.00	0.00
Wi	0.00	0.00	0.00
Di	0.00	0.00	0.00

Current Date: 2/19/2021 4:54 PM
Units system: English
File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\T-MOBILE\CT\CT11396B\L600\Rev. 1\CT11396B (L600) (Rev. 1)..retx

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+1.6Wo
LC2=0.9DL+1.6Wo
LC3=1.2DL+Wi+Di
LC4=1.2DL
LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_RECT 4X3X1_4	**31**	LC1 at 0.00%	**0.90**	**OK**	Eq. H1-1b
		32	LC1 at 0.00%	0.68	OK	Eq. H1-1b
	L 2-1_2X2-1_2X3_16	**1**	LC3 at 0.00%	2.03	N.G.	Eq. H2-1
		2	LC3 at 0.00%	**2.32**	**N.G.**	Eq. H2-1
	L 2X2X3_16	**27**	LC3 at 0.00%	**1.73**	**N.G.**	Sec. F1
		28	LC3 at 100.00%	0.72	OK	Sec. F1
	LU 3X2X1_4	**21**	LC2 at 0.00%	1.24	N.G.	Eq. H2-1
		22	LC1 at 46.88%	1.18	N.G.	Eq. H2-1
		23	LC1 at 0.00%	0.80	OK	Eq. H2-1
		24	LC3 at 0.00%	0.75	OK	Eq. H2-1
		25	LC2 at 100.00%	1.61	N.G.	Eq. H2-1
		26	LC1 at 0.00%	**1.85**	**N.G.**	Eq. H2-1
	PIPE 2-1_2x0.203	**29**	LC1 at 6.25%	**0.77**	**OK**	Eq. H3-6
	PIPE 2x0.154	**3**	LC1 at 47.92%	**2.01**	**N.G.**	Eq. H1-1a
		4	LC3 at 0.00%	0.77	OK	Eq. H1-1b
		5	LC3 at 0.00%	0.41	OK	Eq. H1-1b
		6	LC3 at 0.00%	0.30	OK	Eq. H1-1b
		7	LC3 at 0.00%	0.09	OK	Eq. H3-1
		15	LC3 at 72.92%	0.11	OK	Eq. H1-1b
		16	LC1 at 33.33%	0.96	OK	Eq. H1-1b
		30	LC3 at 0.00%	0.71	OK	Eq. H1-1b

Current Date: 2/19/2021 4:54 PM
Units system: English
File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\T-MOBILE\CT\CT11396B\L600\Rev. 1\CT11396B (L600) (Rev. 1)..retx

Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	2.00	0.00	0.00	0
3	-2.00	0.00	0.00	0
4	6.00	0.00	0.00	0
5	-6.00	0.00	0.00	0
6	0.00	-2.917	0.00	0
7	2.00	-2.917	0.00	0
8	-2.00	-2.917	0.00	0
22	6.00	1.5415	0.20	0
23	6.00	-4.4585	0.20	0
25	-6.00	-5.4585	0.20	0
28	1.00	0.00	-0.9583	0
29	1.00	-2.917	-0.9583	0
30	-1.00	0.00	-0.9583	0
31	-1.00	-2.917	-0.9583	0
32	1.666	0.00	0.00	0
33	1.666	-2.917	0.00	0
34	-1.666	0.00	0.00	0
35	-1.666	-2.917	0.00	0
38	0.00	0.25	-1.1583	0
39	0.00	-3.167	-1.1583	0

40	-6.00	-1.4585	0.00	0
41	-2.00	-1.2585	-1.2083	0
42	0.583	0.25	-3.0793	0
43	0.583	-3.167	-3.0793	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
41	1	1	1	0	0	0
42	1	1	1	1	1	1
43	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	5	4		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
2	10	9		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
3	5	10		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
4	3	8		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
5	2	7		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
6	4	9		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
7	1	6		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
15	22	23		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
16	24	25		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
21	28	30		LU 3X2X1_4	A36	0.00	0.00	0.00
22	31	29		LU 3X2X1_4	A36	0.00	0.00	0.00
23	30	34		LU 3X2X1_4	A36	0.00	0.00	0.00
24	35	31		LU 3X2X1_4	A36	0.00	0.00	0.00
25	29	33		LU 3X2X1_4	A36	0.00	0.00	0.00
26	32	28		LU 3X2X1_4	A36	0.00	0.00	0.00
27	30	31		L 2X2X3_16	A36	0.00	0.00	0.00
28	28	29		L 2X2X3_16	A36	0.00	0.00	0.00
29	38	39		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
30	40	41		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
31	42	38		HSS_RECT 4X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
32	43	39		HSS_RECT 4X3X1_4	A500 GrB rectangular	0.00	0.00	0.00

