NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
4 Angela's Way, Burlington CT 06013
860-209-4690
denise@northeastsitesolutions.com

July 19, 2019

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

RE: Exempt Modification Application
60 Industrial Park Road, Vernon CT 06076
Latitude: 41.835626
Longitude: -72.454885
T-Mobile Site #: CT11140J-L600

Dear Ms. Bachman:

T-Mobile is requesting to file an exempt modification for an existing 175-foot monopole tower located at 60 Industrial Park Road, Vernon CT 06076. T-Mobile currently has nine (9) antennas at the 178.6-foot level of the existing 175-foot tower. The tower is owned by Millenicom, LLC and property is owned by LILYMAXJACK, LLC. T-Mobile now intends to replace six (6) antennas with three (3) new 600/700 Mhz antennas and three (3) 1900/2100 Mhz antennas. The new antennas would be installed at the 178.6-foot level of the tower.

Planned Tower Modifications:
Remove: N/A

Remove and Replace:
(3) RR90 Antenna (REMOVE) – RFS-APXAARR24_43U-NA20 Antenna 600/700 Mhz (REPLACE)
(3) RR90 Antenna (REMOVE) – AIR32 Antenna 1900/2100 Mhz (REPLACE)

Install New:
(3)Fiber line
(3) RRU 4449 B71+B12

Existing to Remain:
(12) 1-5/8" coax
(3) APX16DWV – 1900/2100 Mhz
(3)Twin TMA

Ground:
Upgrade Existing 6102 Cabinet (Internally)
Upgrade existing Breaker

This facility was approved by the Town of Vernon P&Z on March 8, 2000. This modification complies with this original approval. Please see attached.

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 Mayor Daniel A. Champagne, Elected Official and Andrew Marchese, Zoning Enforcement Officer for the Town of Vernon, as well as the property owner and the tower owner.

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,

Denise Sabo
Mobile: 860-209-4690
Fax: 413-521-0558
Office: 4 Angela's Way, Burlington CT 06013
Email: denise@northeastsitesolutions.com

Attachments
cc:
Mayor Daniel A. Champagne
Vernon Town Hall
14 Park Place, 3rd Fl.
Vernon CT 06066

Office of Zoning Administration
55 W Main Street
Vernon CT 06066
Attn: Andrew Marchese
Zoning Enforcement Officer

LILYMAXJACK, LLC
60 Industrial Park
Vernon CT 06066

Millenicom, LLC
c/o Marcus Communications
P.O. Box 1498
Manchester CT 06045

Exhibit A

Town of Vernon, Conn.

BUILDING PERMIT and CERTIFICATE OF ZONING COMPLIANCE

№ 29885

ESTIMATED COST
Structual $ 95,000.00
Plumbing
Heating
Wiring

FINAL COST: $

FEE $ 950.00

March 8 19 2000

APPLICANT'S PERMIT

Permission is hereby granted to Omnipoint Communications

To installation of telecommunications tower

on the ..... side of No. 60 Industrial Park Road Owner: Beauregard

Class		Size			Air Condition
Type				Heating	Oil Burner
Foundations		Porch	X		Cement
Ext. Walls				Basement	Earth
Roof				Plumbing	
Roofing				Bath	Lavatory
Interior		Ceiling Height		Fire Places	
No. of Rooms	1st Floor	2nd Floor		Weatherstrip	Insulation
Floors				Attach. Garage	Cement
Flooring				Interior Finish	
Joists				Breezeway X	

This permit expires six (6) months from the above date.

All building permits are approved subject to field inspection.

BUILDING DEPARTMENT, TOWN OF VERNON, CONN.

Glenn F. Bolles
Building Official/ Zoning Enforcement Officer

APPLICATION FOR BUILDING PERMIT

(Continued from the other side)

9. Size of building _____ (No of stories) Height 175' Depth _____ Front _____

10. Material of footing _____ Depth below grade _____ Width _____ Thickness _____

11. Material of foundation _____ Below Grade (DEPTH) _____ (Thickness) _____
Above Grade (HEIGHT) _____ (Thickness) _____

12. Material of chimney _____ Foundation _____ Height _____ Width _____ Depth _____

13. No. of flues _____ Size _____ Thickness of lining _____ City Sewer _____ Septic Tank _____

14. MASONRY CONSTRUCTION

	Front Wall	Side Wall	Rear Wall	Partition Wall	Veneer
Basement					
1st Story					
2nd Story					

15. WOOD CONSTRUCTION

		Joists			Girders			Columns or Piers			
Floors	Size	Longest Span	Centers	Bridging	Size	Longest Span	Centers	Size	Length	Centers	Footing
1st											
2nd											

16. Size of sill _____ Size of outside studs _____ Distance on centers _____

17. Size studs of bearing partitions _____ Centers _____ Are joists doubled under partitions? _____

18. Size of plate _____ Size of headers _____ Will firestops be provided? _____

19. Size of rafters _____ Distances on centers _____ Size of hip or valley rafter _____

20. Species and grade of framing _____
Type and grade of sheathing _____

21. Further Details Installation of a telecommunications monopole with antennas and an associated equipment compound

Call Before You Dig #: _____

22. ***All work covered by this application has been authorized by the (owner) or (agent) of this property and will be done according to approved plans and all local codes and regulations. Notice must be given to the Building Department when job is ready for inspection and when job is completed.***

25 February, 2020
DATE

J. Brendan Shorter
APPLICANT J. Brendan Shorter,
Attorney for Omnipoint Communications, Inc.

Print name under signature

Exhibit B

Tax ID 30-0133-0005G Printed 02/06/2019 Card No. 1 of 1

INDUSTRIAL PARK ROAD LLC
75 GERBER ROAD EAST
SOUTH WINDSOR, CT 06074
CENSUS TRACT: 530600

Neighborhood Number
12100
Neighborhood Name
General Commercial
TAXING DISTRICT INFORMATION

Jurisdiction Name	Town of Vernon
Area	146
Routing Number	5044

Site Description

Topography

Public Utilities
Water, Sewer, Gas, Electric
Street or Road
Paved
Neighborhood

Zoning:
Industrial
Legal Acres:
5.1000

Transfer of Ownership

Owner	Consideration	Transfer Date	Deed Book	Page	Deed Type
DJV REAL ESTATE LLC	0	03/22/2018	2546	253	W
LILYMAXJACK LLC	700000	10/30/2017	2529	193	W
BEAUREGARD GEORGE W	0	07/05/2005	1744	267	Q
BEAUREGARD GEORGE W & KAREN S	0	07/05/2005	1744	264	Q
BEAUREGARD KAREN S & GEORGE W	0	03/07/2000	1244	40	Q
BEAUREGARD GEORGE W	0	04/13/1999	1200	11	Q

Valuation Record

Assessment Year		2011	2016	2017	2018				
Reason for Change		2011 REVAL	2016 Reval	BAA	2018 ASMT				
Market	L	313380	245720	245720	245720				
	I	668250	1449820	754280	574280				
	T	981630	1695540	1000000	820000				
70% Assessed/Use	L	219370	172000	172000	172000				
	I	467770	1014880	528000	401990				
	T	687140	1186880	700000	573990				

Land Size

Land Type	Rating, Soil ID - or - Actual Frontage	Acreage - or - Effective Frontage	Square Feet - or - Effective Depth	Influence Factor

Tax ID 30-0133-0005G Printed 02/06/2019

Physical Characteristics

ROOFING

Built-up
Insulation

WALLS

	B	1	2	U
Frame		Yes		
Guard	Yes	Yes	Yes	Yes

FRAMING

	B	1	2	U
F Res	0	34908	0	4000

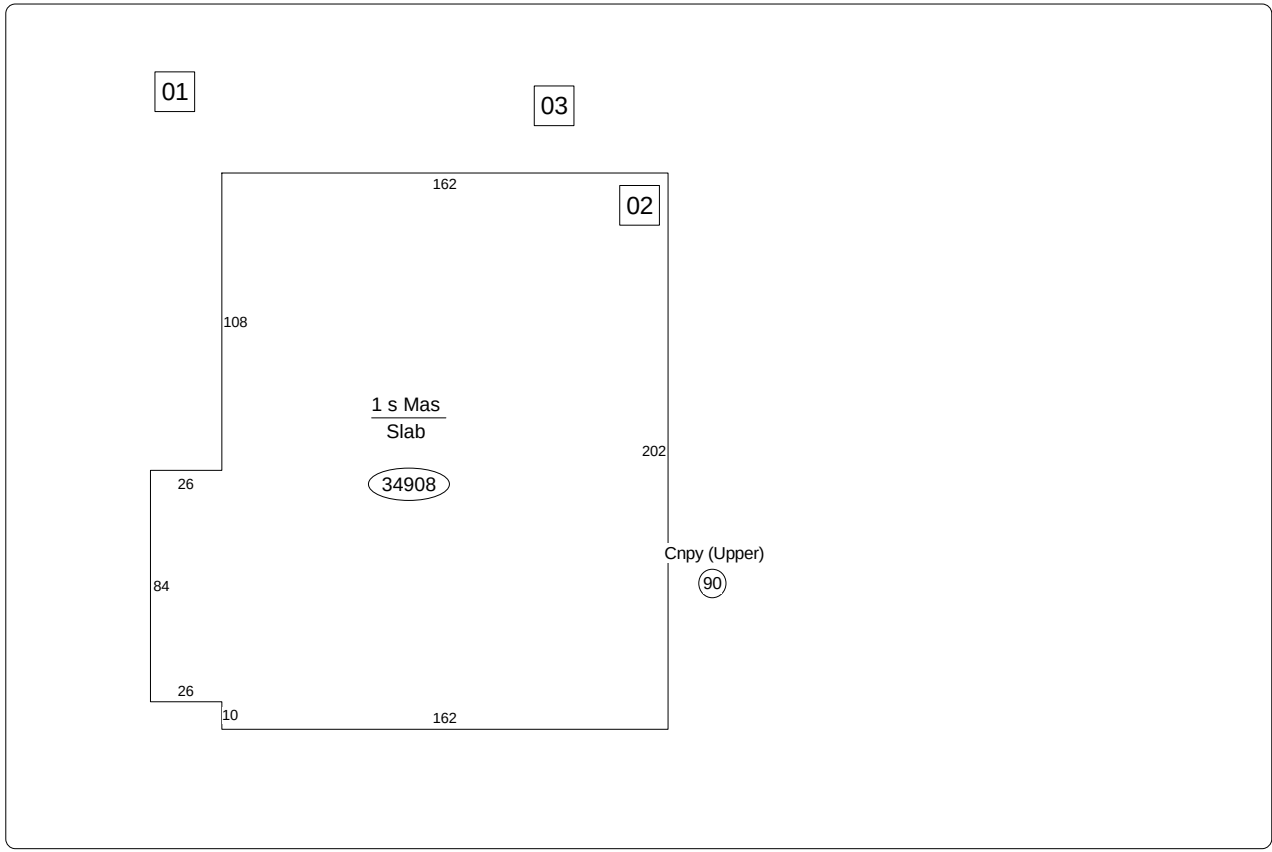
FINISH

	UF	SF	FO	FD
1	34908	0	0	0
U	4000	0	0	0
Total	38908	0	0	0

HEATING AND AIR CONDITIONING

	B	1	2	U
Heat	0	34908	0	4000
Sprink	0	34908	0	4000

PLUMBING	Residential		Commercial	
	#	TF	#	TF
Full Baths				
Half Baths			3	6
Extra Fixtures				
TOTAL		0		6



Special Features

Description

Summary of Improvements

ID	USE	Story Height	Const Type	Grade	Year Cons	Eff Year	Cond	Size or Area
C	LMFG	0.00		Fair	1968	1970	FR	34908
01	PAVING	0.00	85	Avg	1968	1968	AV	23800
02	MEZZSF	1.00		Fair	1968	1968	AV	4000
03	TOWERMON	0.00		Avg	2000	2000	AV	380

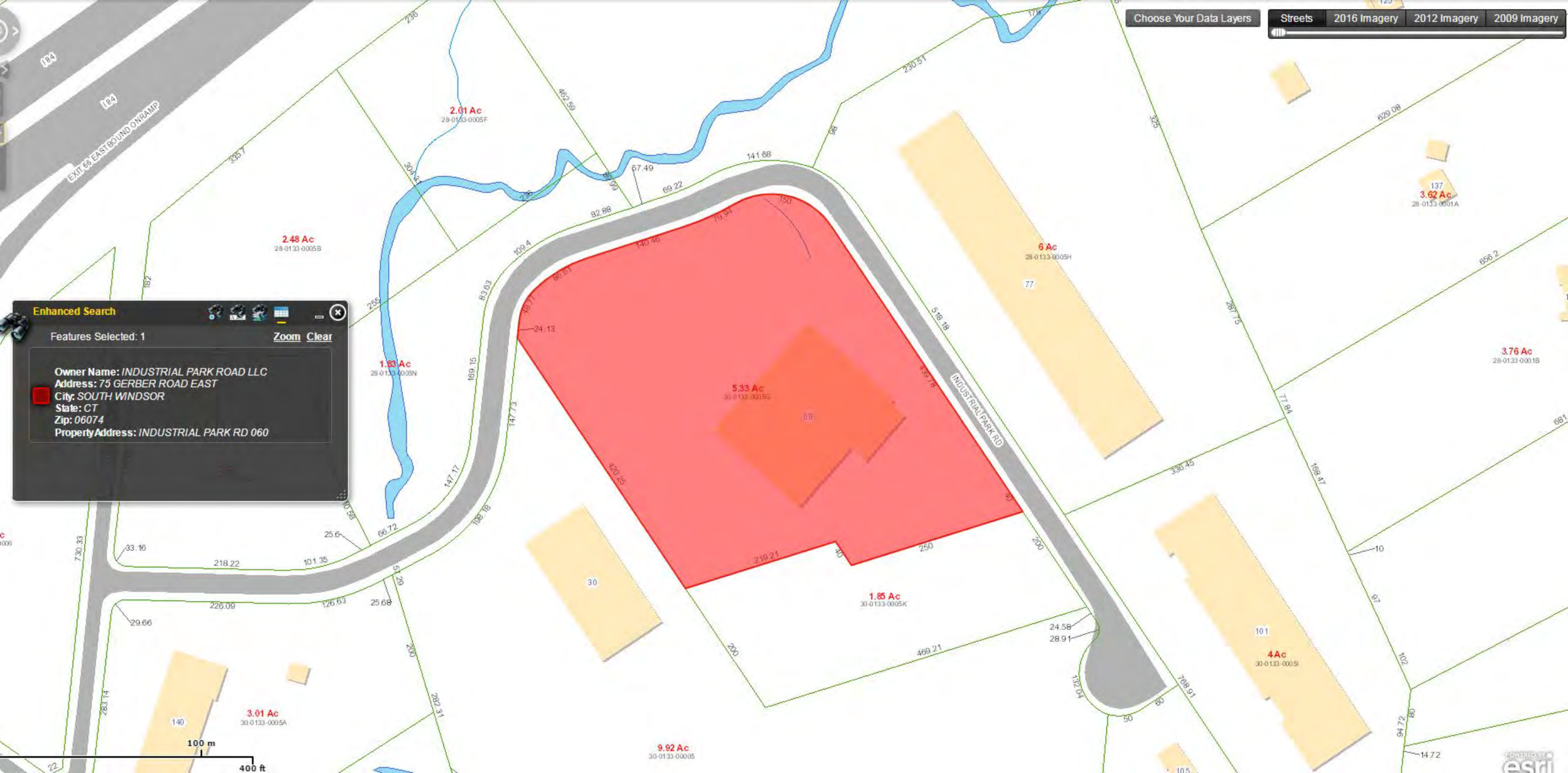

Choose Your Data Layers
Streets
2016 Imagery
2012 Imagery
2009 Imagery
Enhanced Search
Features Selected: 1
Zoom
Clear
Owner Name: INDUSTRIAL PARK ROAD LLC
Address: 75 GERBER ROAD EAST
City: SOUTH WINDSOR
State: CT
Zip: 06074
PropertyAddress: INDUSTRIAL PARK RD 060
EXIT 66 EASTBOUND ONRAMP
INDUSTRIAL PARK RD
2.01 Ac
28-0133-0005F
2.48 Ac
28-0133-0005B
1.83 Ac
28-0133-0005N
5.33 Ac
30-0133-0005G
1.85 Ac
30-0133-0005K
6 Ac
28-0133-0005H
3.62 Ac
28-0133-0001A
3.76 Ac
28-0133-0001B
4 Ac
30-0133-0005I
3.01 Ac
30-0133-0005A
9.92 Ac
30-0133-00005
100 m
400 ft

Exhibit C

T-Mobile

NORTHEAST, LLC.

PROJECT: L600

SITE I.D. NUMBER:

CT11140J

SITE NAME:

MANCHESTER/ I-84 X63

SITE ADDRESS:

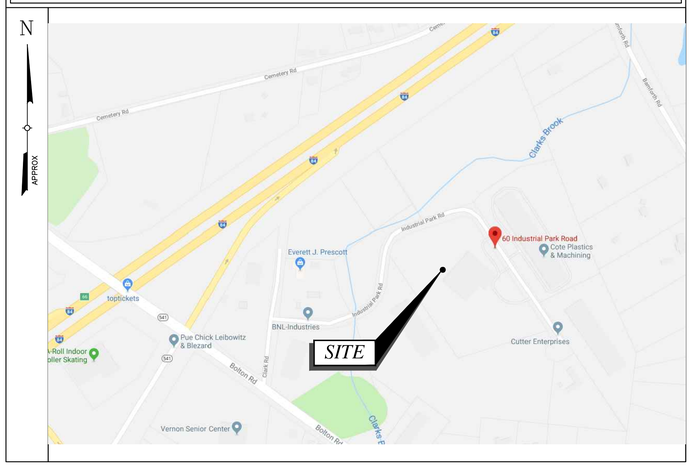
60 INDUSTRIAL PARK RD
VERNON, CT 06066

PROJECT INDEX

SITE NUMBER:	CT11140J
SITE NAME:	MANCHESTER/ I-85 X63
SITE ADDRESS:	60 INDUSTRIAL PARK RD. VERNON, CT 06066
PROPERTY OWNER:	MILLENICOM, LLC
APPLICANT:	T-MOBILE NORTHEAST LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
STRUCTURE TYPE:	MONOPOLE
LATTITUDE (NAD83):	N 41.835626"
LONGITUDE (NAD83):	W 72.454885"
GRADE ELEVATION:	382' AMSL (PER GOOGLE EARTH)
MUNICIPALITY:	VERNON
ZONING:	INDUSTRIAL
PARCEL ID:	30-0133-0005G

PROJECT CLIENT:	NORTHEAST SITE SOLUTIONS, LLC
CONTACT:	SHELDON FREINCLE
PHONE:	(201) 776-8521
ENGINEER/ STRUCTURAL ENG:	TECTONIC ENGINEERING CONSULTANTS, PC.
CONTACT:	EDWARD IAMICELI
PHONE:	(845) 567-6656x2811

VICINITY MAP (NTS)



NAME

SHEET NO	DESCRIPTION	REVISION	DATE
T-1	TITLE SHEET	0	07/19/19
A-1	SITE PLAN & T-MOBILE EQUIPMENT AREA PLAN	0	07/19/19
A-2	ELEVATION	0	07/19/19
A-3	EXIST/NEW ANTENNA PLANS & ANTENNA SCHEDULE	0	07/19/19
A-4	DETAILS & ANTENNA SCHEMATIC	0	07/19/19
A-5	NOTES	0	07/19/19
E-1	ELECTRICAL NOTES & ONE-LINE DIAGRAM	0	07/19/19
G-1	GROUNDING DETAILS & NOTES	0	07/19/19

CODE COMPLIANCE

CODE INFORMATION

- STATE OF CONNECTICUT BUILDING CODE, LATEST EDITION
- ANSI/TIA-222-G
- NATIONAL ELECTRIC CODE, LATEST EDITION

DESIGN NOTE

DESIGN BASED ON RFDS DATED 07/10/2019, VERSION 5.1

RAN TEMPLATE: 67D94DB HYBRID (EVOLVED FROM 4B)
A&L TEMPLATE: 67D94DB_1xAIR+10P

STRUCTURAL NOTE

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED JULY 19, 2019 REV 1.

811 Know what's below. Call before you dig.

STATE OF CONNECTICUT
EDWARD N. IAMICELI
PEN.0028473
LICENSED
PROFESSIONAL ENGINEER

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road
P.O. Box 37
Mountainville, NY 10953
Phone: (845) 534-5959
(800) 829-6531
www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656

T-Mobile
NORTHEAST, LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11140J	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	07/19/19	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY	DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

MANCHESTER/ I-84 X63
CT11140J
60 INDUSTRIAL PARK RD
VERNON, CT 06066

SHEET TITLE

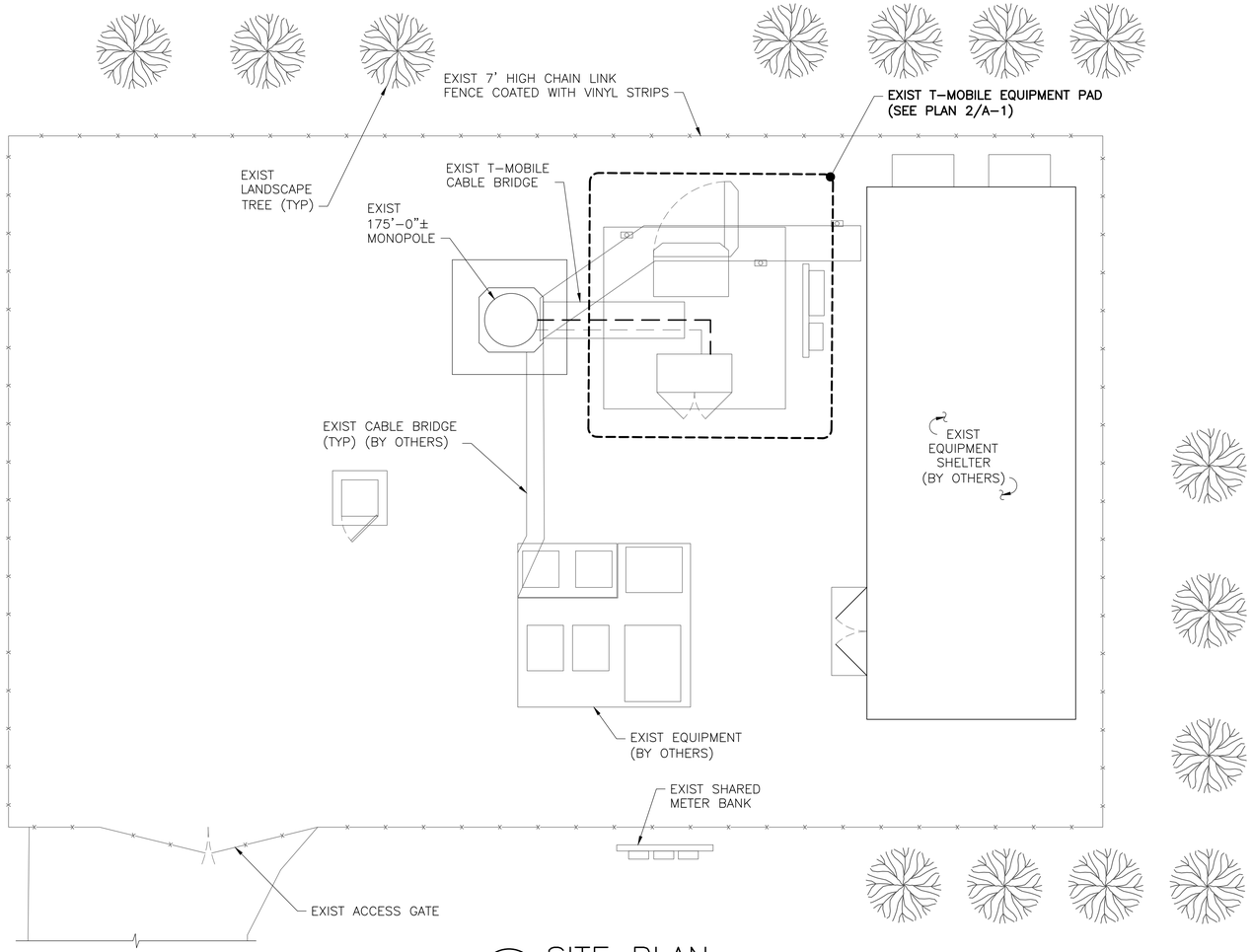
TITLE SHEET

SHEET NUMBER

T-1

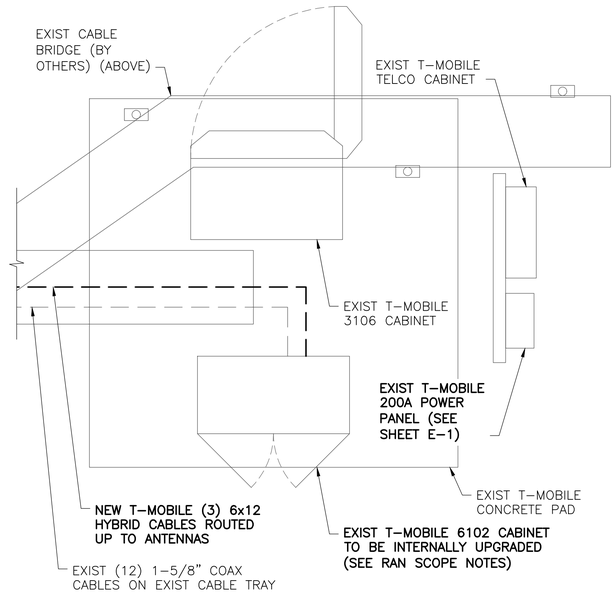
N

APPROX



1 A-1 SITE PLAN

SCALE: 1/4" = 1'-0"



2 A-1 T-MOBILE EQUIPMENT AREA PLAN

SCALE: 1/2" = 1'-0"

RAN SCOPE NOTES

1. REPLACE (1) DU WITH (1) BB6630 FOR LTE
2. INSTALL (1) BB6630 FOR FUTURE 5G N600
3. ADD (3) 6x12 HCS
4. EXISTING: (12) COAXIAL LINES
5. ADD (1) BBU

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T-Mobile NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11140J	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	07/19/19	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY _____ DATE _____

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

MANCHESTER/ I-84 X63
CT11140J
60 INDUSTRIAL PARK RD
VERNON, CT 06066

SHEET TITLE

SITE PLAN & T-MOBILE EQUIP AREA PLAN

SHEET NUMBER

A-1

STATE OF CONNECTICUT
EDWARD N. IAMICELI
PEN.0028473
LICENSED
PROFESSIONAL ENGINEER

STRUCTURAL NOTE:
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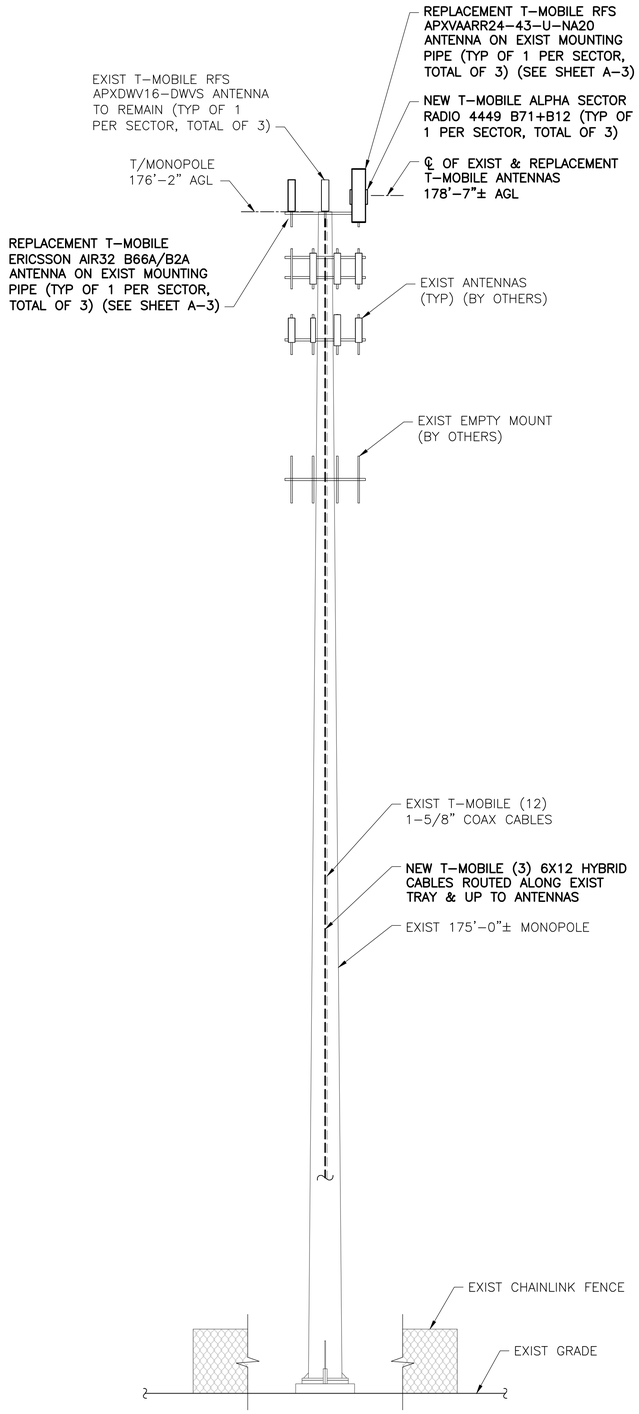

NOTE: NOT ALL SITE FEATURES SHOWN FOR CLARITY.

1/A–2 ELEVATION

SCALE: 3/32" = 1'–0"

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NORTHEAST, LLC.

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Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT1114OJ	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	07/19/19	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

MANCHESTER/ I–84 X63
CT1114OJ
60 INDUSTRIAL PARK RD
VERNON, CT 06066

SHEET TITLE

WATER TANK ELEVATION

SHEET NUMBER

A–2

N

APPROX

ANTENNA & CABLE SCHEDULE

SECTOR MARK	ANTENNA MODEL	AZIMUTH	ELEC DOWNTILT	MECH DOWNTILT	ANTENNA CENTERLINE	SECTOR	STATUS	TMA/RRU	CABLE	JUMPER TYPE	CABLE LENGTH
A-1 LTE	RFS APXVAARR24-43-U-NA20	30°	2°	0°	178'-7"±	LEFT ALPHA	REPLACEMENT	0/1	NEW 6x12 HYBRID CABLE	COAX	195'-0"
										COAX	195'-0"
A-2 GSM/UMTS	RFS APX16WV-16DWV-S-E-A20	30°	2°	0°	178'-7"±	CENTER ALPHA	EXIST	2/0	EXIST (4) 1 5/8" COAX	COAX	195'-0"
										COAX	195'-0"
A-3 LTE	ERICSSON AIR32 B66A/B2A	30°	2°	0°	178'-7"±	RIGHT ALPHA	REPLACEMENT	0/0	NEW 6x12 HYBRID CABLE	FIBER	195'-0"
										FIBER	195'-0"
B-1 LTE	RFS APXVAARR24-43-U-NA20	150°	2°	0°	178'-7"±	LEFT BETA	REPLACEMENT	0/1	NEW 6x12 HYBRID CABLE	COAX	195'-0"
										COAX	195'-0"
A-2 GSM/UMTS	RFS APX16WV-16DWV-S-E-A20	150°	2°	0°	178'-7"±	CENTER BETA	EXIST	2/0	EXIST (4) 1 5/8" COAX	COAX	195'-0"
										COAX	195'-0"
B-3 LTE	ERICSSON AIR32 B66A/B2A	150°	2°	0°	178'-7"±	RIGHT BETA	REPLACEMENT	0/0	NEW 6x12 HYBRID CABLE	FIBER	195'-0"
										FIBER	195'-0"
C-1 LTE	RFS APXVAARR24-43-U-NA20	270°	2°	0°	178'-7"±	LEFT GAMMA	REPLACEMENT	0/1	NEW 6x12 HYBRID CABLE	COAX	195'-0"
										COAX	195'-0"
A-2 GSM/UMTS	RFS APX16WV-16DWV-S-E-A20	270°	2°	0°	178'-7"±	CENTER GAMMA	EXIST	2/0	EXIST (4) 1 5/8" COAX	COAX	195'-0"
										COAX	195'-0"
C-3 LTE	ERICSSON AIR32 B66A/B2A	270°	2°	0°	178'-7"±	RIGHT GAMMA	REPLACEMENT	0/0	NEW 6x12 HYBRID CABLE	FIBER	195'-0"
										FIBER	195'-0"

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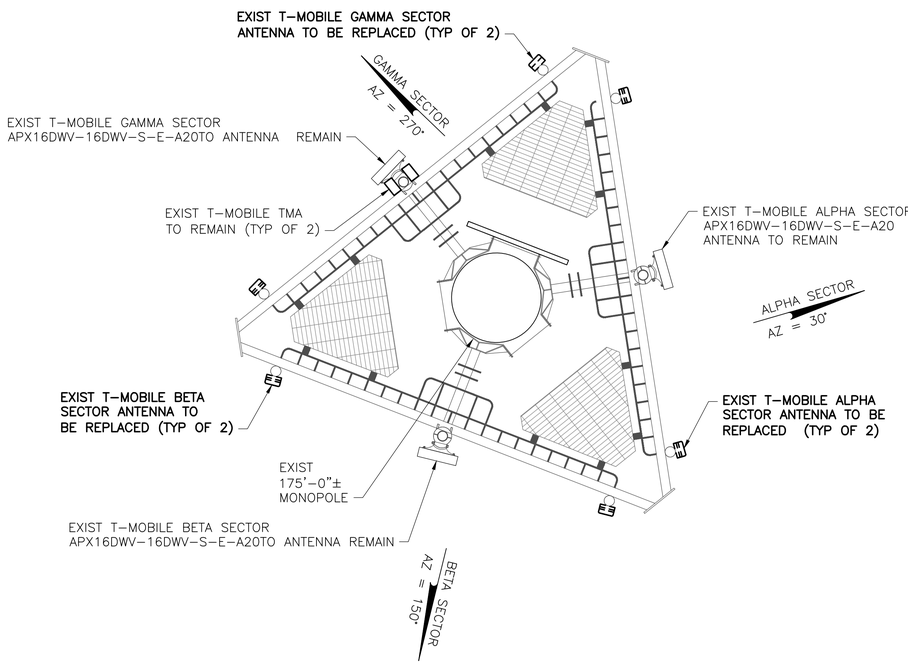
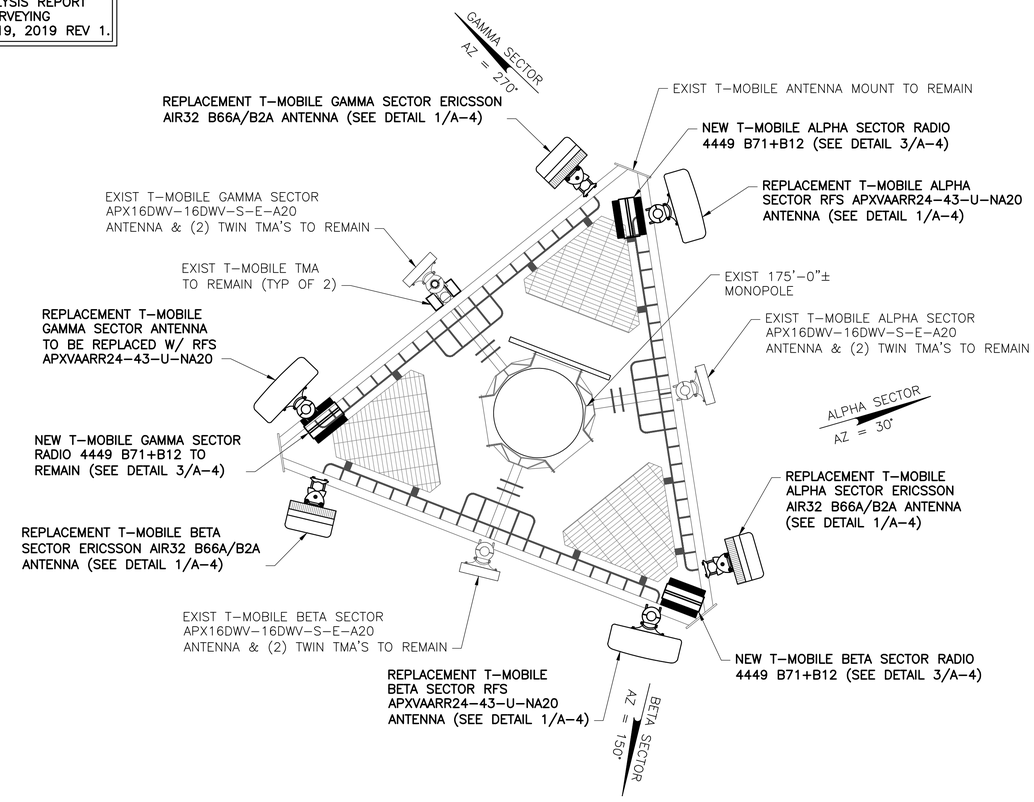


1/A-3 EXIST T-MOBILE ANTENNA PLAN

SCALE: 1/2" = 1'-0"



2/A-3 NEW T-MOBILE ANTENNA PLAN

SCALE: 1/2" = 1'-0"

STATE OF CONNECTICUT
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APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11140J	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	07/19/19	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY	DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

MANCHESTER/ I-84 X63
CT11140J
60 INDUSTRIAL PARK RD
VERNON, CT 06066

SHEET TITLE

EXIST/NEW
ANTENNA PLANS
& ANTENNA SCHEDULE

SHEET NUMBER

A-3

STRUCTURAL NOTE:
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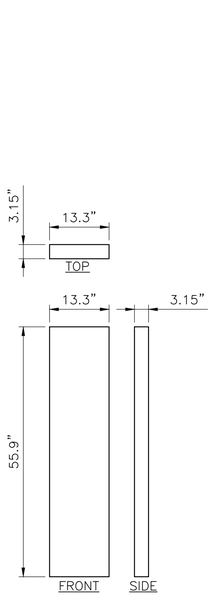
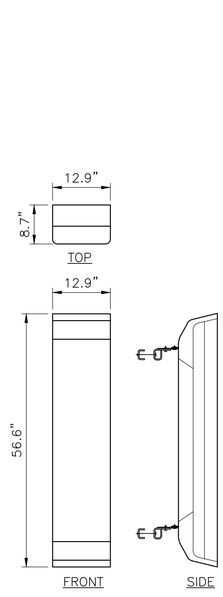
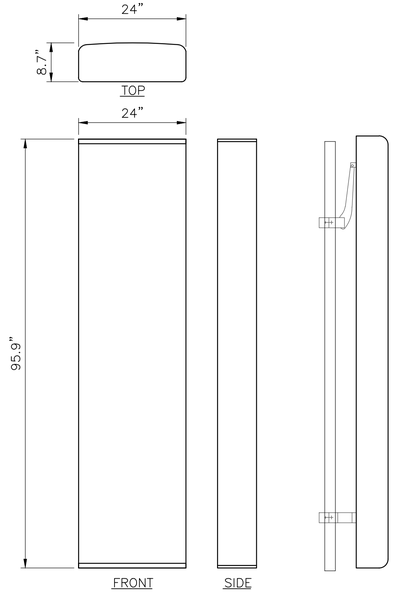


APX16DWV-16DWVS
WEIGHT: 40.7 LBS
(EXISTING)

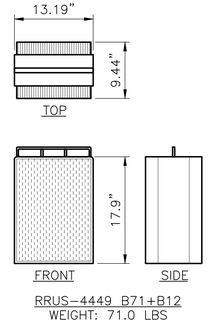


AIR32 B66A/B2A
WEIGHT: 180 LBS
(PROPOSED)



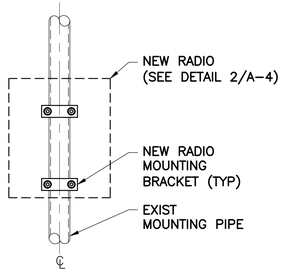
RFS: APXVAARR24_43_U_NA20
WEIGHT: 128 LBS
(PROPOSED)

1 A-4 ANTENNA DETAILS
SCALE: NTS



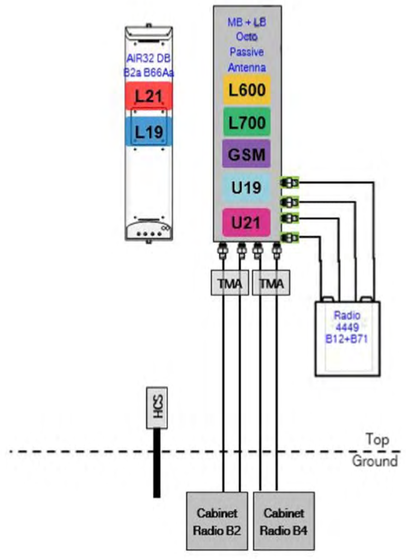
RRUS-4449 B71+B12
WEIGHT: 71.0 LBS

2 A-4 RADIO DETAIL
SCALE: 1" = 1'-0"



NOTE: MOUNTING OF RADIO TO MOUNTING PIPE, INCLUDING MOUNTING BRACKET ASSEMBLY SHALL BE PER MANUFACTURER DIRECTION.

