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
3965 Congress Street, Fairfield CT 06824
Latitude: 41. 1883470
Longitude: -73.2990760
T-Mobile Site#: CT11077C-L600

Dear Ms. Bachman:

T-Mobile is requesting to file an exempt modification for an existing 150-foot monopole tower located at 3965 Congress Street, Fairfield CT 06824. T-Mobile currently has three (3) antennas at the 116-foot level of the existing 150-foot tower. The tower and property are owned by The Town of Fairfield. T-Mobile now intends to replace three (3) antenna with three (3) new 1900/2100 MHz antenna and add three (3) new 600/700 MHz antenna. The new antenna would be installed at the 116-foot and level of the tower.

Planned Tower Modifications:
Remove: N/A

Remove and Replace:
(3) APX16DWV Antenna (**REMOVE)** – AIR32 B66A B2A Antenna 1900/2100 MHz **(REPLACE)**

Install New:
(2)Fiber line
(3) RRU 4449 B71+B12
(3) APXAARR24_43U-NA20 Antenna 600/700 MHz
Handrail Kit (SITEPRO01)

Existing to Remain:
(12) 1-1/4" coax
(6) Twin TMA

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

This facility was approved by the Town of Fairfield P&Z on May 25, 1994. 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 First Selectman Michael C. Tetreau, Elected Official and Jim Wendt, Planning Director for the Town of Fairfield, as well as the property owner and the tower owner (Town of Fairfield).

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:
First Selectman Michael C. Tetreau
Sullivan Independence Hall
725 Old Post Road
Fairfield CT 06824

Sullivan Independence Hall
725 Old Post Road
Fairfield CT 06824
Attn: Jim Wendt
Planning Director

Exhibit A

Return

Town of Fairfield

Town Planning and Zoning Department

Zonning Compliance Permit

Hse Num: 3965 **Street:** Congress Street **Map:** 170 **Parcel:** 41 - ____ **Unit:** 0000 **Permit #** 23333

Zone: AAA **FIRM:** ____ **Date:** 05/25/1994 **Occupancy/Use:** per plans **Receipt #** 0

State Fee: $30.00

Description: 10' x 30' equipment shelter + 150' antenna Town Fee: $50.00

Applicant: Fairfield Town Of Total: $80.00

Print Date: 07/16/2019

Return

Town of Fairfield

Town Planning and Zoning Department

Zonning Compliance Permit

Hse Num: 3965 **Street:** Congress Street **Map:** 170 **Parcel:** 41 - ____ **Unit:** 0000 **Permit #** 26289

Zone: AAA **FIRM:** ____ **Date:** 05/27/1998 **Occupancy/Use:** per plans **Receipt #** 0

Description: 9 1/2' x 11' concrete equipment pad & 9 new antennas on exist pole

Applicant: Town of Fairfield

State Fee: $30.00

Town Fee: $50.00

Total: $80.00

Print Date: 07/16/2019

Exhibit B

3965 CONGRESS STREET

Location	3965 CONGRESS STREET	**Mblu**	170/ 41/ / /
Acct#	05308	**Owner**	FAIRFIELD TOWN OF
Assessment	$939,330	**Appraisal**	$1,341,900
PID	14189	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$508,400	$833,500	$1,341,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$355,880	$583,450	$939,330

Owner of Record

Owner	FAIRFIELD TOWN OF	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	725 OLD POST ROAD FAIRFIELD, CT 06824	**Book & Page**	395/ 523
		Sale Date	

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
FAIRFIELD TOWN OF	$0		395/ 523	

Building Information

Building 1 : Section 1

Year Built:	1959
Living Area:	3,848
Replacement Cost:	$670,756
Building Percent Good:	60
Replacement Cost Less Depreciation:	$402,500

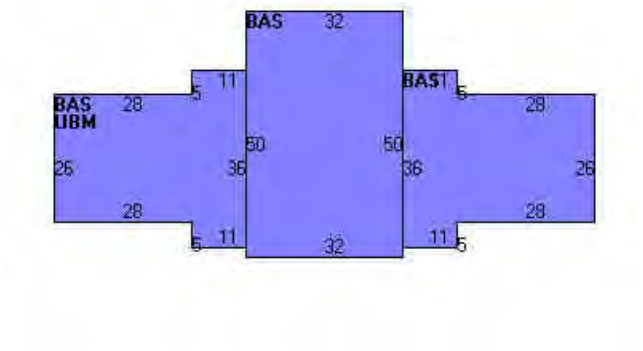
Building Attributes	
Field	**Description**

STYLE	Fire Station
MODEL	Ind/Comm
Stories:	1
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	Brick/Masonry
Roof Structure	Gable/Hip
Roof Cover	Asphalt
Interior Wall 1	Minim/Masonry
Interior Wall 2	Plywood Panel
Interior Floor 1	Concr-Finished
Interior Floor 2	Vinyl/Asphalt
Heating Fuel	Gas
Heating Type	Hot Water
AC Type	None
Bldg Use	Fire Dept
Total Rooms	
Total Bedrms	00
Total Baths	0
Liv Area	
Effect Area	
1st Floor Use:	9032
Heat/AC	None
Frame Type	Masonry
Baths/Plumbing	Average

Building Photo

(http://images.vgsi.com/photos2/FairfieldCTPhotos//\02\03\13/9

Building Layout



(http://images.vgsi.com/photos2/FairfieldCTPhotos//Sketches/14

Building Sub-Areas (sq ft)			
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	3,848	3,848
UBM	Basement, Unfinished	1,124	0
		4,972	3,848

Extra Features

Extra Features				
Code	**Description**	**Size**	**Value**	**Bldg #**
SPR1	SPRINKLERS-WET	4972 S.F.	$6,900	1

Land

Land Use

Use Code	9032
Description	Fire Dept

Land Line Valuation

Size (Acres)	1.2
Depth	0

Zone		**Assessed Value**	$583,450
Neighborhood	C6	**Appraised Value**	$833,500
Alt Land Appr	No		
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	PAVING-ASPHALT			5000 S.F.	$15,800	1
LT1	LIGHTS-IN W/PL			1 UNITS	$700	1
SHD2	W/LIGHTS ETC			80 S.F.	$1,200	1
GEN1	GENERATOR			1 UNITS	$10,000	1
SHD5	CELL SHED			300 SF	$16,200	1
SHD5	CELL SHED			300 SF	$16,200	1
SHD5	CELL SHED			300 SF	$16,200	1
SHD5	CELL SHED			300 SF	$16,200	1
FN4	FENCE-8' CHAIN			600 L.F.	$6,500	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$508,400	$833,500	$1,341,900
2017	$508,400	$833,500	$1,341,900
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Assessment			
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2016	$355,880	$583,450	$939,330


4009
1700400000
DOUGLAS MARY O/EST C/O PETER D DOUGLAS
4009 CONGRESS STREET
3958
1700160000
JOHNSON TIMOTH
3958 CONGRESS ST
CONGRESS ST
7109-00
Fairfield Fire Department Station 5
3965
1700410000
FAIRFIELD TOWN OF
3965 CONGRESS STREET
170039A0000
O'HARA MARGARET
03 CROSS HIGHWAY
1700420000
3931 CONGRESS LLC
3931 CONGRESS STREET

Exhibit C

T-Mobile

NORTHEAST, LLC.

PROJECT: L600

SITE I.D. NUMBER:

CT11077C

SITE NAME:

FAIRFIELD FIRE RESCUE #5

SITE ADDRESS:

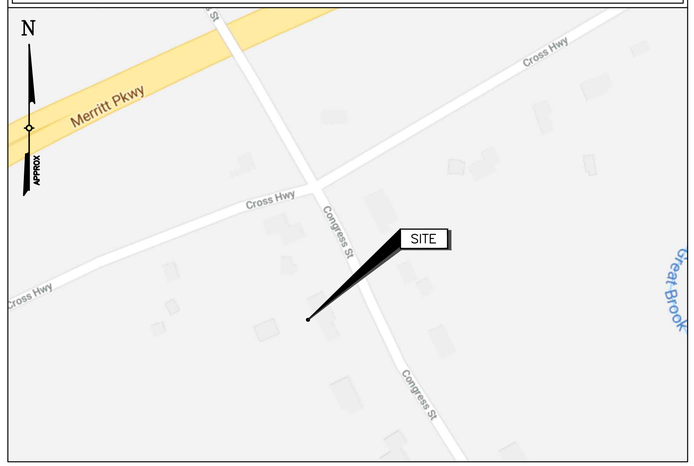
3965 CONGRESS STREET
FAIRFIELD, CT 06824

PROJECT INDEX

SITE NUMBER:	CT11077C
SITE NAME:	FAIRFIELD FIRE RESCUE #5
SITE ADDRESS:	3965 CONGRESS STREET FAIRFIELD COUNTY FAIRFIELD, CT 06824
PROPERTY OWNER:	TOWN OF FAIRFIELD 725 OLD POST ROAD FAIRFIELD, CT 06824
APPLICANT:	T-MOBILE NORTHEAST LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
STRUCTURE TYPE:	MONOPOLE
LATTITUDE (NAD83):	41.1883470° N
LONGITUDE (NAD83):	73.2990760° W
GRADE ELEVATION:	277' (AMSL, PER GOOGLE MAPS)

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)



SHEET INDEX

SHEET NO	DESCRIPTION	REVISION	DATE
T-1	TITLE SHEET	1	07/22/19
A-1	SITE PLAN & T-MOBILE EQUIPMENT PLAN	1	07/22/19
A-2	MONOPOLE ELEVATION	1	07/22/19
A-3	EXIST/NEW T-MOBILE ANTENNA PLANS & ANTENNA SCHEDULE	1	07/22/19
A-4	DETAILS & ANTENNA SCHEMATIC	1	07/22/19
A-5	NOTES	1	07/22/19
E-1	ELECTRICAL NOTES & ONE-LINE DIAGRAM	1	07/22/19
G-1	GROUNDING DETAILS & NOTES	1	07/22/19

CODE COMPLIANCE

CODE INFORMATION

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

RFDS DESIGN

DESIGN BASED ON RFDS DATED 07/18/2019, VERSION 5.2.