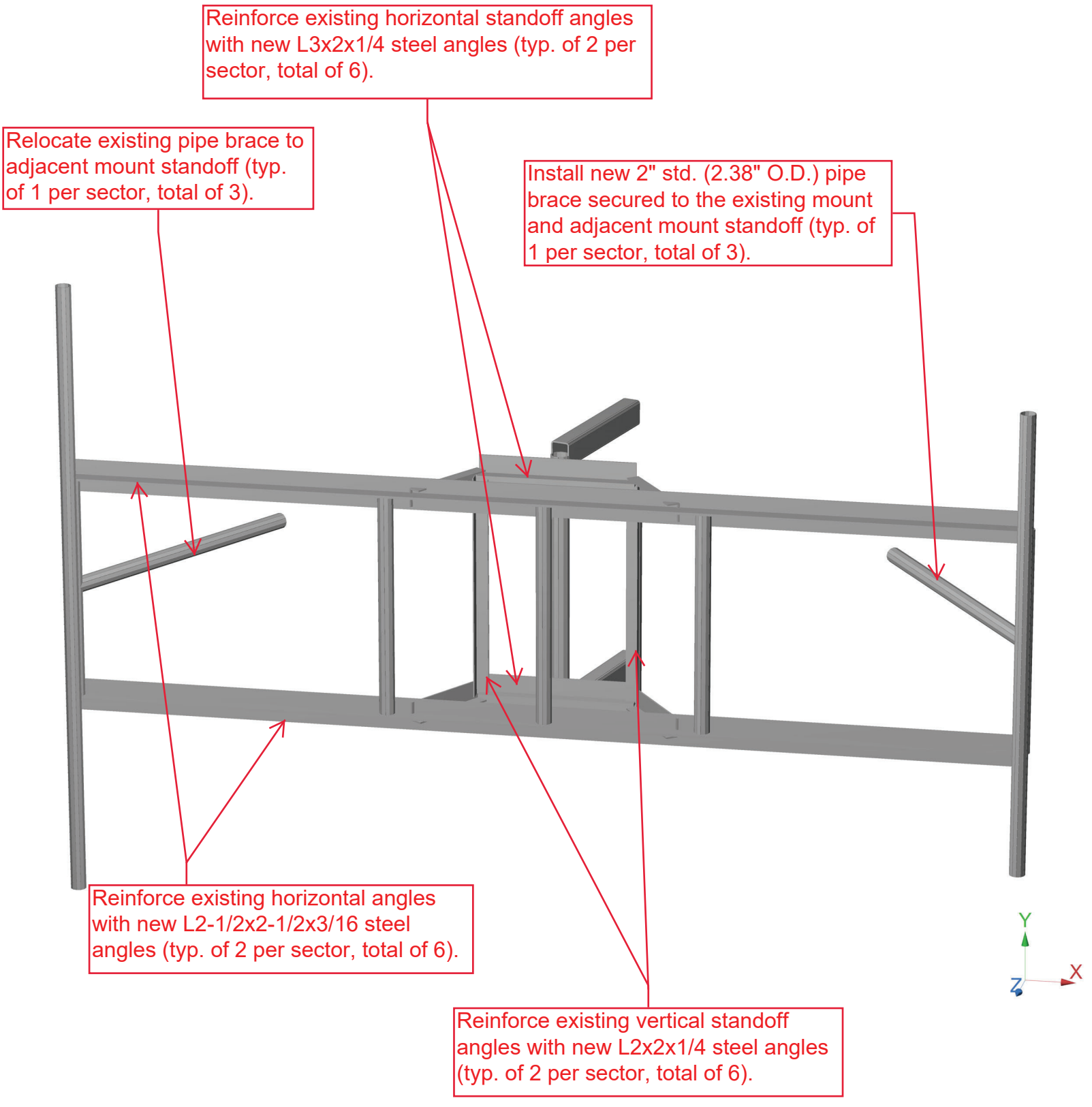
Orientation of local axes

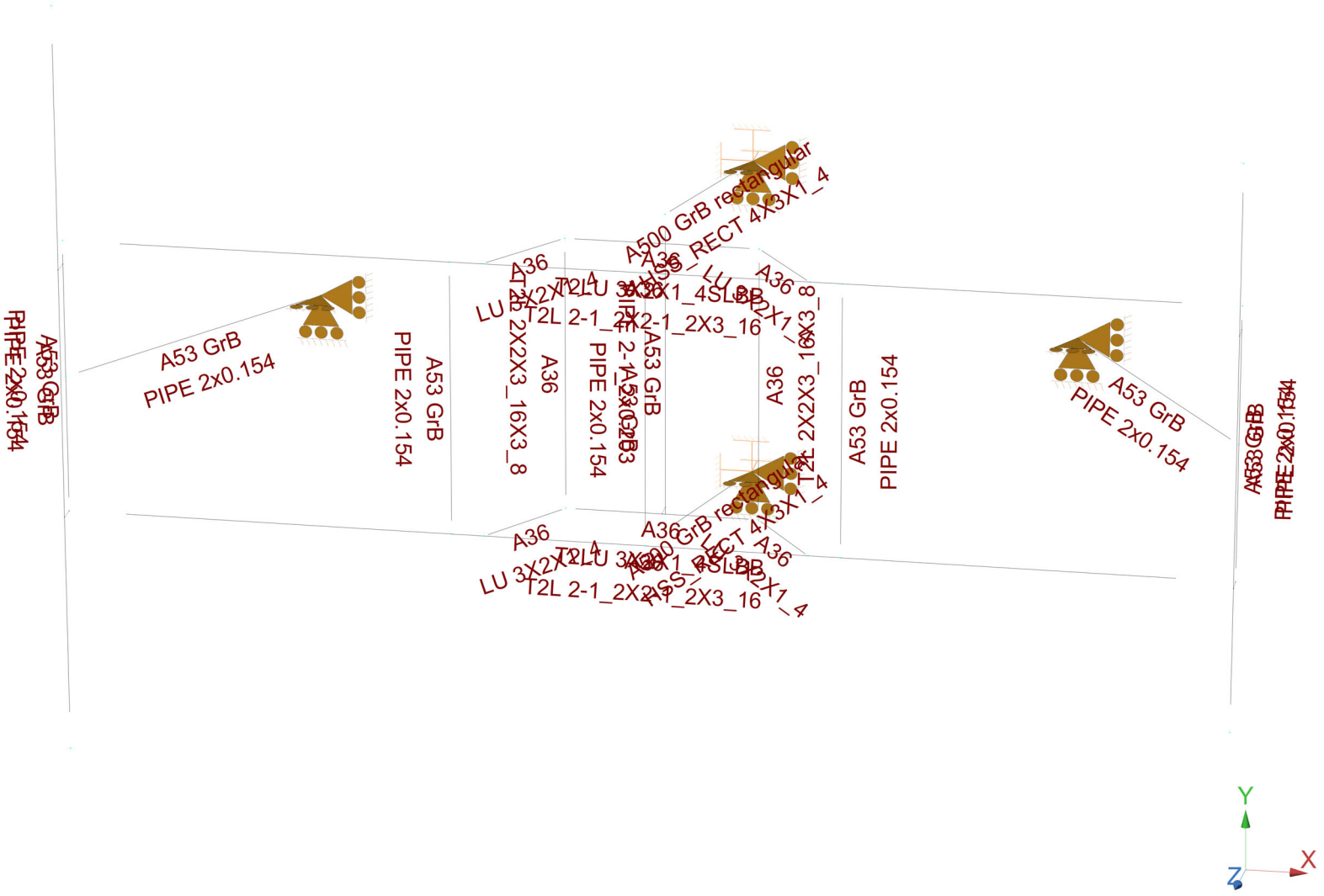
Member	Rotation [Deg]	Axes23	NX	NY	NZ
1	90.00	0	0.00	0.00	0.00
21	180.00	0	0.00	0.00	0.00
23	180.00	0	0.00	0.00	0.00
24	360.00	0	0.00	0.00	0.00
26	180.00	0	0.00	0.00	0.00