3 A-4 RADIO MOUNTING DETAIL
SCALE: 1" = 1'-0"



TYP ALL SECTORS

4 A-4 ANTENNA SCHEMATIC
SCALE: NTS

STATE OF CONNECTICUT
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NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11140J	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	07/19/19	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

MANCHESTER/ I-84 X63
CT11140J
60 INDUSTRIAL PARK RD
VERNON, CT 06066

SHEET TITLE

DETAILS &
ANTENNA SCHEMATIC

SHEET NUMBER

A-4

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE STATE OF CONNECTICUT BUILDING CODE, LATEST VERSION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
2. CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
3. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY, UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
4. DIMENSIONS SHOWN ARE TO FINISH SURFACES, UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE AUTHORIZED REPRESENTATIVE OR THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
5. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
6. CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
7. ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE "NOTICE TO PROCEED," CONTRACTOR WILL CONTACT THE CONSTRUCTION MANAGER OF RECORD A MINIMUM OF 48 HOURS PRIOR TO WORK START.
8. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
9. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.
10. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS, AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.
12. CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE OWNER.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
14. CONTRACTOR SHALL MAINTAIN LIABILITY INSURANCE TO PROTECT THE OWNER.
15. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
16. MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACES, EQUIPMENT, IMPROVEMENTS, AND PIPING. REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION.
17. REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
18. KEEP CONTRACT AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
19. 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 ENGINEER.
20. PROVIDE 48 HOURS WRITTEN NOTICE TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
21. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS AND OTHER DOCUMENTATION SHALL BE TURNED OVER TO AT COMPLETION OF CONSTRUCTION.
22. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF ACCEPTANCE BY. ANY WORK, MATERIALS OR EQUIPMENT FOUND TO BE DEFECTIVE DURING THAT PERIOD SHALL BE CORRECTED IMMEDIATELY UPON WRITTEN NOTIFICATION AT NO ADDITIONAL COST TO T–MOBILE.

STRUCTURAL NOTES

1. 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 ENGINEER.
2. 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", LATEST EDITION.
3. STRUCTURAL STEEL BEAMS SHALL CONFORM TO ASTM A992 (Fy=50ksi). STRUCTURAL STEEL PLATES AND ANGLES SHALL CONFORM TO ASTM A36.
4. ROUND AND SQUARE HOLLOW STRUCTURAL SECTIONS (HSS) CONFORM TO ASTM A500 "COLD–FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE C.
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.
6. CONNECTIONS: WELD OR BOLT CONNECTIONS, AS INDICATED:

   A) CONNECTIONS NOT DETAILED ON THE DRAWINGS SHALL CONFORM TO THE REQUIREMENTS OF THE CITED AISC SPECIFICATION.

   B) STRUCTURAL BOLTS SHALL CONFORM TO THE LATEST ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS".

   C) WHERE THE REACTION VALUES OF BEAMS, BRACING, STRUTS, ETC., ARE NOT SHOWN ON THE DRAWINGS THE CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE END REACTION DERIVED FROM THE TABLES AND FORMULA OF UNIFORM LOAD CONSTANTS IN PART 2, NINTH EDITION, OF THE AISC MANUAL OF STEEL CONSTRUCTION FOR THE GIVEN MEMBER SIZE, SPAN AND YIELD STRENGTH.

   D) MINIMUM 3/16" FILLET E70–XX WELD SHALL APPLY UNLESS NOTED.

   E) MINIMUM 1/2" DIA. A325 BOLTS SHALL APPLY UNLESS NOTED.

   F) MINIMUM SIZE OF CLIP ANGLES SHALL BE L3x3x3/8" UNLESS NOTED.

   G) ALL GUSSET PLATES SHALL BE 3/8" THICK UNLESS NOTED.

   H) ALL HOLES FOR BOLTS SHALL BE 1/16 INCH LARGER THAN THE BOLT DIAMETER WITH AN EDGE DISTANCE OF AT LEAST 1 1/2 TIMES THE BOLT DIAMETER AND A SPACING OF AT LEAST 3 TIMES THE BOLT DIAMETER. ALL BOLTS SHALL BE PROVIDED WITH PALNUTS OR LOCK NUTS.
7. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS AND CONFORM TO ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS", LATEST EDITION. BOLTS SHALL BE 3/4 INCH DIA. UNLESS OTHERWISE NOTED.
8. 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".
9. 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.
10. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
11. 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.
12. ALL STEEL SUPPORTS SHALL BE INSTALLED WITH DOUBLE NUTS AND SHALL BE INSTALLED SNUG TIGHT.
13. SLEEVE ANCHORS SHALL CONFORM TO FEDERAL SPECIFICATION FF–S–325, GROUP II, TYPE 3, CLASS 3, AS MANUFACTURED BY HILTI FASTENING SYSTEMS OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE THREE (3) INCHES.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF–S–325, GROUP II, TYPE 4, CLASS 1, HILTI KWIK BOLT II OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE FOUR (4) INCHES.
15. EPOXY ANCHORING SYSTEM SHALL BE THE HILTI HY–270 FOR MASONRY CONSTRUCTION WITH HOLLOW BRICK OR BLOCK & THE HILTI HIT HY200 INJECTION ADHESIVE ANCHOR FOR GROUT FILLED CONCRETE MASONRY UNITS AND CONCRETE. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF 1/2"ø STAINLESS STEEL ANCHOR ROD W/NUTS & WASHERS, AN INTERNALLY THREADED INSERT, A SCREEN TUBE FOR THE HY–270 ONLY & AN EPOXY ADHESIVE (6" MIN EMBEDMENT). THE INSTALLATION PROCEDURE SHALL BE AS FOLLOWS

   A. DRILL THE HOLE USING MANUFACTURER RECOMMENDED DRILL BIT UP TO SPECIFIED DEPTH. HAMMERING IS NOT PERMITTED.

   B. CLEAN THE HOLE USING NYLON BRUSH AND/OR COMPRESSED AIR. THE HOLE SHOULD BE CLEAR OF ANY LOOSE MATERIAL. IF WET, THE MASONRY SHOULD BE ALLOWED TO DRY FULLY BEFORE ANCHOR INSTALLATION.

   C. INSERT SPECIFIED SCREEN TUBE INTO THE HOLE.

   D. FILL THE SCREEN TUBE COMPLETELY WITH ADHESIVE, BEGINNING AT THE BOTTOM END.

   E. INSERT ANCHOR ROD OR INTERNALLY THREADED INSERT INTO THE ADHESIVE–FILLED SCREEN TUBE, TWISTING SLIGHTLY.

   F. LOAD FASTENER ONLY AFTER MANUFACTURER SPECIFIED CURE TIME HAS ELAPSED.
16. GRATING SHALL BE GALVANIZED WELDED STEEL BAR GRATING TYPE W/BA WITH 1–1/4" BEARING BARS AT 1–3/16" OC. FASTEN TO SUPPORTING MEMBERS WITH SADDLE–TYPE CLIPS AT 2'–0" O.C. AND BAND ALL EXPOSED EDGES.
17. SUBMIT DRAWINGS OF ALL STRUCTURAL AND MISCELLANEOUS STEEL TO THE ENGINEER FOR APPROVAL AND INCORPORATE ALL COMMENTS PRIOR TO FABRICATION.
18. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER APPROVAL.
19. ALL WORK SHALL BE INSPECTED BY THE ENGINEER DURING AND AT THE COMPLETION OF CONSTRUCTION.
20. CONTRACTOR TO REMOVE MASTIC ON THE EXISTING WALL/PARAPET AT EVERY STEEL SUPPORT ATTACHMENT AND REPOINT MASONRY AS REQUIRED. A BED OF SILICONE SHALL BE APPLIED BEHIND AND ALL AROUND THE STEEL SUPPORT ATTACHMENT TO MAKE IT WEATHERPROOF.
21. HAMMER DRILLS ARE NOT TO BE USED WHEN DRILLING HOLES FOR SLEEVE OR EXPANSION BOLTS INSTALLED IN MASONRY BLOCKS/BRICKS.
22. ALL HOLES TO BE ADDED IN THE FIELD SHALL BE PUNCHED OR DRILLED. NO HOLE BURNING SHALL BE ALLOWED.
23. NOTES ARE NOT PROJECT SPECIFIC.

SITE NOTES

1. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWING.
2. RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
3. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
4. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
5. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
6. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES.
7. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEER.
8. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED, AND COVERED WITH MULCH.
9. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
10. CARE SHALL BE TAKEN TO RETAIN NATURAL GROWTH AND PREVENT DAMAGE TO TREES WITHIN AND OUTSIDE THE LIMITS OF CONSTRUCTION AND SPECIFIED WORK AREAS CAUSED BY EQUIPMENT AND MATERIALS. ANY DAMAGE TO THIS NATURAL GROWTH SHALL BE RESTORED AT THE EXPENSE OF THE CONTRACTOR.
11. ALL AREAS DISTURBED BY THE CONTRACTOR WITHOUT AUTHORIZATION SHALL BE RESTORED BY THE CONTRACTOR.
12. IN THE EVENT THE CONTRACTOR DAMAGES AN EXISTING UTILITY SERVICE CAUSING AN INTERRUPTION IN SAID SERVICE, HE SHALL IMMEDIATELY COMMENCE WORK TO RESTORE SERVICE AND MAY NOT CEASE HIS WORK OPERATION UNTIL SERVICE IS RESTORED.

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APPROVALS

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9927.CT11140J	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	07/19/19	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY _____ DATE _____

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

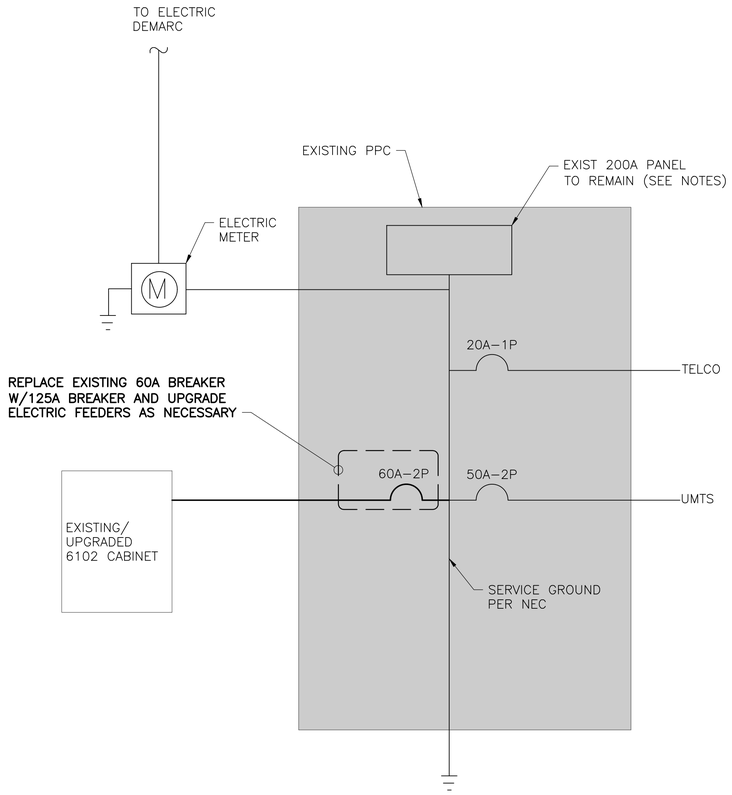
MANCHESTER/ I–84 X63
CT11140J
60 INDUSTRIAL PARK RD
VERNON, CT 06066

SHEET TITLE

NOTES

SHEET NUMBER

A–5



NOTES:
1. THE ABOVE DIAGRAM IS GENERIC AND ANY ELECTRICAL WORK SHALL BE COMPLETED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH NEC STANDARDS.
2. ELECTRICAL CONSULT SHALL BE PERFORMED TO CONSTRUCTION TO CONFIRM THE POWER REQUIREMENTS AND FEASIBILITY.

1 / E–1 ONE–LINE DIAGRAM

SCALE: NTS

GENERAL ELECTRICAL NOTES

1. CONTRACTOR SHALL PERFORM ALL VERIFICATION OBSERVATION TESTS, AND EXAMINATION WORK PRIOR TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ENGINEER LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT AND DISCREPANCIES.
2. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
3. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED AND APPROVED BY UNDERWRITER'S LABORATORIES (U.L.) AND SHALL BEAR THE INSPECTION LABEL "J" WHERE SUBJECT TO SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF ALL GOVERNING BODIES HAVING JURISDICTION. AND SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU.
4. CONTRACTOR TO COORDINATE WITH SITE OWNER FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS TO BE PAID BY CONTRACTOR.
5. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
6. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
7. METER SOCKETS AMPERES, VOLTAGE AND NUMBER OF PHASES SHALL BE NOTED AND SHALL BE MANUFACTURED BY SQUARE "D" COMPANY, SANGAMO OR APPROVED EQUAL. METER SOCKET SHALL BE APPROVED BY UTILITY COMPANY PRIOR TO INSTALLATION.
8. WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM WITH TYPE THHN INSULATION UNLESS SPECIFICALLY NOTED OTHERWISE.
9. ALL CONDUCTORS SHALL BE COPPER.
10. USE T–TAP CONNECTIONS ON ALL MULTI–CIRCUITS WITH COMMON NEUTRAL CONDUCTOR FOR LIGHTING FIXTURES.
11. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANEL BOARD, PULLBOX, J–BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.)
12. CONDUIT:
    A. RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH ZINC INTERIOR AND SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS, IN CONTACT WITH THE EARTH, UNDER PUBLIC ROADWAYS, IN MASONRY WALLS OR EXPOSED ON BUILDING EXTERIOR.
    B. INTERMEDIATE METAL CONDUIT SHALL BE U.L. LABEL, FITTINGS SHALL BE THREADED ALUMINUM OR STEEL AND SHALL BE USED FOR ALL EXTERIOR RUNS. THREADLESS COUPLINGS AND CONNECTORS SHALL NOT BE USED.
    C. ELECTRICAL METALLIC TUBING (EMT) SHALL HAVE U.L. LABEL, FITTINGS SHALL BE NO SET SCREW OR CRIMP TYPE FITTINGS SHALL BE USED. GLAND RING COMPRESSION TYPE. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.
    D. FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE, SEAL TIGHT FLEXIBLE CONDUIT. ALL CONDUIT IN EXCESS OF SIX FEET IN LENGTH SHALL HAVE FULL SIZE GROUND WIRE.
    E. CONDUIT SHALL BE SIZED PER THE NEC AND AS SHOWN.
    F. CONDUIT RUNS MAY BE SURFACE MOUNTED IN CEILINGS OR WALLS UNLESS INDICATED OTHERWISE. CONDUIT INDICATED SHALL RUN PARALLEL OR AT RIGHT ANGLES TO CEILING, FLOOR OR BEAMS. VERIFY EXACT ROUTING OF ALL EXPOSED CONDUIT WITH OWNER PRIOR TO INSTALLING.
    G. ALL CONDUIT ONLY (C.O.) RUNS SHALL HAVE A PULL WIRE OR ROPE.
13. COVERPLATES SHALL BE BRUSHED STAINLESS STEEL FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANKED OUTLETS, AND SHALL HAVE ENGRAVED LETTERING WHERE INDICATED WEATHERPROOF RECEPTACLES SHALL HAVE SIERRA #WPD–8 LIFT COVERPLATES.
14. REFER TO MANUFACTURERS MANUAL FOR RECOMMENDED FUSE AND WIRE SIZES.
15. ALL FINAL CONNECTIONS TO THE EQUIPMENT ARE TO BE OF FLEXIBLE WEATHERPROOF CONDUIT TO MEET APPLICABLE CODES.
16. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
17. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2, UNLESS OTHERWISE NOTED.
18. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE CONSTRUCTION MANAGER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.
19. PROVIDE CONSTRUCTION MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
20. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH GAINING APPROVALS AND PAYING ALL FEES ASSESSED BY UTILITY COMPANY FOR ELECTRICAL SERVICE.

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www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567–6656

T-Mobile NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11140J	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	07/19/19	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

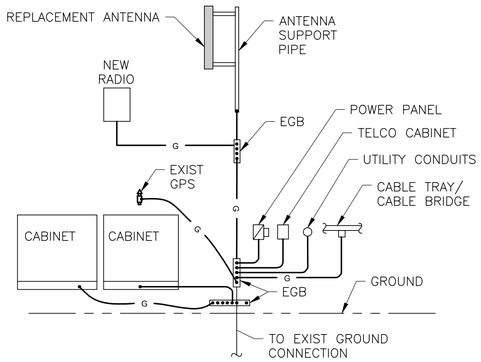
MANCHESTER/ I–84 X63
CT11140J
60 INDUSTRIAL PARK RD
VERNON, CT 06066

SHEET TITLE

ELECTRICAL NOTES
& ONE–LINE DIAGRAM

SHEET NUMBER

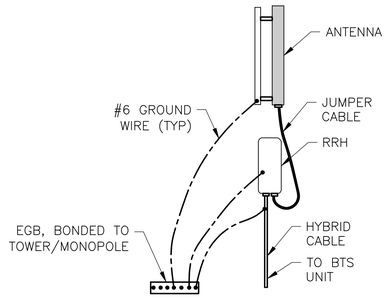
E–1



NOTE: CONTRACTOR SHALL CONFIRM ALL EQUIPMENT IS GROUNDED. IF NOT, CONTRACTOR SHALL GROUND EQUIPMENT AS SHOWN AND AS REQUIRED.

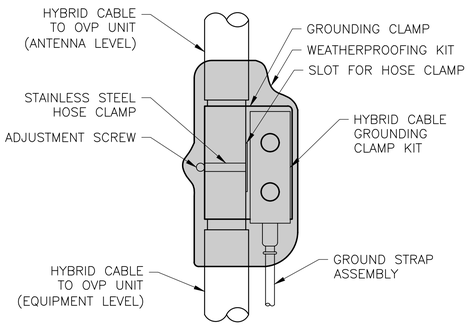
1 / G-1 GROUNDING RISER DIAGRAM

SCALE: NTS



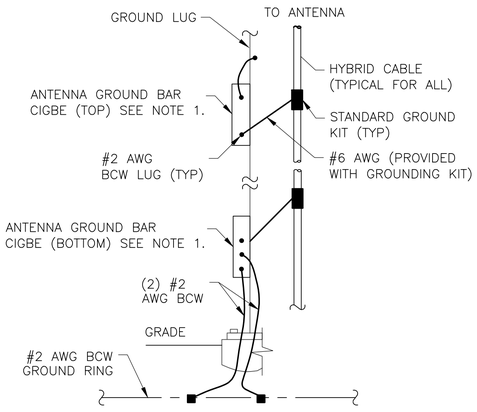
2 / G-1 HYBRID CABLE CONNECTIOND DETAIL

SCALE: NTS



3 / G-1 HYBRID CABLE GROUNDING DETAIL

SCALE: NTS

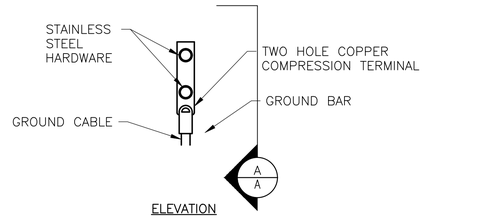


NOTES:

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

4 / G-1 ANTENNA CABLE GROUNDING

SCALE: NTS



NOTES:

1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.
4. ALL GROUND LUGS MUST NE HEAT SHRUNK AT WIRE/LUG CONNECTION.

5 / G-1 GROUND BAR CONNECTION DETAIL

SCALE: NTS

GROUNDING NOTES

1. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
2. ALL GROUNDING WORK SHALL BE IN ACCORDANCE WITH T-MOBILE STANDARD PRACTICE.
3. ALL BUS CONNECTORS SHALL BE TWO-HOLE, LONG-BARREL TYPE COMPRESSION LUGS, T&B OR EQUAL, UNLESS OTHERWISE NOTED ON DRAWINGS. ALL LUGS SHALL BE ATTACHED TO BUSSES USING BOLTS, NUTS, AND LOCK WASHERS. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED.
4. ALL CONNECTORS SHALL BE CRIMPED USING HYDRAULIC CRIMPING TOOLS, T&B #TBM 8 OR EQUIVALENT.
5. ALL CONNECTIONS SHALL BE MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE FILED TO ENSURE PROPER CONTACT. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED. ALL CONNECTIONS ARE TO HAVE A NON-OXIDIZING AGENT APPLIED PRIOR TO INSTALLATION.
6. ALL COPPER BUSSES SHALL BE CLEANED, POLISHED, AND A NON-OXIDIZING AGENT APPLIED. NO FINGERPRINTS OR DISCOLORED COPPER WILL BE PERMITTED.
7. ALL BENDS SHALL BE AS SHALLOW AS POSSIBLE, WITH NO TURN SHORTER THAN AN 8-INCH NOMINAL RADIUS.
8. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2. ALL GROUNDING CONDUCTORS SHALL RUN THROUGH PVC SLEEVES WHEREVER CONDUCTORS RUN THROUGH WALLS, FLOORS, OR CEILINGS. IF CONDUCTORS MUST RUN THROUGH EMT, BOTH ENDS OF CONDUIT SHALL BE GROUNDED. SEAL BOTH ENDS OF CONDUIT WITH SILICONE CAULK.
9. GROUNDING SYSTEM RESISTANCE SHALL NOT EXCEED 10 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY THE PROJECT MANAGER FOR FURTHER INSTRUCTION ON METHODS FOR REDUCING THE RESISTANCE VALUE.
10. ALL ROOF TOP ANTENNA MOUNTS SHALL BE GROUNDED WITH A #2 GROUND WIRE CONNECTED TO THE NEAREST GROUND BUS. ALL CONNECTIONS ARE TO BE CAD-WELDED IF POSSIBLE.
11. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE PROJECT MANAGER.
12. GROUNDING CONNECTION TO TRAVEL IN A DOWNWARD DIRECTION.
13. ALL EXPOSED #2 WIRE MUST BE TINN NOT BTW.
14. TECTONIC TAKES NO RESPONSIBILITY OR LIABILITY FOR THE GROUNDING SYSTEM AS SHOWN ON THIS SITE. THIS IS A STANDARD GROUNDING SYSTEM.

STATE OF CONNECTICUT
EDWARD N. IAMICELI
PEN.0028473
LICENSED
PROFESSIONAL ENGINEER

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road
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Phone: (845) 534-5959
(800) 829-6531
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Project Contact Info
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T-Mobile
NORTHEAST, LLC.
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NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
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PROJECT NUMBER	DESIGNED BY
9927.CT11140J	EI

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0	07/19/19	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY	DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

MANCHESTER/ I-84 X63
CT11140J
60 INDUSTRIAL PARK RD
VERNON, CT 06066

SHEET TITLE

GROUNDING DETAILS & NOTES

SHEET NUMBER

G-1

Exhibit D

STRUCTURAL ANALYSIS REPORT

T-MOBILE "L600 SCOPE"

SITE INFORMATION

STRUCTURAL ANALYSIS FOR L600 UPGRADE - MONOPOLE
SITE NAME: MANCHESTER/ I-84 X63
SITE ADDRESS: 60 INDUSTRIAL PARK RD, VERNON, CT 06066

PREPARED FOR:

NORTHEAST SITE SOLUTIONS

PREPARED BY:

TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C.

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

CONTACT:
1279 ROUTE 300
NEWBURGH, NY 12550
1 (800) 829 – 6531

JULY 19, 2019

TECTONIC WORK ORDER #: 9927.CT11140J, REVISION 1

Utilization: 74%

APPROVED BY: _____

STATE OF CONNECTICUT
EDWARD N. IAMICELI
No. 28473
LICENSED
PROFESSIONAL ENGINEER

Edward N. Iamiceli, P.E.

9927.CT11140J
T-MOBILE / NORTHEAST SITE SOLUTIONS **7/19/19**

ANALYSIS OF MONOPOLE & ANTENNA MOUNTS
L600 UPGRADE
REVISON 1

SITE NAME / ID

MANCHESTER/ I-84 X63

SITE ADDRESS

60 INDUSTRIAL PARK RD
VERNON, CT 06O66

PURPOSE

ANALYSIS OF MONOPOLE AND LOW-PROFILE PLATFORM TO SUPPORT THE PROPOSED INSTALLATION.

DESIGN CRITERIA

1. EQUIPMENT MANUFACTURERS SPECIFICATIONS.
2. 2018 CONNECTICUT STATE BUILDING CODE (IBC 2015).
3. ASCE 7-10.
4. ANSI/TIA-222-G-2005.

ASSUMPTIONS

1. AS NOTED.

REFERENCES

1. FIELD NOTES AND FIELD PICTURES.
2. MANUAL OF STEEL CONSTRUCTION.
3. MAPPING REPORT BY HIGHTOWER SOLUTIONS, DATED 6/7/19.

PROCEDURE

1. CALCULATE THE LOADS TO BE RESISTED.
2. CHECK MONOPOLE STRESSES TO RESIST LOADS.
3. CHECK LOW-PROFILE PLATFORM MEMBER STRESSES TO RESIST LOADS.
4. CHECK CONNECTIONS.

RESULTS/CONCLUSIONS

THE EXISTING MONOPOLE TOWER AND ANTENNA MOUNTING SYSTEM ARE ADEQUATE TO SUPPORT THE PROPOSED INSTALLATION.

NO INFORMATION ON THE EXISTING FOUNDATION WAS MADE AVAILABLE AT THE TIME OF THIS REPORT. AS SUCH, THE FOUNDATION HAS NOT BEEN EVALUATED.

CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND RECOMMENDATIONS AS NOTED ON THE CONSTRUCTION DRAWINGS AND NOTIFY THE DESIGN ENGINEER OF ANY DISCREPANCIES PRIOR TO FABRICATION OF STEEL. ANY FURTHER CHANGES TO THE ANTENNA AND/OR EQUIPMENT CONFIGURATION SHOULD BE REVIEWED WITH RESPECT TO THEIR EFFECT ON STRUCTURAL LOADS PRIOR TO IMPLEMENTATION.

PREPARED BY: J. JULIEN DATE: 07/19/19

CHECKED BY: I. MARINACCIO DATE: 07/19/19

STRUCTURAL ANALYSIS REPORT

Project Information

W.O. Number:	9927.CT11140J	Report Date:	7/19/19
Client:	T-Mobile / Northeast Site Solutions	Revision:	1
Site Name:	Manchester/ I-84 X63		
Owner:	T-Mobile / Northeast Site Solutions		
Address:	60 Industrial Park Rd	FCC Registration Number:	-
City, State, Zip:	Vernon, CT 06066	County:	Tolland

Structure Information

Structure Type:	Monopole	Manufacturer:	N/A
Structure Height:	175 ft	Year Built:	N/A

Original Drawings: Structure: No Foundation: No

Previous Analysis: Yes

Documents provided:

Item	By	No.	Date
Previous Structural Analysis	Maser Consulting	17963005A	12/4/17
RFDS	T-Mobile	CT11140J	4/26/19
Tower & Mount Mapping Report	Hightower Solutions	CT11140J	6/7/19
Construction Drawings	Tectonic Engineering	9927.CT11140J	6/21/19

Inspection

Type: Limited visual inspection from ground. Date: 5/24/19
Tower Climb 6/5/19

General Condition:
Tower: Good
Foundation: Good

Observations: None

Finish: Painted Condition: Intact

Existing T-Mobile Installation

Antennas:

Height (ft.)	Carrier	Qty	Manuf.	Model	Mount	Comment
178.58	T-Mobile	**6**	**EMS**	**RR901702DP**	Existing Low-Profile Platform	**To Be Removed**
		3	RFS	APX16DWV-16DWV-S-E-A20		To Remain
		6	-	Twin Style TMA		

Cables:

Height (ft.)	Qty	Nom. Size	Location/Support
178.58	12	1-5/8" Coax	Existing to remain along the interior of the pole

Proposed T-Mobile Installation

T-Mobile is proposing to replace six (6) of the existing panel antennas with six (6) newer model antennas and associated appurtenances. The final T-Mobile configuration upon this installation will be as follows:

Antennas:

Height (ft.)	Carrier	Qty	Manuf.	Model	Mount	Location
178.58	T-Mobile	**3**	**Ericsson**	**AIR32 KRD901146-1_B66A_B2A**	Existing Low-Profile Platform	Face A, B, and C
		6	-	Twin Style TMA		
		3	**RFS**	**APXVAARR24_43-U-NA20**		
		3	**Ericsson**	**RRU 4449 B71+B12**		
		3	RFS	APX16DWV-16DWV-S-E-A20		

Cables:

Height (ft.)	Qty	Nom. Size	Location/Support
178.58	12	1-5/8" Coax	Existing to remain along the interior of the pole
178.58	**3**	**6x12 Hybriflex**	**Proposed to be routed along the interior of the pole**

STRUCTURAL ANALYSIS REPORT (CONT.)

W.O. Number:	9927.CT11140J	Report Date:	7/19/2019
Client:	T-Mobile / Northeast Site Solutions	Revision:	1
Site Name:	Manchester/ I-84 X63		

Analysis Criteria

Design Standard: ANSI/TIA/222-G-2005
Building Code: 2018 Connecticut State Building Code

	Capacity (no ice)	Capacity w/ ice	Service
Wind Speed:	97 mph*	50 mph	60 mph
Basic Ice Thickness:	0 inch	0.75 inch	0 inch

*This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category II was/were used in this analysis.

Structure Class: 2 Seismic: No
Exposure Category: B
Topo Category: 1 Crest Height: 0 ft

Assumptions:

1. The monopole and foundation were designed, manufactured, and constructed in accordance with the approved design drawings and applicable codes and standards in affect at the time.
2. The tower and foundation have been properly maintained in accordance with industry standards.
3. The flange plates are have been designed to resist the full moment capacity of the pole shaft and connection bolts.
4. The weight and wind area of certain appurtenances have been estimated.

Analysis Results

Tower Members:

Element	% Usage
Pole Shaft	73
Anchor Bolts	67
Base Plate	64
Flange Bolts	74
Low-Profile Platform	72
Platform Connections	32

Service Load Deformations (Max):

Type	Actual	Allowable	% of Allowable
Tower Horizontal (in)	14.57	63.00	23%
Twist & Sway (deg):	0.78	4.00	20%

Tower Base Reactions:		
Axial:	65	Kips
Shear:	28	Kips
Moment:	3597	K-ft

For detailed information, see the attached tnxTower output.

Conclusions

Based on our analysis, the existing tower **has adequate capacity** to support the proposed T-Mobile installation as described herein in accordance with current code requirements.

No information on the existing foundation was made available at the time of this report. As such, the foundation has not been evaluated.

The existing low-profile platform and its connections **has adequate capacity** to support the proposed T-Mobile installation as described herein in accordance with current code requirements.

This analysis is based on a limited visual inspection from the ground, an antenna/coax verification & mount mapping report, and the information provided by the client. Any further changes to the antenna configuration or other appurtenances should be reviewed with respect to their effect on structural loads prior to implementation. If the existing conditions are not as represented in this report, the design engineer should be immediately notified prior to construction.