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 16, 2019.

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

STATE OF CONNECTICUT · EDWARD N. IAMICELI · 26473 · LICENSED PROFESSIONAL ENGINEER

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70 Pleasant Hill Road
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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.CT11077C	JV

REV.	DATE	DESCRIPTION	DRAWN BY
0	07/19/19	ISSUED FOR CONSTRUCTION	BWY
1	07/22/19	REVISED PER COMMENTS	MB

ISSUED BY	DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

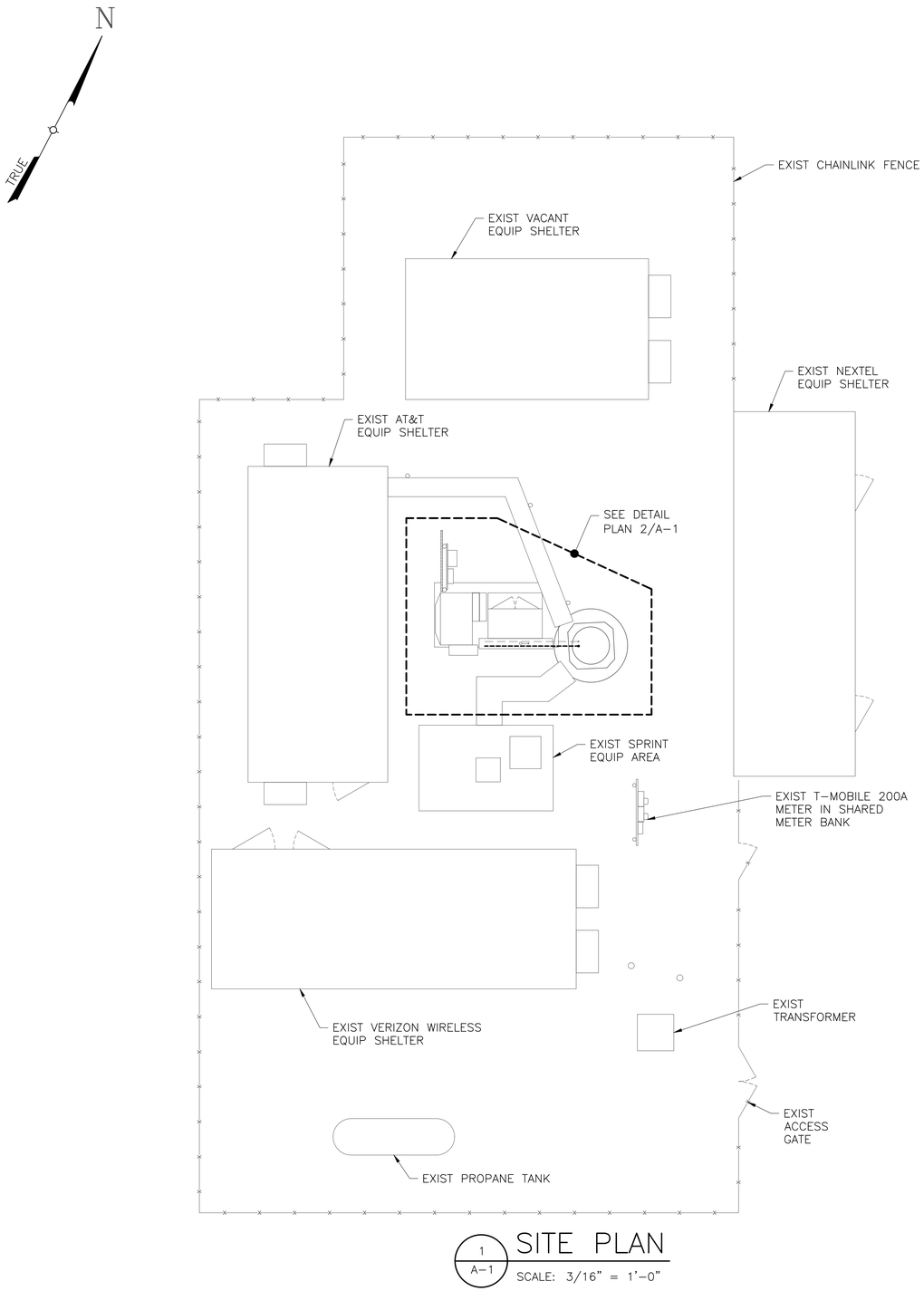
FAIRFIELD FIRE RESCUE #5
CT11077C
3965 CONGRESS STREET
FAIRFIELD COUNTY
FAIRFIELD, CT
06824

SHEET TITLE

TITLE SHEET

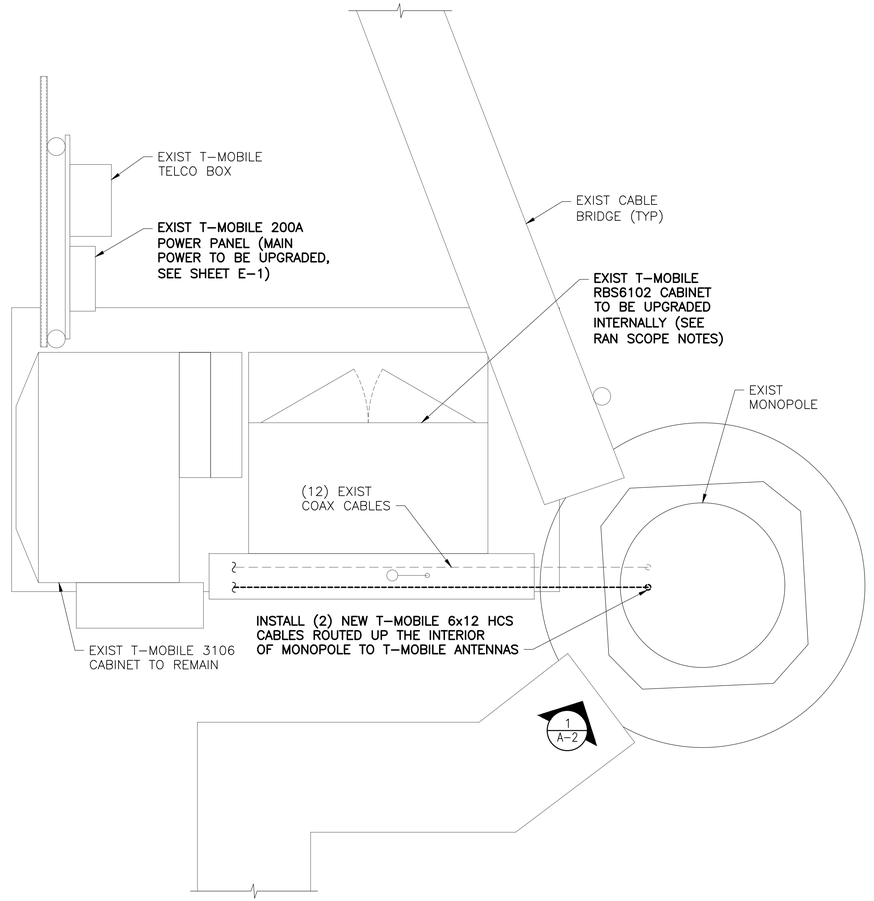
SHEET NUMBER

T-1



1 / A-1 SITE PLAN

SCALE: 3/16" = 1'-0"



2 / A-1 T-MOBILE EQUIPMENT AREA PLAN

SCALE: 3/4" = 1'-0"

RAN SCOPE NOTES

1. REPLACE (1) DUS41 WITH (1) BB6630 FOR LTE.
2. INSTALL (1) BB630 FOR FUTURE 5G N600.
3. ADD (2) 6x12 HCS
4. EXIST (12) 1-2/8" COAX CABLES
5. REMOVE BATTERIES FROM CABINET
6. ADD (1) BBU.