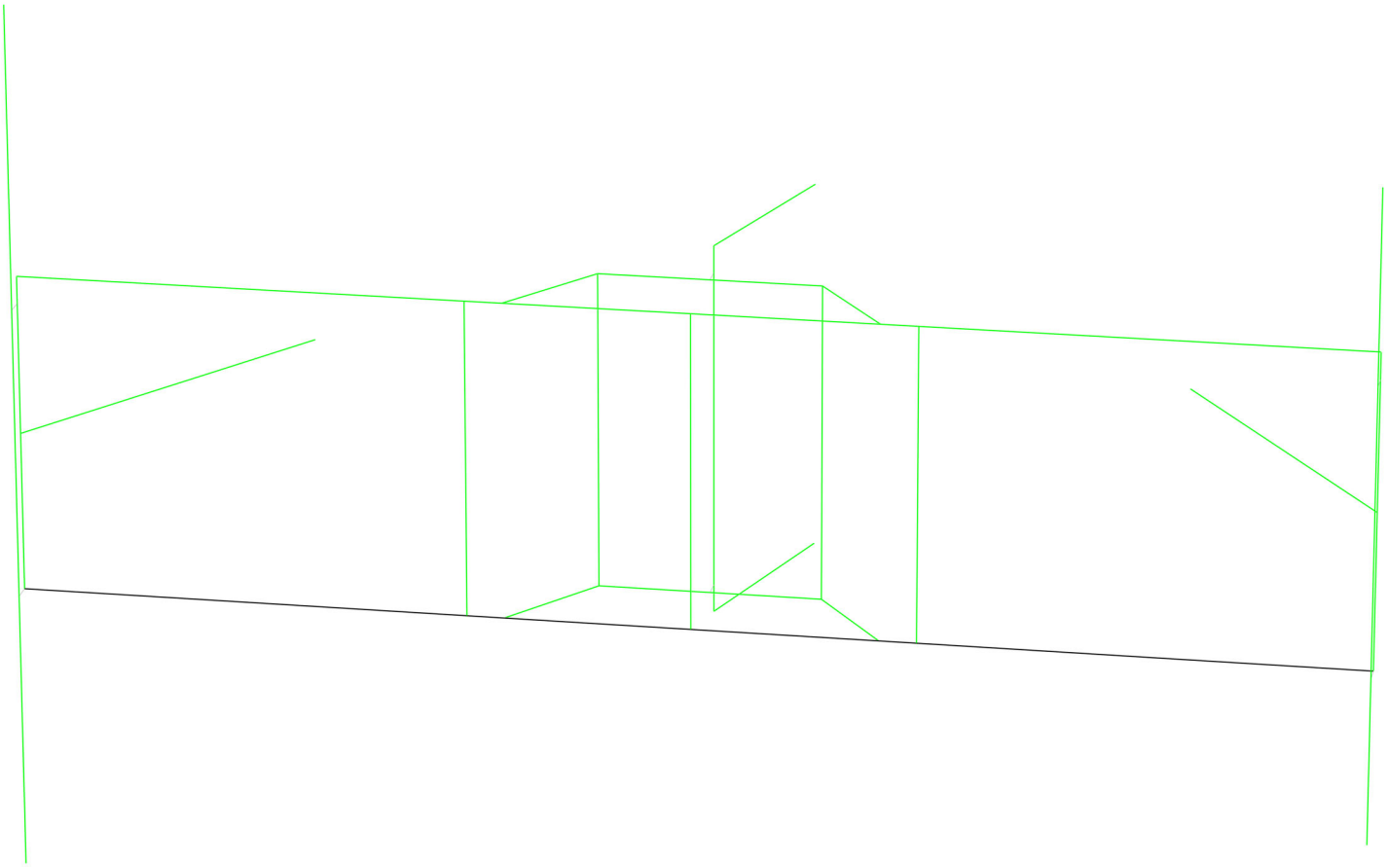
27	15.00	0	0.00	0.00	0.00
28	75.00	0	0.00	0.00	0.00