Prepared by: John Julien
Staff Engineer

Reviewed by: Ian Marinaccio, EIT
Project Engineer

Submitted By: Edward N. Iamiceli Date: 7/19/19
Edward N. Iamiceli, P.E.
Sr. Project Manager

CONNECTICUT DESIGN CRITERIA - STATE

Revison:

CT is NOT a Home Rule State; Tab added only for Design Criteria

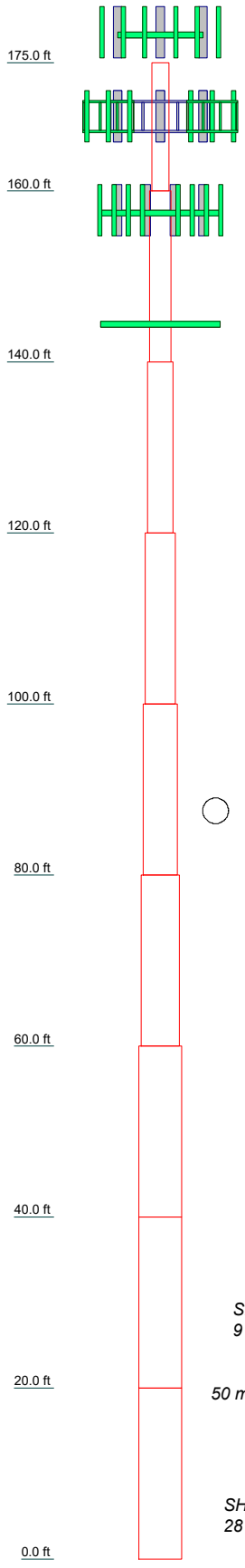
(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS

				Wind Design Parameters					
Municipality	**Ground Snow Load**	**MCE Spectral Accelerations** (%g)		**Ultimate Design Wind Speeds,** V_{ult} (mph)			**Nominal Design Wind Speeds,** V_{asd} (mph)		
		S_s	S_1	Risk Cat.I	Risk Cat.II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV
Andover	30	0.176	0.063	120	130	140	93	101	108
Ansonia	30	0.195	0.064	115	125	135	89	97	105
Ashford	35	0.173	0.063	120	130	140	93	101	108
Avon	35	0.181	0.064	110	120	130	85	93	101
Barkhamsted	40	0.177	0.065	110	120	125	85	93	97
Beacon Falls	30	0.192	0.064	115	125	135	89	97	105
Berlin	30	0.183	0.063	115	125	135	89	97	105
Bethany	30	0.189	0.063	115	125	135	89	97	105
Bethel	30	0.215	0.066	110	120	125	85	93	97
Bethlehem	35	0.190	0.065	110	120	125	85	93	97
Bloomfield	35	0.180	0.064	115	125	130	89	97	101
Bolton	30	0.177	0.063	115	125	135	89	97	105
Bozrah	30	0.170	0.061	120	135	145	93	105	112
Branford	30	0.180	0.061	120	130	140	93	101	108
Bridgeport	30	0.209	0.064	115	125	135	89	97	105
Bridgewater	35	0.201	0.066	110	120	125	85	93	97
Bristol	35	0.185	0.064	110	120	130	85	93	101
Brookfield	35	0.208	0.066	110	120	125	85	93	97
Brooklyn	35	0.171	0.062	120	130	140	93	101	108
Burlington	35	0.182	0.064	110	120	130	85	93	101
Canaan	40	0.173	0.065	105	115	120	81	89	93
Canterbury	35	0.171	0.061	120	130	140	93	101	108
Canton	35	0.180	0.064	110	120	130	85	93	101
Chaplin	35	0.173	0.062	120	130	140	93	101	108
Cheshire	30	0.186	0.063	115	125	135	89	97	105
Chester	30	0.172	0.060	120	130	140	93	101	108
Clinton	30	0.169	0.059	120	135	140	93	105	108
Colchester	30	0.174	0.061	120	130	140	93	101	108
Colebrook	40	0.174	0.065	105	115	125	81	89	97
Columbia	30	0.175	0.062	120	130	140	93	101	108
Cornwall	40	0.180	0.065	105	115	120	81	89	93
Coventry	30	0.176	0.063	120	130	140	93	101	108
Cromwell	30	0.181	0.063	115	125	135	89	97	105
Danbury	30	0.217	0.067	110	120	125	85	93	97
Darien	30	0.242	0.068	110	120	130	85	93	101
Deep River	30	0.170	0.060	120	130	140	93	101	108
Derby	30	0.195	0.064	115	125	135	89	97	105
Durham	30	0.179	0.062	115	130	140	89	101	108
Eastford	40	0.172	0.063	120	130	140	93	101	108
East Granby	35	0.177	0.065	110	120	130	85	93	101
East Haddam	30	0.172	0.061	120	130	140	93	101	108
East Hampton	30	0.177	0.062	120	130	140	93	101	108

New Milford	35	0.198	0.066	105	115	125	81	89	97
Newtown	30	0.208	0.066	110	120	130	85	93	101
Norfolk	40	0.175	0.065	105	115	125	81	89	97
North Branford	30	0.179	0.061	120	130	140	93	101	108
North Canaan	40	0.173	0.065	105	115	120	81	89	93
North Haven	30	0.184	0.062	115	125	135	89	97	105
North Stonington	30	0.163	0.059	125	135	145	97	105	112
Norwalk	30	0.232	0.067	110	120	130	85	93	101
Norwich	30	0.168	0.060	125	135	145	97	105	112
Old Lyme	30	0.164	0.059	125	135	145	97	105	112
Old Saybrook	30	0.164	0.059	125	135	145	97	105	112
Orange	30	0.192	0.063	115	125	135	89	97	105
Oxford	30	0.196	0.064	110	125	130	85	97	101
Plainfield	35	0.170	0.061	125	135	145	97	105	112
Plainville	35	0.184	0.064	115	125	135	89	97	105
Plymouth	35	0.186	0.064	110	120	130	85	93	101
Pomfret	40	0.172	0.063	120	130	140	93	101	108
Portland	30	0.180	0.063	115	130	135	89	101	105
Preston	30	0.167	0.060	125	135	145	97	105	112
Prospect	30	0.188	0.064	115	125	135	89	97	105
Putnam	40	0.172	0.063	120	130	140	93	101	108
Redding	30	0.220	0.067	110	120	130	85	93	101
Ridgefield	30	0.230	0.068	110	120	125	85	93	97
Rocky Hill	30	0.181	0.063	115	125	135	89	97	105
Roxbury	35	0.197	0.065	110	120	125	85	93	97
Salem	30	0.170	0.060	120	135	140	93	105	108
Salisbury	40	0.173	0.065	105	115	120	81	89	93
Scotland	30	0.172	0.061	120	130	140	93	101	108
Seymour	30	0.194	0.064	115	125	135	89	97	105
Sharon	40	0.179	0.065	105	115	120	81	89	93
Shelton	30	0.199	0.064	115	125	135	89	97	105
Sherman	35	0.202	0.066	105	115	120	81	89	93
Simsbury	35	0.179	0.064	110	120	130	85	93	101
Somers	35	0.174	0.064	115	125	135	89	97	105
Southbury	35	0.198	0.065	110	120	130	85	93	101
Southington	30	0.185	0.064	115	125	135	89	97	105
South Windsor	30	0.178	0.064	115	125	135	89	97	105
Sprague	30	0.171	0.061	120	130	140	93	101	108
Stafford	35	0.173	0.064	115	125	135	89	97	105
Stamford	30	0.249	0.069	110	120	130	85	93	101
Sterling	35	0.170	0.061	125	135	145	97	105	112
Stonington	30	0.159	0.058	125	140	150	97	108	116
Stratford	30	0.201	0.064	115	125	135	89	97	105
Suffield	35	0.176	0.065	110	120	130	85	93	101
Thomaston	35	0.186	0.064	110	120	130	85	93	101
Thompson	40	0.172	0.063	120	130	140	93	101	108
Tolland	35	0.175	0.064	115	125	135	89	97	105
Torrington	40	0.182	0.065	110	120	125	85	93	97
Trumbull	30	0.207	0.065	115	125	135	89	97	105
Union	40	0.172	0.064	115	125	135	89	97	105
Vernon	30	0.177	0.064	115	125	135	89	97	105
Voluntown	30	0.168	0.060	125	135	145	97	105	112
Wallingford	30	0.183	0.063	115	125	135	89	97	105

TOWER ANALYSIS

Section	Size	Length (ft)	Grade	Weight (K)
1	P24x3/8	15.00	A53-B-42	1.4
2	P30x3/8	20.00		2.4
3	P36x3/8	20.00		2.9
4	P42x3/8	20.00		3.3
5	P48x3/8	20.00		3.8
6	P54x3/8	20.00		4.3
7	P60x3/8	20.00		4.8
8	P60x1/2	20.00		6.4
9	P60x5/8	20.00		7.9
				37.2



ALL REACTIONS ARE FACTORED

AXIAL 110 K

SHEAR 9 K

MOMENT 1214 kip-ft

TORQUE 0 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 65 K

SHEAR 28 K

MOMENT 3597 kip-ft

TORQUE 0 kip-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
AIR 32 B66Aa B2a w/ Mount Pipe	178.583	RRUS 11 B12	168.71
AIR 32 B66Aa B2a w/ Mount Pipe	178.583	RRUS 11 B12	168.71
AIR 32 B66Aa B2a w/ Mount Pipe	178.583	RRUS 11 B12	168.71
APXVARR24_43-C-NA20 w/ Mount Pipe	178.583	RRUS 32	168.71
		RRUS 32	168.71
APXVARR24_43-C-NA20 w/ Mount Pipe	178.583	RRUS 32	168.71
APXVARR24_43-C-NA20 w/ Mount Pipe	178.583	RRUS 4478 B14	168.71
		RRUS 4478 B14	168.71
RADIO 4449 B12/B71	178.583	RRUS 4478 B14	168.71
RADIO 4449 B12/B71	178.583	(3) 12' Sector Frames	168.71
RADIO 4449 B12/B71	178.583	GPS_A	157.71
(2) Twin Style TMA	178.583	(2) RFS TMA	157.71
(2) Twin Style TMA	178.583	(2) RFS TMA	157.71
(2) Twin Style TMA	178.583	(2) RFS TMA	157.71
APX16DWVS-16DWVS w/ Mount pipe	178.583	BXA-171063-8BF-EDIN-X w/ Mount Pipe	157.71
APX16DWVS-16DWVS w/ Mount pipe	178.583	BXA-171063-8BF-EDIN-X w/ Mount Pipe	157.71
APX16DWVS-16DWVS w/ Mount pipe	178.583	BXA-171063-8BF-EDIN-X w/ Mount Pipe	157.71
10'6" Low Profile Platform	178.583	(2) LPA-80063-4CF-EDIN-X w/ Mount Pipe	157.71
DC6-48-60-18-8F	168.71	(2) LPA-80063-4CF-EDIN-X w/ Mount Pipe	157.71
DC6-48-60-18-8F	168.71	Generic Panel Antenna	157.71
800 10121 w/ Mount Pipe	168.71	Generic Panel Antenna	157.71
800 10121 w/ Mount Pipe	168.71	Generic Panel Antenna	157.71
800 10121 w/ Mount Pipe	168.71	(2) Generic Panel Antenna	157.71
QS66512-2 w/ Mount Pipe	168.71	14' Low Profile Platform	157.71
QS66512-2 w/ Mount Pipe	168.71	14' Low Profile Platform	144.71
QS66512-2 w/ Mount Pipe	168.71	(4) 2" STD Pipe (2.375 OD)x6'-0"	144.71
HPA-65R-BUU-H6 w/ Mount Pipe	168.71	(4) 2" STD Pipe (2.375 OD)x6'-0"	144.71
HPA-65R-BUU-H6 w/ Mount Pipe	168.71	(4) 2" STD Pipe (2.375 OD)x6'-0"	144.71
HPA-65R-BUU-H6 w/ Mount Pipe	168.71		
RRUS 32 B2	168.71		
RRUS 32 B2	168.71		
RRUS 32 B2	168.71		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 72.7%

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PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Tectonic
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job: ***9927.CT11140J, Revision 1***		
Project: ***175' Monopole***		
Client: T-Mobile	Drawn by: Ian Marinaccio	App'd:
Code: TIA-222-G	Date: 07/19/19	Scale: NTS
Path: G:\Newburgh\Projects\9927 NSS-L600 project\CT11140J\Structural\Tower\Rev 1\CT11140J.eri		Dwg No. E-1

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Newburgh, NY 12550
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FAX: (845) 567-8703

Job	Page
9927.CT11140J, Revision 1	1 of 15
Project	**Date**
175' Monopole	14:48:43 07/19/19
Client	**Designed by**
T-Mobile	Ian Marinaccio

Tower Input Data

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

Tower is located in Tolland County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 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.
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

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	175.00-160.00	15.00	P24x3/8	A53-B-42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L2	160.00-140.00	20.00	P30x3/8	(42 ksi) A53-B-42 (42 ksi)	
L3	140.00-120.00	20.00	P36x3/8	A53-B-42 (42 ksi)	
L4	120.00-100.00	20.00	P42x3/8	A53-B-42 (42 ksi)	
L5	100.00-80.00	20.00	P48x3/8	A53-B-42 (42 ksi)	
L6	80.00-60.00	20.00	P54x3/8	A53-B-42 (42 ksi)	
L7	60.00-40.00	20.00	P60x3/8	A53-B-42 (42 ksi)	
L8	40.00-20.00	20.00	P60x1/2	A53-B-42 (42 ksi)	
L9	20.00-0.00	20.00	P60x5/8	A53-B-42 (42 ksi)	

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 175.00-160.00				1	1	1			
L2 160.00-140.00				1	1	1			
L3 140.00-120.00				1	1	1			
L4 120.00-100.00				1	1	1			
L5 100.00-80.00				1	1	1			
L6 80.00-60.00				1	1	1			
L7 60.00-40.00				1	1	1			
L8 40.00-20.00				1	1	1			
L9 20.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
* **										
Climbing Ladder	C	No	Surface Ar (CaAa)	175.00 - 0.00	1	1	0.000 0.000	1.0000		7.90
Safety Line 3/8	C	No	Surface Ar (CaAa)	175.00 - 11.17	1	1	0.000 0.000	0.3750		0.22

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* *plf*
LDF7-50A(1-5/8")	C	No	No	Inside Pole	175.00 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
LDF7-50A(1-5/8")	C	No	No	Inside Pole	175.00 - 0.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
HCS 6X12 4AWG(1-5/8) **	C	No	No	Inside Pole	175.00 - 0.00	3	No Ice	0.00	2.40
							1/2" Ice	0.00	2.40
							1" Ice	0.00	2.40
Fiber Optic	C	No	No	Inside Pole	168.71 - 0.00	2	No Ice	0.00	0.08
							1/2" Ice	0.00	0.08
							1" Ice	0.00	0.08
DC Power	C	No	No	Inside Pole	168.71 - 0.00	4	No Ice	0.00	0.89
							1/2" Ice	0.00	0.89
							1" Ice	0.00	0.89
LDF7-50A(1-5/8") **	C	No	No	Inside Pole	168.71 - 0.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
LDF7-50A(1-5/8")	C	No	No	Inside Pole	157.71 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
LDF4-50A(1/2) *	C	No	No	Inside Pole	157.71 - 0.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15

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	175.00-160.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.063	0.000	0.53
L2	160.00-140.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.750	0.000	0.95
L3	140.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.750	0.000	0.97
L4	120.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.750	0.000	0.97
L5	100.00-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.750	0.000	0.97
L6	80.00-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.750	0.000	0.97
L7	60.00-40.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

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
		C	0.000	0.000	2.750	0.000	0.97
L8	40.00-20.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.750	0.000	0.97
L9	20.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.331	0.000	0.97

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	175.00-160.00	A	2.353	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	16.179	0.000	0.79
L2	160.00-140.00	A	2.327	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	21.366	0.000	1.29
L3	140.00-120.00	A	2.294	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	21.101	0.000	1.31
L4	120.00-100.00	A	2.256	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	20.797	0.000	1.30
L5	100.00-80.00	A	2.211	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	20.439	0.000	1.29
L6	80.00-60.00	A	2.156	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	20.000	0.000	1.27
L7	60.00-40.00	A	2.085	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	19.429	0.000	1.26
L8	40.00-20.00	A	1.981	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	18.598	0.000	1.23
L9	20.00-0.00	A	1.775	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	12.566	0.000	1.13

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	175.00-160.00	0.0000	1.2763	0.0000	3.3738
L2	160.00-140.00	0.0000	1.2944	0.0000	3.6176
L3	140.00-120.00	0.0000	1.3069	0.0000	3.7865
L4	120.00-100.00	0.0000	1.3160	0.0000	3.9016
L5	100.00-80.00	0.0000	1.3230	0.0000	3.9730
L6	80.00-60.00	0.0000	1.3285	0.0000	4.0041
L7	60.00-40.00	0.0000	1.3329	0.0000	3.9910
L8	40.00-20.00	0.0000	1.3329	0.0000	3.8529

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L9	20.00-0.00	0.0000	1.1391	0.0000	2.7365

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	13	Climbing Ladder	160.00 - 175.00	1.0000	1.0000
L1	14	Safety Line 3/8	160.00 - 175.00	1.0000	1.0000
L2	13	Climbing Ladder	140.00 - 160.00	1.0000	1.0000
L2	14	Safety Line 3/8	140.00 - 160.00	1.0000	1.0000
L3	13	Climbing Ladder	120.00 - 140.00	1.0000	1.0000
L3	14	Safety Line 3/8	120.00 - 140.00	1.0000	1.0000
L4	13	Climbing Ladder	100.00 - 120.00	1.0000	1.0000
L4	14	Safety Line 3/8	100.00 - 120.00	1.0000	1.0000
L5	13	Climbing Ladder	80.00 - 100.00	1.0000	1.0000
L5	14	Safety Line 3/8	80.00 - 100.00	1.0000	1.0000
L6	13	Climbing Ladder	60.00 - 80.00	1.0000	1.0000
L6	14	Safety Line 3/8	60.00 - 80.00	1.0000	1.0000
L7	13	Climbing Ladder	40.00 - 60.00	1.0000	1.0000
L7	14	Safety Line 3/8	40.00 - 60.00	1.0000	1.0000
L8	13	Climbing Ladder	20.00 - 40.00	1.0000	1.0000
L8	14	Safety Line 3/8	20.00 - 40.00	1.0000	1.0000
L9	13	Climbing Ladder	0.00 - 20.00	1.0000	1.0000
L9	14	Safety Line 3/8	11.17 - 20.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AIR 32 B66Aa B2a w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	178.58	No Ice 1/2" Ice 1" Ice	6.81 7.30 7.76	6.14 6.99 7.73	0.15 0.22 0.28

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AIR 32 B66Aa B2a w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	6.81 7.30	6.14 6.99	0.15 0.22
			0.00			1" Ice	7.76	7.73	0.28
AIR 32 B66Aa B2a w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	6.81 7.30	6.14 6.99	0.15 0.22
			0.00			1" Ice	7.76	7.73	0.28
APXVARR24_43-C-NA20 w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	17.15 17.77	10.64 12.07	0.14 0.26
			0.00			1" Ice	18.40	13.35	0.39
APXVARR24_43-C-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	17.15 17.77	10.64 12.07	0.14 0.26
			0.00			1" Ice	18.40	13.35	0.39
APXVARR24_43-C-NA20 w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	17.15 17.77	10.64 12.07	0.14 0.26
			0.00			1" Ice	18.40	13.35	0.39
RADIO 4449 B12/B71	A	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	1.65 1.81	1.16 1.30	0.07 0.09
			0.00			1" Ice	1.98	1.45	0.11
RADIO 4449 B12/B71	B	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	1.65 1.81	1.16 1.30	0.07 0.09
			0.00			1" Ice	1.98	1.45	0.11
RADIO 4449 B12/B71	C	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	1.65 1.81	1.16 1.30	0.07 0.09
			0.00			1" Ice	1.98	1.45	0.11
(2) Twin Style TMA	A	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	1.05 1.18	0.55 0.65	0.02 0.03
			0.00			1" Ice	1.32	0.75	0.04
(2) Twin Style TMA	B	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	1.05 1.18	0.55 0.65	0.02 0.03
			0.00			1" Ice	1.32	0.75	0.04
(2) Twin Style TMA	C	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	1.05 1.18	0.55 0.65	0.02 0.03
			0.00			1" Ice	1.32	0.75	0.04
APX16DWVS-16DWVS w/ Mount pipe	A	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	6.68 7.07	3.48 4.12	0.07 0.12
			0.00			1" Ice	7.48	4.78	0.18
APX16DWVS-16DWVS w/ Mount pipe	B	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	6.68 7.07	3.48 4.12	0.07 0.12
			0.00			1" Ice	7.48	4.78	0.18
APX16DWVS-16DWVS w/ Mount pipe	C	From Leg	4.00 0.00	0.0000	178.58	No Ice 1/2" Ice	6.68 7.07	3.48 4.12	0.07 0.12
			0.00			1" Ice	7.48	4.78	0.18
10'6" Low Profile Platform	C	None		0.0000	178.58	No Ice 1/2" Ice	14.66 18.87	14.66 18.87	1.25 1.48
						1" Ice	23.08	23.08	1.71
*******									
DC6-48-60-18-8F	B	From Leg	4.00 0.00	0.0000	168.71	No Ice 1/2" Ice	0.92 1.46	0.92 1.46	0.02 0.04
			0.00			1" Ice	1.64	1.64	0.06
DC6-48-60-18-8F	C	From Leg	4.00 0.00	0.0000	168.71	No Ice 1/2" Ice	0.92 1.46	0.92 1.46	0.02 0.04
			0.00			1" Ice	1.64	1.64	0.06
800 10121 w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	168.71	No Ice 1/2" Ice	3.60 4.00	2.95 3.34	0.07 0.11
			0.00			1" Ice	4.42	3.74	0.17
800 10121 w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	168.71	No Ice 1/2" Ice	3.60 4.00	2.95 3.34	0.07 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	4.42	3.74	0.17
800 10121 w/ Mount Pipe	C	From Leg	4.00	0.0000	168.71	No Ice	3.60	2.95	0.07
			0.00			1/2" Ice	4.00	3.34	0.11
			0.00			1" Ice	4.42	3.74	0.17
QS66512-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	168.71	No Ice	4.04	4.18	0.14
			0.00			1/2" Ice	4.42	4.57	0.21
			0.00			1" Ice	4.82	4.97	0.29
QS66512-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	168.71	No Ice	4.04	4.18	0.14
			0.00			1/2" Ice	4.42	4.57	0.21
			0.00			1" Ice	4.82	4.97	0.29
QS66512-2 w/ Mount Pipe	C	From Leg	4.00	0.0000	168.71	No Ice	4.04	4.18	0.14
			0.00			1/2" Ice	4.42	4.57	0.21
			0.00			1" Ice	4.82	4.97	0.29
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00	0.0000	168.71	No Ice	9.22	6.25	0.07
			0.00			1/2" Ice	9.98	6.96	0.14
			0.00			1" Ice	10.76	7.70	0.22
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00	0.0000	168.71	No Ice	9.22	6.25	0.07
			0.00			1/2" Ice	9.98	6.96	0.14
			0.00			1" Ice	10.76	7.70	0.22
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00	0.0000	168.71	No Ice	9.22	6.25	0.07
			0.00			1/2" Ice	9.98	6.96	0.14
			0.00			1" Ice	10.76	7.70	0.22
RRUS 32 B2	A	From Leg	4.00	0.0000	168.71	No Ice	2.71	1.66	0.05
			0.00			1/2" Ice	2.93	1.85	0.07
			0.00			1" Ice	3.16	2.04	0.10
RRUS 32 B2	B	From Leg	4.00	0.0000	168.71	No Ice	2.71	1.66	0.05
			0.00			1/2" Ice	2.93	1.85	0.07
			0.00			1" Ice	3.16	2.04	0.10
RRUS 32 B2	C	From Leg	4.00	0.0000	168.71	No Ice	2.71	1.66	0.05
			0.00			1/2" Ice	2.93	1.85	0.07
			0.00			1" Ice	3.16	2.04	0.10
RRUS 11 B12	A	From Leg	4.00	0.0000	168.71	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
RRUS 11 B12	B	From Leg	4.00	0.0000	168.71	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
RRUS 11 B12	C	From Leg	4.00	0.0000	168.71	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
RRUS 32	A	From Leg	4.00	0.0000	168.71	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			0.00			1" Ice	3.18	2.05	0.10
RRUS 32	B	From Leg	4.00	0.0000	168.71	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			0.00			1" Ice	3.18	2.05	0.10
RRUS 32	A	From Leg	4.00	0.0000	168.71	No Ice	2.73	1.67	0.05
			0.00			1/2" Ice	2.95	1.86	0.07
			0.00			1" Ice	3.18	2.05	0.10
RRUS 4478 B14	B	From Leg	4.00	0.0000	168.71	No Ice	1.84	1.06	0.06
			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09
RRUS 4478 B14	C	From Leg	4.00	0.0000	168.71	No Ice	1.84	1.06	0.06
			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09
RRUS 4478 B14	C	From Leg	4.00	0.0000	168.71	No Ice	1.84	1.06	0.06
			0.00			1/2" Ice	2.01	1.20	0.08

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*
			0.00			1" Ice	2.19	1.34	0.09
(3) 12' Sector Frames	C	None		0.0000	168.71	No Ice	25.48	25.48	0.49
						1/2" Ice	36.14	36.14	1.00
						1" Ice	46.80	46.80	0.50
***									
GPS_A	C	From Leg	4.00	0.0000	157.71	No Ice	0.26	0.26	0.00
			0.00			1/2" Ice	0.32	0.32	0.00
			0.00			1" Ice	0.39	0.39	0.01
(2) RFS TMA	A	From Leg	4.00	0.0000	157.71	No Ice	1.05	0.55	0.02
			0.00			1/2" Ice	1.18	0.65	0.03
			0.00			1" Ice	1.32	0.75	0.04
(2) RFS TMA	B	From Leg	4.00	0.0000	157.71	No Ice	1.05	0.55	0.02
			0.00			1/2" Ice	1.18	0.65	0.03
			0.00			1" Ice	1.32	0.75	0.04
(2) RFS TMA	C	From Leg	4.00	0.0000	157.71	No Ice	1.05	0.55	0.02
			0.00			1/2" Ice	1.18	0.65	0.03
			0.00			1" Ice	1.32	0.75	0.04
BXA-171063-8BF-EDIN-X w/ Mount Pipe	A	From Leg	4.00	0.0000	157.71	No Ice	3.18	3.35	0.03
			0.00			1/2" Ice	3.56	3.97	0.06
			0.00			1" Ice	3.93	4.60	0.10
BXA-171063-8BF-EDIN-X w/ Mount Pipe	B	From Leg	4.00	0.0000	157.71	No Ice	3.18	3.35	0.03
			0.00			1/2" Ice	3.56	3.97	0.06
			0.00			1" Ice	3.93	4.60	0.10
BXA-171063-8BF-EDIN-X w/ Mount Pipe	C	From Leg	4.00	0.0000	157.71	No Ice	3.18	3.35	0.03
			0.00			1/2" Ice	3.56	3.97	0.06
			0.00			1" Ice	3.93	4.60	0.10
(2) LPA-80063-4CF-EDIN-X w/ Mount Pipe	B	From Leg	4.00	0.0000	157.71	No Ice	6.38	6.56	0.04
			0.00			1/2" Ice	6.78	7.19	0.10
			0.00			1" Ice	7.19	7.84	0.18
(2) LPA-80063-4CF-EDIN-X w/ Mount Pipe	C	From Leg	4.00	0.0000	157.71	No Ice	6.38	6.56	0.04
			0.00			1/2" Ice	6.78	7.19	0.10
			0.00			1" Ice	7.19	7.84	0.18
Generic Panel Antenna	A	From Leg	4.00	0.0000	157.71	No Ice	8.13	8.46	0.07
			0.00			1/2" Ice	8.59	9.42	0.15
			0.00			1" Ice	9.05	10.24	0.23
Generic Panel Antenna	B	From Leg	4.00	0.0000	157.71	No Ice	8.13	8.46	0.07
			0.00			1/2" Ice	8.59	9.42	0.15
			0.00			1" Ice	9.05	10.24	0.23
Generic Panel Antenna	C	From Leg	4.00	0.0000	157.71	No Ice	8.13	8.46	0.07
			0.00			1/2" Ice	8.59	9.42	0.15
			0.00			1" Ice	9.05	10.24	0.23
(2) Generic Panel Antenna	A	From Leg	4.00	0.0000	157.71	No Ice	8.13	8.46	0.07
			0.00			1/2" Ice	8.59	9.42	0.15
			0.00			1" Ice	9.05	10.24	0.23
14' Low Profile Platform	C	None		0.0000	157.71	No Ice	18.85	18.85	1.50
						1/2" Ice	24.30	24.30	1.80
						1" Ice	29.75	29.75	2.09
***									
14' Low Profile Platform	C	None		0.0000	144.71	No Ice	18.85	18.85	1.50
						1/2" Ice	24.30	24.30	1.80
						1" Ice	29.75	29.75	2.09
(4) 2" STD Pipe (2.375 OD)x6'-0"	A	From Leg	4.00	0.0000	144.71	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
(4) 2" STD Pipe (2.375 OD)x6'-0"	B	From Leg	4.00	0.0000	144.71	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05

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
(4) 2" STD Pipe (2.375 OD)x6'-0"	C	From Leg	4.00 0.00 0.00	0.0000	144.71	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05

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 90 deg - No Ice
5	0.9 Dead+1.6 Wind 90 deg - No Ice
6	1.2 Dead+1.6 Wind 180 deg - No Ice
7	0.9 Dead+1.6 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 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	175 - 160	Pole	Max Tension	8	0.00	-0.00	0.00
			Max. Compression	8	-21.00	-0.08	-0.98
			Max. Mx	4	-7.35	-131.65	-0.41
			Max. My	6	-7.35	0.02	-132.21
			Max. Vy	4	9.78	-131.65	-0.41
			Max. Vx	6	9.80	0.02	-132.21
			Max. Torque	2			-0.10
L2	160 - 140	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-40.58	0.08	-0.85
			Max. Mx	4	-15.79	-418.41	-0.39
			Max. My	6	-15.79	-0.07	-419.11
			Max. Vy	4	16.70	-418.41	-0.39
			Max. Vx	6	16.72	-0.07	-419.11
			Max. Torque	10			0.14
L3	140 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-47.66	0.08	-1.77
			Max. Mx	4	-20.46	-768.81	-0.80
			Max. My	6	-20.46	-0.17	-770.07
			Max. Vy	4	18.32	-768.81	-0.80
			Max. Vx	6	18.33	-0.17	-770.07

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			0.14
L4	120 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-55.60	0.08	-2.74
			Max. Mx	4	-25.73	-1152.55	-1.26
			Max. My	6	-25.73	-0.26	-1154.41
			Max. Vy	4	20.04	-1152.55	-1.26
			Max. Vx	6	20.05	-0.26	-1154.41
			Max. Torque	10			0.14
L5	100 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-64.37	0.08	-3.78
			Max. Mx	4	-31.60	-1571.46	-1.76
			Max. My	6	-31.60	-0.35	-1573.98
			Max. Vy	4	21.84	-1571.46	-1.76
			Max. Vx	6	21.85	-0.35	-1573.98
			Max. Torque	10			0.14
L6	80 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-73.96	0.08	-4.91
			Max. Mx	4	-38.05	-2026.52	-2.32
			Max. My	6	-38.05	-0.44	-2029.75
			Max. Vy	4	23.66	-2026.52	-2.32
			Max. Vx	6	23.67	-0.44	-2029.75
			Max. Torque	10			0.14
L7	60 - 40	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-84.31	0.08	-6.12
			Max. Mx	4	-45.10	-2517.52	-2.92
			Max. My	6	-45.10	-0.54	-2521.49
			Max. Vy	4	25.43	-2517.52	-2.92
			Max. Vx	6	25.45	-0.54	-2521.49
			Max. Torque	10			0.14
L8	40 - 20	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-96.37	0.08	-7.27
			Max. Mx	4	-54.06	-3040.76	-3.51
			Max. My	6	-54.06	-0.63	-3045.47
			Max. Vy	4	26.88	-3040.76	-3.51
			Max. Vx	6	26.89	-0.63	-3045.47
			Max. Torque	10			0.14
L9	20 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-109.90	0.08	-8.16
			Max. Mx	4	-64.92	-3591.96	-4.09
			Max. My	6	-64.92	-0.72	-3597.40
			Max. Vy	4	28.23	-3591.96	-4.09
			Max. Vx	6	28.24	-0.72	-3597.40
			Max. Torque	10			0.14

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	8	109.90	0.00	-0.00
	Max. H_x	3	48.69	0.00	28.23
	Max. H_z	2	64.93	0.00	28.23
	Max. M_x	2	3590.77	0.00	28.23
	Max. M_z	4	3591.96	-28.22	-0.00
	Max. Torsion	10	0.14	-9.38	-0.00
	Min. Vert	3	48.69	0.00	28.23
	Min. H_x	4	64.93	-28.22	-0.00

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H_z	6	64.93	-0.00	-28.23
	Min. M_x	6	-3597.40	-0.00	-28.23
	Min. M_z	2	-0.84	0.00	28.23
	Min. Torsion	2	-0.05	0.00	28.23

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	54.11	0.00	0.00	2.68	0.05	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	64.93	-0.00	-28.23	-3590.77	0.84	0.05
0.9 Dead+1.6 Wind 0 deg - No Ice	48.69	-0.00	-28.23	-3559.91	0.81	0.05
1.2 Dead+1.6 Wind 90 deg - No Ice	64.93	28.22	0.00	4.09	-3591.96	-0.05
0.9 Dead+1.6 Wind 90 deg - No Ice	48.69	28.22	0.00	3.24	-3560.29	-0.05
1.2 Dead+1.6 Wind 180 deg - No Ice	64.93	0.00	28.23	3597.40	-0.72	-0.05
0.9 Dead+1.6 Wind 180 deg - No Ice	48.69	0.00	28.23	3564.84	-0.72	-0.05
1.2 Dead+1.0 Ice+1.0 Temp	109.90	-0.00	0.00	8.16	0.08	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	109.90	-0.00	-9.38	-1197.25	0.23	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	109.90	9.38	0.00	8.68	-1207.01	-0.14
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	109.90	0.00	9.38	1214.33	-0.06	-0.00
Dead+Wind 0 deg - Service	54.11	-0.00	-6.04	-762.10	0.22	0.01
Dead+Wind 90 deg - Service	54.11	6.04	0.00	2.92	-764.36	-0.01
Dead+Wind 180 deg - Service	54.11	0.00	6.04	767.60	-0.11	-0.01

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-54.11	0.00	0.00	54.11	0.00	0.000%
2	-0.00	-64.93	-28.23	0.00	64.93	28.23	0.000%
3	-0.00	-48.69	-28.23	0.00	48.69	28.23	0.000%
4	28.22	-64.93	0.00	-28.22	64.93	-0.00	0.000%
5	28.22	-48.69	0.00	-28.22	48.69	-0.00	0.000%
6	0.00	-64.93	28.23	-0.00	64.93	-28.23	0.000%
7	0.00	-48.69	28.23	-0.00	48.69	-28.23	0.000%
8	0.00	-109.90	0.00	0.00	109.90	-0.00	0.000%
9	-0.00	-109.90	-9.38	0.00	109.90	9.38	0.000%
10	9.38	-109.90	0.00	-9.38	109.90	-0.00	0.000%
11	0.00	-109.90	9.38	-0.00	109.90	-9.38	0.000%
12	-0.00	-54.11	-6.04	0.00	54.11	6.04	0.000%
13	6.04	-54.11	0.00	-6.04	54.11	-0.00	0.000%
14	0.00	-54.11	6.04	-0.00	54.11	-6.04	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	0.00067555
3	Yes	4	0.00000001	0.00034408
4	Yes	4	0.00000001	0.00067479
5	Yes	4	0.00000001	0.00034314
6	Yes	4	0.00000001	0.00067868
7	Yes	4	0.00000001	0.00034633
8	Yes	4	0.00000001	0.00008838
9	Yes	6	0.00000001	0.00014382
10	Yes	6	0.00000001	0.00014504
11	Yes	6	0.00000001	0.00014594
12	Yes	4	0.00000001	0.00012149
13	Yes	4	0.00000001	0.00012180
14	Yes	4	0.00000001	0.00012232

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 160	14.565	14	0.7803	0.0001
L2	160 - 140	12.148	14	0.7491	0.0001
L3	140 - 120	9.155	14	0.6648	0.0000
L4	120 - 100	6.574	14	0.5572	0.0000
L5	100 - 80	4.454	14	0.4478	0.0000
L6	80 - 60	2.784	14	0.3442	0.0000
L7	60 - 40	1.535	14	0.2482	0.0000
L8	40 - 20	0.673	14	0.1599	0.0000
L9	20 - 0	0.169	14	0.0784	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.58	AIR 32 B66Aa B2a w/ Mount Pipe	14	14.565	0.7803	0.0001	53418
168.71	DC6-48-60-18-8F	14	13.543	0.7694	0.0001	42462
157.71	GPS_A	14	11.789	0.7420	0.0000	16731
144.71	14' Low Profile Platform	14	9.827	0.6881	0.0000	12184

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 160	68.347	6	3.6627	0.0004
L2	160 - 140	57.008	6	3.5174	0.0003
L3	140 - 120	42.961	6	3.1217	0.0001
L4	120 - 100	30.845	6	2.6159	0.0001
L5	100 - 80	20.895	6	2.1020	0.0001
L6	80 - 60	13.059	6	1.6151	0.0000
L7	60 - 40	7.198	6	1.1644	0.0000
L8	40 - 20	3.157	6	0.7502	0.0000
L9	20 - 0	0.791	6	0.3676	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.58	AIR 32 B66Aa B2a w/ Mount Pipe	6	68.347	3.6627	0.0006	11533
168.71	DC6-48-60-18-8F	6	63.551	3.6122	0.0007	9168
157.71	GPS_A	6	55.321	3.4840	0.0007	3606
144.71	14' Low Profile Platform	6	46.115	3.2313	0.0005	2610

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	175 - 160 (1)	P24x3/8	15.00	0.00	0.0	27.8325	-7.35	1052.07	0.007
L2	160 - 140 (2)	P30x3/8	20.00	0.00	0.0	34.9011	-15.79	1311.06	0.012
L3	140 - 120 (3)	P36x3/8	20.00	0.00	0.0	41.9697	-20.46	1490.10	0.014
L4	120 - 100 (4)	P42x3/8	20.00	0.00	0.0	49.0383	-25.73	1668.87	0.015
L5	100 - 80 (5)	P48x3/8	20.00	0.00	0.0	56.1069	-31.60	1847.49	0.017
L6	80 - 60 (6)	P54x3/8	20.00	0.00	0.0	63.1755	-38.05	2026.00	0.019
L7	60 - 40 (7)	P60x3/8	20.00	0.00	0.0	70.2440	-45.10	2204.43	0.020
L8	40 - 20 (8)	P60x1/2	20.00	0.00	0.0	93.4624	-54.06	3125.69	0.017
L9	20 - 0 (9)	P60x5/8	20.00	0.00	0.0	116.583 0	-64.92	4139.15	0.016

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	175 - 160 (1)	P24x3/8	132.21	623.72	0.212	0.00	623.72	0.000
L2	160 - 140 (2)	P30x3/8	419.11	947.86	0.442	0.00	947.86	0.000
L3	140 - 120 (3)	P36x3/8	770.07	1338.81	0.575	0.00	1338.81	0.000

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 $\frac{M_{uy}}{\phi M_{ny}}$
L4	120 - 100 (4)	P42x3/8	1154.42	1796.56	0.643	0.00	1796.56	0.000
L5	100 - 80 (5)	P48x3/8	1573.98	2321.11	0.678	0.00	2321.11	0.000
L6	80 - 60 (6)	P54x3/8	2029.75	2912.46	0.697	0.00	2912.46	0.000
L7	60 - 40 (7)	P60x3/8	2521.49	3570.61	0.706	0.00	3570.61	0.000
L8	40 - 20 (8)	P60x1/2	3045.47	4860.41	0.627	0.00	4860.41	0.000
L9	20 - 0 (9)	P60x5/8	3597.39	6198.18	0.580	0.00	6198.18	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	175 - 160 (1)	P24x3/8	9.80	526.03	0.019	0.10	1019.71	0.000
L2	160 - 140 (2)	P30x3/8	16.72	655.53	0.026	0.05	1598.37	0.000
L3	140 - 120 (3)	P36x3/8	18.33	745.05	0.025	0.05	2189.07	0.000
L4	120 - 100 (4)	P42x3/8	20.05	834.44	0.024	0.05	2868.84	0.000
L5	100 - 80 (5)	P48x3/8	21.85	923.75	0.024	0.05	3637.70	0.000
L6	80 - 60 (6)	P54x3/8	23.67	1013.00	0.023	0.05	4495.63	0.000
L7	60 - 40 (7)	P60x3/8	25.45	1102.21	0.023	0.05	5442.62	0.000
L8	40 - 20 (8)	P60x1/2	26.89	1562.84	0.017	0.05	7685.07	0.000
L9	20 - 0 (9)	P60x5/8	28.24	2069.58	0.014	0.05	10134.58	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	175 - 160 (1)	0.007	0.212	0.000	0.019	0.000	0.219 ✔	1.000	4.8.2 ✔
L2	160 - 140 (2)	0.012	0.442	0.000	0.026	0.000	0.455 ✔	1.000	4.8.2 ✔
L3	140 - 120 (3)	0.014	0.575	0.000	0.025	0.000	0.590 ✔	1.000	4.8.2 ✔
L4	120 - 100 (4)	0.015	0.643	0.000	0.024	0.000	0.659 ✔	1.000	4.8.2 ✔
L5	100 - 80 (5)	0.017	0.678	0.000	0.024	0.000	0.696 ✔	1.000	4.8.2 ✔
L6	80 - 60 (6)	0.019	0.697	0.000	0.023	0.000	0.716 ✔	1.000	4.8.2 ✔
L7	60 - 40 (7)	0.020	0.706	0.000	0.023	0.000	0.727 ✔	1.000	4.8.2 ✔
L8	40 - 20 (8)	0.017	0.627	0.000	0.017	0.000	0.644 ✔	1.000	4.8.2 ✔
L9	20 - 0 (9)	0.016	0.580	0.000	0.014	0.000	0.596 ✔	1.000	4.8.2 ✔

Section Capacity Table

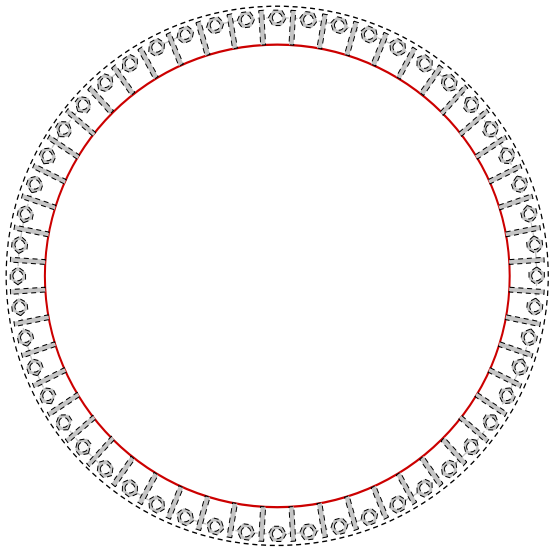
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	175 - 160	Pole	P24x3/8	1	-7.35	1052.07	21.9	Pass
L2	160 - 140	Pole	P30x3/8	2	-15.79	1311.06	45.5	Pass
L3	140 - 120	Pole	P36x3/8	3	-20.46	1490.10	59.0	Pass
L4	120 - 100	Pole	P42x3/8	4	-25.73	1668.87	65.9	Pass
L5	100 - 80	Pole	P48x3/8	5	-31.60	1847.49	69.6	Pass
L6	80 - 60	Pole	P54x3/8	6	-38.05	2026.00	71.6	Pass
L7	60 - 40	Pole	P60x3/8	7	-45.10	2204.43	72.7	Pass
L8	40 - 20	Pole	P60x1/2	8	-54.06	3125.69	64.4	Pass
L9	20 - 0	Pole	P60x5/8	9	-64.92	4139.15	59.6	Pass
							Summary	
						Pole (L7)	72.7	Pass
						RATING =	**72.7**	**Pass**

Monopole Base Plate Connection

Site Info	
Site Name	Manchester/ I-84 X63
Order #	9927.CT11140J

Analysis Considerations	
TIA-222 Revision	G
Grout Considered:	No
l_{ar} (in)	3.5
Eta Factor, η	0.5

Applied Loads	
Moment (kip-ft)	3597.40
Axial Force (kips)	64.92
Shear Force (kips)	28.24



Connection Properties

Anchor Rod Data

(52) 1-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 66.96" BC

Base Plate Data

70" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Stiffener Data

(52) 8"H x 4.5"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Pole Data

60" x 0.625" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Anchor Rod Summary		*(units of kips, kip-in)*
Pu_c = 50.83	ϕPn_t = 77.52	**Stress Rating**
Vu = 0.54	ϕVn = n/a	**67.0%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary		
Max Stress (ksi):	4.52	(Shear)
Allowable Stress (ksi):	19.44	
Stress Rating:	**23.3%**	**Pass**

Stiffener Summary		
Horizontal Weld:	**37.0%**	**Pass**
Vertical Weld:	**31.7%**	**Pass**
Plate Flexure+Shear:	**28.0%**	**Pass**
Plate Tension+Shear:	**45.1%**	**Pass**
Plate Compression:	**64.3%**	**Pass**

Pole Summary		
Punching Shear:	**12.3%**	**Pass**

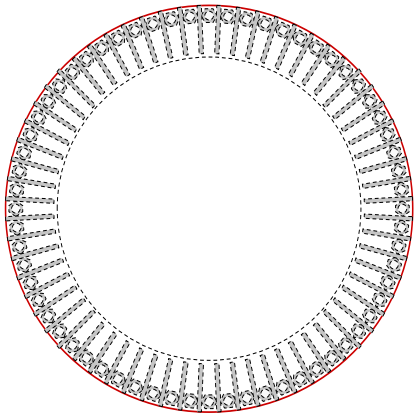
Monopole Flange Plate Connection

Elevation = 20 ft.