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ISSUED BY _____ DATE _____

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

FAIRFIELD FIRE RESCUE #5
CT11077C
3965 CONGRESS STREET
FAIRFIELD COUNTY
FAIRFIELD, CT
06824

SHEET TITLE

SITE PLAN & T-MOBILE EQUIPMENT AREA PLAN

SHEET NUMBER

A-1

STRUCTURAL NOTE:
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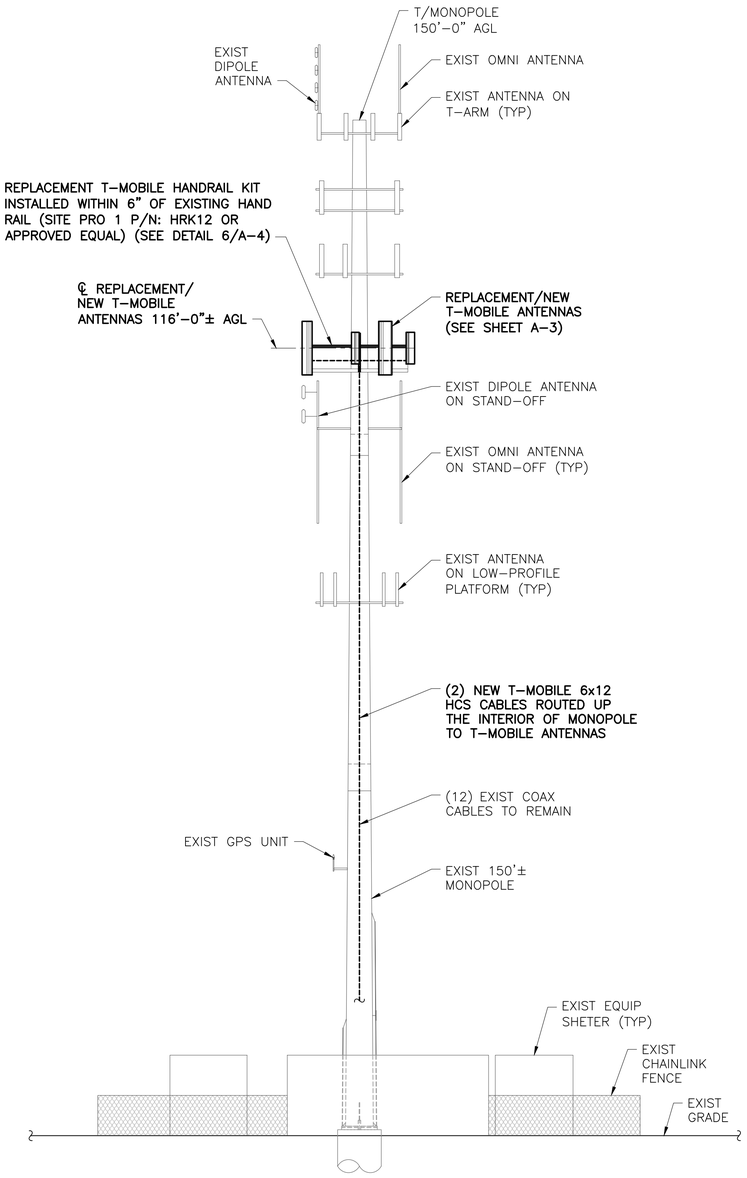

NOTE: NOT ALL SITE FEATURES SHOWN FOR CLARITY.

1
A-2
MONOPOLE ELEVATION
SCALE: 3/32" = 1'-0"

STATE OF CONNECTICUT
EDWARD V. IANNICELLI
26473
LICENSED
PROFESSIONAL ENGINEER

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ISSUED BY | DATE

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ORIGINAL SIZE IN INCHES

SITE INFORMATION

FAIRFIELD FIRE RESCUE #5
CT11077C
3965 CONGRESS STREET
FAIRFIELD COUNTY
FAIRFIELD, CT
06824

SHEET TITLE

MONOPOLE
ELEVATION

SHEET NUMBER

A-2

ANTENNA AND COAXIAL 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	ERICSSON AIR32 B66A/B2A	150°	6°	0°	116'–0"±	LEFT ALPHA	REPLACED	0/0	NEW 6x12 HCS	FIBER	160'–0"
A–2 LTE/GSM/UMTS	RFS APXVAARR24–43–U–NA20	150°	6°	0°	116'–0"±	RIGHT ALPHA	NEW	2/1	NEW 6x12 HCS & (4) EXIST 1 5/8" COAX	FIBER	160'–0"
										COAX	160'–0"
B–1 LTE	ERICSSON AIR32 B66A/B2A	240°	5°	0°	116'–0"±	LEFT BETA	REPLACED	0/0	NEW 6x12 HCS	FIBER	160'–0"
										FIBER	160'–0"
B–2 LTE/GSM/UMTS	RFS APXVAARR24–43–U–NA20	240°	5°	0°	116'–0"±	RIGHT BETA	NEW	2/1	NEW 6x12 HCS & (4) EXIST 1 5/8" COAX	FIBER	160'–0"
										COAX	160'–0"
C–1 LTE	ERICSSON AIR32 B66A/B2A	320°	4°	0°	116'–0"±	LEFT GAMMA	REPLACED	0/0	NEW 6x12 HCS	FIBER	160'–0"
										FIBER	160'–0"
C–2 LTE/GSM/UMTS	RFS APXVAARR24–43–U–NA20	320°	4°	0°	116'–0"±	RIGHT GAMMA	NEW	2/1	NEW 6x12 HCS & (4) EXIST 1 5/8" COAX	FIBER	160'–0"
										COAX	160'–0"

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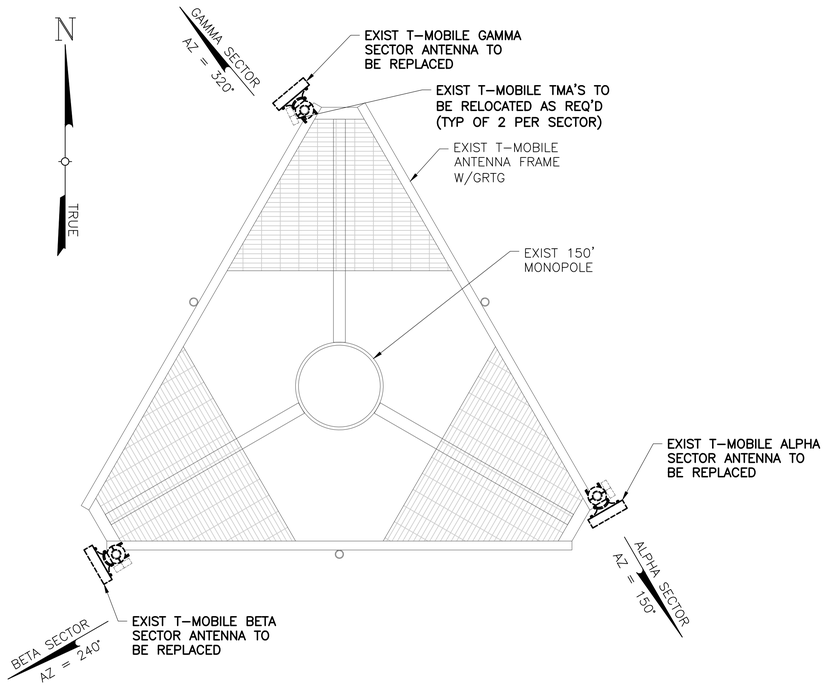
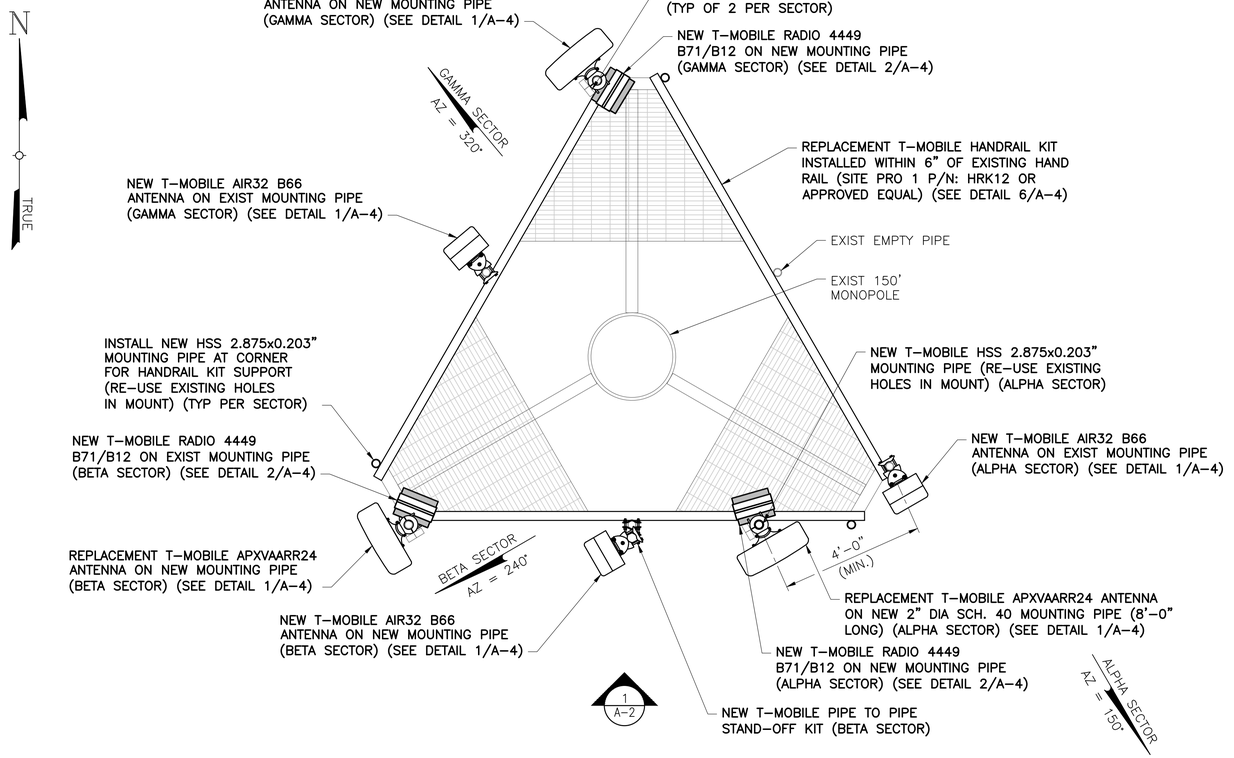