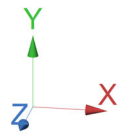
HUDSON
Design Group LLC

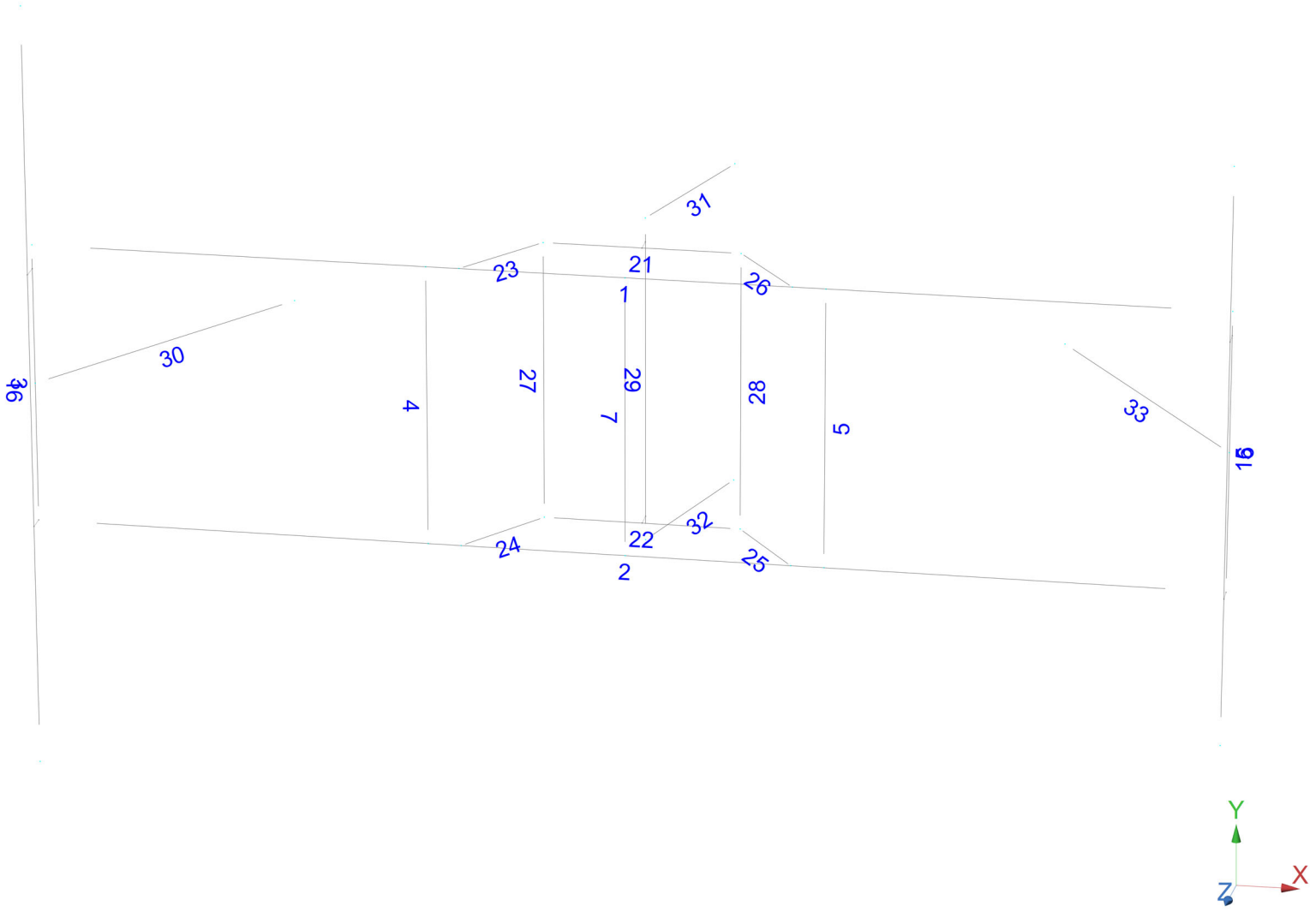
Mount Calculations
(Modified Conditions)


Reinforce existing horizontal standoff angles with new L3x2x1/4 steel angles (typ. of 2 per sector, total of 6).
Relocate existing pipe brace to adjacent mount standoff (typ. of 1 per sector, total of 3).
Install new 2" std. (2.38" O.D.) pipe brace secured to the existing mount and adjacent mount standoff (typ. of 1 per sector, total of 3).
Reinforce existing horizontal angles with new L2-1/2x2-1/2x3/16 steel angles (typ. of 2 per sector, total of 6).
Reinforce existing vertical standoff angles with new L2x2x1/4 steel angles (typ. of 2 per sector, total of 6).
Y
X
Z