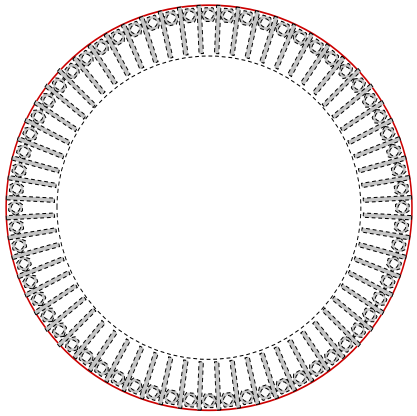
Site Name	Manchester/ I-84 X63
Order #	9927.CT11140J
TIA-222 Revision	G

Applied Loads	
Moment (kip-ft)	3045.47
Axial Force (kips)	54.06
Shear Force (kips)	26.89

Top Plate - Internal



Bottom Plate - Internal



Connection Properties

Bolt Data

(64) 1-1/4" ø bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 56" BC

Top Plate Data

44" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

44" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

(64) 10"H x 7"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Bottom Stiffener Data

(64) 10"H x 7"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Top Pole Data

60" x 0.5" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

60" x 0.625" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	39.93	
Allowable (kips)	76.31	
Stress Rating:	**52.3%**	**Pass**

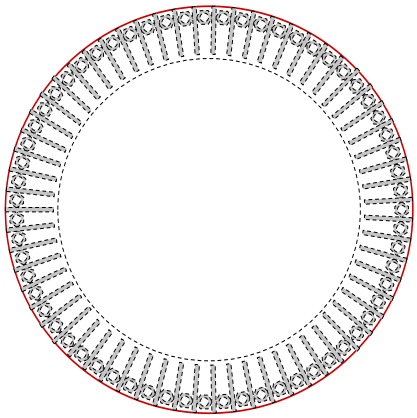
Monopole Flange Plate Connection

Elevation = 40 ft.

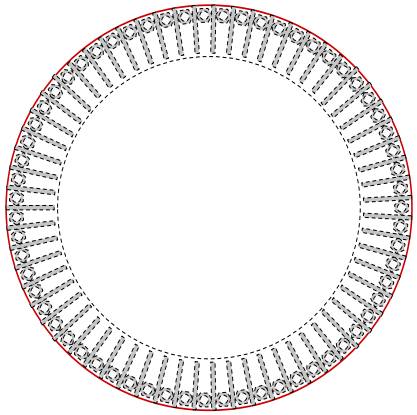
Site Name	Manchester/ I-84 X63
Order #	9927.CT11140J
TIA-222 Revision	G

Applied Loads	
Moment (kip-ft)	2521.49
Axial Force (kips)	45.10
Shear Force (kips)	25.45

Top Plate - Internal



Bottom Plate - Internal



Connection Properties

Bolt Data

(63) 1-1/4" ø bolts (A325 N; Fy=81 ksi, Fu=105 ksi) on 56" BC

Top Plate Data

44" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

44" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

(63) 10"H x 7"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Bottom Stiffener Data

(63) 10"H x 7"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Top Pole Data

60" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

60" x 0.5" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	33.58	
Allowable (kips)	76.31	
Stress Rating:	**44.0%**	**Pass**

Monopole Flange Plate Connection

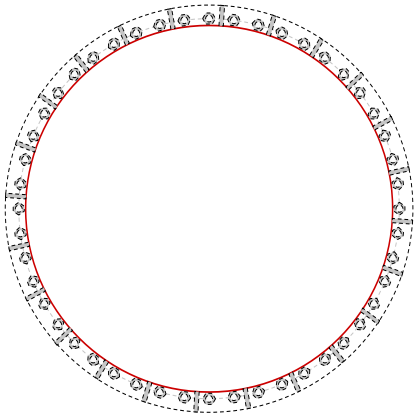
Elevation = 60 ft.

Site Name	Manchester/ I-84 X63
Order #	9927.CT11140J

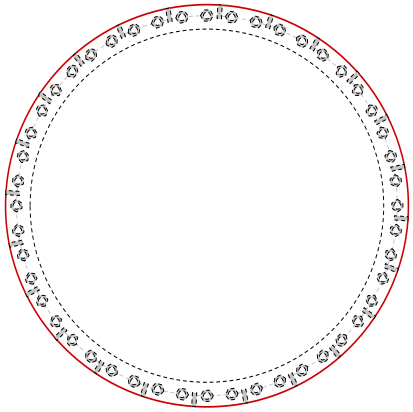
TIA-222 Revision	G

Applied Loads	
Moment (kip-ft)	2029.75
Axial Force (kips)	38.05
Shear Force (kips)	23.67

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(48) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 56" BC

Top Plate Data

60" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

52" ID x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

(24) 5"H x 3"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Bottom Stiffener Data

(24) 4"H x 2"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Top Pole Data

54" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

60" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	35.45	
Allowable (kips)	54.53	
Stress Rating:	**65.0%**	**Pass**

Monopole Flange Plate Connection

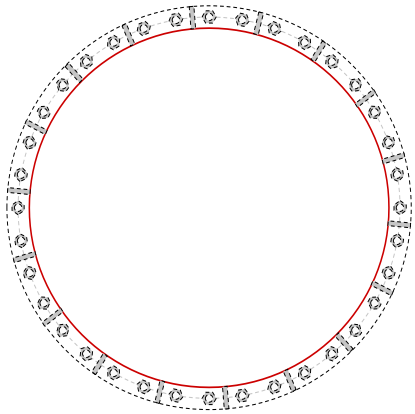
Elevation = 80 ft.

Site Name	Manchester/ I-84 X63
Order #	9927.CT11140J

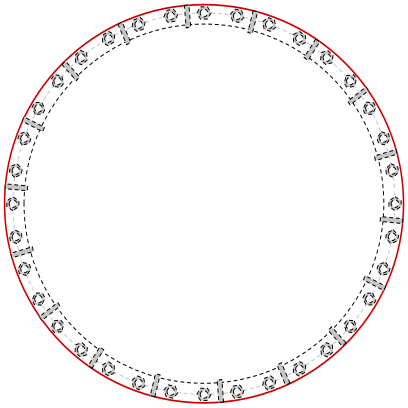
TIA-222 Revision	G

Applied Loads	
Moment (kip-ft)	1573.98
Axial Force (kips)	31.60
Shear Force (kips)	21.85

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(36) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 51" BC

Top Plate Data

54" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

48" ID x 1" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

(18) 5"H x 3"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Bottom Stiffener Data

(18) 5"H x 3"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Top Pole Data

48" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

54" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	40.27	
Allowable (kips)	54.53	
Stress Rating:	**73.8%**	**Pass**

Monopole Flange Plate Connection

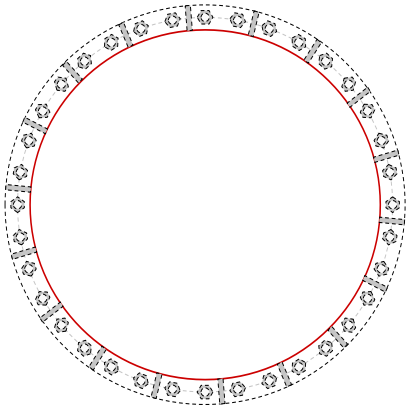
Elevation = 100 ft.

Site Name	Manchester/ I-84 X63
Order #	9927.CT11140J

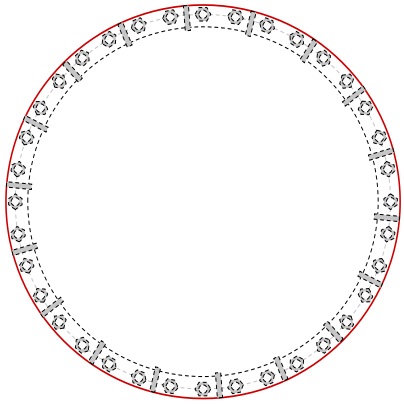
TIA-222 Revision	G

Applied Loads	
Moment (kip-ft)	1154.41
Axial Force (kips)	25.73
Shear Force (kips)	20.05

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(36) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 45" BC

Top Plate Data

48" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

42" ID x 1" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

(18) 5"H x 3"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Bottom Stiffener Data

(18) 5"H x 3"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Top Pole Data

42" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

48" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	33.48	
Allowable (kips)	54.53	
Stress Rating:	**61.4%**	**Pass**

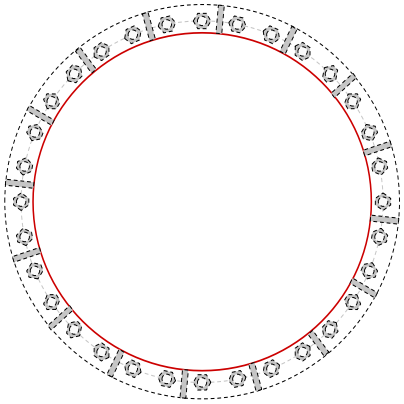
Monopole Flange Plate Connection

Elevation = 120 ft.

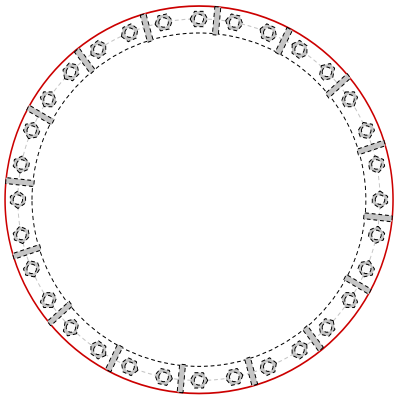
Site Name	Manchester/ I-84 X63
Order #	9927.CT11140J
TIA-222 Revision	G

Applied Loads	
Moment (kip-ft)	770.07
Axial Force (kips)	20.46
Shear Force (kips)	18.33

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(32) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 38.5" BC

Top Plate Data

42" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

35.5" ID x 1" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

(16) 5"H x 3"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Bottom Stiffener Data

(16) 5"H x 3"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Top Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

42" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	29.36	
Allowable (kips)	54.53	
Stress Rating:	**53.8%**	**Pass**

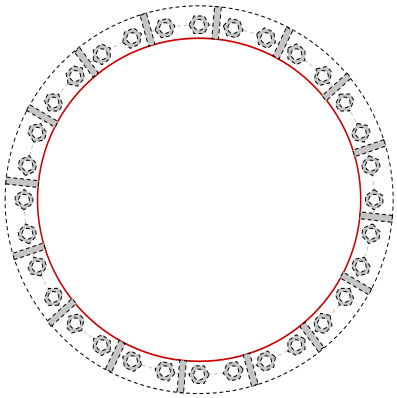
Monopole Flange Plate Connection

Elevation = 140 ft.

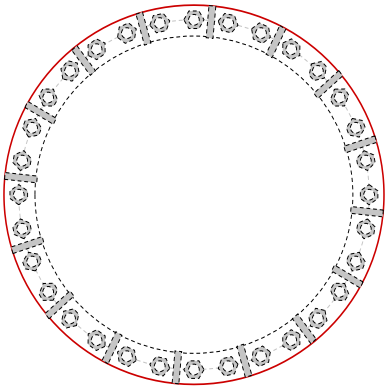
Site Name	Manchester/ I-84 X63
Order #	9927.CT11140J
TIA-222 Revision	G

Applied Loads	
Moment (kip-ft)	419.11
Axial Force (kips)	15.79
Shear Force (kips)	16.72

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(32) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 32.5" BC

Top Plate Data

36" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

29.5" ID x 1" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

(16) 5"H x 3"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Bottom Stiffener Data

(16) 5"H x 3"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Top Pole Data

30" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

36" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	18.84	
Allowable (kips)	54.53	
Stress Rating:	**34.6%**	**Pass**

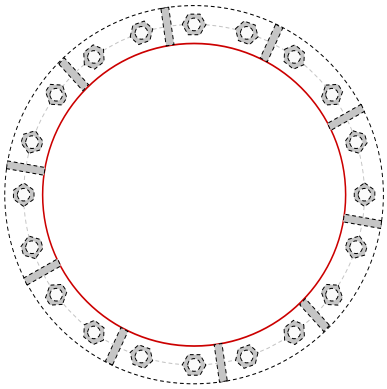
Monopole Flange Plate Connection

Elevation = 160 ft.

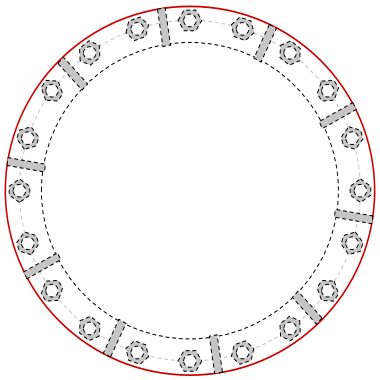
Site Name	Manchester/ I-84 X63
Order #	9927.CT11140J
TIA-222 Revision	G

Applied Loads	
Moment (kip-ft)	132.21
Axial Force (kips)	7.35
Shear Force (kips)	9.80

Top Plate - External



Bottom Plate - Internal



Connection Properties

Bolt Data

(20) 1" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 27" BC

Top Plate Data

30" OD x 1.25" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

23.5" ID x 1" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

(10) 5"H x 3"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Bottom Stiffener Data

(10) 5"H x 3"W x 0.625"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.375" fillet

Top Pole Data

24" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

30" x 0.375" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	11.38	
Allowable (kips)	54.53	
Stress Rating:	**20.9%**	**Pass**

MOUNT ANALYSIS

Tectonic	Job No.	9927.CT11140J		
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.	Sheet No.	1	of	3
	Calculated By	JJ	Date :	07/19/19
	Checked By	IM	Date :	07/19/19

WIND AND ICE LOADS PER TIA-222-G

W.O.	9927.CT11140J
Project Name	Manchester/ I-84 X63
Location	60 Industrial Park Rd, Vernon, CT 06066
County	Tolland

Tower Type	MP	Monopole
Structure Class	2	Substantial hazard
Exposure Category	B	Suburban/wooded/obstructed
Topo Category	1	Flat or rolling terrain
Height of crest	0	ft

Basic Wind Speed (3-sec gust):		
Without ice	97	mph*
With ice	50	mph
Maintenance	40	mph
Ice thickness	1.00	in

*Nominal converted from 135mph ultimate risk cat. 2

Importance Factor	
Wind only	1.00
Wind with ice	1.00
Ice thickness	1.00

Supporting Data:	
K_e	0.90
K_t	N/A
f	N/A
z_g	1200
α	7
$K_{z,min}$	0.7
K_d	0.95
G_h	1.00

Height	z (ft)	178.58
	Kh	N/A
	Kzt	1.00
	Kz	1.17
	Kiz	1.18
Wind Pressure, qz (psf)	No Ice	26.69
	With Ice	7.09
	Service	4.54
(tiz)	Ice Thk	2.37
Appurtenances (qzGh)	No Ice	26.69
	With Ice	7.09
	Service	4.54

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No.	9927.CT11140J		
Sheet No.	2	of	3
Calculated By	JJ	Date :	07/19/19
Checked By	IM	Date :	07/19/19

Appurtenance Information

Effective Projected Area for Appurtenance $(EPA)_A=Max((EPA)_N,(EPA)_T)$

$(EPA)_T=\sum(C_aA_A)_T$ | $(EPA)_N=\sum(C_aA_A)_N$

Reduction Factor = 0.9

Wind Only Load Combinations

Antenna Configuration	(E) or (P)	Qty per Sector	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(Aa)_T$ (ft^2)	Wind ward Side Face $(CaAa)_T$ (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward face Normal $(C_aA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)	Antenna Weight (lb)	Total Weight (lb)
AIR-32 B2A/B66A	**P**	1	178.58	4.72	12.90	8.70	Flat	1.38	1.28	3.42	4.24	5.07	5.86	156	113	132.2	132.2
TMA	E	2	178.58	1.32	14.00	3.10	Flat	1.32	1.20	0.34	0.81	1.54	3.32	44	11	33.0	66.0
RRU 4449 B71+B12	**P**	1	178.58	1.25	13.20	10.40	Flat	1.20	1.20	1.08	1.17	1.38	1.49	40	31	75.0	75.0
APX16DWV-16DWVS-E-A20	E	1	178.58	4.66	13.00	3.15	Flat	1.76	1.28	1.22	1.93	5.05	5.81	155	52	40.7	40.7
APXVAARR24_43-U-NA20	**P**	1	178.58	7.99	24.00	8.70	Flat	1.53	1.27	5.79	8.00	15.98	18.22	486	213	153.3	153.3
										$\sum(CaAA)_T$	16.15	$\sum(CaAA)_N$	34.69				467

Wind with Ice Load Combinations | **Ice Thk=** 2.37 in

Antenna Configuration	(E) or (P)	Qty per Sector	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(A_a)_T$ (ft^2)	Windward Side Face $(CaAa)_T$ (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward Face Normal $(C_aA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)	Ice Area for Weight (ft^2)	Ice Weight Alone (lbs)
AIR-32 B2A/B66A	P	1	178.58	5.11	17.64	13.44	Cylindrical	0.72	0.72	5.72	3.72	7.51	4.88	35	26	17.0	187.6
TMA	E	2	178.58	1.71	18.74	7.84	Cylindrical	0.7	0.7	1.12	1.41	2.67	3.37	12	5	3.8	41.5
RRU 4449 B71+B12	P	1	178.58	1.64	17.94	15.14	Cylindrical	0.7	0.7	2.07	1.31	2.46	1.55	11	9	4.9	54.3
APX16DWV-16DWVS-E-A20	E	1	178.58	5.05	17.74	7.89	Cylindrical	0.72	0.72	3.32	2.15	7.47	4.84	34	15	12.5	138.6
APXVAARR24_43-U-NA20	P	1	178.58	8.39	178.58	13.44	Cylindrical	0.7	0.7	9.39	5.92	124.80	78.63	92	42	43.6	481.3
										$\sum(CaAA)_T$	14.50	$\sum(CaAA)_N$	93.26				903

Maintenance Load Combinations

AIR-32 B2A/B66A	(E) or (P)	Qty per Sector	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(A_a)_T$ (ft^2)	Windward Side Face $(CaAa)_T$ (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward Face Normal $(C_aA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)
AIR-32 B2A/B66A	P	1	178.58	4.72	12.90	8.70	Flat	1.38	1.28	3.42	4.24	5.07	5.86	27	19
TMA	E	2	178.58	1.32	14.00	3.10	Flat	1.32	1.20	0.34	0.81	1.54	3.32	8	2
RRU 4449 B71+B12	P	1	178.58	1.25	13.20	10.40	Flat	1.20	1.20	1.08	1.17	1.38	1.49	7	5
APX16DWV-16DWVS-E-A20	E	1	178.58	4.66	13.00	3.15	Flat	1.76	1.28	1.22	1.93	5.05	5.81	26	9
APXVAARR24_43-U-NA20	P	1	178.58	7.99	24.00	8.70	Flat	1.53	1.27	5.79	8.00	15.98	18.22	83	36

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No.	9927.CT11140J		
Sheet No.	3	of	3
Calculated By	JJ	Date :	07/19/19
Checked By	IM	Date :	07/19/19

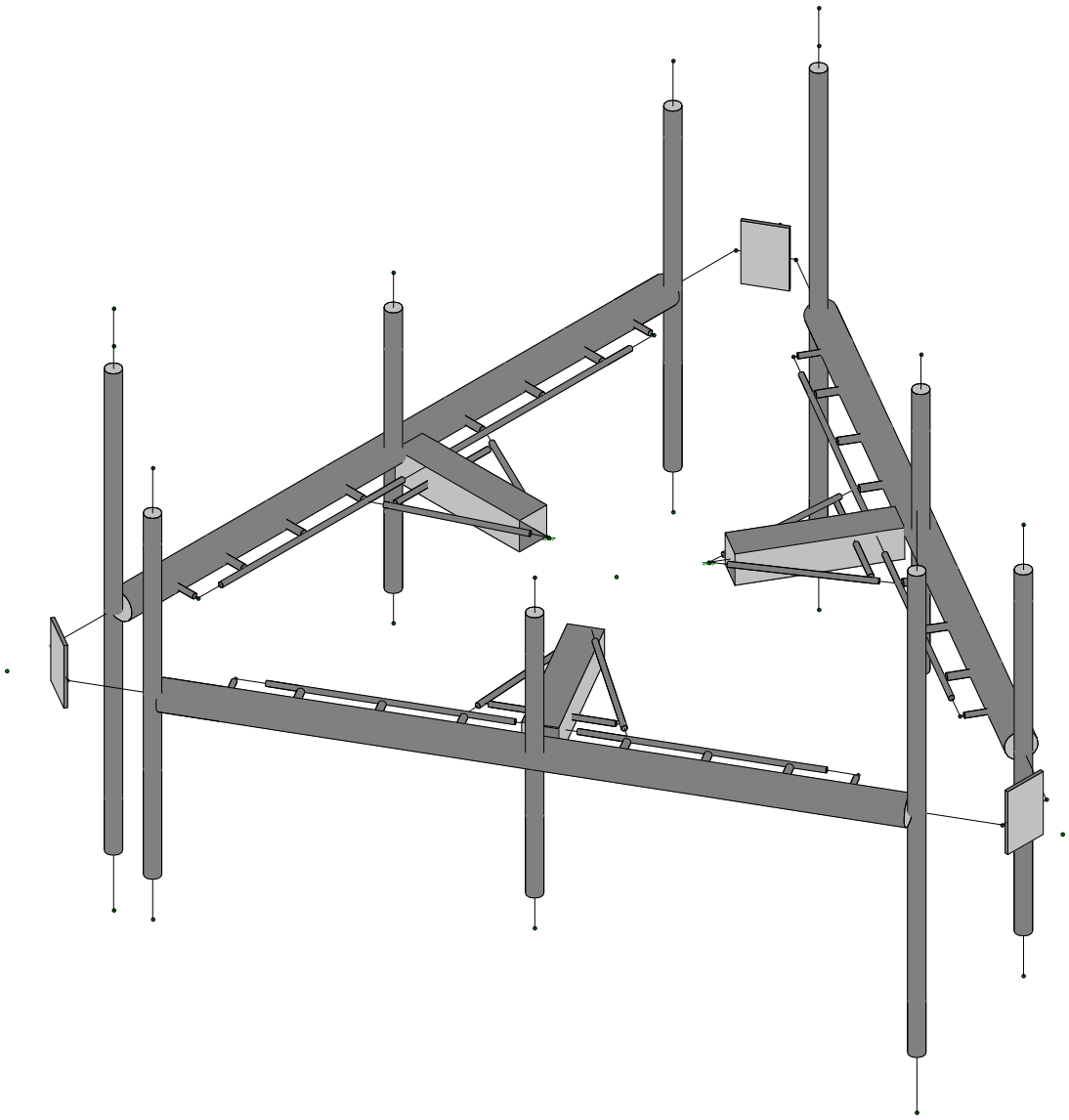
Existing Low-Profile Platform

Mount Center Line=	178.58 ft

Member lengths and widths based on mapping report by Hightower Solutions, dated 6/7/19.

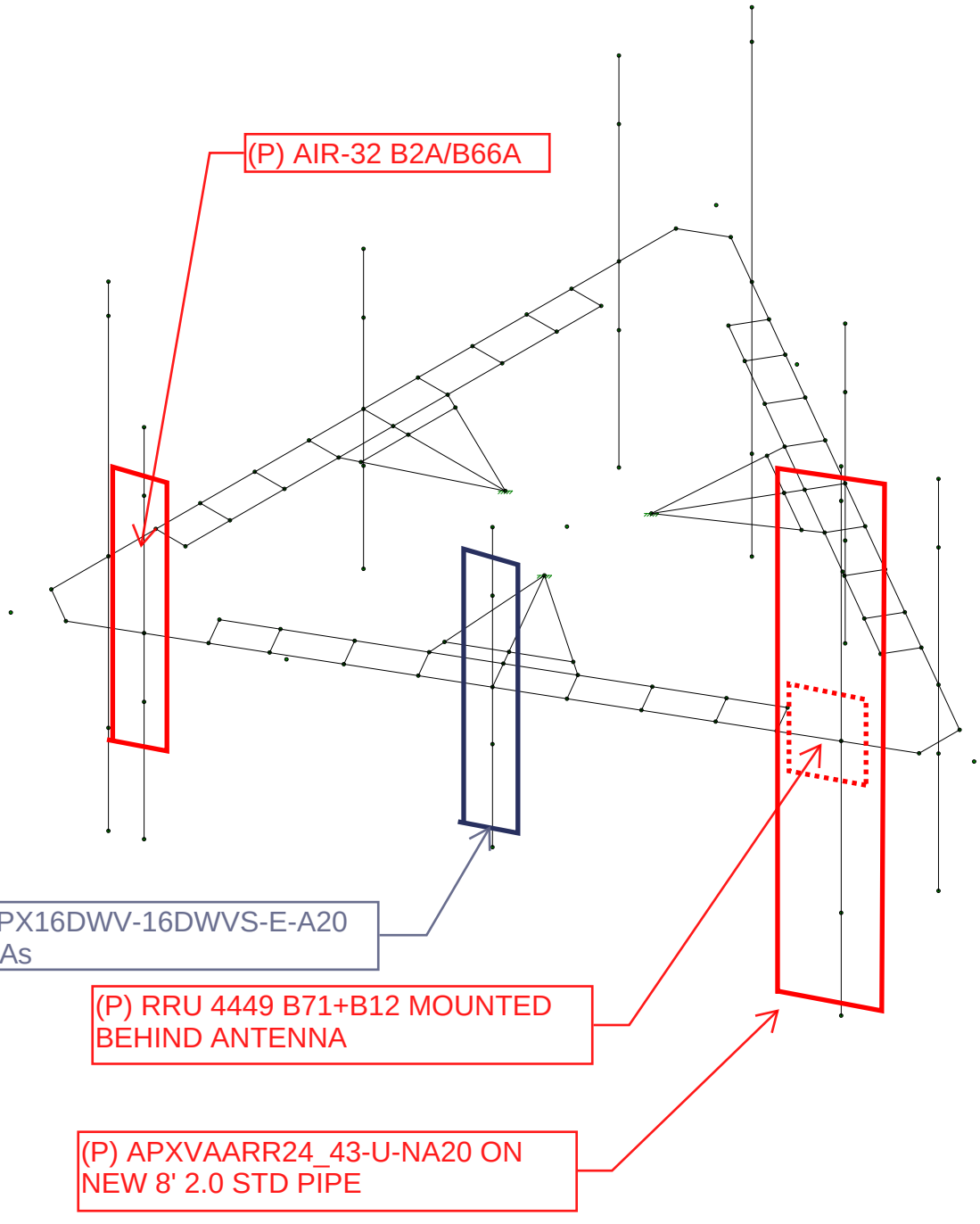
Reduction Factor = 0.9

Mount Part	Quantity	Length (ft)	Projected Width (in)	Depth (in)	Flat or Cylindrical ?	Drag Factor	Projected Area (ft^2)	Wind Force (lbs/ft)	Ice Weight Area (ft^2)	Ice Weight (lbs/ft)	Projected Area with Ice (ft^2)	Wind Force Ice (lbs/ft)	Maintenance Force (lbs/ft)
4.5" OD Pipe - Face Horizontal	3	10.50	4.50	4.50	Cylindrical	1.2	14.18	10.8	37.09	13.0	29.09	5.9	1.8
1" Solid Rod - Grating Support	3	0.50	1.00	1.00	Cylindrical	1.2	0.15	2.4	0.39	2.9	0.86	3.7	0.4
2.38" OD Pipe - MountPIpe	9	6.00	2.38	2.38	Cylindrical	1.2	12.85	5.7	33.63	6.9	38.43	4.5	1.0
HSS 5x5 x3/8 - Standoff	3	2.50	5.00	5.00	Flat	2	6.25	20.0	12.50	18.4	12.17	10.4	3.4
.75" Solid Rod - Grating Support	6	2.50	0.75	0.75	Cylindrical	1.2	1.13	1.8	2.94	2.2	8.23	3.5	0.3
PL 1/2 x10	3	0.86	10.00	0.50	Flat	2	4.30	40.0	4.52	19.3	6.34	15.7	6.8

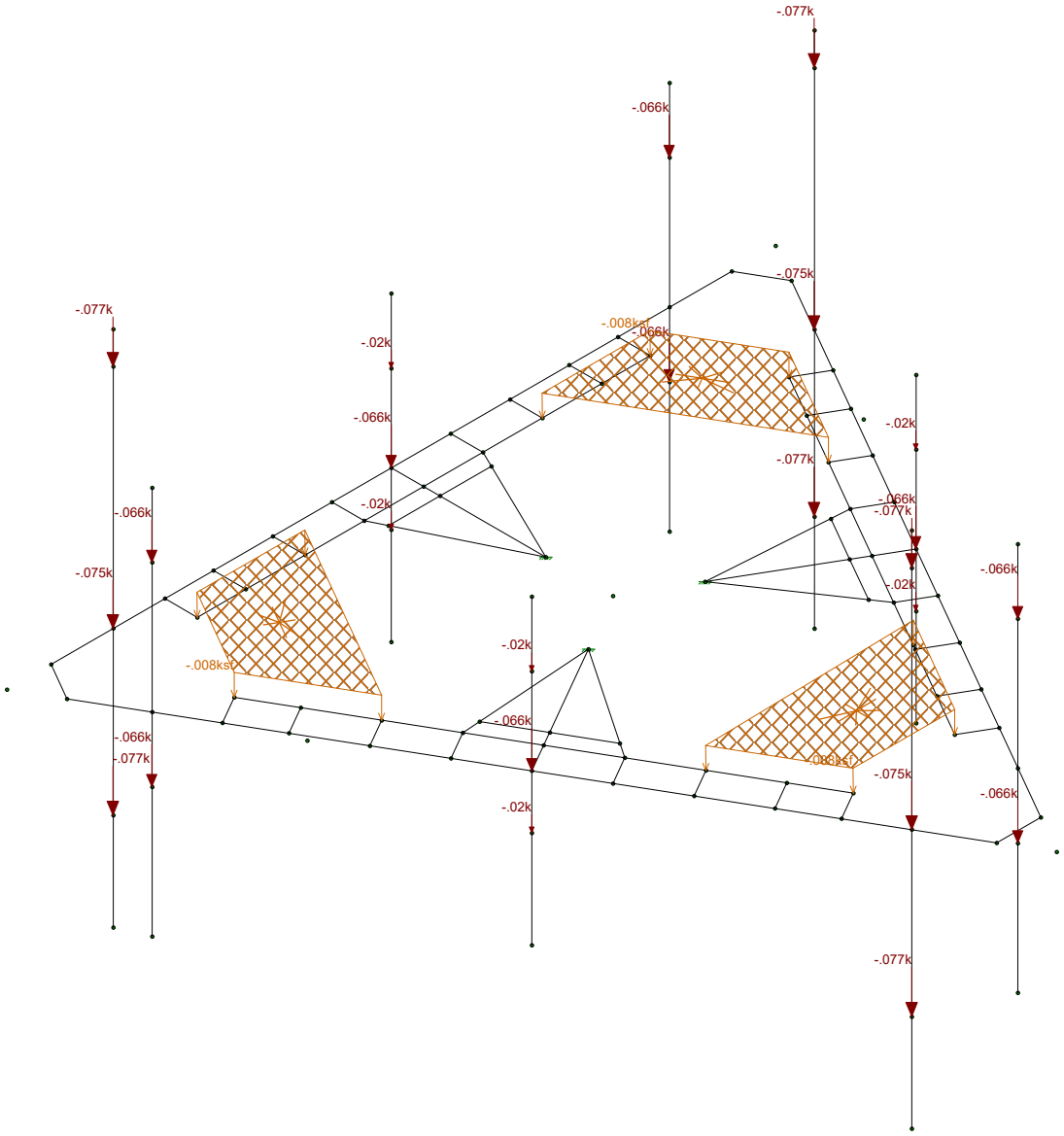


Envelope Only Solution

Tectonic	Low-Profile Platform	SK - 15
John Julien		July 19, 2019 at 12:37 PM
9927.CT11140J		Low-profile platform.r3d