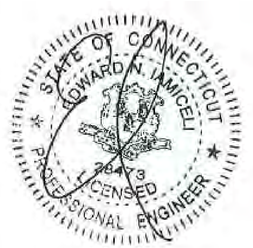
1 A–3 EXISTING T–MOBILE ANTENNA PLAN

SCALE: 1/2" = 1'–0"



2 A–3 NEW T–MOBILE ANTENNA PLAN

SCALE: 1/2" = 1'–0"



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ISSUED BY _____ DATE _____

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

FAIRFIELD FIRE RESCUE #5
CT11077C
3965 CONGRESS STREET
FAIRFIELD COUNTY
FAIRFIELD, CT
06824

SHEET TITLE

EXISTING/NEW
T–MOBILE ANTENNA PLANS
& ANTENNA SCHEDULE

SHEET NUMBER

A–3

STRUCTURAL NOTE:
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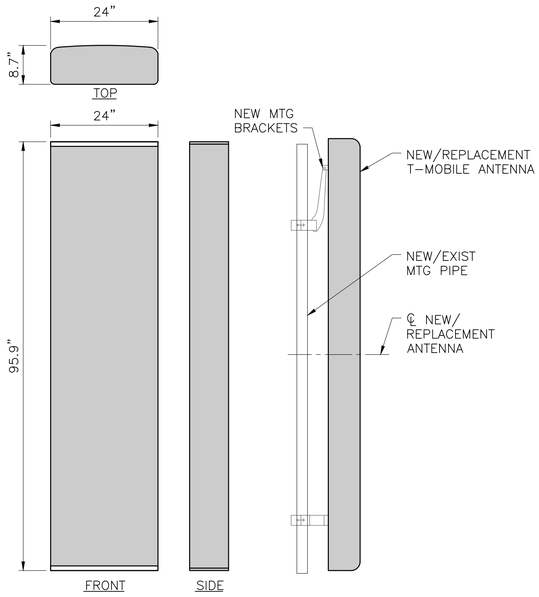
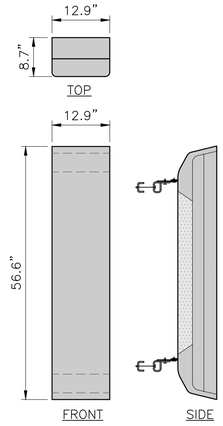
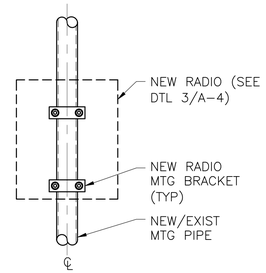


RFS: APXVAARR24_43_U_NA20
WEIGHT: 128 LBS

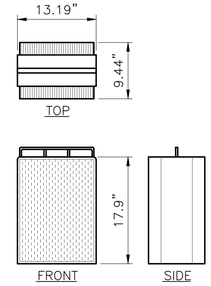


AIR32 DUAL BAND (DB) B66Aa/B2a
WEIGHT: 132.2 LBS



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

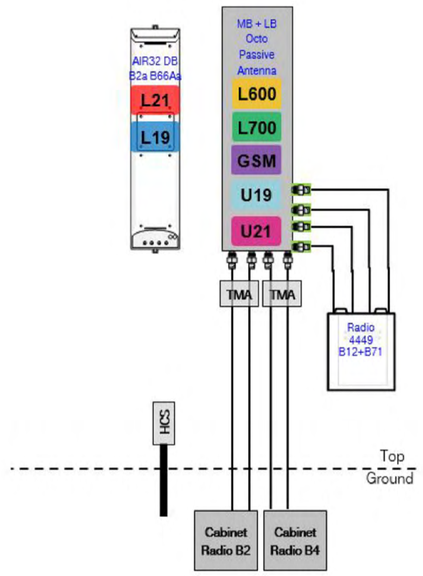
2 A-4 RADIO MOUNTING DETAIL
SCALE: 1" = 1'-0"



RRUS-4449 B71+B12
WEIGHT: 71.0 LBS

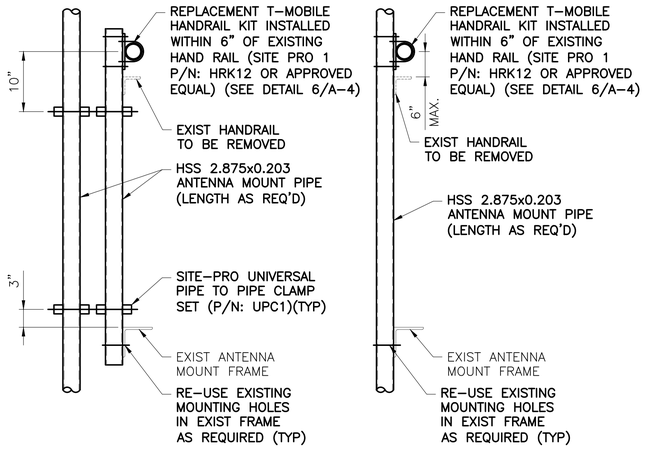
3 A-4 RADIO DETAIL
SCALE: 1" = 1'-0"

1 A-4 ANTENNA DETAILS
SCALE: 3/4" = 1'-0"



TYP ALL SECTORS

4 A-4 ANTENNA SCHEMATIC
SCALE: NTS

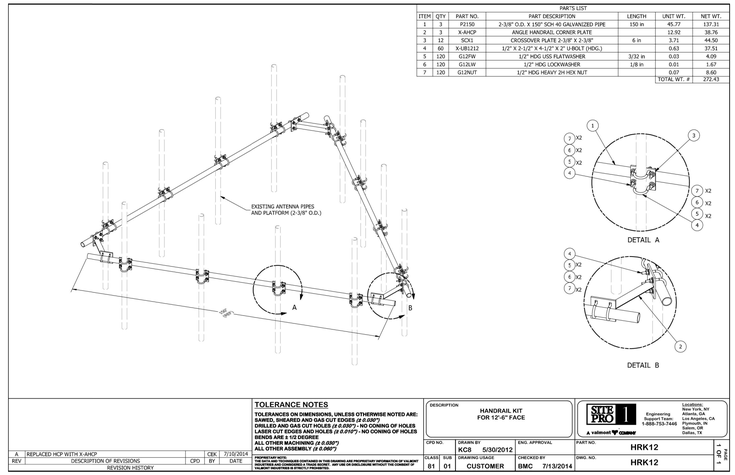


NEW ANTENNA PIPE TO PIPE MOUNT ATTACHED TO EXISTING ANTENNA MOUNT FRAME

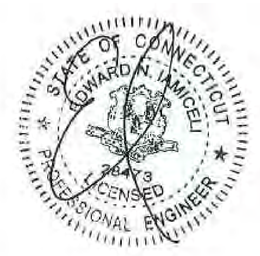
NEW ANTENNA MOUNT PIPE ATTACHED TO EXISTING ANTENNA MOUNT FRAME

NOTES:
1. PANEL ANTENNAS AND ASSOCIATED EQUIPMENT AND CABLES NOT SHOWN FOR CLARITY.
2. EXISTING HAND RAIL TO BE REMOVED ONCE NEW HANDRAIL KIT HAS BEEN INSTALLED

5 A-4 ANTENNA MOUNT DETAILS
SCALE: 1" = 1'-0"



6 A-4 HANDRAIL KIT DETAIL
SCALE: NTS



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APPROVALS

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

PROJECT NUMBER	DESIGNED BY
9927.CT11077C	JV

REV.	DATE	DESCRIPTION	DRAWN BY
2	07/19/19	ISSUED FOR CONSTRUCTION	BWY
1	07/22/19	REVISED PER COMMENTS	MB

ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

FAIRFIELD FIRE RESCUE #5
CT11077C
3965 CONGRESS STREET
FAIRFIELD COUNTY
FAIRFIELD, CT
06824

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.