A500 GrB rectangular
HSS_RECT 4X3X1_4
A36
LU 3X2X2X1_4SLBB
T2L 2-1_2X3_16
A53 GrB
PIPE 2x0.154
A36
LU 3X2X2X3_16X3_8
T2L 2-1_2X3_16X3_8
A53 GrB
PIPE 2x0.154
A36
T2L 2-1_2X3_16
A53 GrB
PIPE 2x0.154
A36
T2L 2-1_2X3_16
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 2x0.154
A36
T2L 2-1_2X3_16
A36
LU 3X2X2X1_4SLBB
A500 GrB rectangular
HSS_RECT 4X3X1_4
Y
X
Z




Y
X
Z


31
23
21
26
1
30
36
27
29
28
4
7
5
33
16
32
24
22
25
2
Y
X
Z

Current Date: 2/19/2021 4:43 PM
Units system: English
File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\T-MOBILE\CT\CT11396B\L600\Rev. 1\CT11396B (L600)(Mods)(Rev. 1).retx

Load data

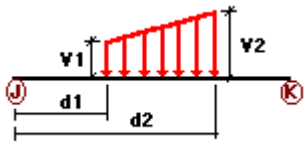
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wo	Wind Load (No Ice)	No	WIND
Wi	Wind Load (With Ice)	No	WIND
Di	Ice Load	No	LL

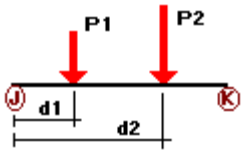
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	1	z	-0.014	0.00	0.00	No	0.00	No
	2	z	-0.014	0.00	0.00	No	0.00	No
	4	z	-0.008	0.00	0.00	No	0.00	No
	5	z	-0.008	0.00	0.00	No	0.00	No
	7	z	-0.008	0.00	0.00	No	0.00	No
	21	z	-0.016	0.00	0.00	No	0.00	No
	22	z	-0.016	0.00	0.00	No	0.00	No
	23	z	-0.016	0.00	0.00	No	0.00	No
	24	z	-0.016	0.00	0.00	No	0.00	No
	25	z	-0.016	0.00	0.00	No	0.00	No
	26	z	-0.016	0.00	0.00	No	0.00	No
	27	z	-0.011	0.00	0.00	No	0.00	No
	28	z	-0.011	0.00	0.00	No	0.00	No
	29	z	-0.009	0.00	0.00	No	0.00	No
	30	z	-0.008	0.00	0.00	No	0.00	No
	33	z	-0.008	0.00	0.00	No	0.00	No
Di	1	y	-0.017	0.00	0.00	No	0.00	No
	2	y	-0.017	0.00	0.00	No	0.00	No
	3	y	-0.013	0.00	0.00	No	0.00	No
	4	y	-0.013	0.00	0.00	No	0.00	No
	5	y	-0.013	0.00	0.00	No	0.00	No
	6	y	-0.013	0.00	0.00	No	0.00	No
	7	y	-0.013	0.00	0.00	No	0.00	No
	15	y	-0.013	0.00	0.00	No	0.00	No

16	y	-0.013	0.00	0.00	No	0.00	No
21	y	-0.017	0.00	0.00	No	0.00	No
22	y	-0.017	0.00	0.00	No	0.00	No
23	y	-0.017	0.00	0.00	No	0.00	No
24	y	-0.017	0.00	0.00	No	0.00	No
25	y	-0.017	0.00	0.00	No	0.00	No
26	y	-0.017	0.00	0.00	No	0.00	No
27	y	-0.015	0.00	0.00	No	0.00	No
28	y	-0.015	0.00	0.00	No	0.00	No
29	y	-0.015	0.00	0.00	No	0.00	No
30	y	-0.013	0.00	0.00	No	0.00	No
33	y	-0.013	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	1	y	-0.016	10.50	No
	15	y	-0.027	1.00	No
		y	-0.027	5.00	No
	16	y	-0.075	0.50	No
		y	-0.075	7.50	No
		y	-0.074	1.50	No
Wo	1	z	-0.024	10.50	No
	15	z	-0.105	1.00	No
		z	-0.105	5.00	No
	16	z	-0.329	0.50	No
		z	-0.329	7.50	No
		z	-0.019	1.50	No
Wi	1	z	-0.011	10.50	No
	15	z	-0.032	1.00	No
		z	-0.032	5.00	No
	16	z	-0.085	0.50	No
		z	-0.085	7.50	No
		z	-0.019	1.50	No
Di	1	y	-0.031	10.50	No
	15	y	-0.104	1.00	No
		y	-0.104	5.00	No
	16	y	-0.315	0.50	No
		y	-0.315	7.50	No
		y	-0.065	1.50	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (No Ice)	No	0.00	0.00	0.00
Wi	Wind Load (With Ice)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wo	0.00	0.00	0.00
Wi	0.00	0.00	0.00
Di	0.00	0.00	0.00