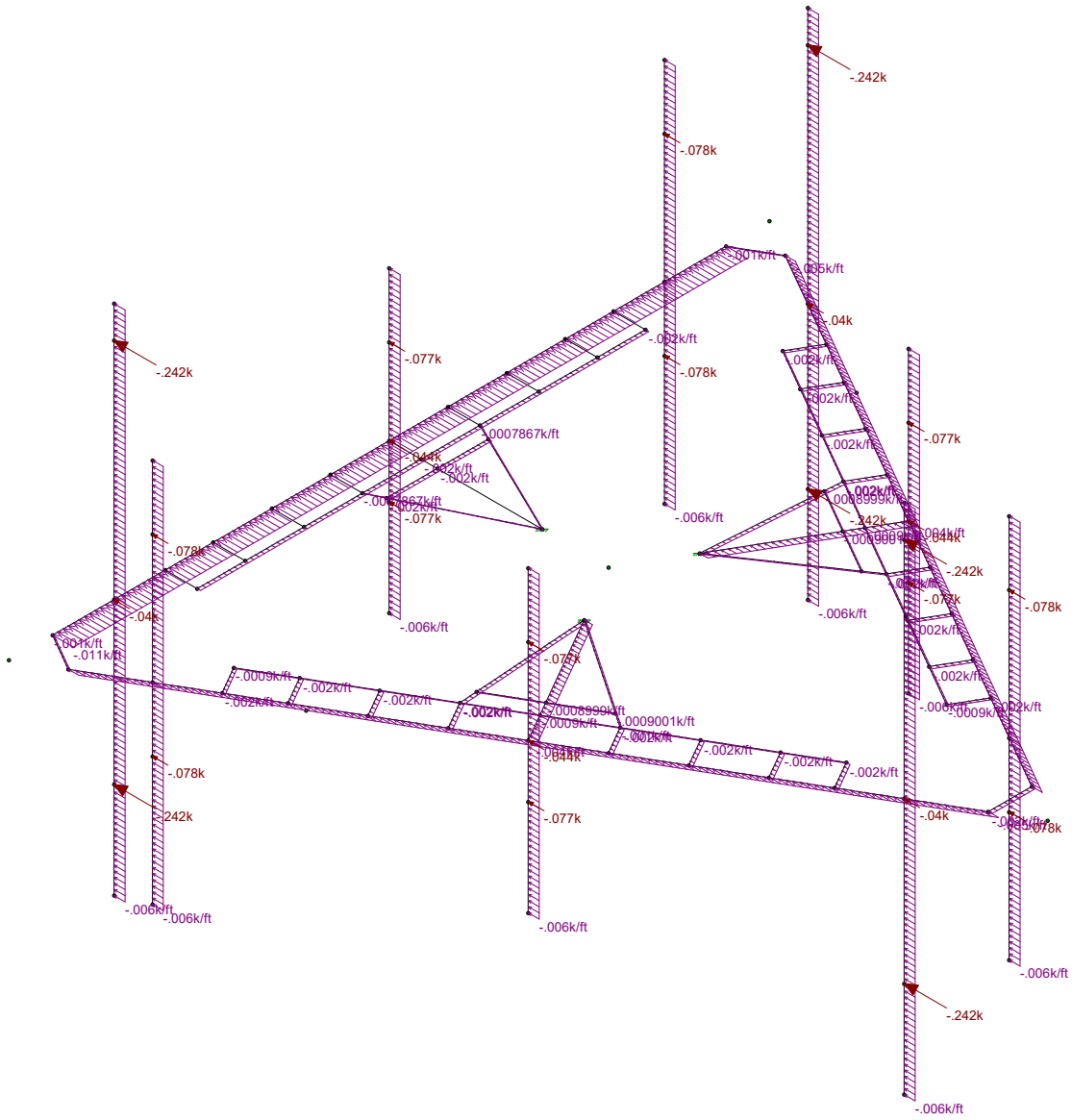


Tectonic	Low-Profile Platform	
John Julien		July 19, 2019 at 12:45 PM
9927.CT11140J		Low-profile platform.r3d



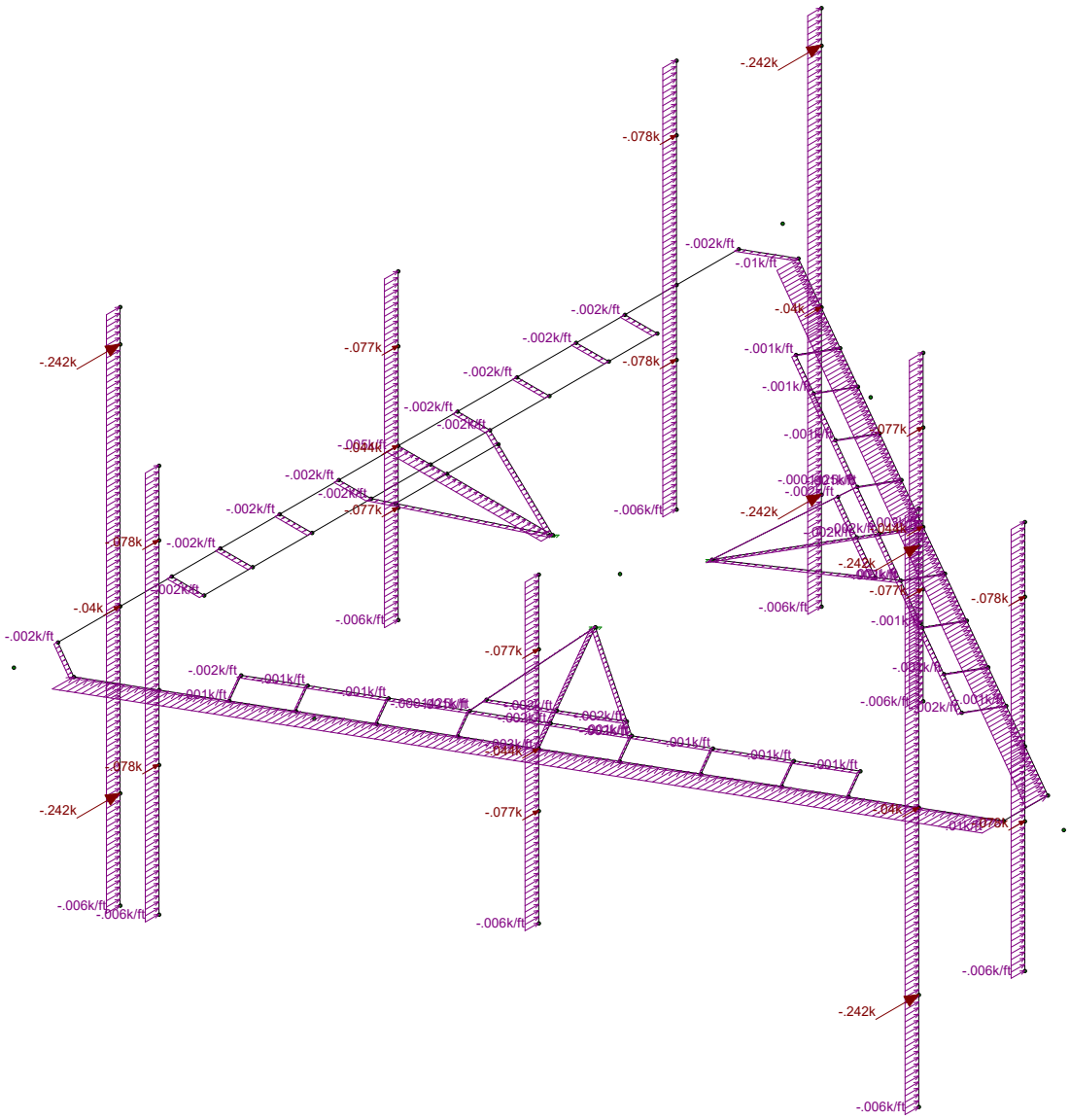
Loads: BLC 1, DL
Envelope Only Solution

Tectonic	Low-Profile Platform	SK - 16
John Julien		July 19, 2019 at 12:38 PM
9927.CT11140J		Low-profile platform.r3d



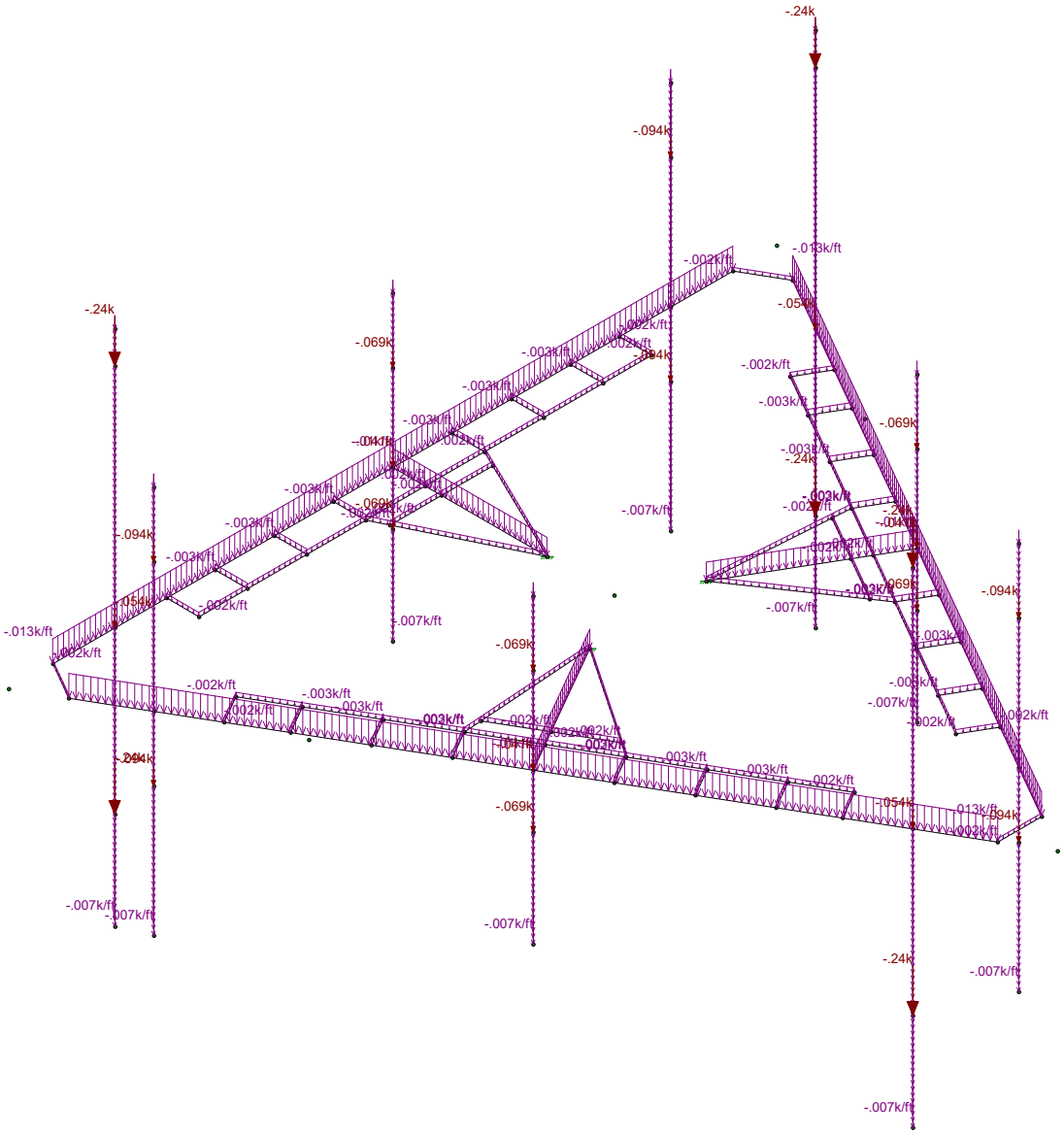
Loads: BLC 2, WLX
Envelope Only Solution

Tectonic	Low-Profile Platform	SK - 17
John Julien		July 19, 2019 at 12:38 PM
9927.CT11140J		Low-profile platform.r3d



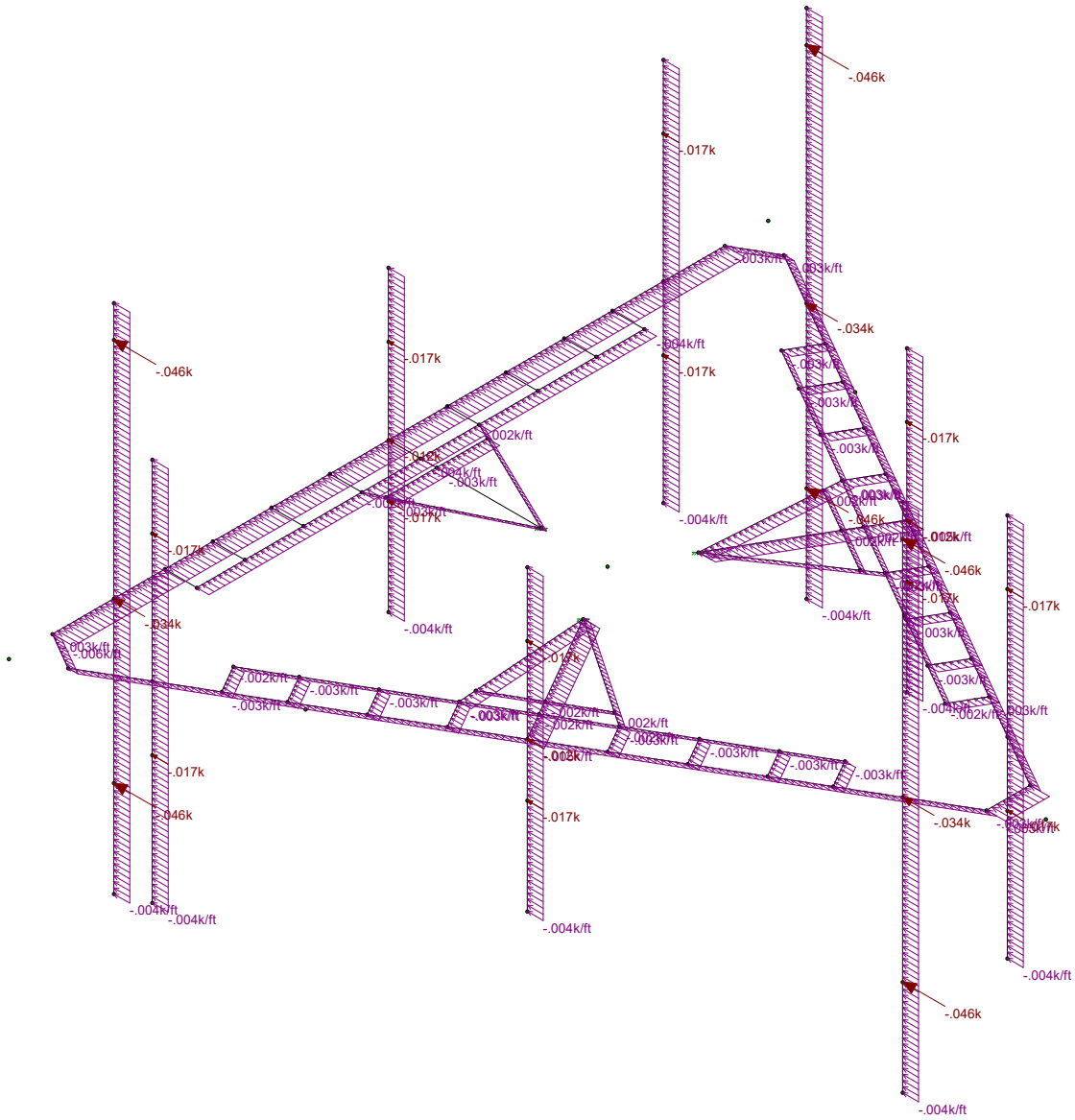
Loads: BLC 3, WLZ
Envelope Only Solution

Tectonic	Low-Profile Platform	SK - 18
John Julien		July 19, 2019 at 12:39 PM
9927.CT11140J		Low-profile platform.r3d



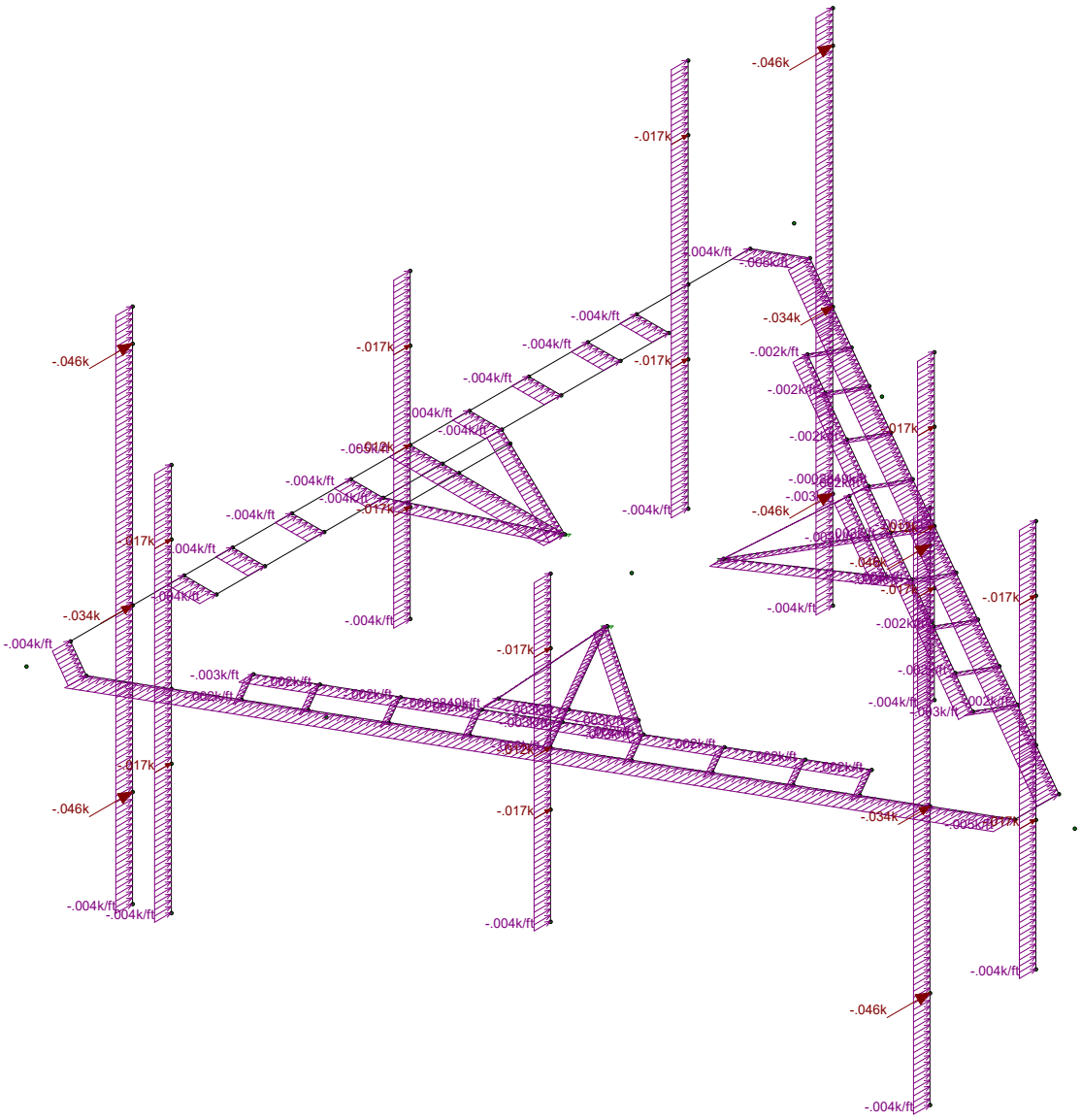
Loads: BLC 4, DL (ICE)
Envelope Only Solution

Tectonic	Low-Profile Platform	SK - 19
John Julien		July 19, 2019 at 12:39 PM
9927.CT11140J		Low-profile platform.r3d



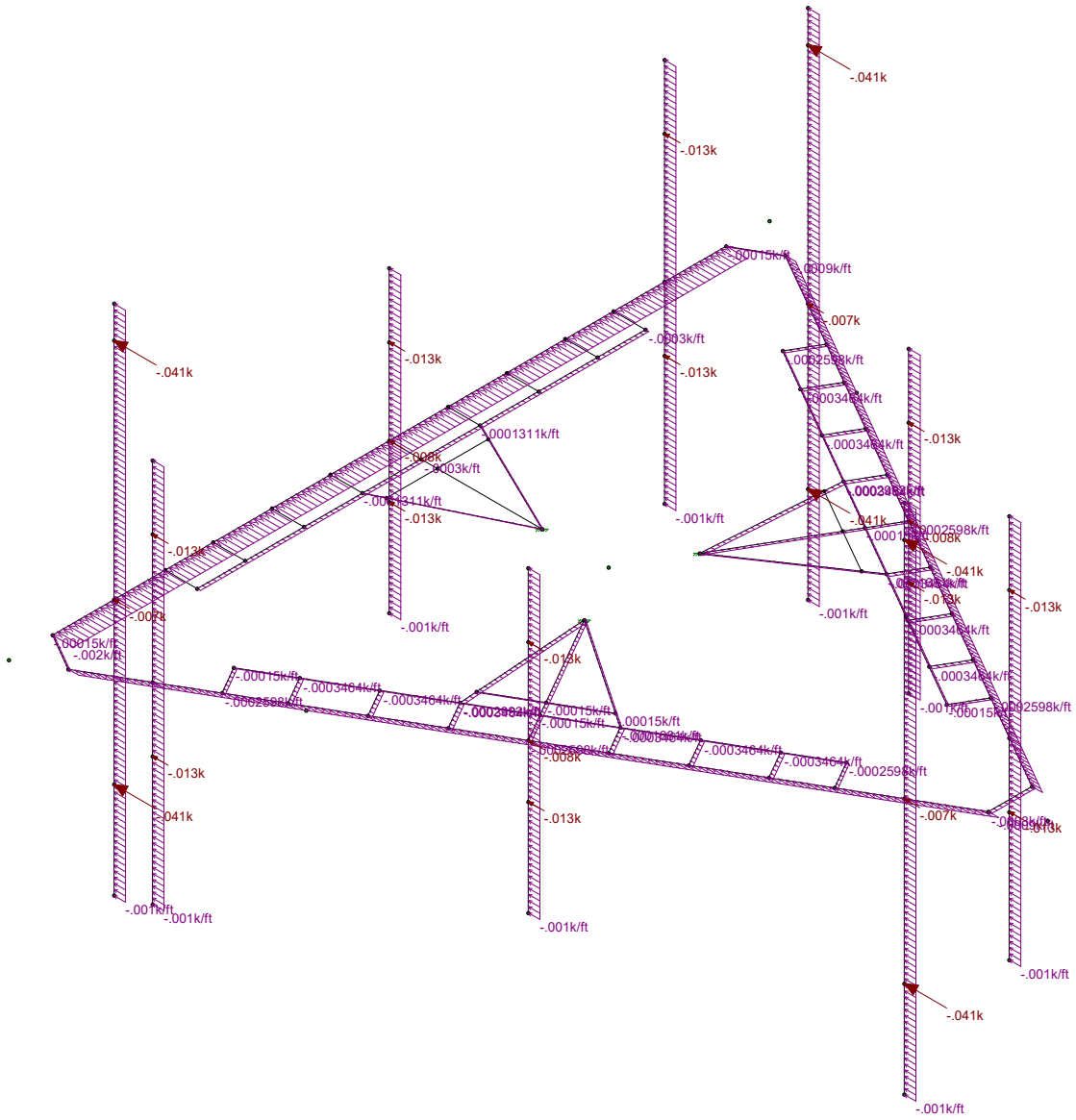
Loads: BLC 5, WLX (ICE)
Envelope Only Solution

Tectonic	Low-Profile Platform	SK - 20
John Julien		July 19, 2019 at 12:39 PM
9927.CT11140J		Low-profile platform.r3d



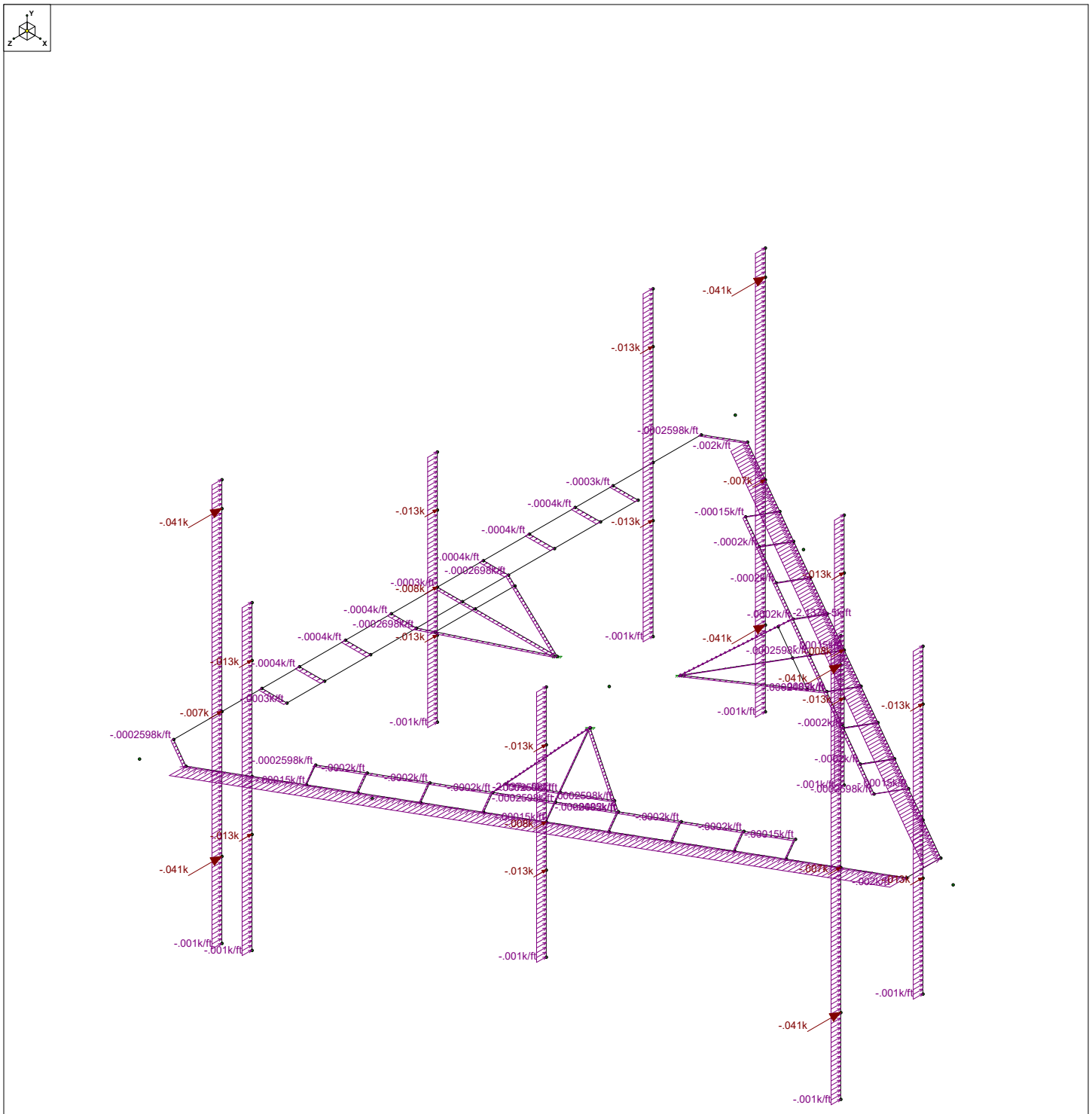
Loads: BLC 6, WLZ (ICE)
Envelope Only Solution

Tectonic	Low-Profile Platform	SK - 21
John Julien		July 19, 2019 at 12:40 PM
9927.CT11140J		Low-profile platform.r3d



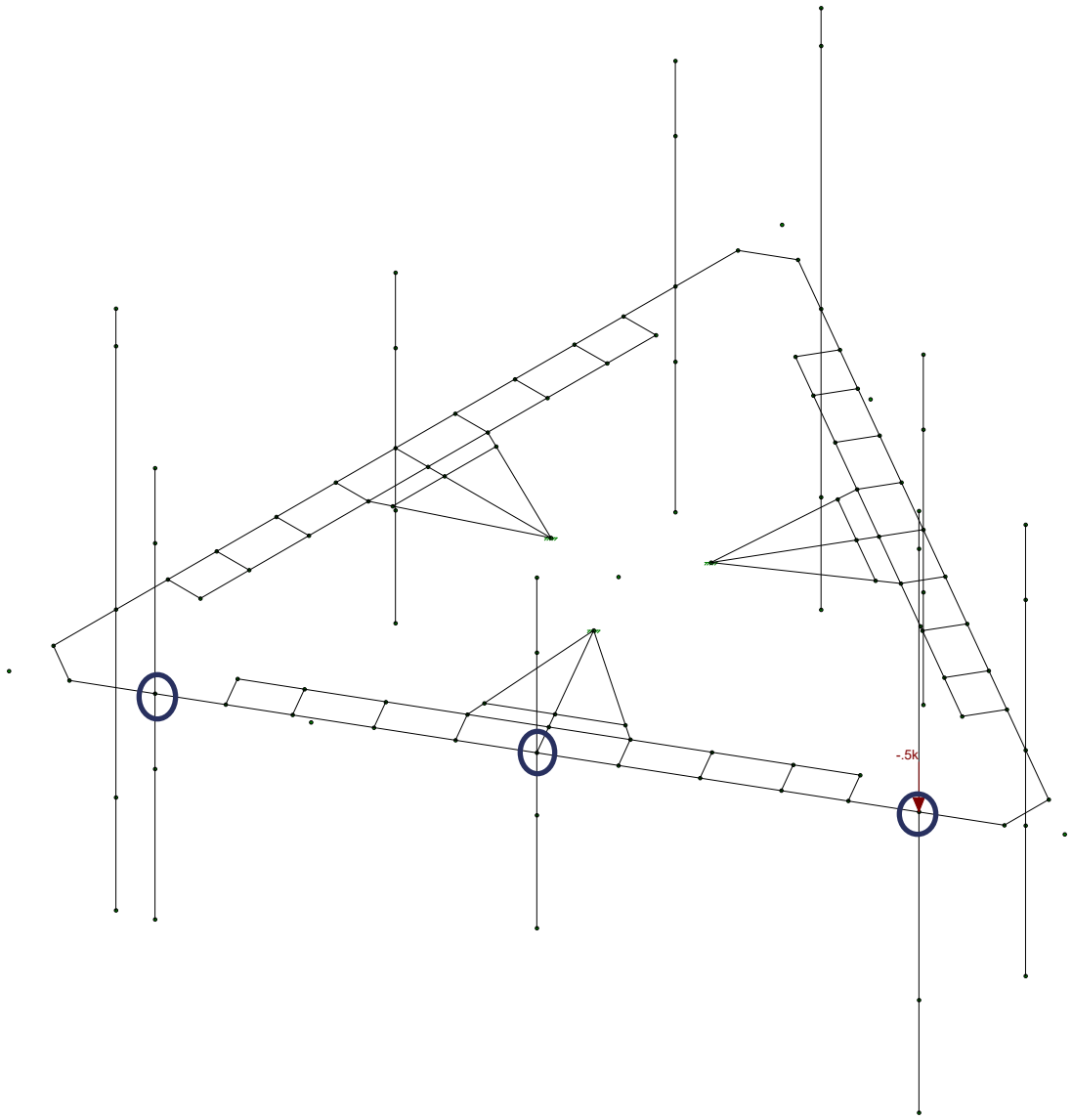
Loads: BLC 7, WLX (MAINT)
Envelope Only Solution

Tectonic	Low-Profile Platform	SK - 23
John Julien		July 19, 2019 at 12:41 PM
9927.CT11140J		Low-profile platform.r3d



Loads: BLC 8, WLZ (MAINT)
Envelope Only Solution

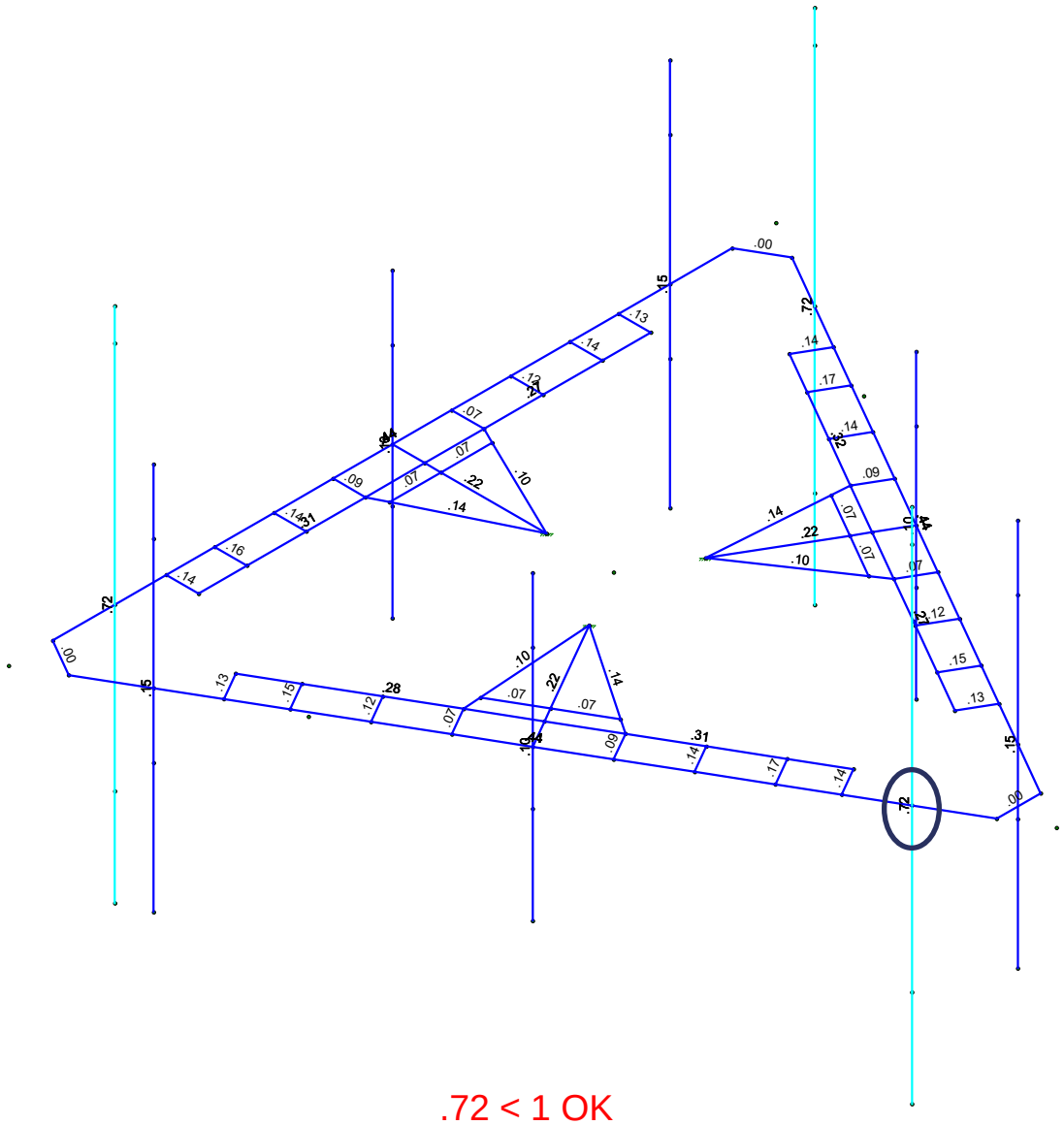
Tectonic	Low-Profile Platform	SK - 24
John Julien		July 19, 2019 at 12:41 PM
9927.CT11140J		Low-profile platform.r3d



MAN LOAD AT ANTENNA PIPE LOCATIONS

Loads: BLC 9, Lm1
Envelope Only Solution

Tectonic	Low-Profile Platform	SK - 25
John Julien		July 19, 2019 at 12:41 PM
9927.CT11140J		Low-profile platform.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Tectonic	Low-Profile Platform	SK - 14
John Julien		July 19, 2019 at 12:37 PM
9927.CT11140J		Low-profile platform.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	DL	DL		-1.05		24			3	
2	WLX	WL+X				24		60		
3	WLZ	WL+Z				24		60		
4	DL (ICE)	SL				24		60		
5	WLX (ICE)	WL+X				24		60		
6	WLZ (ICE)	WL+Z				24		60		
7	WLX (MAINT)	WL+X				24		56		
8	WLZ (MAINT)	WL+Z				24		56		
9	Lm1	OL1				1				
10	Lm2	OL2				1				
11	Lm3	OL3				1				
12	BLC 1 Transient Area...	None						12		

Load Combinations

	Description	So...	P...	S...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...
1	1.4D	Yes	Y		1	1.4																		
2	1.2D+1.6WLX	Yes	Y		1	1.2	2	1.6																
3	1.2D+1.6WLZ	Yes	Y		1	1.2	3	1.6																
4	1.2D+1.6(WLX+WLZ) - 0..	Yes	Y		1	1.2	2	1.6																
5	1.2D+1.6(WLX+WLZ) - 3..	Yes	Y		1	1.2	2	1.3...	3	.8														
6	1.2D+1.6(WLX+WLZ) - 6..	Yes	Y		1	1.2	2	.8	3	1.3...														
7	1.2D+1.6(WLX+WLZ) - 9..	Yes	Y		1	1.2	2		3	1.6														
8	1.2D+1.6(WLX+WLZ) - 1..	Yes	Y		1	1.2	2	-.8	3	1.3...														
9	1.2D+1.6(WLX+WLZ) - 1..	Yes	Y		1	1.2	2	-1....	3	.8														
10	1.2D+1.6(WLX+WLZ) - 1..	Yes	Y		1	1.2	2	-1.6	3															
11	1.2D+1.6(WLX+WLZ) - 2..	Yes	Y		1	1.2	2	-1....	3	-.8														
12	1.2D+1.6(WLX+WLZ) - 2..	Yes	Y		1	1.2	2	-.8	3	-1....														
13	1.2D+1.6(WLX+WLZ) - 2..	Yes	Y		1	1.2	2		3	-1.6														
14	1.2D+1.6(WLX+WLZ) - 3..	Yes	Y		1	1.2	2	.8	3	-1....														
15	1.2D+1.6(WLX+WLZ) - 3..	Yes	Y		1	1.2	2	1.3...	3	-.8														
16	**Wind Load with Ice**																							
17	1.2D+1.0Di+1.0WLXi	Yes	Y		1	1.2	4	1	5	1														
18	1.2D+1.0Di+1.0WLZi	Yes	Y		1	1.2	4	1			6	1												
19	1.2D+1.0Di+1.0(WLXi+...	Yes	Y		1	1.2	4	1	5	1	6													
20	1.2D+1.0Di+1.0(WLXi+...	Yes	Y		1	1.2	4	1	5	.87	6	.5												
21	1.2D+1.0Di+1.0(WLXi+...	Yes	Y		1	1.2	4	1	5	.5	6	.87												
22	1.2D+1.0Di+1.0(WLXi+...	Yes	Y		1	1.2	4	1	5		6	1												
23	1.2D+1.0Di+1.0(WLXi+...	Yes	Y		1	1.2	4	1	5	-.5	6	.87												
24	1.2D+1.0Di+1.0(WLXi+...	Yes	Y		1	1.2	4	1	5	-.87	6	.5												
25	1.2D+1.0Di+1.0(WLXi+...	Yes	Y		1	1.2	4	1	5	-1	6													
26	1.2D+1.0Di+1.0(WLXi+...	Yes	Y		1	1.2	4	1	5	-.87	6	-.5												
27	1.2D+1.0Di+1.0(WLXi+...	Yes	Y		1	1.2	4	1	5	-.5	6	-.87												
28	1.2D+1.0Di+1.0(WLXi+...	Yes	Y		1	1.2	4	1	5		6	-1												