STATE OF CONNECTICUT
EDWARD N. LAMICELI
28473
PROFESSIONAL ENGINEER
LICENSED

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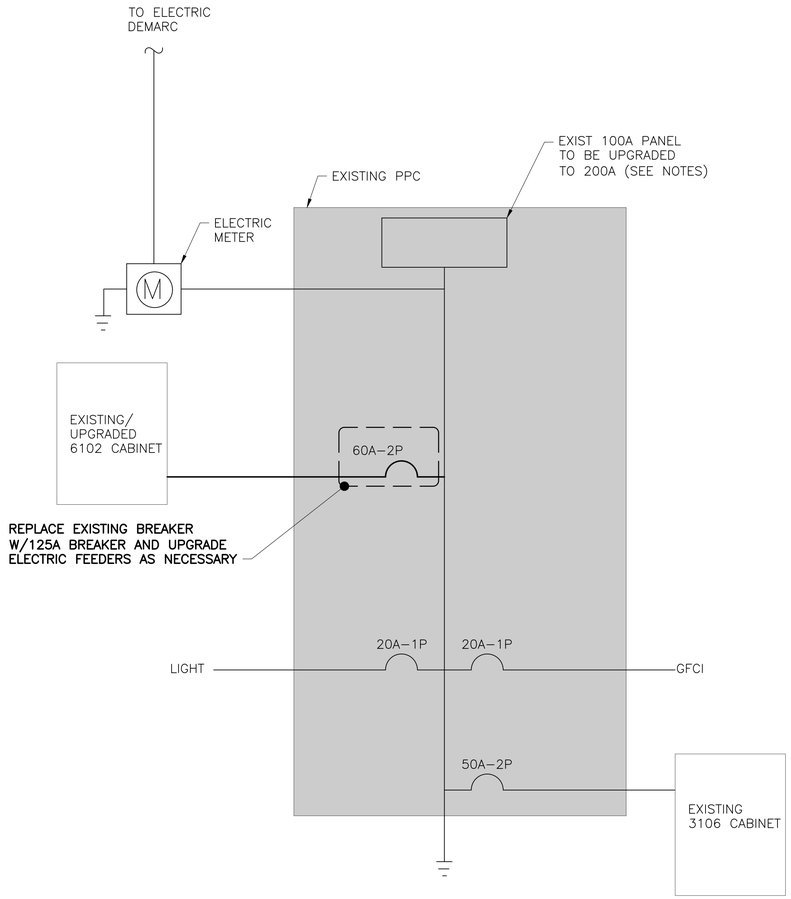

NOTES:
1. THE ABOVE DIAGRAM IS GENERIC AND ANY ELECTRICAL WORK SHALL BE COMPLETED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH NEC STANDARDS.
2. ELECTRICAL IS REQUIRED TO BE UPGRADED TO 200A PANEL. ELECTRICAL CONSULT SHALL BE PERFORMED TO CONSTRUCTION. ADDITIONAL TRENCHING AND CONSTRUCTION MAY BE REQUIRED FOR UPGRADE.

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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OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11077C	JV

REV.	DATE	DESCRIPTION	DRAWN BY
0	07/19/19	ISSUED FOR CONSTRUCTION	BWY
1	07/22/19	REVISED PER COMMENTS	MB

ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

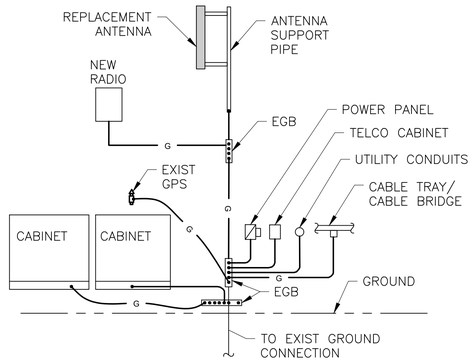
FAIRFIELD FIRE RESCUE #5
CT11077C
3965 CONGRESS STREET
FAIRFIELD COUNTY
FAIRFIELD, CT
06824

SHEET TITLE

ELECTRICAL NOTES
& ONE–LINE DIAGRAM

SHEET NUMBER

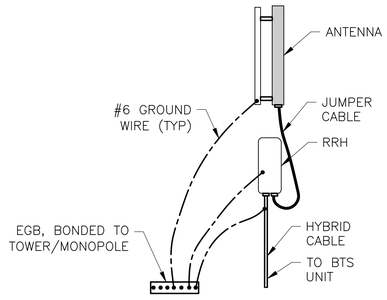
E–1



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

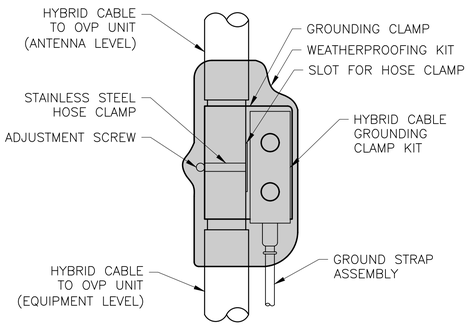
1 / G-1 GROUNDING RISER DIAGRAM

SCALE: NTS



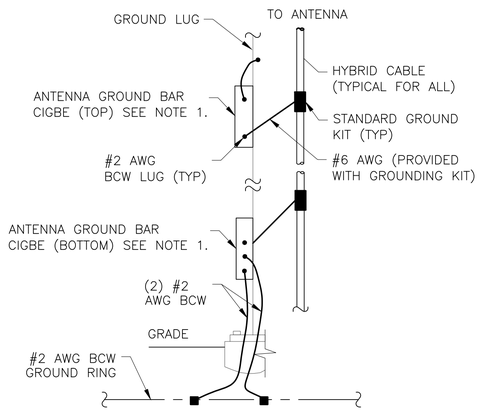
2 / G-1 HYBRID CABLE CONNECTIOND DETAIL

SCALE: NTS



3 / G-1 HYBRID CABLE GROUNDING DETAIL

SCALE: NTS

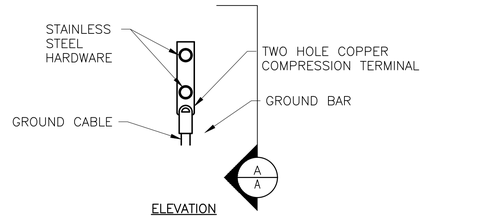


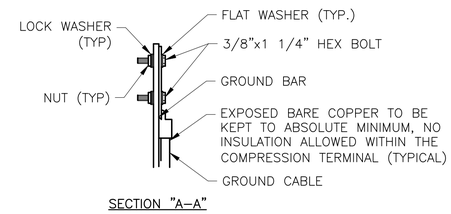
NOTES:

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:

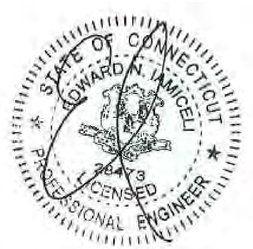
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.
4. ALL GROUND LUGS MUST NE HEAT SHRUNK AT WIRE/LUG CONNECTION.

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.



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.CT11077C	JV

REV.	DATE	DESCRIPTION	DRAWN BY
0	07/19/19	ISSUED FOR CONSTRUCTION	BWY
1	07/22/19	REVISED PER COMMENTS	MB

ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

FAIRFIELD FIRE RESCUE #5
CT11077C
3965 CONGRESS STREET
FAIRFIELD COUNTY
FAIRFIELD, CT
06824

SHEET TITLE

GROUNDING DETAILS & NOTES

SHEET NUMBER

G-1

Exhibit D

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

STRUCTURAL ANALYSIS REPORT

TECTONIC WORK ORDER #:	9927.CT11077C
PROJECT SCOPE OF WORK:	T-MOBILE "L600 SCOPE"
SITE TYPE:	ANTENNA MOUNT ON 150' MONOPOLE
DATE:	July 22, 2019
REVISION #:	2
SITE ID #:	CT11077C
SITE NAME:	FAIRFIELD FIRE RESCUE #5
SITE ADDRESS:	3965 CONGRESS STREET, FAIRFIELD, CT 06824
PREPARED FOR:	NORTHEAST SITE SOLUTIONS

☐ PASS ☒ PASS WITH MODS ☐ FAIL

99% UTILIZATION

APPROVED BY: _____

EDWARD N. IAMICELI, P.E.

Tectonic Engineering & Surveying Consultants P.C.