Current Date: 2/19/2021 4:43 PM
Units system: English
File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\T-MOBILE\CT\CT11396B\L600\Rev. 1\CT11396B (L600)(Mods)(Rev. 1).retx

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+1.6Wo
LC2=0.9DL+1.6Wo
LC3=1.2DL+Wi+Di
LC4=1.2DL
LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_RECT 4X3X1_4	**31**	LC3 at 0.00%	**0.37**	**OK**	Eq. H1-1b
		32	LC3 at 0.00%	0.35	OK	Eq. H1-1b
	LU 3X2X1_4	**23**	LC3 at 0.00%	**0.63**	**OK**	Eq. H2-1
		24	LC3 at 100.00%	0.62	OK	Eq. H2-1
		25	LC3 at 0.00%	0.37	OK	Eq. H2-1
		26	LC3 at 100.00%	0.39	OK	Eq. H2-1
	PIPE 2-1_2x0.203	**29**	LC3 at 100.00%	**0.26**	**OK**	Eq. H1-1b
	PIPE 2x0.154	**3**	LC1 at 47.92%	**0.96**	**OK**	Eq. H1-1a
		4	LC3 at 100.00%	0.59	OK	Eq. H1-1b
		5	LC3 at 0.00%	0.26	OK	Eq. H1-1b
		6	LC3 at 0.00%	0.34	OK	Eq. H1-1b
		7	LC3 at 0.00%	0.07	OK	Eq. H1-1b
		15	LC3 at 72.92%	0.13	OK	Eq. H1-1b
		16	LC1 at 33.33%	0.96	OK	Eq. H1-1b
		30	LC3 at 0.00%	0.32	OK	Eq. H1-1b
		33	LC2 at 0.00%	0.07	OK	Eq. H1-1b
	T2L 2-1_2X2-1_2X3_16	**1**	LC3 at 32.29%	0.82	OK	Eq. H2-1
		2	LC3 at 0.00%	**0.97**	**With warnings**	Eq. H2-1
	T2L 2X2X3_16X3_8	**27**	LC3 at 100.00%	**0.81**	**OK**	Eq. H2-1
		28	LC3 at 0.00%	0.28	OK	Eq. H2-1
	T2LU 3X2X1_4SLBB	**21**	LC3 at 50.00%	**0.56**	**OK**	Eq. H2-1
		22	LC3 at 0.00%	0.46	OK	Eq. H2-1

Current Date: 2/19/2021 4:43 PM
Units system: English
File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\T-MOBILE\CT\CT11396B\L600\Rev. 1\CT11396B (L600)(Mods)(Rev. 1).retx

Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	2.00	0.00	0.00	0
3	-2.00	0.00	0.00	0
4	6.00	0.00	0.00	0
5	-6.00	0.00	0.00	0
6	0.00	-2.917	0.00	0
7	2.00	-2.917	0.00	0
8	-2.00	-2.917	0.00	0
22	6.00	1.5415	0.20	0
23	6.00	-4.4585	0.20	0
24	-6.00	2.5415	0.20	0
25	-6.00	-5.4585	0.20	0
28	1.00	0.00	-0.9583	0
29	1.00	-2.917	-0.9583	0
30	-1.00	0.00	-0.9583	0
31	-1.00	-2.917	-0.9583	0
32	1.666	0.00	0.00	0
33	1.666	-2.917	0.00	0
34	-1.666	0.00	0.00	0
35	-1.666	-2.917	0.00	0
38	0.00	0.25	-1.1583	0