Load Combinations (Continued)

	Description	So...	P...	S...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...
29	1.2D+1.0Di+1.0(WLXi+...	Yes	Y		1	1.2	4	1	5	.5	6	-.87												
30	1.2D+1.0Di+1.0(WLXi+...	Yes	Y		1	1.2	4	1	5	.87	6	-.5												
31	**Maintenance Load (Wit...		Y																					
32	1.2D+1.5Lm1+1.0WLX (...	Yes	Y		1	1.2	9	1.5	7	1	8													
33	1.2D+1.5Lm1+1.0WLZ (...	Yes	Y		1	1.2	9	1.5	7		8	1												
34	1.2D+1.5Lm1+1.0(WLX+...	Yes	Y		1	1.2	9	1.5	7	1	8													
35	1.2D+1.5Lm1+1.0(WLX+...	Yes	Y		1	1.2	9	1.5	7	.87	8	.5												
36	1.2D+1.5Lm1+1.0(WLX+...	Yes	Y		1	1.2	9	1.5	7	.5	8	.87												
37	1.2D+1.5Lm1+1.0(WLX+...	Yes	Y		1	1.2	9	1.5	7		8	1												
38	1.2D+1.5Lm1+1.0(WLX+...	Yes	Y		1	1.2	9	1.5	7	-.5	8	.87												
39	1.2D+1.5Lm1+1.0(WLX+...	Yes	Y		1	1.2	9	1.5	7	-.87	8	.5												
40	1.2D+1.5Lm1+1.0(WLX+...	Yes	Y		1	1.2	9	1.5	7	-1	8													
41	1.2D+1.5Lm1+1.0(WLX+...	Yes	Y		1	1.2	9	1.5	7	-.87	8	-.5												
42	1.2D+1.5Lm1+1.0(WLX+...	Yes	Y		1	1.2	9	1.5	7	-.5	8	-.87												
43	1.2D+1.5Lm1+1.0(WLX+...	Yes	Y		1	1.2	9	1.5	7		8	-1												
44	1.2D+1.5Lm1+1.0(WLX+...	Yes	Y		1	1.2	9	1.5	7	.5	8	-.87												
45	1.2D+1.5Lm1+1.0(WLX+...	Yes	Y		1	1.2	9	1.5	7	.87	8	-.5												
46	**Maintenance Load (Wit...		Y																					
47	1.2D+1.5Lm2+1.0WLX (...	Yes	Y		1	1.2	10	1.5	7	1	8													
48	1.2D+1.5Lm2+1.0WLZ (...	Yes	Y		1	1.2	10	1.5	7		8	1												
49	1.2D+1.5Lm2+1.0(WLX+...	Yes	Y		1	1.2	10	1.5	7	1	8													
50	1.2D+1.5Lm2+1.0(WLX+...	Yes	Y		1	1.2	10	1.5	7	.87	8	.5												
51	1.2D+1.5Lm2+1.0(WLX+...	Yes	Y		1	1.2	10	1.5	7	.5	8	.87												
52	1.2D+1.5Lm2+1.0(WLX+...	Yes	Y		1	1.2	10	1.5	7		8	1												
53	1.2D+1.5Lm2+1.0(WLX+...	Yes	Y		1	1.2	10	1.5	7	-.5	8	.87												
54	1.2D+1.5Lm2+1.0(WLX+...	Yes	Y		1	1.2	10	1.5	7	-.87	8	.5												
55	1.2D+1.5Lm2+1.0(WLX+...	Yes	Y		1	1.2	10	1.5	7	-1	8													
56	1.2D+1.5Lm2+1.0(WLX+...	Yes	Y		1	1.2	10	1.5	7	-.87	8	-.5												
57	1.2D+1.5Lm2+1.0(WLX+...	Yes	Y		1	1.2	10	1.5	7	-.5	8	-.87												
58	1.2D+1.5Lm2+1.0(WLX+...	Yes	Y		1	1.2	10	1.5	7		8	-1												
59	1.2D+1.5Lm2+1.0(WLX+...	Yes	Y		1	1.2	10	1.5	7	.5	8	-.87												
60	1.2D+1.5Lm2+1.0(WLX+...	Yes	Y		1	1.2	10	1.5	7	.87	8	-.5												
61	**Maintenance Load (Wit...		Y																					
62	1.2D+1.5Lm3+1.0WLX (...	Yes	Y		1	1.2	11	1.5	7	1	8													
63	1.2D+1.5Lm3+1.0WLZ (...	Yes	Y		1	1.2	11	1.5	7		8	1												
64	1.2D+1.5Lm3+1.0(WLX+...	Yes	Y		1	1.2	11	1.5	7	1	8													
65	1.2D+1.5Lm3+1.0(WLX+...	Yes	Y		1	1.2	11	1.5	7	.87	8	.5												
66	1.2D+1.5Lm3+1.0(WLX+...	Yes	Y		1	1.2	11	1.5	7	.5	8	.87												
67	1.2D+1.5Lm3+1.0(WLX+...	Yes	Y		1	1.2	11	1.5	7		8	1												
68	1.2D+1.5Lm3+1.0(WLX+...	Yes	Y		1	1.2	11	1.5	7	-.5	8	.87												
69	1.2D+1.5Lm3+1.0(WLX+...	Yes	Y		1	1.2	11	1.5	7	-.87	8	.5												
70	1.2D+1.5Lm3+1.0(WLX+...	Yes	Y		1	1.2	11	1.5	7	-1	8													
71	1.2D+1.5Lm3+1.0(WLX+...	Yes	Y		1	1.2	11	1.5	7	-.87	8	-.5												
72	1.2D+1.5Lm3+1.0(WLX+...	Yes	Y		1	1.2	11	1.5	7	-.5	8	-.87												
73	1.2D+1.5Lm3+1.0(WLX+...	Yes	Y		1	1.2	11	1.5	7		8	-1												
74	1.2D+1.5Lm3+1.0(WLX+...	Yes	Y		1	1.2	11	1.5	7	.5	8	-.87												
75	1.2D+1.5Lm3+1.0(WLX+...	Yes	Y		1	1.2	11	1.5	7	.87	8	-.5												

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design L...	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	4.5" OD Pipe	HSS4.500X0.237	None	None	A53 Gr.B	Typical	2.96	6.79	6.79	13.6
2	.75" Rod	.75" Solid Rod	None	None	A36 Gr.36	Typical	.442	.016	.016	.031
3	1" Solid Rod	1" Solid Rod	None	None	A36 Gr.36	Typical	.785	.049	.049	.098
4	2.38" Pipe	HSS2.375X0.154_A1085	None	None	A53 Gr.B	Typical	1.075	.669	.669	1.339
5	HSS 5x5x3/8	HSS5X5X6	None	None	A500 Gr.B Rect	Typical	6.18	21.7	21.7	36.1

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design L...	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
6	PL 1/2 x10	Flat	None	None	A36 Gr.36	Typical	200	1666.667	6666.667	4577.604

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N15	max	1.243	4	2.748	19	2.167	7	.23	7	3.418	7	-3.357	10
2		min	-1.244	10	1.338	10	-2.167	13	-1.084	73	-3.418	13	-7.331	17
3	N16	max	2.068	4	2.748	27	1.452	8	-2.879	6	3.628	15	3.932	41
4		min	-2.068	10	1.338	6	-1.452	14	-6.287	27	-3.628	9	1.661	5
5	N17	max	1.914	5	2.75	23	1.631	6	6.412	23	3.628	11	3.573	24
6		min	-1.914	11	1.339	14	-1.632	12	2.937	14	-3.628	5	1.568	15
7	Totals:	max	5.224	4	8.188	30	5.211	7						
8		min	-5.224	10	4.497	2	-5.211	13						

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc...	LC	Shear Check	Loc.....		L...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	Cb	Eqn
1	M1	HSS4.500X0.237	.439	5.2...	30	.098	5.2...		30	65.388	93.24	10.579	10.579	1.435	H1-1b
2	M2	HSS4.500X0.237	.439	5.2...	22	.098	5.2...		23	65.388	93.24	10.579	10.579	1.435	H1-1b
3	M3	HSS4.500X0.237	.439	5.2...	26	.115	5.2...		41	65.388	93.24	10.579	10.579	1.435	H1-1b
4	M4	Flat	.001	.678	12	.195	.678	y	10	6477....	6480	1350	2700	1.029	H1-1b
5	M5	Flat	.001	0	4	.195	0	y	14	6477....	6480	1350	2700	1.029	H1-1b
6	M6	Flat	.001	.678	8	.194	.678	y	6	6477....	6480	1350	2700	1.028	H1-1b
7	M7	HSS5X5X6	.216	2.3...	22	.061	2.3...	y	73	251.868	255.852	36.57	36.57	1.551	H1-1b
8	M8	HSS5X5X6	.218	2.3...	30	.071	2.3...	y	39	251.868	255.852	36.57	36.57	1.551	H1-1b
9	M9	HSS5X5X6	.219	2.3...	26	.059	2.3...	y	40	251.868	255.852	36.57	36.57	1.551	H1-1b
10	M10	1" Solid Rod	.144	0	12	.021	.5		6	24.687	25.447	.424	.424	1.739	H1-1b
11	M11	1" Solid Rod	.117	0	12	.015	.5		6	24.687	25.447	.424	.424	1.708	H1-1b
12	M12	1" Solid Rod	.073	0	11	.017	.5		5	24.687	25.447	.424	.424	1.16	H1-1b
13	M13	1" Solid Rod	.091	0	9	.021	.5		15	24.687	25.447	.424	.424	1.699	H1-1b
14	M14	1" Solid Rod	.140	0	8	.020	.5		14	24.687	25.447	.424	.424	1.596	H1-1b
15	M15	1" Solid Rod	.163	0	8	.021	.5		14	24.687	25.447	.424	.424	1.716	H1-1b
16	M16	1" Solid Rod	.167	.5	12	.022	0		6	24.687	25.447	.424	.424	1.716	H1-1b
17	M17	1" Solid Rod	.143	.5	12	.020	0		6	24.687	25.447	.424	.424	1.595	H1-1b
18	M18	1" Solid Rod	.092	.5	12	.021	0		7	24.687	25.447	.424	.424	1.293	H1-1b
19	M19	1" Solid Rod	.073	.5	4	.018	0		9	24.687	25.447	.424	.424	1.108	H1-1b
20	M20	1" Solid Rod	.119	.5	4	.016	0		10	24.687	25.447	.424	.424	1.596	H1-1b
21	M21	1" Solid Rod	.147	.5	4	.018	0		10	24.687	25.447	.424	.424	1.716	H1-1b
22	M22	1" Solid Rod	.166	.5	4	.023	0		10	24.687	25.447	.424	.424	1.736	H1-1b
23	M23	1" Solid Rod	.141	.5	4	.020	0		10	24.687	25.447	.424	.424	1.621	H1-1b
24	M24	1" Solid Rod	.091	.5	4	.021	0		11	24.687	25.447	.424	.424	1.306	H1-1b
25	M25	1" Solid Rod	.074	.5	8	.018	0		13	24.687	25.447	.424	.424	1.077	H1-1b
26	M26	1" Solid Rod	.120	.5	8	.016	0		14	24.687	25.447	.424	.424	1.682	H1-1b
27	M27	1" Solid Rod	.148	.5	8	.020	0		14	24.687	25.447	.424	.424	1.732	H1-1b
28	M28	.75" Solid Rod	.135	0	8	.022	.5		14	13.563	14.314	.179	.179	1.5	H1-1b
29	M29	.75" Solid Rod	.277	2.5...	8	.015	3.4...		73	1.991	14.314	.179	.179	1.465	H1-1a
30	M30	.75" Solid Rod	.142	.5	4	.024	0		10	13.563	14.314	.179	.179	1.572	H1-1b
31	M31	.75" Solid Rod	.135	0	4	.022	.5		10	13.563	14.314	.179	.179	1.634	H1-1b
32	M32	.75" Solid Rod	.274	2.5...	4	.012	3.4...		39	1.991	14.314	.179	.179	1.462	H1-1a
33	M33	.75" Solid Rod	.143	.5	12	.023	0		6	13.563	14.314	.179	.179	1.647	H1-1b
34	M34	.75" Solid Rod	.131	0	12	.022	.5		6	13.563	14.314	.179	.179	1.4	H1-1b
35	M35	.75" Solid Rod	.268	2.5...	12	.013	.729		6	1.991	14.314	.179	.179	1.466	H1-1a
36	M36	.75" Solid Rod	.139	.5	8	.023	0		14	13.563	14.314	.179	.179	1.646	H1-1b
37	M37	.75" Solid Rod	.101	.262	7	.038	.262		74	5.547	14.314	.179	.179	1.511	H1-1...
38	M38	.75" Solid Rod	.141	.262	5	.038	.262		39	5.547	14.314	.179	.179	1.525	H1-1...
39	M39	.75" Solid Rod	.103	.262	15	.036	.262		40	5.547	14.314	.179	.179	1.508	H1-1...

Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc...	LC	Shear Check	Loc.....	L...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	Cb	Eqn
40	M40	.75" Solid Rod	.139	.262	13	.035	.262	20	5.547	14.314	.179	.179	1.526	H1-1...
41	M41	.75" Solid Rod	.104	.262	11	.034	.262	22	5.547	14.314	.179	.179	1.513	H1-1...
42	M42	.75" Solid Rod	.141	.262	9	.037	.262	73	5.547	14.314	.179	.179	1.526	H1-1...
43	M43	.75" Solid Rod	.066	.794	29	.012	.794	74	12.496	14.314	.179	.179	1.399	H1-1b
44	M44	.75" Solid Rod	.066	.794	24	.014	.794	40	12.496	14.314	.179	.179	1.4	H1-1b
45	M45	.75" Solid Rod	.066	.794	21	.009	.794	21	12.496	14.314	.179	.179	1.399	H1-1b
46	M46	HSS2.375X0.1...	.722	4	13	.042	4	13	15.878	33.875	2.004	2.004	1.512	H1-1b
47	M47	HSS2.375X0.1...	.095	2.33	13	.014	2.33	13	26.195	33.875	2.004	2.004	1.717	H1-1b
48	M48	HSS2.375X0.1...	.149	3	7	.015	3	7	22.119	33.875	2.004	2.004	1.69	H1-1b
49	M49	HSS2.375X0.1...	.721	4	7	.042	4	7	15.878	33.875	2.004	2.004	1.524	H1-1b
50	M50	HSS2.375X0.1...	.096	2.33	13	.014	2.33	13	26.195	33.875	2.004	2.004	1.779	H1-1b
51	M51	HSS2.375X0.1...	.148	3	13	.015	3	13	22.119	33.875	2.004	2.004	1.698	H1-1b
52	M52	HSS2.375X0.1...	.722	4	7	.042	4	7	15.878	33.875	2.004	2.004	1.524	H1-1b
53	M53	HSS2.375X0.1...	.096	2.33	7	.014	2.33	7	26.195	33.875	2.004	2.004	1.779	H1-1b
54	M54	HSS2.375X0.1...	.148	3	13	.015	3	13	22.119	33.875	2.004	2.004	1.698	H1-1b
55	M55	.75" Solid Rod	.314	.947	4	.015	0	41	1.991	14.314	.179	.179	1.557	H1-1a
56	M56	.75" Solid Rod	.317	.947	12	.015	.947	7	1.991	14.314	.179	.179	1.556	H1-1a
57	M57	.75" Solid Rod	.308	.947	8	.014	.947	15	1.991	14.314	.179	.179	1.556	H1-1a
58	M58	.75" Solid Rod	.065	0	21	.008	0	6	12.496	14.314	.179	.179	1.406	H1-1b
59	M59	.75" Solid Rod	.065	0	29	.014	0	74	12.496	14.314	.179	.179	1.406	H1-1b
60	M60	.75" Solid Rod	.065	0	25	.012	0	40	12.496	14.314	.179	.179	1.406	H1-1b

The maximum member stress is at 72% of its capacity. Therefore, the existing members are adequate to support the proposed loads.

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No. 9927.CT11140J, R1
Calculated By: JJ Date : 7/19/19
Checked By: IM Date : 7/19/19

Design connection per AISC Steel Manual, 14th edition [LRFD].

Connection Details

Bolts

Quantity =	4	
Diameter =	0.75	
Vertical Spacing =	6.75	in (assumed)
Horizontal Spacing =	6.75	in (assumed)
Grade =	A325	
F_{nt} =	90	ksi
F_{nv} =	54	ksi

Loading Details
Node N16

Shear, Z =	2.068	k
Shear, Y =	2.748	k
Tension, X =	1.452	k
Mz =	6.287	k-ft
My =	3.628	k-ft
Mx =	3.932	k-ft

[Table J3.2]
[Table J3.2]

1 - Tensile Capacity

$$\phi R_{nt} = F_{nt} A_b$$ [Eqn. J3-1]

φ =	0.75	
F_{nt} =	90	ksi
A_b =	0.442	in^2
φR_{nt} =	29.84	k
T_{max} =	9.18	k

Rnt > Tmax
31%
OK

2 - Shear Capacity

$$\phi R_{nv} = F_{nv} A_b$$ [Eqn. J3-1]

φ =	0.75	
F_{nv} =	54	ksi
A_b =	0.442	in^2
φR_{nv} =	17.90	k
V_{max} =	5.80	k

Rnv > Vmax
32%
OK

3 - Combined Tension and Shear Capacity

$$\phi R'_{nt} = F'_{nt} A_b$$ [Eqn. J3-2]

$$F'_{nt} = 1.3F_{nt} - \frac{F_{nt}}{\phi F_{nv}} f_{rv} \leq F_{nt}$$ [Eqn. J3-3a]

φ =	0.75	
F'_{nt} =	88	ksi
A_b =	0.442	in^2
$\varphi R'_{nt}$ =	29.11	k
T_{max} =	9.18	k

R'nt > Tmax
32%
OK

Exhibit E

TOWER/MOUNT MAPPING REPORT

Name:

CT11140J

Site #:

CT11140J

Date Site Was Visited / Report Date:

6-5-2019 / 6-7-2019

Prepared For:

ENGINEERING FIRM

Tectonic

PRACTICAL SOLUTIONS, EXCEPTIONAL SERVICE.

TOWER OWNER/CARRIER

T-Mobile

Prepared By:

15225 Hwy 36 Suite 1
Bennington, NE 68007-5163
Inspectors:
Matt Toelle, Trystin Graves
Report Prepared By:
Dylan LaFrancis, Brandon Cool
Report Reviewed By:
Nick Ryan (402) 915-5337

SCOPE OF WORK

SCOPE OF WORK

At the request of Tectonic Engineering, field crews from HighTower Solutions Inc. in Bennington, NE performed a structural tower/mount mapping for CT11140J. The tower/mount mapping was conducted to collect data for determining the tower/mount's structural capacities and current antenna loading. The acquired data was transmitted to Tectonic Engineering's offices for analysis. This document contains the results from the structural tower/mount mapping.

HIGHTOWER'S INFORMATION GATHERING METHODS

HighTower Solutions Inc. uses the latest tools and technology to gather structural information. We use Ultrasonic Thickness Testing Equipment, Total Station Optical Transits, Dial Calipers, Handheld GPS Devices, Guy Tension Meters, and many other hand held tools. Every tool is inspected and calibrated at regular intervals. Our crews are trained in the operation of all tools and have hours of actual field operation experience.

HIGHTOWER'S SAFETY PRACTICES

HighTower Solutions Inc. carries out all work while staying in compliance with OSHA rules and regulations. We are a member of the National Association of Tower Erectors and multiple state associations. Our crews are equipped with the best safety equipment available, and travel to every site with the necessary equipment for any type of tower rescue. It is our passion to keep everyone safe! HighTower's employees have certifications in Tower Rescue, CPR, First Aid, RF Safety Training, OSHA Courses, and many other tool operating classes. Along with these certifications, we have two certified climb rescue instructors that hold tower rescue refresher courses monthly.

reports@hightowersolutionsinc.com
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TABLE OF CONTENTS

SITE COMMENTS FROM FIELD CREW VISIT:

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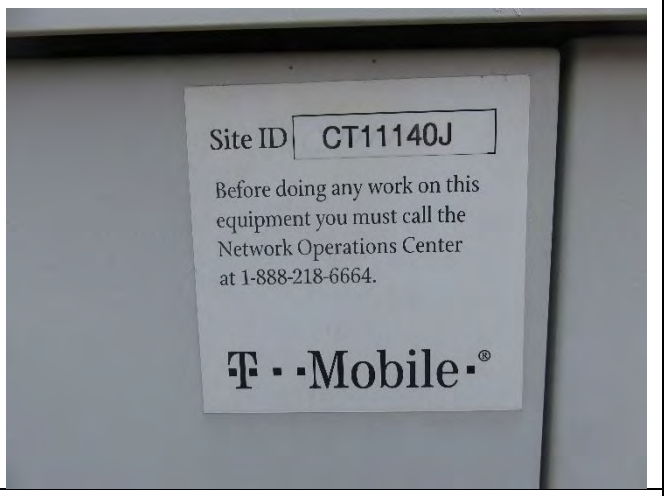
TOWER INFORMATION

IDENTIFICATION	
TOWER TYPE	Monopole
ADDRESS	60 Industrial Park Rd Vernon, Connecticut
FCC #	N/A
LATITUDE	41.83563
LONGITUDE	-72.45489
TOWER TAG INFORMATION	
N/A	N/A

FULL VIEW

ENTERING COMPOUND



T-MOBILE SIGN

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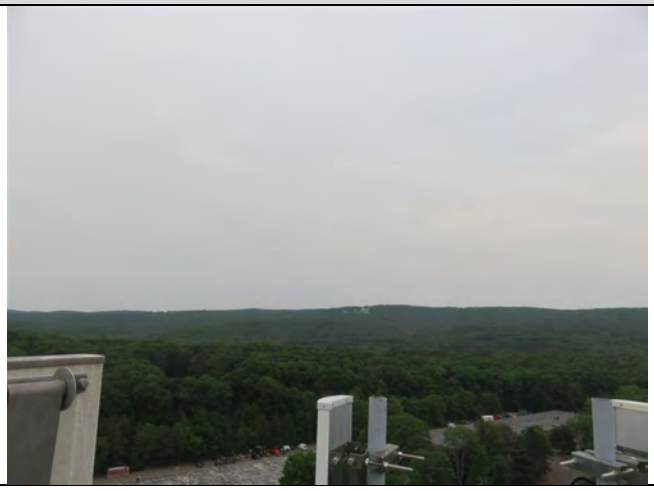
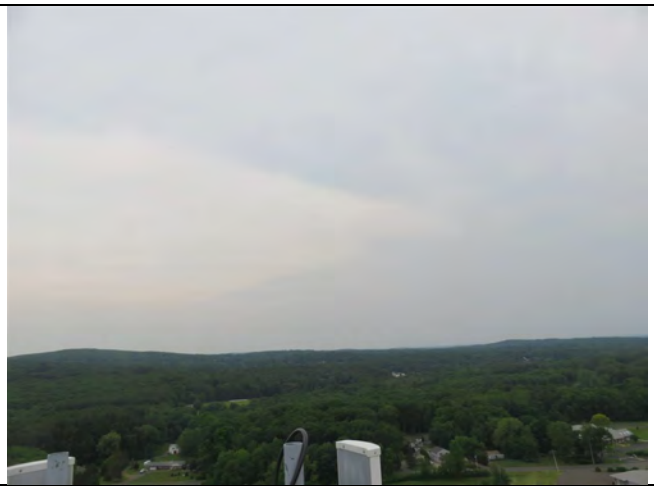
CARDINAL DIRECTION PICTURES

NORTH VIEW



EAST VIEW



SOUTH VIEW

WEST VIEW

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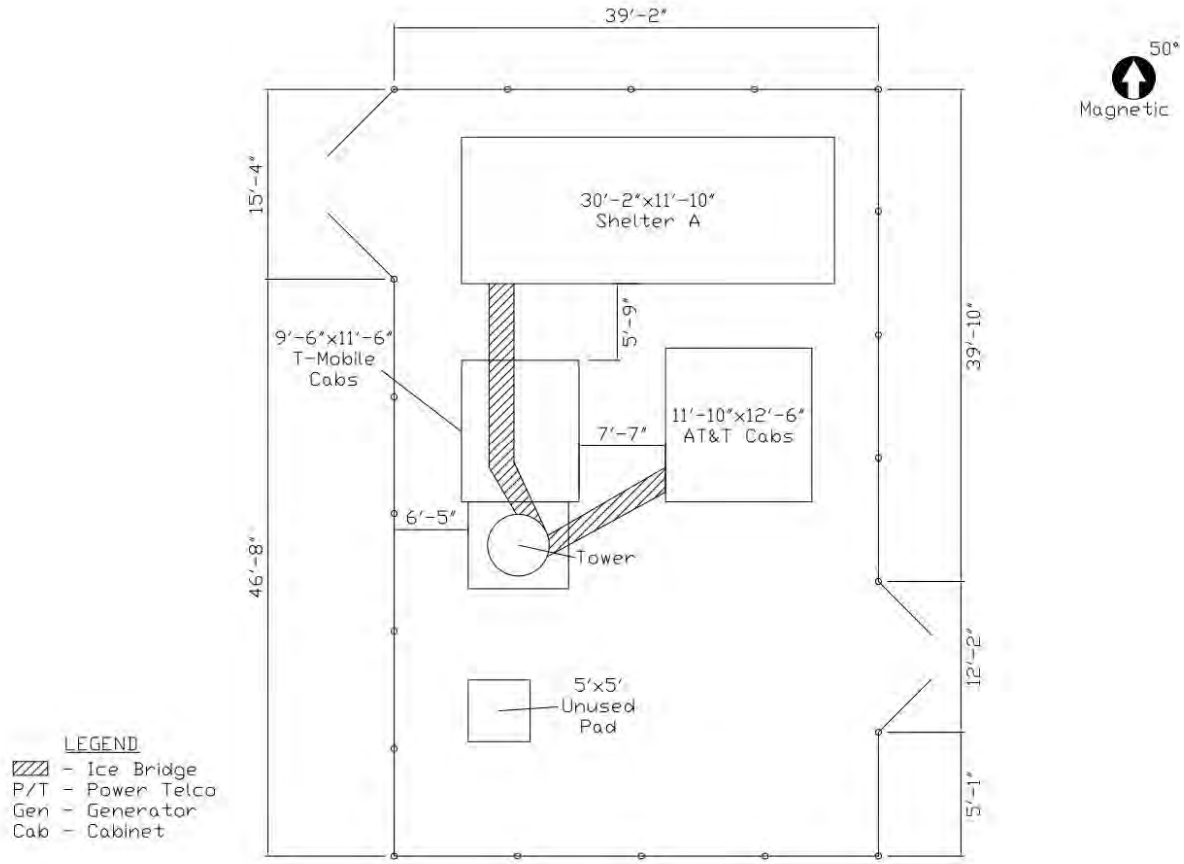
COMPOUND/SITE LAYOUT



COMPOUND PICTURE #1

COMPOUND PICTURE #2

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ANTENNA INFORMATION SUMMARY

ANT. #	HEIGHT	ANTENNA	LEG/FACE & AZIMUTH	MOUNT TYPE	COAX INFO.	CARRIER
1	144'2"Base	3 QTY Unused Mount	N/A	(Base of Mount 144'2"/144'2") 6'5"Lsa/13'8"Lbm 2.50"Sq.Tube/3.50"Dia.Pipe	N/A	N/A
2	157'9"Center	2 QTY Panel 5'11"Tx15"Wx16"D 6/RFS QTY TMA's 4.50"Tx6.50"Wx.75"D	2 per Alpha 80°	(Base of Mount 156'9"/156'9") 6'5"Lsa/13'8"Lbm 2.50"Sq.Tube/3.50"Dia.Pipe	12 QTY 1 5/8" #19-30	Shelter A
3	157'9"Center	3 QTY Panel 5'6"Tx11"Wx6"D Shares TMA's w/ Ant.#2	1 per Sector 80°/200°/320°	(Base of Mount 156'9"/156'9") 6'5"Lsa/13'8"Lbm 2.50"Sq.Tube/3.50"Dia.Pipe	12 QTY 1 5/8" #19-30	Shelter A
4	158'3"Center	4 QTY Amphenol Panel LPA-80063-4CF-EDIN-4 4'Tx15"Wx16"D Shares TMA's w/ Ant.#2	2 per B/G 200°/320°	(Base of Mount 156'9"/156'9") 6'5"Lsa/13'8"Lbm 2.50"Sq.Tube/3.50"Dia.Pipe	12 QTY 1 5/8" #19-30	Shelter A
5	158'7"Center	3 QTY Amphenol Panel BXA-171063-8BF-EDIN-2 3'11"Tx6"Wx4"D Shares TMA's w/ Ant.#2	1 per Sector 80°/200°/320°	(Base of Mount 156'9"/156'9") 6'5"Lsa/13'8"Lbm 2.50"Sq.Tube/3.50"Dia.Pipe	12 QTY 1 5/8" #19-30	Shelter A
6	162'2"Base	1 QTY GPS 5.50"Tx3.50"Dia.	Alpha	(Base of Mount 156'9"/156'9") 6'5"Lsa/13'8"Lbm 2.50"Sq.Tube/3.50"Dia.Pipe	1 QTY 1/2" #31	Shelter A
7	167'5"Base	6 QTY Ericsson RRH 2'3"Tx11.50"Wx6"D	2 per Sector	(Base of Mount 164'10"/166'5"/166'5") 7'Tpm/4'Lx3'Tsa/ 12'6"Lx3'Tbm 4.50"Dia.Pipe/2.38"Dia.Pipe /2.38"Dia.Pipe	2/4 QTY Black Cable/ Commscope Fiber Optic/ DC Power .40"/.80" #32-36,#43	AT&T
8	167'5"Base	3 QTY Ericsson RRH 16"Tx12"Wx9"D	1 per Sector	(Base of Mount 164'10"/166'5"/166'5") 7'Tpm/4'Lx3'Tsa/ 12'6"Lx3'Tbm 4.50"Dia.Pipe/2.38"Dia.Pipe /2.38"Dia.Pipe	2/4 QTY Black Cable/ Commscope Fiber Optic/ DC Power .40"/.80" #32-36,#43	AT&T
9	167'5"Base	2 QTY Strikesorb Squid DC6-48-60-18-8F 18"Tx9"Dia.	1 per B/G	(Base of Mount 164'10"/166'5"/166'5") 7'Tpm/4'Lx3'Tsa/ 12'6"Lx3'Tbm 4.50"Dia.Pipe/2.38"Dia.Pipe /2.38"Dia.Pipe	2/4 QTY Black Cable/ Commscope Fiber Optic/ DC Power .40"/.80" #32-36,#43	AT&T
10	168'1"Base	3 QTY Ericsson RRH 16"Tx16"Wx5"D	1 per Sector	(Base of Mount 164'10"/166'5"/166'5") 7'Tpm/4'Lx3'Tsa/ 12'6"Lx3'Tbm 4.50"Dia.Pipe/2.38"Dia.Pipe /2.38"Dia.Pipe	2/4 QTY Black Cable/ Commscope Fiber Optic/ DC Power .40"/.80" #32-36,#43	AT&T

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11	168'1"Center	3 QTY CCI Panel HPA-65R-BUU-H6 5'2"Tx14"Wx7"D	1 per Sector 0°/120°/230°	(Base of Mount 164'10"/166'5"/166'5") 7'Tpm/4'Lx3'Tsa/ 12'6"Lx3'Tbm 4.50"Dia.Pipe/2.38"Dia.Pipe /2.38"Dia.Pipe	2/4 QTY Black Cable/ Commscope Fiber Optic/ DC Power .40"/.80" #32-36,#43	AT&T
12	168'1"Center	3 QTY Quintel Panel See Pic 5'9"Tx12"Wx11"D	1 per Sector 0°/120°/230°	(Base of Mount 164'10"/166'5"/166'5") 7'Tpm/4'Lx3'Tsa/ 12'6"Lx3'Tbm 4.50"Dia.Pipe/2.38"Dia.Pipe /2.38"Dia.Pipe	2/4 QTY Black Cable/ Commscope Fiber Optic/ DC Power .40"/.80" #32-36,#43	AT&T
13	168'6"Center	3 QTY Kathrein Panel 80010121 4'6"Tx12"Wx4.50"D 3 Powerwave QTY TMA's 14"Tx10"Wx3"D	1 per Sector 30°/170°/300°	(Base of Mount 164'10"/166'5"/166'5") 7'Tpm/4'Lx3'Tsa/ 12'6"Lx3'Tbm 4.50"Dia.Pipe/2.38"Dia.Pipe /2.38"Dia.Pipe	2/4/6 QTY Black Cable, Commscope, Andrew Fiber Optic/DC Power/LDF7-50A .40", .80", 1 5/8" #32-43	AT&T
14	177'11"Center	6 QTY EMS Panel RR901702DP 4'8"Tx8"Wx2.50"D	Pos #1&3 per Sector 40°/160°/280°	See Mount Member Details	6 QTY 1 5/8" #1-6	T-Mobile
15	177'11"Center	3 QTY RFS Panel APX16DWV-16DWVS 4'10"Tx12.50"Wx4"D 3 Ericsson, 3 RFS QTY TMA's 11"Tx6"Wx3.50"D , 6.50"Tx5"Wx3"D	Pos #2 per Sector 30°/150°/270°	See Mount Member Details	6 QTY 1 5/8" #7-12	T-Mobile

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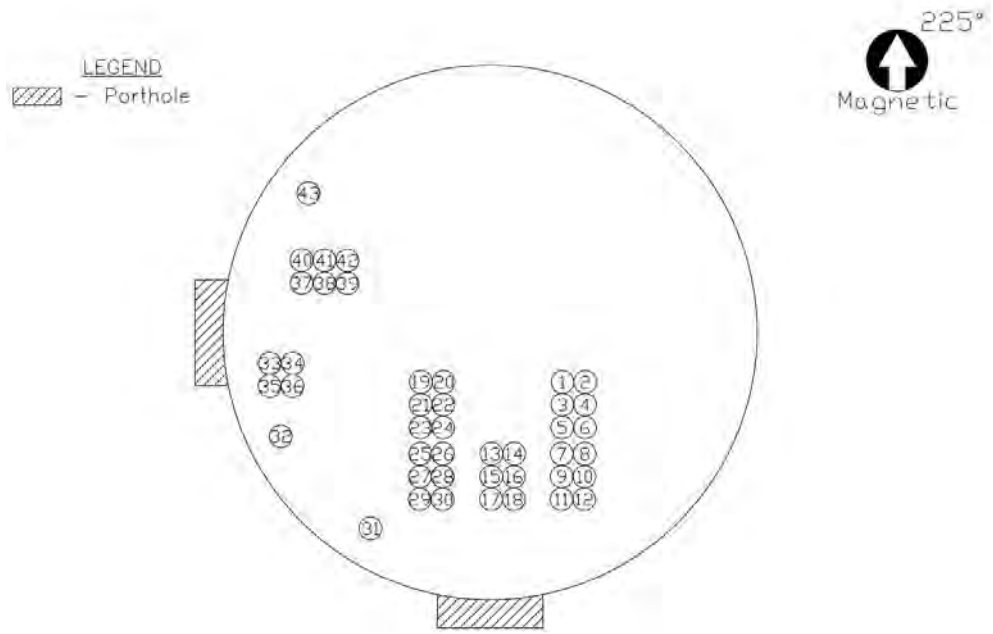
COAX INFORMATION



STEP BOLT INFORMATION		CLIMB LADDER INFORMATION	
START/STOP HEIGHT	N/A	*START/STOP HEIGHT*	11'2"/176'
LOCATION	N/A	*LOCATION*	315°
BOLT DIAMETER	N/A	*RUNG SIZE*	.62"Dia.Solid Rod
BOLT LENGTH	N/A	*RUNNER SIZE*	N/A
SPACING	N/A	*LADDER WIDTH*	13"
SAFETY CLIMB	N/A	*SPACING*	16"
		SAFETY CLIMB	Yes

COAX DETAILS

COAX #	SIZE	MANUFACTURER	MODEL	CARRIER	ANTENNA
#1	1 5/8"	N/A	N/A	T-Mobile	#14
#2	1 5/8"	N/A	N/A	T-Mobile	#14
#3	1 5/8"	N/A	N/A	T-Mobile	#14
#4	1 5/8"	N/A	N/A	T-Mobile	#14
#5	1 5/8"	N/A	N/A	T-Mobile	#14
#6	1 5/8"	N/A	N/A	T-Mobile	#14
#7	1 5/8"	N/A	N/A	T-Mobile	#15
#8	1 5/8"	N/A	N/A	T-Mobile	#15
#9	1 5/8"	N/A	N/A	T-Mobile	#15
#10	1 5/8"	N/A	N/A	T-Mobile	#15
#11	1 5/8"	N/A	N/A	T-Mobile	#15
#12	1 5/8"	N/A	N/A	T-Mobile	#15