1279 Route 300 | Newburgh, NY 12550
845.567.6656 Tel | 845.567.8703 Fax

tectonicengineering.com
Equal Opportunity Employer

dba, Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road, PO Box 37 | Mountainville, NY 10953

STRUCTURAL ANALYSIS REPORT

Project Information

W.O. Number:	9927.CT11077C	Report Date:	7/22/19
Client:	T-Mobile / Northeast Site Solutions	Revision:	2
Site Name:	Fairfield Fire Rescue #5		
Owner:	Town of Fairfield		
Address:	3965 Congress Street	FCC Registration Number:	-
City, State, Zip:	Fairfield, CT 06824	County:	Fairfield

Structure Information

Structure Type:	Monopole	Manufacturer:	Valmont
Structure Height:	150 ft	Year Built:	1994

Original Drawings: Structure: No Foundation: No

Previous Analysis: Yes

Documents provided:

Item	By	No.	Date
Original Tower and Foundation Design Report	Paul J. Ford & Company	31298-044 R2	12/16/98
Antenna/Coax Verification & Mount Mapping Report	Hightower Solutions	CT11077C	6/6/19
RFDS	T-Mobile	CT11077C	7/18/19
Construction Drawings Rev 1	Tectonic Engineering	9927.CT11077C	7/22/19

Inspection

Type: Limited visual inspection from ground. Date: 5/15/19
Tower Climb 6/4/19

General Condition:
Tower: Good
Foundation: Good

Observations: None

Finish: Galvanized Condition: Intact

Existing T-Mobile Installation

Antennas:

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

Cables:

Height (ft.)	Qty	Nom. Size	Location/Support
116	12	1-1/4" Coax	Existing to remain along the exterior of the pole

Proposed T-Mobile Installation

T-Mobile is proposing to replace all three (3) 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
116	T-Mobile	**3**	**Ericsson**	**AIR32 KRD901146-1_B66A_B2A**	Existing Low-Profile Platform **w/ Handrail Kit (SitePro1 HRK12 or approved equal)**	Face A, B, and C
		6	-	Twin Style TMA		
		3	**RFS**	**APXVAARR24_43-U-NA20**		
		3	**Ericsson**	**RRU 4449 B71+B12**		

Cables:

Height (ft.)	Qty	Nom. Size	Location/Support
116	12	1-1/4" Coax	Existing to remain along the exterior of the pole
116	**2**	**6x12 Hybriflex**	**Proposed to be routed along the exterior of the pole**

STRUCTURAL ANALYSIS REPORT (CONT.)

W.O. Number:	9927.CT11077C	Report Date:	7/22/2019
Client:	T-Mobile / Northeast Site Solutions	Revision:	2
Site Name:	Fairfield Fire Rescue #5		

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 C 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: C
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 slip jointed splices were assembled in accordance with the manufacturer's specs.
3. The tower and foundation have been properly maintained in accordance with industry standards.
4. The tower is considered to be used for non-emergency services and therefore, structure class II has been used for the analysis.
5. The weight and wind area of certain appurtenances have been estimated.
6. The existing tower modifications have been installed in accordance with the original design drawings. The connections have been adequately designed to develop the full capacity of the reinforcing members.
7. The foundation geometry and geotechnical values are based solely on the previous analysis report by Paul J. Ford & Company, referenced above.

Analysis Results

Tower Members:

Element	% Usage
Pole Shaft	84
Pole Reinforcement	99
Anchor Bolts	93
Base Plate	62
Base Foundation	90
Base Foundation Soil Interaction	54
Low-Profile Platform	84
Platform Connections	51

Service Load Deformations (Max):

Type	Actual	Allowable	% of Allowable
Tower Horizontal (in)	23.21	54.00	43%
Twist & Sway (deg):	1.24	4.00	31%

Foundation Reactions (Envelope)

Axial	59	kips
Shear	51	kips
Moment	4640	k-ft

For detailed information, see the attached tnxTower output.

Conclusions

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

The existing low-profile platform and its connections **will have adequate capacity** to support the proposed T-Mobile installation as described herein in accordance with current code requirements. **In order for the results of this analysis to be valid, a handrail kit (SitePro1 #HRK12, or approved equal) and new HSS2.875x0.203 corner mounting pipes must be installed prior to the installation of the proposed equipment. See Construction Drawings by Tectonic for more details.**

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: Ian Marinaccio, EIT
Project Engineer

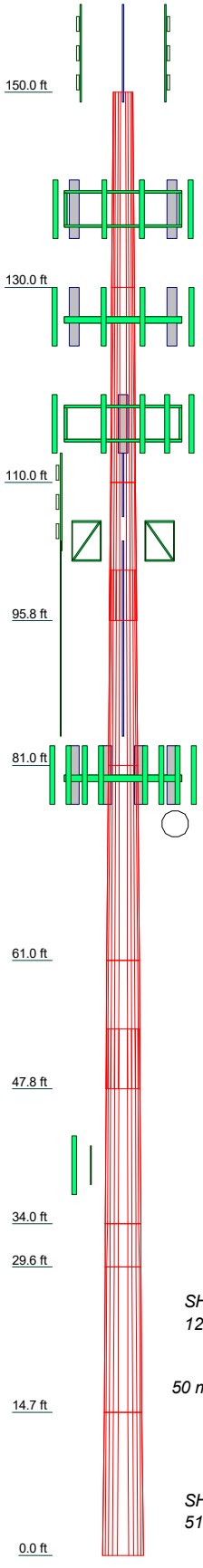
Submitted By: Edward N. Iamiceli Date: 7/22/19

Edward N. Iamiceli, P.E.
Sr. Project Manager

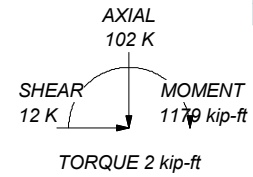
(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS												
				Wind Design Parameters								
Municipality	**Ground Snow Load** (psf)	**MCE Spectral Accelerations** (%g)		**Ultimate Design Wind Speeds,** V_{ult} (mph)			**Nominal Design Wind Speeds,** V_{asd} (mph)			**Wind-Borne Debris Regions**[1]		**Hurricane-Prone Regions**
		S_s	S_1	Risk Cat.I	Risk Cat.II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV	Risk Cat. II & III except Occup I-2	Risk Cat III Occup I-2 & Risk Cat. IV	
East Hampton	30	0.177	0.062	120	130	140	93	101	108			Yes
East Hartford	30	0.180	0.064	115	125	135	89	97	105			Yes
East Haven	30	0.182	0.062	120	130	140	93	101	108		Type B	Yes
East Lyme	30	0.164	0.059	125	135	145	97	105	112	Type B	Type A	Yes
Easton	30	0.215	0.066	110	120	130	85	93	101			Yes
East Windsor	35	0.177	0.064	115	125	135	89	97	105			Yes
Ellington	35	0.176	0.064	115	125	135	89	97	105			Yes
Enfield	35	0.176	0.065	110	125	130	85	97	101			Yes
Essex	30	0.168	0.059	120	135	145	93	105	112		Type A	Yes
Fairfield	30	0.215	0.065	115	125	135	89	97	105		Type B	Yes
Farmington	35	0.183	0.064	115	125	135	89	97	105			Yes
Franklin	30	0.171	0.061	120	130	140	93	101	108		Type A	Yes
Glastonbury	30	0.180	0.063	115	125	135	89	97	105			Yes
Goshen	40	0.181	0.065	105	115	125	81	89	97			
Granby	35	0.176	0.065	110	120	130	85	93	101			Yes
Greenwich	30	0.259	0.070	110	120	130	85	93	101			Yes
Griswold	30	0.168	0.060	125	135	145	97	105	112		Type A	Yes
Groton	30	0.160	0.058	125	135	145	97	105	112	Type B	Type A	Yes
Guilford	30	0.176	0.061	120	130	140	93	101	108		Type B	Yes
Haddam	30	0.175	0.061	120	130	140	93	101	108			Yes
Hamden	30	0.185	0.063	115	125	135	89	97	105			Yes
Hampton	35	0.172	0.062	120	130	140	93	101	108			Yes
Hartford	30	0.181	0.064	115	125	135	89	97	105			Yes
Hartland	40	0.175	0.065	110	120	125	85	93	97			Yes
Harwinton	35	0.183	0.065	110	120	130	85	93	101			Yes
Hebron	30	0.177	0.063	120	130	140	93	101	108			Yes
Kent	40	0.188	0.065	105	115	120	81	89	93			
Killingly	40	0.171	0.062	120	130	140	93	101	108			Yes
Killingworth	30	0.173	0.061	120	130	140	93	101	108			Yes
Lebanon	30	0.173	0.062	120	130	140	93	101	108			Yes
Ledyard	30	0.163	0.059	125	135	145	97	105	112		Type A	Yes
Lisbon	30	0.169	0.061	125	135	145	97	105	112		Type A	Yes
Litchfield	40	0.184	0.065	110	120	125	85	93	97			Yes
Lyme	30	0.164	0.059	125	135	145	97	105	112		Type A	Yes
Madison	30	0.173	0.060	120	130	140	93	101	108		Type B	Yes
Manchester	30	0.178	0.064	115	125	135	89	97	105			Yes
Mansfield	35	0.173	0.062	120	130	140	93	101	108			Yes
Marlborough	30	0.177	0.062	120	130	140	93	101	108			Yes
Meriden	30	0.183	0.063	115	125	135	89	97	105			Yes
Middlebury	35	0.191	0.064	110	120	130	85	93	101			Yes
Middlefield	30	0.181	0.063	115	125	135	89	97	105			Yes
Middletown	30	0.180	0.063	115	130	135	89	101	105			Yes
Milford	30	0.194	0.063	115	125	135	89	97	105		Type B	Yes
Monroe	30	0.205	0.065	110	120	130	85	93	101			Yes