39	0.00	-3.167	-1.1583	0
40	-6.00	-1.4585	0.00	0
41	-4.00	-1.4585	-3.00	0
42	0.583	0.25	-3.0793	0
43	0.583	-3.167	-3.0793	0
44	6.00	-1.4585	0.00	0
45	4.00	-1.4585	-3.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
41	1	1	1	0	0	0
42	1	1	1	1	1	1
43	1	1	1	1	1	1
45	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	5	4		T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
2	10	9		T2L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
3	5	10		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
4	3	8		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
5	2	7		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
6	4	9		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
7	1	6		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
15	22	23		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
16	24	25		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
21	28	30		T2LU 3X2X1_4SLBB	A36	0.00	0.00	0.00
22	31	29		T2LU 3X2X1_4SLBB	A36	0.00	0.00	0.00
23	30	34		LU 3X2X1_4	A36	0.00	0.00	0.00
24	35	31		LU 3X2X1_4	A36	0.00	0.00	0.00
25	29	33		LU 3X2X1_4	A36	0.00	0.00	0.00
26	32	28		LU 3X2X1_4	A36	0.00	0.00	0.00
27	30	31		T2L 2X2X3_16X3_8	A36	0.00	0.00	0.00
28	28	29		T2L 2X2X3_16X3_8	A36	0.00	0.00	0.00
29	38	39		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
30	40	41		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
31	42	38		HSS_RECT 4X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
32	43	39		HSS_RECT 4X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
33	44	45		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
1	270.00	0	0.00	0.00	0.00
2	270.00	0	0.00	0.00	0.00
21	90.00	0	0.00	0.00	0.00
22	270.00	0	0.00	0.00	0.00
23	180.00	0	0.00	0.00	0.00
24	360.00	0	0.00	0.00	0.00
26	180.00	0	0.00	0.00	0.00
27	180.00	0	0.00	0.00	0.00

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11396B

Killingly/I-395/X93_1
79 Putnam Pike
Killingly, Connecticut 06241

January 27, 2021

EBI Project Number: 6221000330

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**15.16%**

January 27, 2021

T-Mobile
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CT11396B - Killingly/I-395/X93_1

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **79 Putnam Pike** in **Killingly, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 79 Putnam Pike in Killingly, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated

value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s) in Sector A, the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s) in Sector B, the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerline of the proposed antennas is 150 feet above ground level (AGL).

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

11) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz
Gain:	15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd
Height (AGL):	150 feet	Height (AGL):	150 feet	Height (AGL):	150 feet
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE %:	**1.49%**	Antenna B1 MPE %:	**1.49%**	Antenna C1 MPE %:	**1.49%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd
Height (AGL):	150 feet	Height (AGL):	150 feet	Height (AGL):	150 feet
Channel Count:	5	Channel Count:	5	Channel Count:	5
Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts
ERP (W):	4,151.83	ERP (W):	4,151.83	ERP (W):	4,151.83
Antenna A2 MPE %:	**1.58%**	Antenna B2 MPE %:	**1.58%**	Antenna C2 MPE %:	**1.58%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	3.07%
AT&T	0.8%
Verizon	5.31%
Metro PCS	0.57%
Sprint	3.71%
Town	1.7%
Site Total MPE % :	15.16%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	3.07%
T-Mobile Sector B Total:	3.07%
T-Mobile Sector C Total:	3.07%
Site Total MPE % :	15.16%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz GSM	4	1167.14	150.0	7.46	1900 MHz GSM	1000	0.75%
T-Mobile 1900 MHz LTE	2	2334.27	150.0	7.46	1900 MHz LTE	1000	0.75%
T-Mobile 600 MHz LTE	2	591.73	150.0	1.89	600 MHz LTE	400	0.47%
T-Mobile 600 MHz NR	1	1577.94	150.0	2.52	600 MHz NR	400	0.63%
T-Mobile 700 MHz LTE	2	695.22	150.0	2.22	700 MHz LTE	467	0.48%
						Total:	**3.07%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	3.07%
Sector B:	3.07%
Sector C:	3.07%
T-Mobile Maximum MPE % (Sector A):	3.07%
Site Total:	15.16%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **15.16%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.