#13	1 5/8"	N/A	N/A	Term @Ground	Term @175'
#14	1 5/8"	N/A	N/A	Term @Ground	Term @175'
#15	1 5/8"	N/A	N/A	Term @Ground	Term @175'
#16	1 5/8"	N/A	N/A	Term @Ground	Term @175'
#17	1 5/8"	N/A	N/A	Term @Ground	Term @175'
#18	1 5/8"	N/A	N/A	Term @Ground	Term @175'
#19	1 5/8"	N/A	N/A	Shelter A	#2-5
#20	1 5/8"	N/A	N/A	Shelter A	#2-5
#21	1 5/8"	N/A	N/A	Shelter A	#2-5
#22	1 5/8"	N/A	N/A	Shelter A	#2-5
#23	1 5/8"	N/A	N/A	Shelter A	#2-5
#24	1 5/8"	N/A	N/A	Shelter A	#2-5
#25	1 5/8"	N/A	N/A	Shelter A	#2-5
#26	1 5/8"	N/A	N/A	Shelter A	#2-5
#27	1 5/8"	N/A	N/A	Shelter A	#2-5
#28	1 5/8"	N/A	N/A	Shelter A	#2-5
#29	1 5/8"	N/A	N/A	Shelter A	#2-5
#30	1 5/8"	N/A	N/A	Shelter A	#2-5
#31	1/2"	N/A	N/A	Shelter A	#6
#32	.40"	Black Cable	Fiber Optic	AT&T	#7-13
#33	.80"	Andrew / Commscope	DC Power	AT&T	#7-13
#34	.80"	Andrew / Commscope	DC Power	AT&T	#7-13
#35	.80"	Andrew / Commscope	DC Power	AT&T	#7-13
#36	.80"	Andrew / Commscope	DC Power	AT&T	#7-13
#37	1 5/8"	Andrew	LDF7-50A	AT&T	#13
#38	1 5/8"	Andrew	LDF7-50A	AT&T	#13
#39	1 5/8"	Andrew	LDF7-50A	AT&T	#13
#40	1 5/8"	Andrew	LDF7-50A	AT&T	#13
#41	1 5/8"	Andrew	LDF7-50A	AT&T	#13
#42	1 5/8"	Andrew	LDF7-50A	AT&T	#13
#43	.40"	Black Cable	Fiber Optic	AT&T	#7-13

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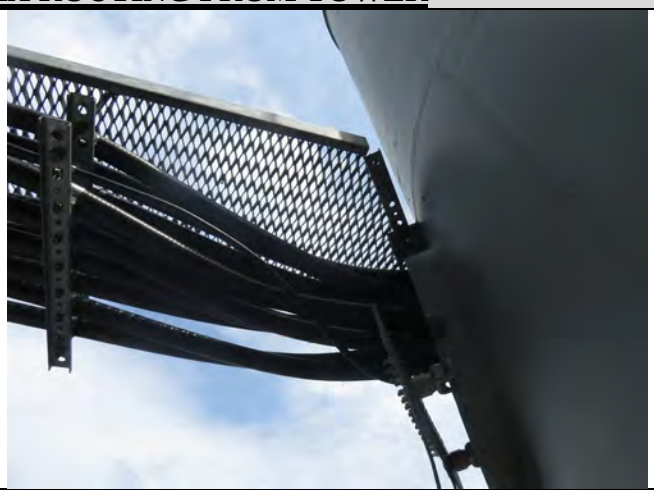
PICTURES UP FACES AND COAX ROUTING FROM TOWER

UP NORTH FACE



COAX ROUTING TO SHELTER A

COAX ROUTING TO SHELTER A

COAX ROUTING TO SHELTER A

COAX ROUTING TO SHELTER A

SHELTER A SIGN

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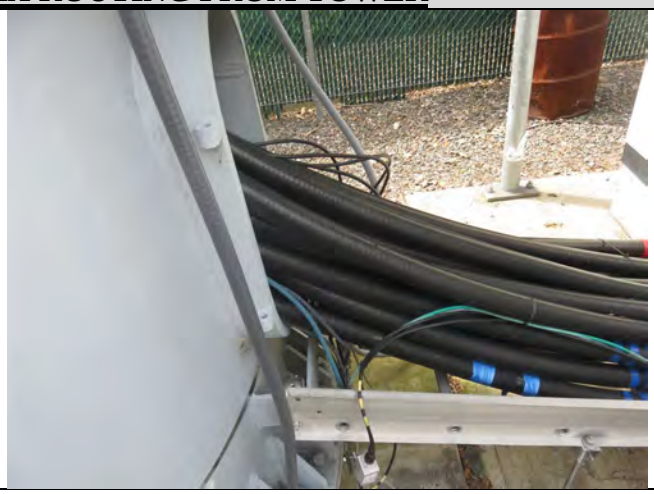
PICTURES UP FACES AND COAX ROUTING FROM TOWER

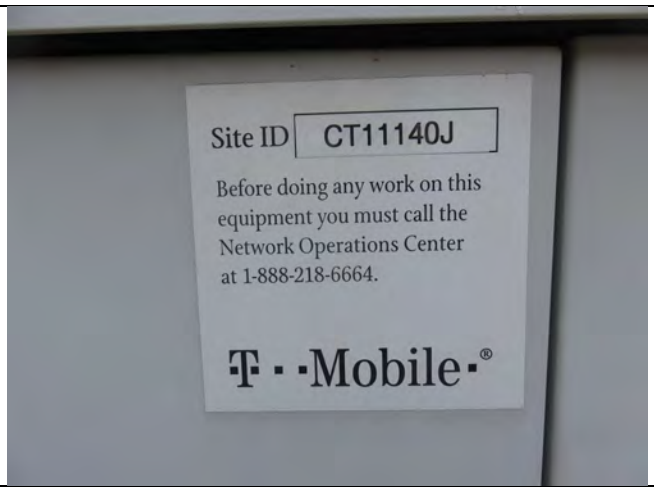
SHELTER A



COAX ROUTING TO T-MOBILE

COAX ROUTING TO T-MOBILE

T-MOBILE CAB



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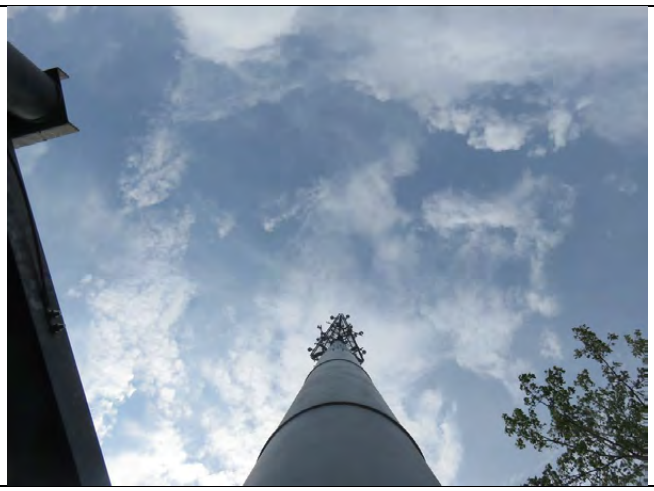

UP EAST FACE

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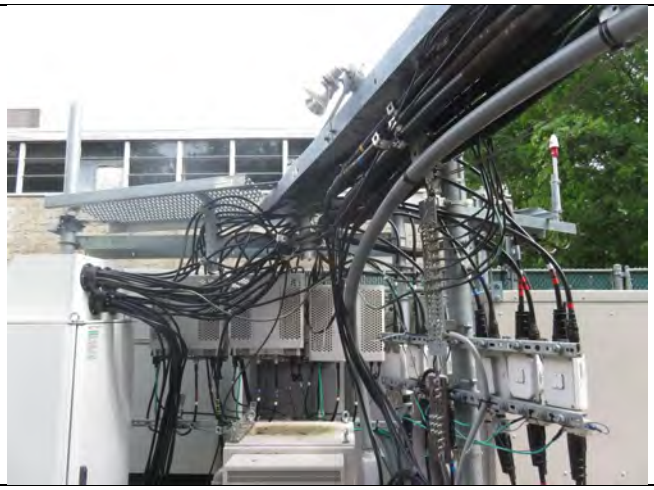
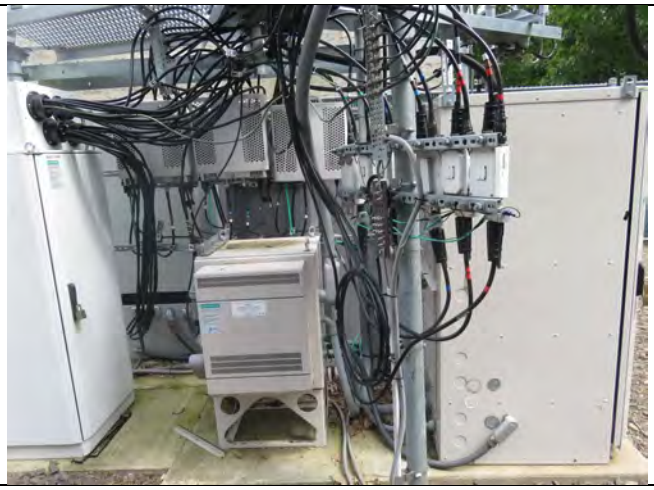
PICTURES UP FACES AND COAX ROUTING FROM TOWER

COAX ROUTING AT&T

COAX ROUTING AT&T

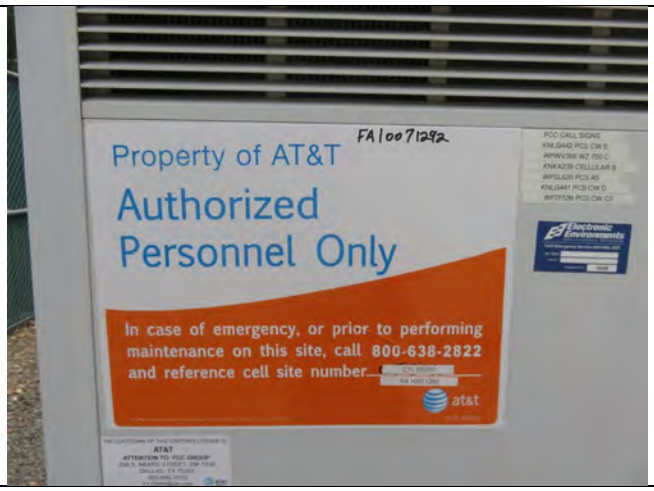


COAX ROUTING AT&T



COAX ROUTING AT&T

AT&T CAB



AT&T CAB SIGN

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PICTURES UP FACES AND COAX ROUTING FROM TOWER

	
UP SOUTH FACE	**UP WEST FACE**

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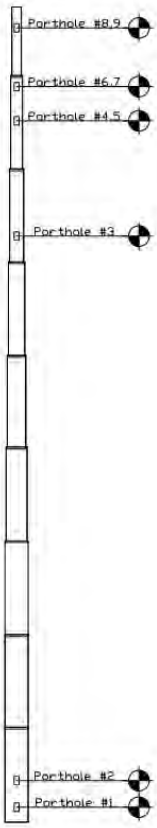
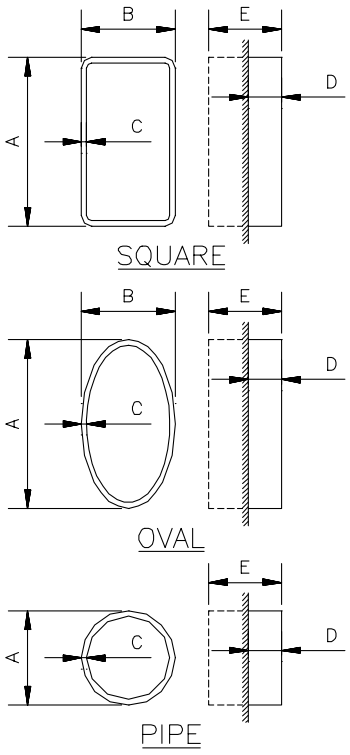
PORTHOLE SUMMARY

#	HEIGHT (CENTER HEIGHT MEASUREMENT UNLESS OTHERWISE NOTED)	QTY	AZIMUTH	SHAPE	A	B	C	D	E	IN USE ?
1	3'3"	2	50°/140°	Rectangle	2'3"	13"	1.05"	3"	6"	Yes,No
2	9'	3	50°/140°/230°	Rectangle	2'3"	13"	1.05"	3"	6"	Yes,Yes,No
3	127'1"	3	0°/120°/240°	Rectangle	6"	4"	.25"	5"	7"	No,No,No
4	151'6"	3	0°/120°/240°	Rectangle	6"	4"	.25"	5"	7"	Yes,Yes,Yes
5	152'9"	3	0°/120°/240°	Rectangle	6"	4"	.25"	5"	7"	Yes,Yes,Yes
6	158'11"	3	0°/120°/240°	Rectangle	6"	4"	.25"	5"	7"	Yes,Yes,Yes
7	160'1"	3	0°/120°/240°	Rectangle	6"	4"	.25"	5"	7"	Yes,Yes,Yes
8	171'6"	3	0°/120°/240°	Rectangle	6"	4"	.25"	5"	7"	No,No,No
9	172'9"	3	0°/120°/240°	Rectangle	6"	4"	.25"	5"	7"	No,No,No



PORTHOLE PROFILE DRAWING



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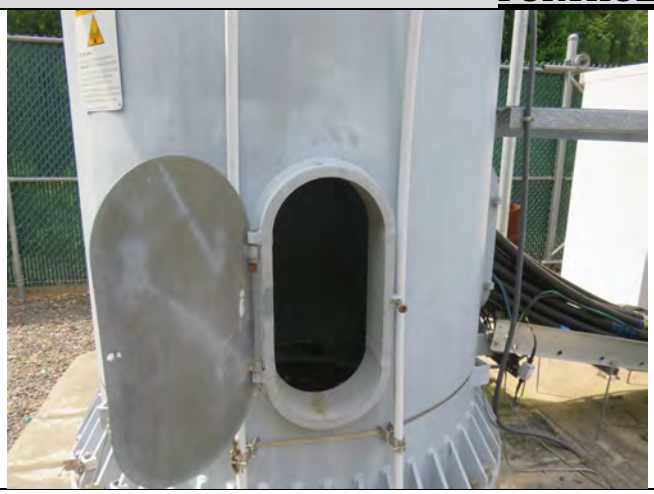
PORTHOLE PICTURES



PORTHOLE 1

PORTHOLE 1

PORTHOLE 2

PORTHOLE 2

PORTHOLE 3

PORTHOLE 3

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PORTHOLE PICTURES

PORTHOLE 4

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PORTHOLE 5

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PORTHOLE PICTURES

PORTHOLE 7

PORTHOLE 7

PORTHOLE 8

PORTHOLE 9

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TOWER PICTURES

FULL VIEW OF TOWER

TOP HALF OF TOWER

BOTTOM HALF OF TOWER

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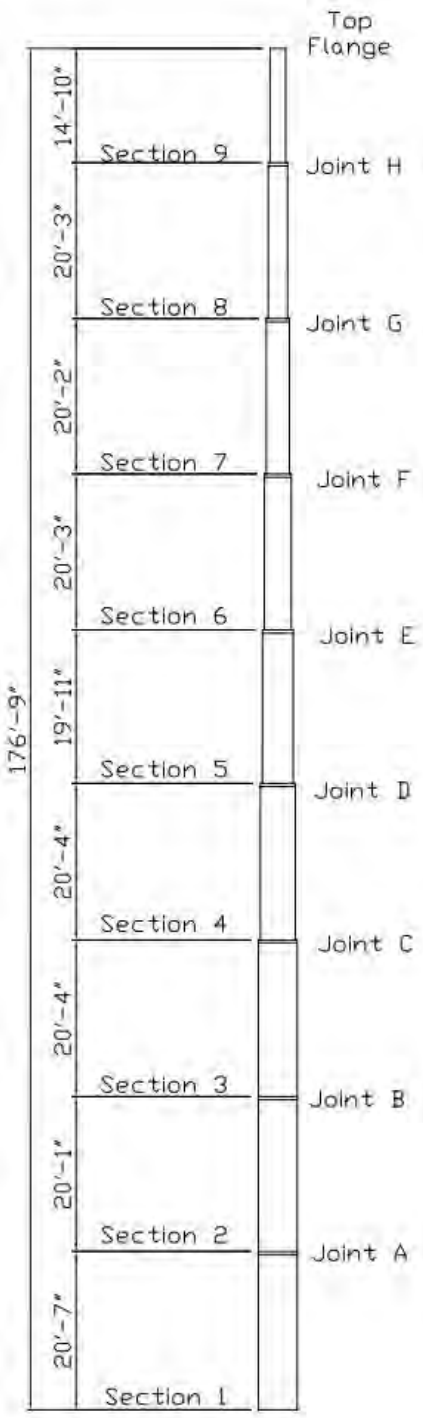
TOWER PROFILE DETAIL

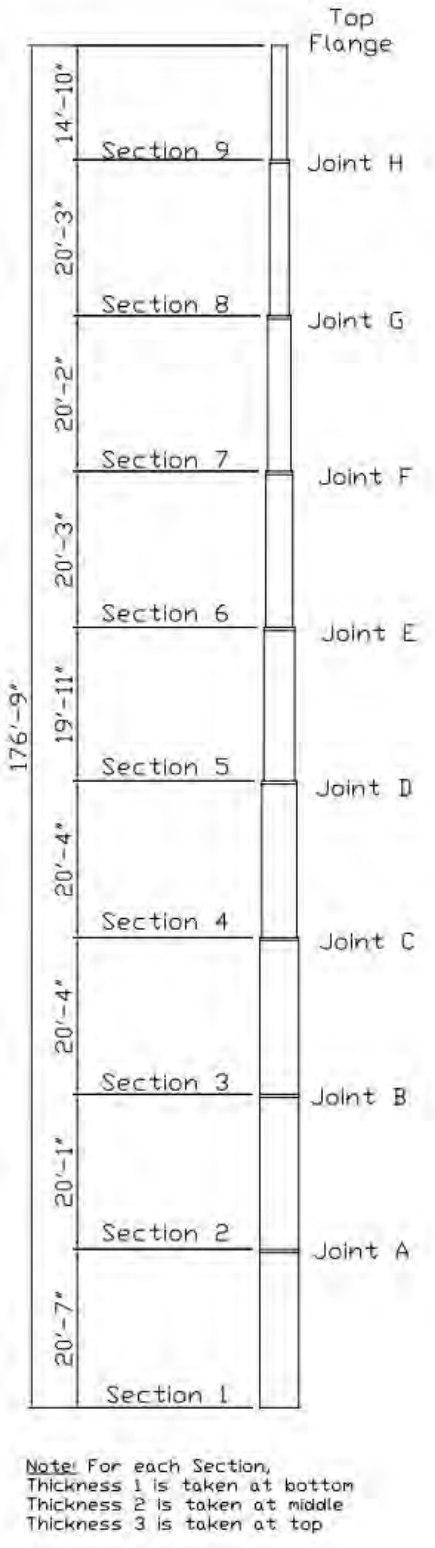
SECTION #6	*Circum. Top of Section*	11'.75"Cir.
	Thickness(1,2,3)	.409",.405",.401"
	Section Stamp	116.329
	Circum. Base	11'.75"Cir.
	Side length Base	N/A
	# of Sides	N/A
SECTION #5	*Circum. Top of Section*	12'7.25"Cir.
	Thickness(1,2,3)	.435",.425",.419"
	Section Stamp	116.329
	Circum. Base	12'7.25"Cir.
	Side length Base	N/A
	# of Sides	N/A
SECTION #4	*Circum. Top of Section*	14'2.75"Cir.
	Thickness(1,2,3)	.392",.395",.395"
	Section Stamp	116.329
	Circum. Base	14'2.75"Cir.
	Side length Base	N/A
	# of Sides	N/A
SECTION #3	*Circum. Top of Section*	15'8.75"Cir.
	Thickness(1,2,3)	.390",.391",.390"
	Section Stamp	116.329
	Circum. Base	15'8.75"Cir.
	Side length Base	N/A
	# of Sides	N/A
SECTION #2	*Circum. Top of Section*	15'8.75"Cir.
	Thickness(1,2,3)	.529",.529",.528"
	Section Stamp	116.329
	Circum. Base	15'8.75"Cir.
	Side length Base	N/A
	# of Sides	N/A
SECTION #1	*Circum. Top of Section*	15'8.75"Cir.
	Thickness(1,2,3)	.659",.663",.668"
	Section Stamp	116.329
	Circum. Base	15'8.75"Cir.
	Side length Base	N/A
	# of Sides	N/A



Note: For each Section,
Thickness 1 is taken at bottom
Thickness 2 is taken at middle
Thickness 3 is taken at top

TOWER PROFILE DETAIL

SECTION #12	*Circum. Top of Section*	
	Thickness(1,2,3)	
	Section Stamp	
	Circum. Base	
	Side length Base	
	# of Sides	
SECTION #11	*Circum. Top of Section*	
	Thickness(1,2,3)	
	Section Stamp	
	Circum. Base	
	Side length Base	
	# of Sides	
SECTION #10	*Circum. Top of Section*	
	Thickness(1,2,3)	
	Section Stamp	
	Circum. Base	
	Side length Base	
	# of Sides	
SECTION #9	*Circum. Top of Section*	6'4.50"Cir.
	Thickness(1,2,3)	.407",.401",.397"
	Section Stamp	116.329
	Circum. Base	6'4.50"Cir.
	Side length Base	N/A
	# of Sides	N/A
SECTION #8	*Circum. Top of Section*	7'11.75"Cir.
	Thickness(1,2,3)	.425",.397",.385"
	Section Stamp	116.329
	Circum. Base	7'11.75"Cir.
	Side length Base	N/A
	# of Sides	N/A
SECTION #7	*Circum. Top of Section*	9'5.50"Cir.
	Thickness(1,2,3)	.389",.392",.399"
	Section Stamp	116.329
	Circum. Base	9'5.50"Cir.
	Side length Base	N/A
	# of Sides	N/A



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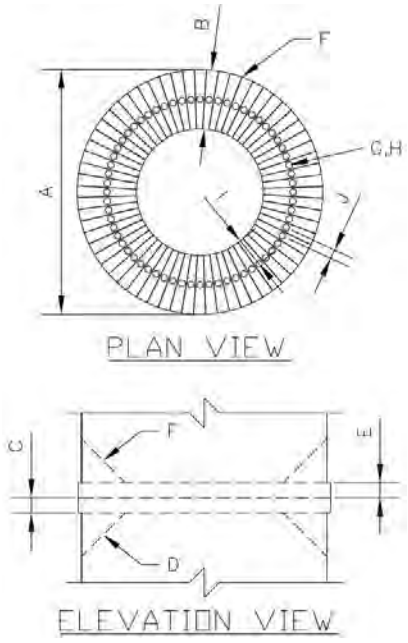
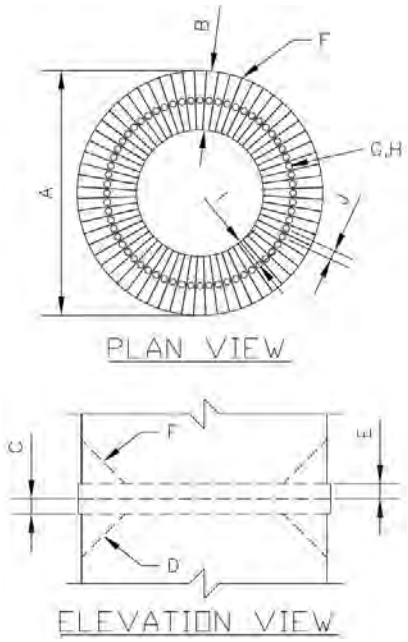
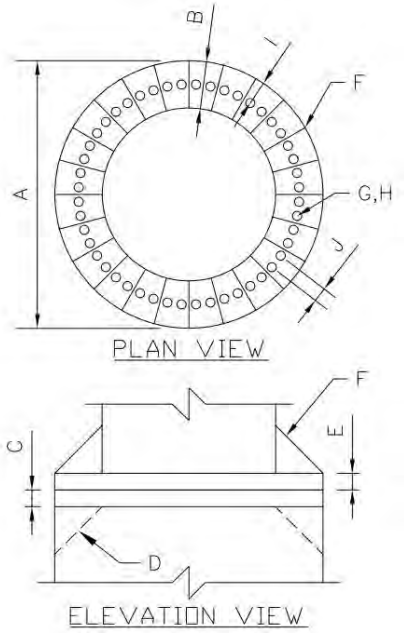
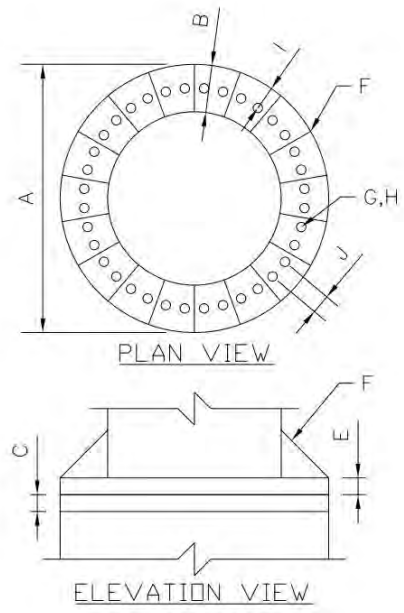
TOWER FLANGE DETAILS

JOINT "A"			
-	*Height to Flange Center*	20'7"	
A	*Circumference*	16'3.50"Cir.	
B	*Plate Edge to Tower*	8"	
C	*Bottom Flange Thickness*	1.25"	
-	*Bottom Flange Weld Size*	.30"	
-	*# of Bottom Gussets*	32	
D	*Bottom Gusset Size*	9.50"Tx7"Wx.62"Flat	
E	*Top Flange Thickness*	1.25"	
-	*Top Flange Weld Size*	.50"	
-	*# of Top Gussets*	32	
F	*Top Gusset Size*	10"Tx7"Wx.62"Flat	
G	*# of Bolts*	64	
G	*Bolt Dia.*	1.25"	
H	*Nut Size*	1.96"	
I	*Plate Edge to Hole Center*	2"	
J	*Hole to Hole*	3"	
JOINT "B"			
-	*Height to Flange Center*	40'8"	
A	*Circumference*	16'3.50"Cir.	
B	*Plate Edge to Tower*	8"	
C	*Bottom Flange Thickness*	1.25"	
-	*Bottom Flange Weld Size*	.24"	
-	*# of Bottom Gussets*	32	
D	*Bottom Gusset Size*	10"Tx7"Wx.62"Flat	
E	*Top Flange Thickness*	1.25"	
-	*Top Flange Weld Size*	.45"	
-	*# of Top Gussets*	32	
F	*Top Gusset Size*	10"Tx7"Wx.62"Flat	
G	*# of Bolts*	63 (Missing 1 Bolt see pic)	
G	*Bolt Dia.*	1.25"	
H	*Nut Size*	1.96"	
I	*Plate Edge to Hole Center*	2"	
J	*Hole to Hole*	3"	

JOINT "C"			
-	*Height to Flange Center*	61'	
A	*Circumference*	15'8.75"Cir.	
B	*Plate Edge to Tower*	Inside-4"/Outside-3.50"	
C	*Bottom Flange Thickness*	1.25"	
-	*Bottom Flange Weld Size*	.27"	
-	*# of Bottom Gussets*	48	
D	*Bottom Gusset Size*	4"Tx2"Wx.62"Flat	
E	*Top Flange Thickness*	1.25"	
-	*Top Flange Weld Size*	.42"	
-	*# of Top Gussets*	48	
F	*Top Gusset Size*	5"Tx3"Wx.62"Flat	
G	*# of Bolts*	48	
G	*Bolt Dia.*	1"	
H	*Nut Size*	1.59"	
I	*Plate Edge to Hole Center*	1.75"	
J	*Hole to Hole*	4"	

JOINT "D"			
-	*Height to Flange Center*	81'4"	
A	*Circumference*	14'2.75"Cir.	
B	*Plate Edge to Tower*	3"	
C	*Bottom Flange Thickness*	1"	
-	*Bottom Flange Weld Size*	.61"	
-	*# of Bottom Gussets*	NA	
D	*Bottom Gusset Size*	NA	
E	*Top Flange Thickness*	1.25"	
-	*Top Flange Weld Size*	.55"	
-	*# of Top Gussets*	18	
F	*Top Gusset Size*	4.75"Tx3"Wx.62"Flat	
G	*# of Bolts*	36	
G	*Bolt Dia.*	1"	
H	*Nut Size*	1.59"	
I	*Plate Edge to Hole Center*	1.50"	
J	*Hole to Hole*	4.50"	

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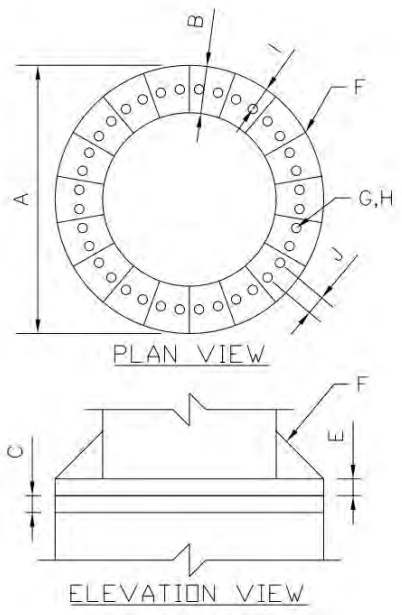
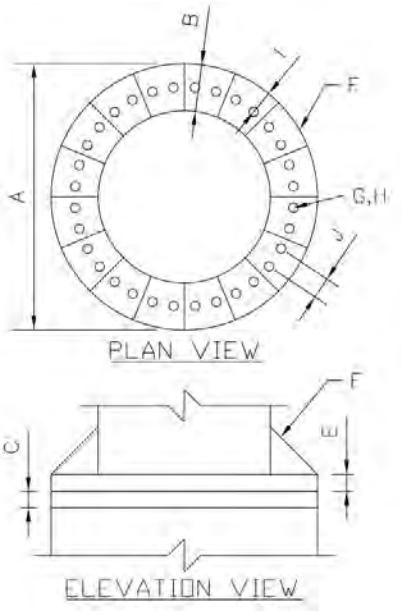
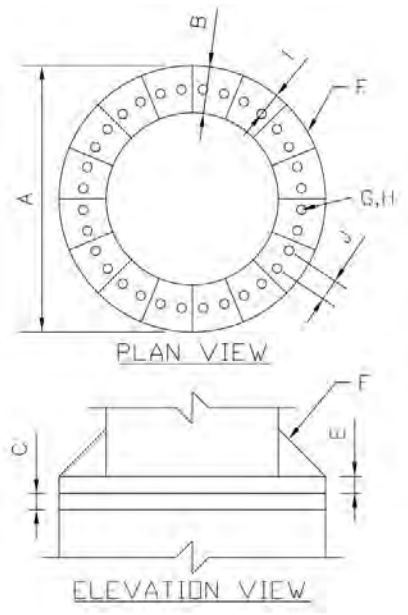
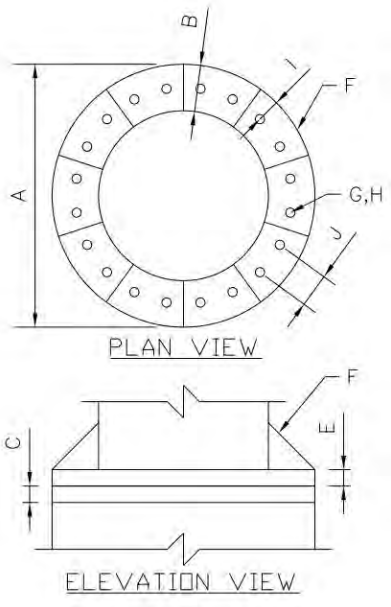
JOINT "E"			
-	*Height to Flange Center*	101'3"	
A	*Circumference*	12'7.25"Cir.	
B	*Plate Edge to Tower*	3"	
C	*Bottom Flange Thickness*	1"	
-	*Bottom Flange Weld Size*	.75"	
-	*# of Bottom Gussets*	NA	
D	*Bottom Gusset Size*	NA	
E	*Top Flange Thickness*	1.25"	
-	*Top Flange Weld Size*	.54"	
-	*# of Top Gussets*	18	
F	*Top Gusset Size*	5"Tx3"Wx.62"Flat	
G	*# of Bolts*	36	
G	*Bolt Dia.*	1"	
H	*Nut Size*	1.59"	
I	*Plate Edge to Hole Center*	1.50"	
J	*Hole to Hole*	4.50"	

JOINT "F"			
-	*Height to Flange Center*	121'6"	
A	*Circumference*	11'.75"Cir.	
B	*Plate Edge to Tower*	3.25"	
C	*Bottom Flange Thickness*	1"	
-	*Bottom Flange Weld Size*	.83"	
-	*# of Bottom Gussets*	NA	
D	*Bottom Gusset Size*	NA	
E	*Top Flange Thickness*	1.25"	
-	*Top Flange Weld Size*	.50"	
-	*# of Top Gussets*	16	
F	*Top Gusset Size*	5"Tx3"Wx.62"Flat	
G	*# of Bolts*	32	
G	*Bolt Dia.*	1"	
H	*Nut Size*	1.59"	
I	*Plate Edge to Hole Center*	1.75"	
J	*Hole to Hole*	4.25"	

JOINT "G"			
-	*Height to Flange Center*	141'8"	
A	*Circumference*	9'5.50"Cir.	
B	*Plate Edge to Tower*	3.25"	
C	*Bottom Flange Thickness*	1"	
-	*Bottom Flange Weld Size*	.67"	
-	*# of Bottom Gussets*	NA	
D	*Bottom Gusset Size*	NA	
E	*Top Flange Thickness*	1.25"	
-	*Top Flange Weld Size*	.46"	
-	*# of Top Gussets*	16	
F	*Top Gusset Size*	5"Tx3"Wx.62"Flat	
G	*# of Bolts*	32	
G	*Bolt Dia.*	1"	
H	*Nut Size*	1.62"	
I	*Plate Edge to Hole Center*	1.75"	
J	*Hole to Hole*	4.50"	

JOINT "H"			
-	*Height to Flange Center*	161'11"	
A	*Circumference*	7'11.75"Cir.	
B	*Plate Edge to Tower*	3.25"	
C	*Bottom Flange Thickness*	1"	
-	*Bottom Flange Weld Size*	.68"	
-	*# of Bottom Gussets*	NA	
D	*Bottom Gusset Size*	NA	
E	*Top Flange Thickness*	1.25"	
-	*Top Flange Weld Size*	.72"	
-	*# of Top Gussets*	10	
F	*Top Gusset Size*	5"Tx3"Wx.62"Flat	
G	*# of Bolts*	20	
G	*Bolt Dia.*	1"	
H	*Nut Size*	1.57"	
I	*Plate Edge to Hole Center*	1.50"	
J	*Hole to Hole*	4.50"	

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TOWER FLANGE PICTURES

JOINT A

JOINT B

JOINT C

JOINT D

JOINT E

JOINT F

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TOWER FLANGE PICTURES

	
JOINT G	**JOINT H**

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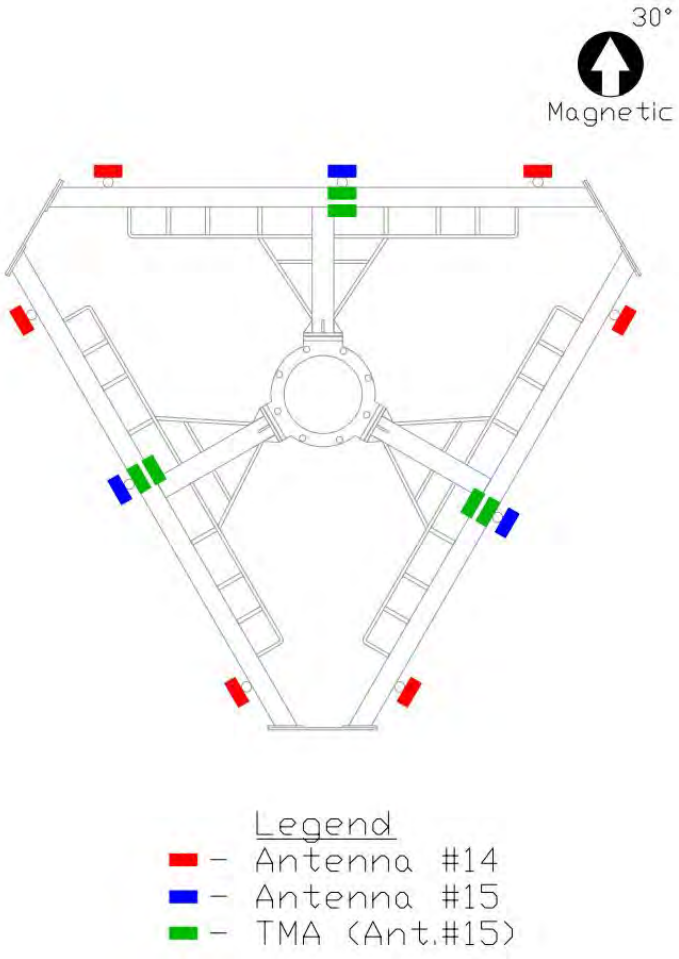
MOUNT MEMBER DETAILS

MOUNT 1 OF 5

	Foundation A.G.L.	8.50"
	Antenna Measurements taken from Top of	Foundation
	Monopoles Circumference at Mount	6'4.50"Cir.
	Height to Bottom of Top Mount	176'9"
	Azimuths	
	Boom	
	Alpha	30°
	Beta	150°
	Gamma	270°

Mount Overview Detail



Typical Abbreviations

LLV	[illegible]	SB	[illegible]
LLH	[illegible]	SBS	[illegible]
DA	[illegible]	MB	[illegible]

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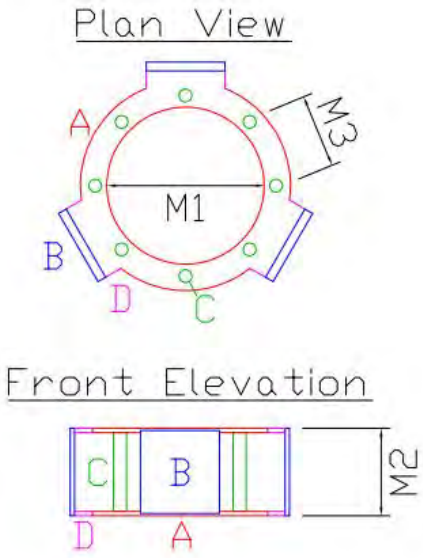
MOUNT MEMBER DETAILS