TOWER ANALYSIS

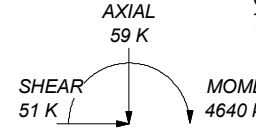
Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	20.00	12	0.2813		23.6100	27.2500		1.6
2	20.00	12	0.2813		27.2500	30.8900		1.8
3	14.17	12	0.2813	5.17	30.8900	33.4690		1.4
4	20.00	12	0.3750		31.9655	35.6055		2.7
5	20.00	12	0.3750		35.6055	39.2455		3.0
6	13.17	12	0.3750	6.17	39.2455	41.6425		2.2
7	20.00	12	0.4375		39.7695	43.4095		3.9
8	4.42	12	0.4375		43.4095	44.2134		0.9
9	14.91	12	0.5800		44.2134	46.9276		4.3
10	14.67	12	0.7000		46.9276	49.5976		5.4
							A572-65	27.2



ALL REACTIONS ARE FACTORED



TORQUE 2 kip-ft
50 mph WIND - 0.7500 in ICE



TORQUE 7 kip-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
10' x 1.5" Dia Dipole	149	SitePro1 HRK12 Handrail kit	116
10' x 1.5" Dia Dipole	149	13' Low-Profile Platform	116
12' x 3" Dia Whip	149	(2) RADIO 4449 B12/B71	116
13' T-Arms	149	RADIO 4449 B12/B71	116
(4) 2" STD Pipe (2.375 OD)x6'-0"	149	(4) Twin Style TMA	116
(4) 2" STD Pipe (2.375 OD)x6'-0"	149	(2) Twin Style TMA	116
(4) 2" STD Pipe (2.375 OD)x6'-0"	149	(2) APXVARR24_43-C-NA20 w/ Mount Pipe	116
RRUS A2 B13	138	APXVARR24_43-C-NA20 w/ Mount Pipe	116
RRUS A2 B13	138	(2) Collar Mount	106
RRUS A2 B13	138	(2) Collar Mount	105
RRUS 32 B30	138	8' x 2" Dia Dipole	104
RRUS 32 B30	138	15'x1.25" Dia Whips	104
RRUS 32 B30	138	20' x 2" Dia Whips	104
DT465B-2XR-V2 w/ Mount Pipe	138	20' x 2" Dia Whips	104
DT465B-2XR-V2 w/ Mount Pipe	138	6' Standoff	104
DT465B-2XR-V2 w/ Mount Pipe	138	6' Standoff	104
APXVSPP18-C-A20_TIA w/ Mount Pipe	138	6' Standoff	104
APXVSPP18-C-A20_TIA w/ Mount Pipe	138	6' Standoff	104
APXVSPP18-C-A20_TIA w/ Mount Pipe	138	RRFDC-3315-PF-48	80
FD-RRH-2x50-800	138	13' Low Profile Platform	80
FD-RRH-2x50-800	138	BXA-171063-12CF-EDIN-X w/ Mount Pipe	80
FD-RRH-2x50-800	138	BXA-171063-12CF-EDIN-X w/ Mount Pipe	80
RRH4X45-19	138	BXA-70063-6CF-EDIN-X w/ Mount Pipe	80
RRH4X45-19	138	BXA-70063-6CF-EDIN-X w/ Mount Pipe	80
RRH4X45-19	138	BXA-70063-6CF-EDIN-X w/ Mount Pipe	80
13' Low-Profile Platform	138	RRH2x40-AWS	80
2" STD Pipe (2.375 OD)x6'-0"	138	RRH2x40-AWS	80
2" STD Pipe (2.375 OD)x6'-0"	138	RRH2x40-AWS	80
2" STD Pipe (2.375 OD)x6'-0"	138	BXA-171063-12CF-EDIN-X w/ Mount Pipe	80
HPA-65R-BUU-H6 w/ Mount Pipe	127	BXA-70063-6CF-EDIN-X w/ Mount Pipe	80
HPA-65R-BUU-H6 w/ Mount Pipe	127	BXA-171063-8BF-EDIN-X w/ Mount Pipe	80
HPA-65R-BUU-H6 w/ Mount Pipe	127	BXA-171063-8BF-EDIN-X w/ Mount Pipe	80
(2) Powerwave Antenna	127	BXA-171063-8BF-EDIN-X w/ Mount Pipe	80
(2) Powerwave Antenna	127	BXA-70063-6CF-EDIN-X w/ Mount Pipe	80
(2) Powerwave Antenna	127	BXA-70063-6CF-EDIN-X w/ Mount Pipe	80
DC6-48-60-18-8F	127	3' Stand Off	40
RRUS 12 B2	127	GPS_A	40
RRUS 12 B2	127		
RRUS 12 B2	127		
RRUS 11 B12	127		
RRUS 11 B12	127		
RRUS 11 B12	127		
13' Low-Profile Platform	127		
2" STD Pipe (2.375 OD)x6'-0"	127		
2" STD Pipe (2.375 OD)x6'-0"	127		
2" STD Pipe (2.375 OD)x6'-0"	127		
AIR 32 B66Aa B2a w/ Mount Pipe	116		
AIR 32 B66Aa B2a w/ Mount Pipe	116		
AIR 32 B66Aa B2a w/ Mount Pipe	116		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 84.4%

Equivalent Thickness of Reinforced Sections

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

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

Job: ***9927.CT11077C, Revision 2***			
Project: ***150' Monopole***			
Client: T-Mobile	Drawn by: Ian Marinaccio		App'd:
Code: TIA-222-G	Date: 07/22/19		Scale: NTS
Path: G:\Newburgh\Projects\9927.NSS-L600 project\CT11077C\Structural\Rev 2\9927.CT11077C - Reinforced.eri			Dwg No. E-1

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Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job	Page
9927.CT11077C, Revision 2	1 of 22
Project	**Date**
150' Monopole	07/22/19
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:

Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	150.00-130.00	20.00	0.00	12	23.6100	27.2500	0.2813	1.1252	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L2	130.00-110.00	20.00	0.00	12	27.2500	30.8900	0.2813	1.1252	A572-65 (65 ksi)
L3	110.00-95.83	14.17	5.17	12	30.8900	33.4690	0.2813	1.1252	A572-65 (65 ksi)
L4	95.83-81.00	20.00	0.00	12	31.9655	35.6055	0.3750	1.5000	A572-65 (65 ksi)
L5	81.00-61.00	20.00	0.00	12	35.6055	39.2455	0.3750	1.5000	A572-65 (65 ksi)
L6	61.00-47.83	13.17	6.17	12	39.2455	41.6425	0.3750	1.5000	A572-65 (65 ksi)
L7	47.83-34.00	20.00	0.00	12	39.7695	43.4095	0.4375	1.7500	A572-65 (65 ksi)
L8	34.00-29.58	4.42	0.00	12	43.4095	44.2134	0.4375	1.7500	A572-65 (65 ksi)
L9	29.58-14.67	14.91	0.00	12	44.2134	46.9276	0.5800	2.3200	A572-65 (65 ksi)
L10	14.67-0.00	14.67		12	46.9276	49.5976	0.7000	2.8000	A572-65 (65 ksi)

Equivalent thickness of reinforced section

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.3436	21.1308	1467.8550	8.3517	12.2300	120.0211	2974.2723	10.3999	5.5736	19.814
	28.1121	24.4279	2267.7368	9.6548	14.1155	160.6557	4595.0496	12.0227	6.5491	23.282
L2	28.1121	24.4279	2267.7368	9.6548	14.1155	160.6557	4595.0496	12.0227	6.5491	23.282
	31.8805	27.7250	3315.4927	10.9579	16.0010	207.2048	6718.0872	13.6454	7.5246	26.75
L3	31.8805	27.7250	3315.4927	10.9579	16.0010	207.2048	6718.0872	13.6454	7.5246	26.75
	34.5504	30.0610	4226.1316	11.8812	17.3369	243.7645	8563.2885	14.7951	8.2158	29.207
L4	33.9349	38.1455	4858.9306	11.3094	16.5581	293.4473	9845.5106	18.7740	7.5617	20.165
	36.7292	42.5408	6739.5147	12.6125	18.4436	365.4114	13656.0839	20.9373	8.5373	22.766
L5	36.7292	42.5408	6739.5147	12.6125	18.4436	365.4114	13656.0839	20.9373	8.5373	22.766
	40.4976	46.9361	9051.7678	13.9156	20.3292	445.2601	18341.3356	23.1005	9.5128	25.367
L6	40.4976	46.9361	9051.7678	13.9156	20.3292	445.2601	18341.3356	23.1005	9.5128	25.367
	42.9792	49.8304	10831.6858	14.7737	21.5708	502.1460	21947.9321	24.5250	10.1552	27.08
L7	42.1806	55.4090	10941.0290	14.0809	20.6006	531.1023	22169.4910	27.2706	9.4857	21.682
	44.7865	60.5368	14268.4708	15.3840	22.4861	634.5453	28911.7901	29.7944	10.4613	23.911
L8	44.7865	60.5368	14268.4708	15.3840	22.4861	634.5453	28911.7901	29.7944	10.4613	23.911
	45.6187	61.6693	15084.2700	15.6718	22.9025	658.6291	30564.8205	30.3517	10.6767	24.404
L9	45.5684	81.4897	19802.7792	15.6207	22.9025	864.6548	40125.7995	40.1067	10.2948	17.75
	48.3784	86.5588	23732.9552	16.5924	24.3085	976.3233	48089.4015	42.6016	11.0222	19.004
L10	48.3361	104.1970	28421.3142	16.5495	24.3085	1169.1924	57589.2880	51.2826	10.7006	15.287
	51.1002	110.2151	33635.7844	17.5053	25.6915	1309.2164	68155.2183	54.2445	11.4161	16.309