MOUNT 2 OF 5

	Member Size	Bolt Size
A	2'Dia.x3"Wx.50"Flat	8-1"
B	9.50"Tx9"Wx.75"Flat	Welded
C	(8)-9"Tx1.50"Dia.Solid Rod	Welded
D	2"Lx9.5"Wx.50"Flat	Molded
M1	1'6"	
M2	10"	
M3	8.50"	

Top Mount Detail



Typical Abbreviations

LLV	[illegible]	SB	[illegible]
LLH	[illegible]	SBS	[illegible]
DA	[illegible]	MB	M[illegible]

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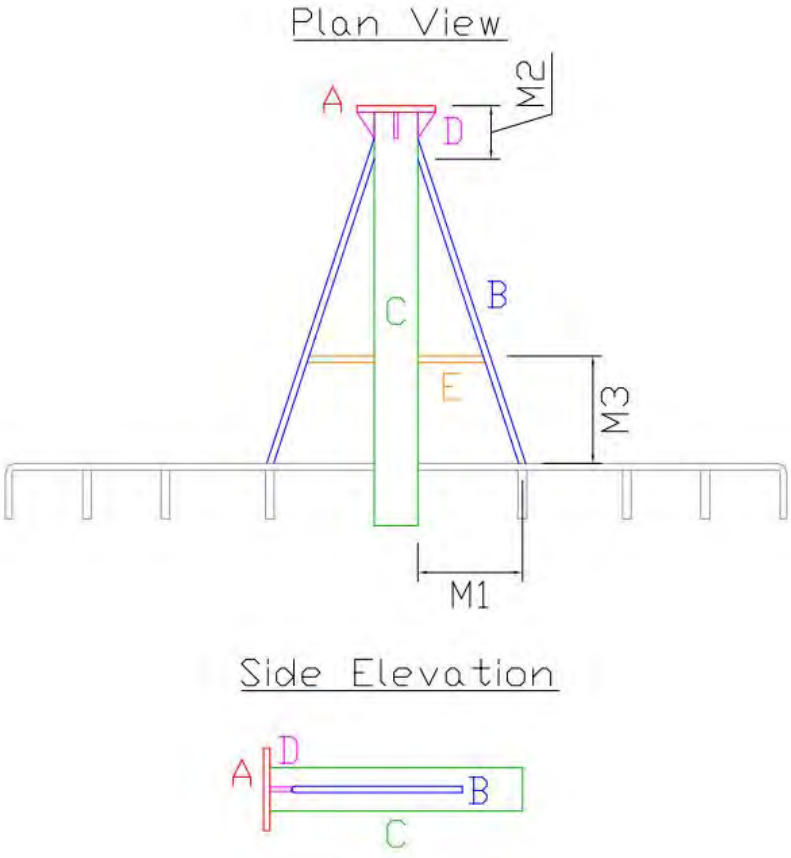
MOUNT MEMBER DETAILS

MOUNT 3 OF 5

	Member Size	Bolt Size
A	9.50"Tx9.50"W.x75"Flat	4-.75"
B	.75"Dia.Solid Rod	Welded
C	2'5"L/5"x5"Sq.Tube x.394"	Welded
D	(4)-2"Tx2.5"Wx.50"Flat	Welded
E	.75"Dia.Solid Rod	Welded
M1	11"	
M2	4"	
M3	9"	

Side Arm Detail



Typical Abbreviations

LLV	[illegible]	SB	[illegible]
LLH	[illegible]	SBS	[illegible]
DA	[illegible]	MB	M[illegible]

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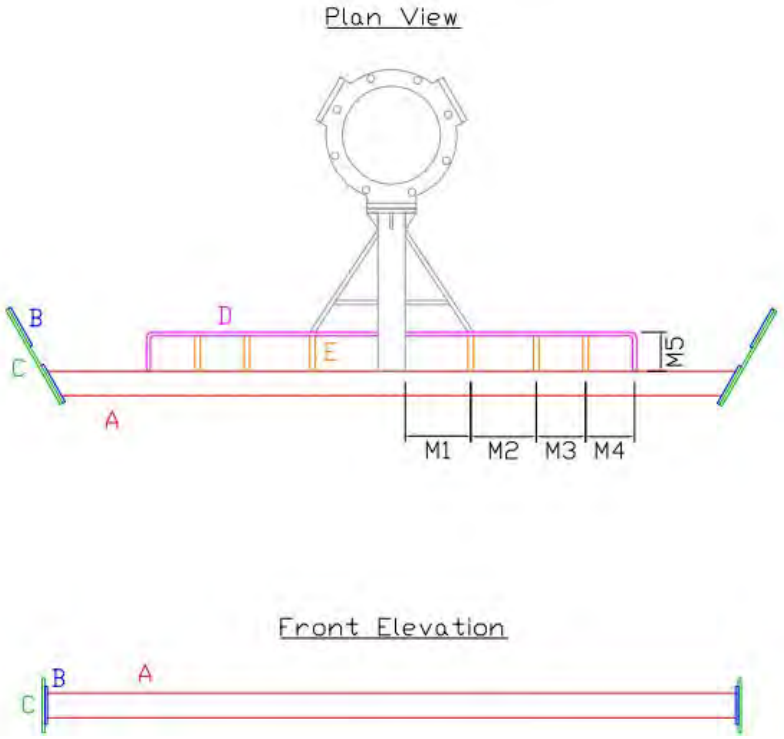
MOUNT MEMBER DETAILS

MOUNT 4 OF 5

	Member Size	Bolt Size
A	10'6"L/ 4.50"Dia.Pipe x.232"	Welded
B	7"Tx8"Wx.50"Flat	Welded
C	10"Tx20"Wx.50"Flat	4b-.50"
D	.75"Dia.Solid Rod	Welded
E	1"Dia.Solid Rod	Welded
M1	11"	
M2	11"	
M3	11"	
M4	9"	
M5	6"	

Boom Detail



Typical Abbreviations

LLV	[illegible]	SB	[illegible]
LLH	[illegible]	SBS	[illegible]
DA	[illegible]	MB	M[illegible]

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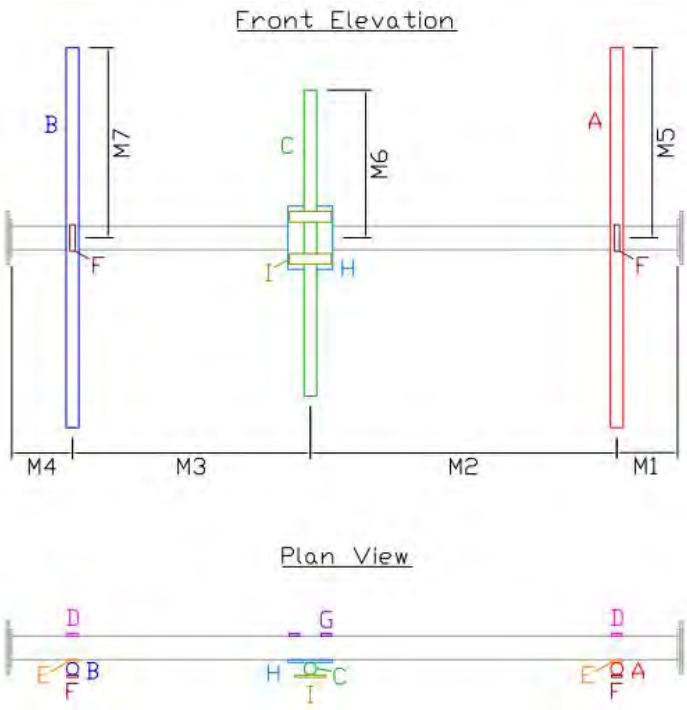
MOUNT MEMBER DETAILS

MOUNT 5 OF 5

	Member Size	Bolt Size
A	6'T/2.38"Dia.Pipe x.15"	
B	6'T/2.38"Dia.Pipe x.15"	
C	4'10"T/2.38"Dia.Pipe x.15"	
D	6"Tx2.50"Wx1"Flat	2-.50"
E	6"Tx2.50"Wx.40"Flat	2-.50"
F	5"Tx1"Wx.50"Flat	Welded
G	(2)-12"Tx2"Wx.50"Flat	2-.62"All-Thread
H	12"Tx8.50"Wx.40"Flat	4-.62"All-Thread
I	2"Tx8"Wx.40"Flat	2-.62"All-Thread
M1	11.50"	
M2	4'10"	
M3	3'9"	
M4	11.50"	
M5	3'	
M6	2'4"	
M7	3'	

Pipe Mount Detail



Typical Abbreviations

LLV	[illegible]	SB	[illegible]
LLH	[illegible]	SBS	[illegible]
DA	[illegible]	MB	[illegible]

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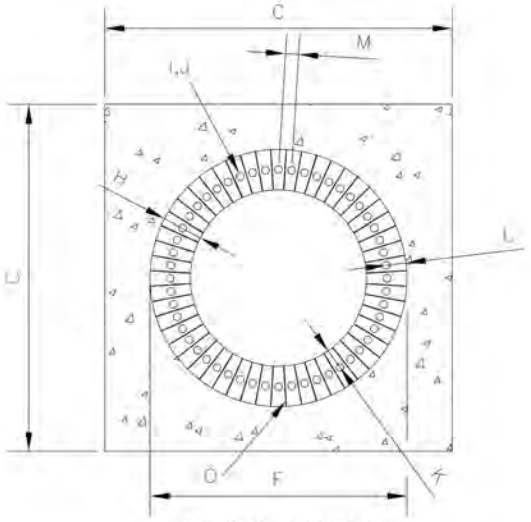
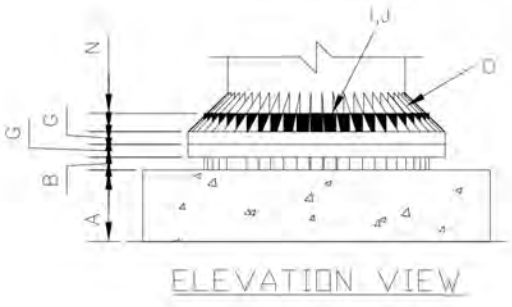
FOUNDATION AND BASE PLATE DETAILS

FOUNDATION DETAILS		
A	*A.G.L.*	8.50"
B	*GAP or Grout*	3.50"Gap
C	*Diameter or Circumference*	N/A
D	*Length of Sides*	4-8'
-	*General Condition*	Good
BASE PLATE DETAILS		
E	*Length Of Sides*	NA
F	*Diameter/ Circumference*	5'10"Dia.
G	*Plate Thickness*	1" / 1.25"
H	*Edge of Plate to Tower Leg*	5"
-	*Weld Height*	.46"
BOLT INFORMATION		
I	*Bolts (QTY/SIZE)*	52-1.25"
J	*Size of Nut*	1.96"
K	*Tower To Center of Bolt*	3.50"
L	*Edge of Plate to Center of Bolt*	1.50"
M	*Bolt to Bolt*	4"
N	*Bolt Projection*	9.50"
GUSSET INFORMATION		
O	*QTY/SIZE*	52/8"Tx4.50"Wx.62"





PICTURE #1 (CLOSE UP)

PICTURE #2 (PERPENDICULAR FROM #1)

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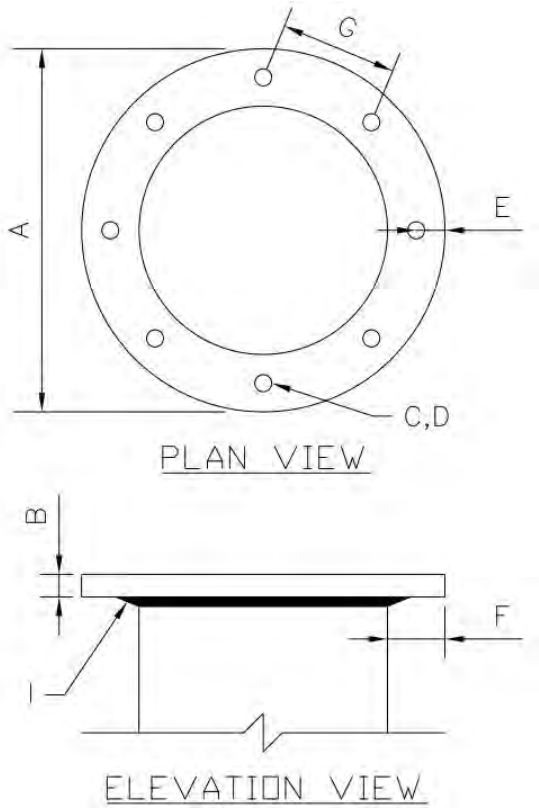
TOP FLANGE DETAILS

TOP FLANGE DETAILS		
A	*Length/Dia./ Circum.*	7'11.75"Cir.
B	*Thickness*	1"
C	*# of Holes and Hole Size*	8-1.15"
D	*# of bolts and bolt Dia.*	N/A
E	*Edge of Plate to Center of Hole*	1.50"
F	*Tower leg to plate edge*	Flush
G	*Hole To Hole Measurement*	8.50"
H	*Leg to Leg Measurement*	N/A
I	*Weld Size to Leg*	.84"
J	*Gussets Qty/Size*	N/A



PICTURE #1 (CLOSE UP)

PICTURE #2 (PERPENDICULAR FROM #1)

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SITE PICTURES

ENTERING COMPOUND


FOUNDATION


BASE PLATE


BASE PLATE

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UP NORTH FACE


COAX ROUTING TO SHELTER A


COAX ROUTING TO SHELTER A


COAX ROUTING TO SHELTER A

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COAX ROUTING TO SHELTER A

SHELTER A SIGN

SHELTER A

COAX ROUTING TO T-MOBILE

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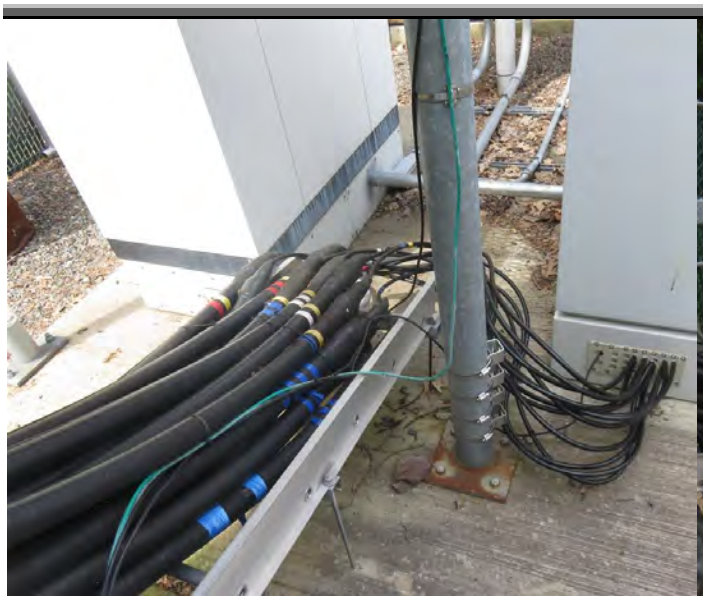
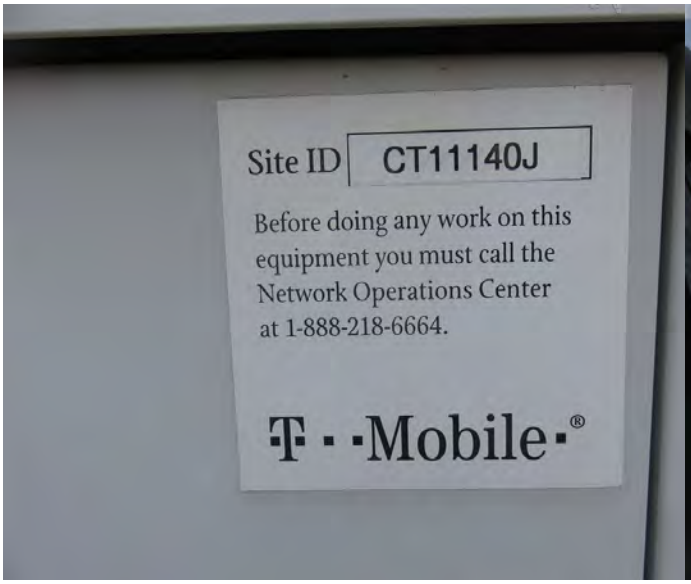


COAX ROUTING TO T-MOBILE

T-MOBILE CAB



T-MOBILE SIGN

UP EAST FACE

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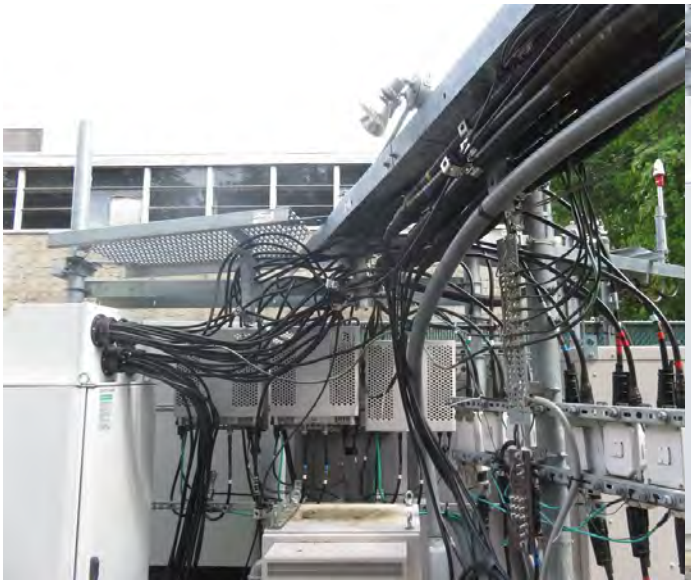
COAX ROUTING AT&T


COAX ROUTING AT&T


COAX ROUTING AT&T


COAX ROUTING AT&T

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AT&T CAB

AT&T CAB SIGN

UP SOUTH FACE

UP WEST FACE

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PORTHOLE 1


PORTHOLE 1


PORTHOLE 2


PORTHOLE 2

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FULL VIEW


BOTTOM HALF


TOP HALF


TOWER SECTION

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TOWER SECTION


TOWER SECTION

CALIBRATED ULTRASOUND


INSIDE TOWER JOINT 1

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INSIDE TOWER JOINT 2


INSIDE TOWER JOINT 2 MISSING BOLT


INSIDE TOWER JOINT 3


JOINT 1

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JOINT 2


JOINT 3


JOINT 4


JOINT 5

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JOINT 6


COMPOUND


COMPOUND


PORTHOLE 3

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JOINT 7


ANT 1


PORTHOLE 4


PORTHOLE 5

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PORTHOLE 6


PORTHOLE 7


ANT 2


ANT 3

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ANT 4

ANT 4 TAG

ANT 5

ANT 5 TAG

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ANT 6


JOINT 8


ANT 7

ANT 7 TAG

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ANT 8


ANT 9


ANT 9 TAG


ANT 10

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ANT 11

ANT 11 TAG

ANT 12

ANT 12 TAG

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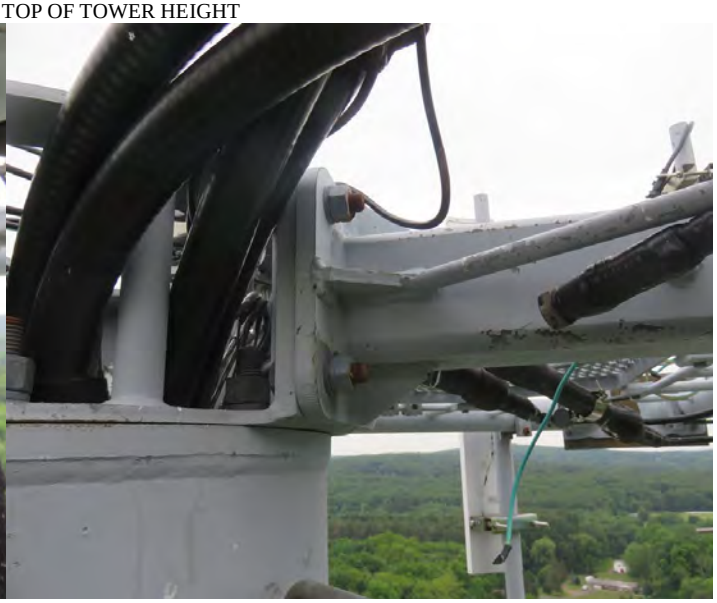
ANT 13 TAG

TOP OF TOWER HEIGHT

MOUNT HEIGHT


MOUNT STRUCTURE

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MOUNT STRUCTURE


TOP FLANGE


TOP FLANGE


MOUNT STRUCTURE

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MOUNT STRUCTURE

MOUNT STRUCTURE

ANT 14

ANT 14 TAG

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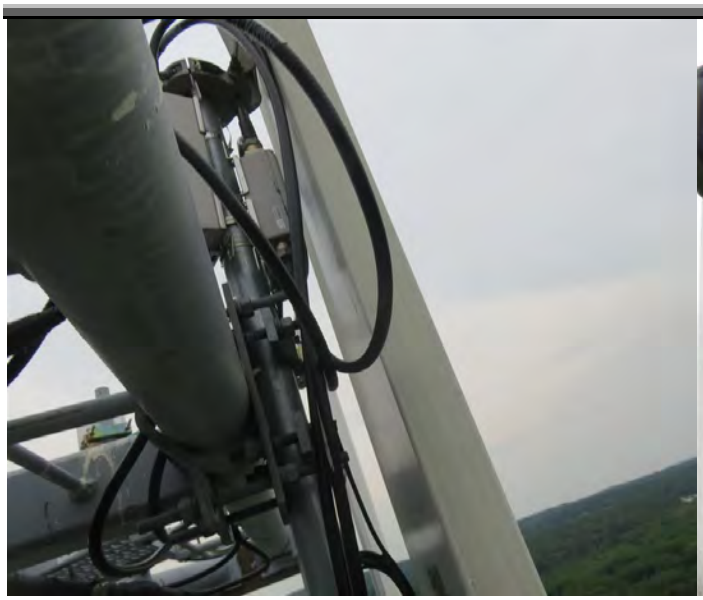
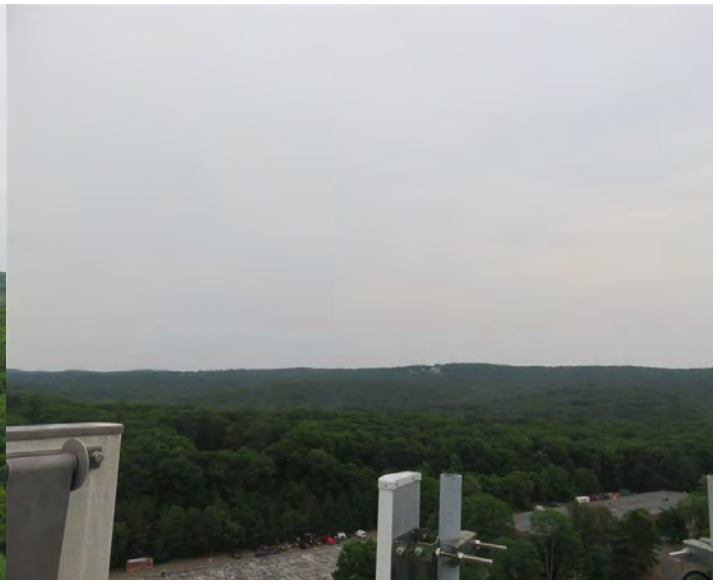


ANT 15

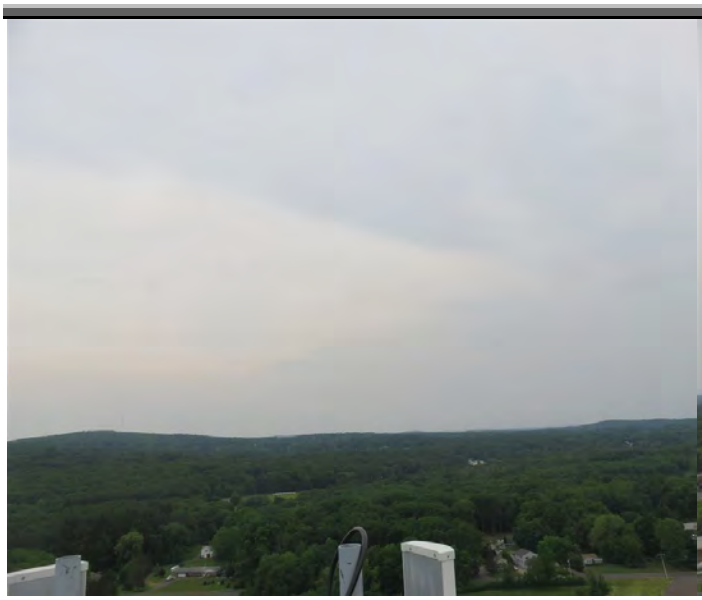
ANT 15 TAG

NORTH



EAST

reports@hightowersolutionsinc.com
HighTower Solutions Inc. 402-915-5337


SOUTH

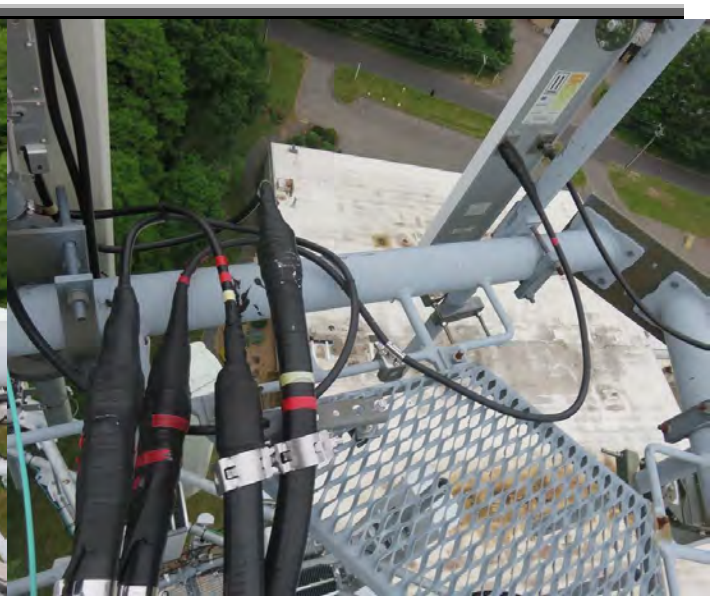

WEST

CENTER HEIGHT ANT 14

CENTER HEIGHT ANT 15

reports@hightowersolutionsinc.com
HighTower Solutions Inc. 402-915-5337

LEFT ALPHA



RIGHT ALPHA

LEFT BETA

RIGHT BETA

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LEFT GAMMA


RIGHT GAMMA


PORTHOLE 3


PORTHOLE 4

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PORTHOLE 5


PORTHOLE 6


PORTHOLE 7


ANT 1

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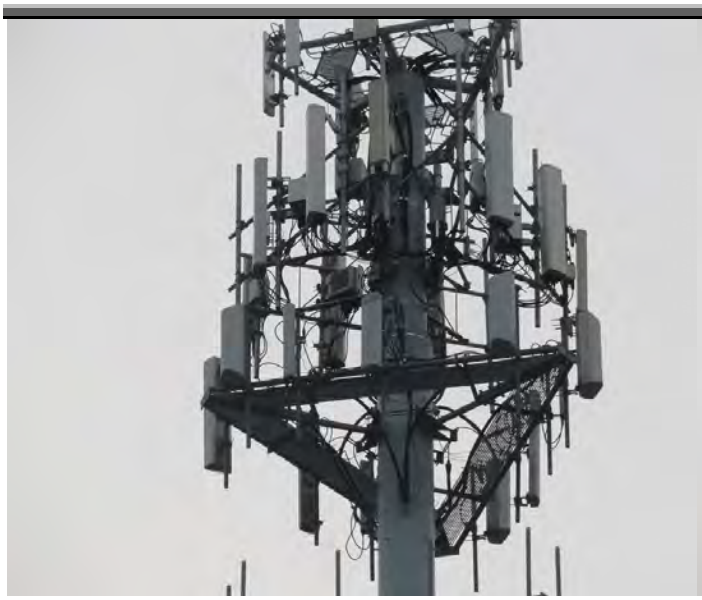
ANT 2


ANT 3


ANT 4


ANT 5

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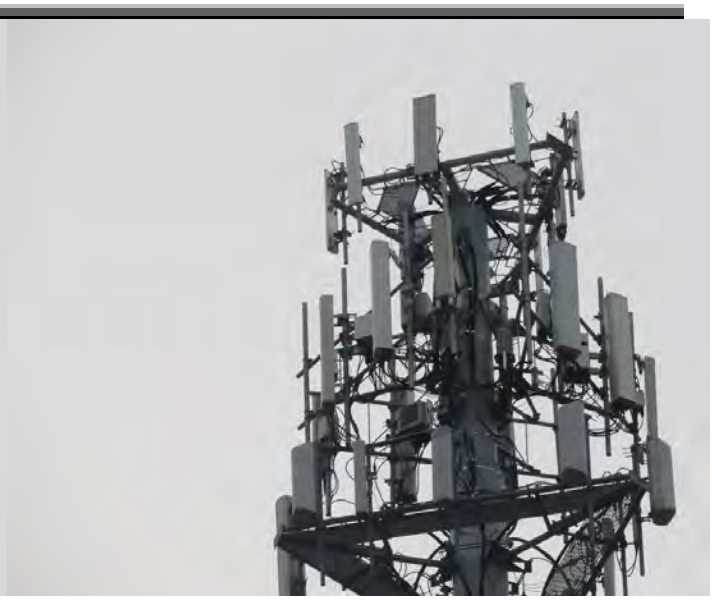
ANT 6


ANT 7


ANT 8


ANT 9

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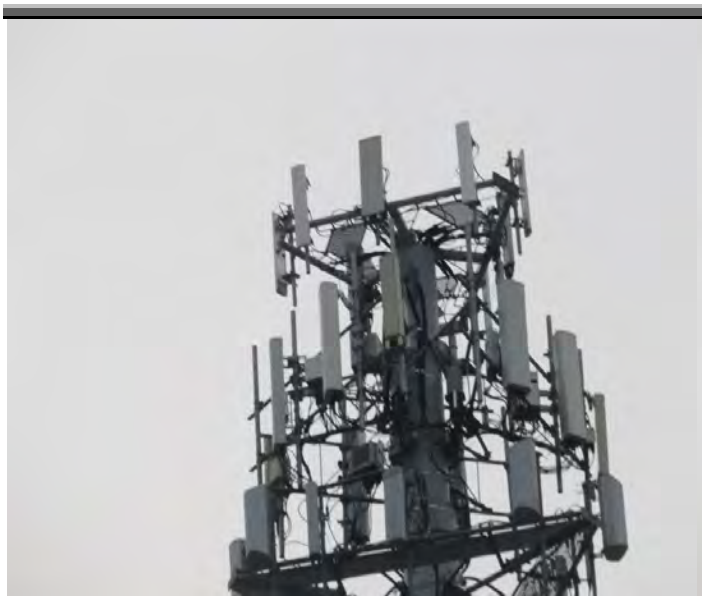
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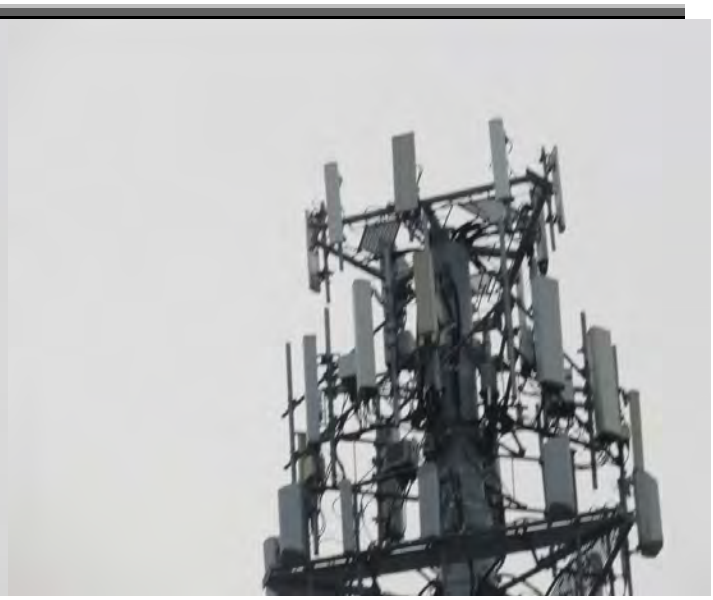
ANT 11


ANT 12


ANT 13

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ANT 14


ANT 15

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HighTower Solutions Inc. 402-915-5337

Exhibit F

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: CT11140J

Manchester/I-84 X63
60 Industrial Park Road
Vernon, Connecticut 06076

May 20, 2019

EBI Project Number: 6219001729

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**7.60%**

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

May 20, 2019

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

Emissions Analysis for Site: CT11140J - Manchester/I-84 X63

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **60 Industrial Park Road** in **Vernon, 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 60 Industrial Park Road in Vernon, 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) 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.

3) 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.

4) 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.

5) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) 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.

8) 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.

9) The antennas used in this modeling are the Ericsson AIR32 B66Aa/B2a for the 2100 MHz / 1900 MHz channel(s), the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector A, the Ericsson AIR32 B66Aa/B2a for the 2100 MHz / 1900 MHz channel(s), the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector B, the Ericsson AIR32 B66Aa/B2a for the 2100 MHz / 1900 MHz channel(s), the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz channel(s) in Sector C.

10) 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.

11) The antenna mounting height centerline of the proposed antennas is 178 feet 7 inches above ground level (AGL).

12) 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.

13) 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:	Ericsson AIR32 B66Aa/B2a	Make / Model:	Ericsson AIR32 B66Aa/B2a	Make / Model:	Ericsson AIR32 B66Aa/B2a
Frequency Bands:	2100 MHz / 1900 MHz	Frequency Bands:	2100 MHz / 1900 MHz	Frequency Bands:	2100 MHz / 1900 MHz
Gain:	15.85 dBd / 15.35 dBd	Gain:	15.85 dBd / 15.35 dBd	Gain:	15.85 dBd / 15.35 dBd
Height (AGL):	178 feet 7 inches	Height (AGL):	178 feet 7 inches	Height (AGL):	178 feet 7 inches
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	8,728.31	ERP (W):	8,728.31	ERP (W):	8,728.31
Antenna A1 MPE %:	**1.05%**	Antenna B1 MPE %:	**1.05%**	Antenna C1 MPE %:	**1.05%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
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 / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz
Gain:	15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd
Height (AGL):	178 feet 7 inches	Height (AGL):	178 feet 7 inches	Height (AGL):	178 feet 7 inches
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	180 Watts	Total TX Power (W):	180 Watts	Total TX Power (W):	180 Watts
ERP (W):	7,002.81	ERP (W):	7,002.81	ERP (W):	7,002.81
Antenna A2 MPE %:	**0.84%**	Antenna B2 MPE %:	**0.84%**	Antenna C2 MPE %:	**0.84%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz
Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd
Height (AGL):	178 feet 7 inches	Height (AGL):	178 feet 7 inches	Height (AGL):	178 feet 7 inches
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	2,481.08	ERP (W):	2,481.08	ERP (W):	2,481.08
Antenna A3 MPE %:	**0.69%**	Antenna B3 MPE %:	**0.69%**	Antenna C3 MPE %:	**0.69%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	2.58%
AT&T	2.53%
Verizon	2.19%
Nextel	0.3%
Site Total MPE % :	7.60%

T-Mobile Sector A Total:	2.58%
T-Mobile Sector B Total:	2.58%
T-Mobile Sector C Total:	2.58%
Site Total:	7.60%

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 2100 MHz LTE	2	2307.55	173.0	5.54	2100 MHz LTE	1000	0.55%
T-Mobile 1900 MHz LTE	2	2056.61	173.0	4.94	1900 MHz LTE	1000	0.49%
T-Mobile 1900 MHz GSM	4	1167.14	173.0	5.61	1900 MHz GSM	1000	0.56%
T-Mobile 2100 MHz UMTS	2	1167.14	173.0	2.80	2100 MHz UMTS	1000	0.28%
T-Mobile 600 MHz LTE	2	591.73	173.0	1.42	600 MHz LTE	400	0.36%
T-Mobile 700 MHz LTE	2	648.82	173.0	1.56	700 MHz LTE	467	0.33%
						Total:	**2.58%**

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:	2.58%
Sector B:	2.58%
Sector C:	2.58%
T-Mobile Maximum MPE % (Sector A):	2.58%
Site Total:	7.60%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.60%** 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.

Exhibit G

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MAYOR-TOWN OF VERNON
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C025

SHIP TO: ANDREW MARCHESE
ZONING ENFORCEMENT OFFICER-TOWN OF
55 W MAIN ST
VERNON CT 06066-3504

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Total	**$7.35**

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BLOOMFIELD CT 06002-1351

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Carrier -- Leave if No Response

R006

SHIP TO: GEORGE W BEAUREGARD
LILYMAXJACK,LLC
60 INDUSTRIAL PARK RD
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Ship Date:	07/20/2019
Expected Delivery Date:	07/22/2019

Priority Mail® Postage:	**$7.35**
Total	**$7.35**

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35 GRIFFIN RD S
BLOOMFIELD CT 06002-1351

Ref#: 140JZAP

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LILYMAXJACK,LLC
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DEBORAH CHASE
T-MOBILE USA- NSS
35 GRIFFIN RD S
BLOOMFIELD CT 06002-1351

Expected Delivery Date: 07/22/19
Ref#: 140JZAP

0024

Carrier -- Leave if No Response

B025

SHIP TO: CHRIS HACK
MILLINICOM C/O MARCUS COMMUNICATIONS
PO BOX 1498
MANCHESTER CT 06045-1498

USPS TRACKING #

9405 5036 9930 0063 4893 46

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Trans. #:	468602455
Print Date:	07/19/2019
Ship Date:	07/20/2019
Expected Delivery Date:	07/22/2019

Priority Mail® Postage:	**$7.35**
Total	**$7.35**

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BLOOMFIELD CT 06002-1351

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