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.00-130.00				1	1	1			
L2 130.00-110.00				1	1	1			
L3 110.00-95.83				1	1	1			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L4 95.83-81.00				1	1	1			
L5 81.00-61.00				1	1	1			
L6 61.00-47.83				1	1	1			
L7 47.83-34.00				1	1	1			
L8 34.00-29.58				1	1	1			
L9 29.58-14.67				1	1	1			
L10 14.67-0.00				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
Black Cable .4"	C	No	Surface Ar (CaAa)	127.00 - 0.00	1	1	0.000 0.000	0.5200		0.14
PWRT-608-S(13/16")	C	No	Surface Ar (CaAa)	127.00 - 0.00	2	2	0.000 0.000	0.8200		0.62
*										
RF 1 5/8 inch-50(1-5/8")	C	No	Surface Ar (CaAa)	80.00 - 0.00	12	6	-0.500 -0.300	1.9700		0.97
FLC 114-50J(1-1/4")	C	No	Surface Ar (CaAa)	80.00 - 0.00	1	1	-0.300 -0.300	1.5800		0.70
***										
LCF114-50J(1-1/4")	A	No	Surface Ar (CaAa)	116.00 - 0.00	24	12	-0.250 0.250	1.5800		0.70
HCS 6X12 4AWG(1-5/8)	A	No	Surface Ar (CaAa)	116.00 - 0.00	2	2	0.000 0.000	1.6600		2.40
Black Cable .32"	A	No	Surface Ar (CaAa)	116.00 - 0.00	1	1	0.000 0.000	0.3150		0.07
**										
Step Bolts	C	No	Surface Ar (CaAa)	140.00 - 12.25	1	1	0.000 0.000	0.3750		2.00
Safety Line 3/8	C	No	Surface Ar (CaAa)	140.00 - 12.25	1	1	0.000 0.000	0.3750		0.22
**										
WT6x25 Reinforcement	A	No	Surface Ar (CaAa)	15.94 - 0.00	1	1	0.000 0.000	0.0000		25.00
WT6x25 Reinforcement	A	No	Surface Ar (CaAa)	15.94 - 0.00	1	1	0.500 0.500	0.0000		25.00
WT6x25 Reinforcement	B	No	Surface Ar (CaAa)	15.94 - 0.00	1	1	0.250 0.250	0.0000		25.00
WT6x25 Reinforcement	C	No	Surface Ar (CaAa)	15.94 - 0.00	1	1	0.000 0.000	0.0000		25.00
WT6x25 Reinforcement	A	No	Surface Ar (CaAa)	31.00 - 0.00	1	1	-0.250 -0.250	0.0000		25.00
WT6x25 Reinforcement	A	No	Surface Ar (CaAa)	31.00 - 0.00	1	1	0.250 0.250	0.0000		25.00
WT6x25 Reinforcement	B	No	Surface Ar (CaAa)	31.00 - 0.00	1	1	0.000 0.000	0.0000		25.00
WT6x25 Reinforcement	C	No	Surface Ar (CaAa)	31.00 - 0.00	1	1	0.250 0.250	0.0000		25.00

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
*									
AVA5-50(7/8")	C	No	No	Inside Pole	104.00 - 0.00	3	No Ice	0.00	0.30
							1/2" Ice	0.00	0.30
							1" Ice	0.00	0.30
AVA5-50(7/8")	C	No	No	Inside Pole	149.00 - 0.00	2	No Ice	0.00	0.30
							1/2" Ice	0.00	0.30
							1" Ice	0.00	0.30
LCF114-50J(1-1/4")	C	No	No	Inside Pole	149.00 - 0.00	1	No Ice	0.00	0.70
							1/2" Ice	0.00	0.70
							1" Ice	0.00	0.70
*									
FLC 12-50J(1/2")	C	No	No	Inside Pole	138.00 - 0.00	1	No Ice	0.00	0.17
							1/2" Ice	0.00	0.17
							1" Ice	0.00	0.17
1" Rigid Conduit	C	No	No	Inside Pole	138.00 - 0.00	1	No Ice	0.00	0.50
							1/2" Ice	0.00	0.50
							1" Ice	0.00	0.50
FLC 114-50J(1-1/4")	C	No	No	Inside Pole	138.00 - 0.00	3	No Ice	0.00	0.70
							1/2" Ice	0.00	0.70
							1" Ice	0.00	0.70

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-130.00	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	0.750	0.000	0.07
L2	130.00-110.00	A	0.000	0.000	13.557	0.000	0.13
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	5.172	0.000	0.15
L3	110.00-95.83	A	0.000	0.000	32.017	0.000	0.31
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	4.123	0.000	0.12
L4	95.83-81.00	A	0.000	0.000	33.508	0.000	0.32
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	4.316	0.000	0.13
L5	81.00-61.00	A	0.000	0.000	45.190	0.000	0.43
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	31.280	0.000	0.41
L6	61.00-47.83	A	0.000	0.000	29.758	0.000	0.29
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	21.480	0.000	0.28
L7	47.83-34.00	A	0.000	0.000	31.249	0.000	0.30
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	22.557	0.000	0.29
L8	34.00-29.58	A	0.000	0.000	9.980	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	7.204	0.000	0.13
L9	29.58-14.67	A	0.000	0.000	33.697	0.000	1.13

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	0.000	0.000	0.40
		C	0.000	0.000	24.324	0.000	0.72
L10	14.67-0.00	A	0.000	0.000	33.147	0.000	1.78
		B	0.000	0.000	0.000	0.000	0.73
		C	0.000	0.000	23.008	0.000	1.01

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-130.00	A	1.733	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	7.682	0.000	0.16
L2	130.00-110.00	A	1.706	0.000	0.000	24.066	0.000	0.43
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	32.574	0.000	0.51
L3	110.00-95.83	A	1.681	0.000	0.000	56.579	0.000	1.01
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	24.946	0.000	0.39
L4	95.83-81.00	A	1.655	0.000	0.000	59.214	0.000	1.06
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	26.108	0.000	0.41
L5	81.00-61.00	A	1.619	0.000	0.000	78.997	0.000	1.39
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	79.082	0.000	1.37
L6	61.00-47.83	A	1.577	0.000	0.000	51.629	0.000	0.89
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	52.907	0.000	0.91
L7	47.83-34.00	A	1.532	0.000	0.000	54.217	0.000	0.94
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	55.559	0.000	0.96
L8	34.00-29.58	A	1.494	0.000	0.000	17.907	0.000	0.37
		B		0.000	0.000	0.423	0.000	0.04
		C		0.000	0.000	17.694	0.000	0.33
L9	29.58-14.67	A	1.441	0.000	0.000	66.370	0.000	1.84
		B		0.000	0.000	4.663	0.000	0.45
		C		0.000	0.000	61.937	0.000	1.40
L10	14.67-0.00	A	1.289	0.000	0.000	69.691	0.000	2.45
		B		0.000	0.000	7.566	0.000	0.79
		C		0.000	0.000	53.782	0.000	1.56

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-130.00	0.0000	0.2253	0.0000	1.5299
L2	130.00-110.00	-2.8397	-0.5143	-2.4507	2.0481
L3	110.00-95.83	-6.4533	-2.8276	-5.3767	-0.5259
L4	95.83-81.00	-6.6158	-2.8953	-5.5920	-0.5377
L5	81.00-61.00	-2.8767	0.1353	-2.4327	1.7820
L6	61.00-47.83	-2.8196	0.2699	-2.4256	1.9456
L7	47.83-34.00	-2.8770	0.2738	-2.4959	1.9998

Section	*Elevation*	CP_X	CP_Z	CP_X *Ice*	CP_Z *Ice*
	ft	*in*	*in*	*in*	*in*
L8	34.00-29.58	-2.9300	0.2773	-2.6645	1.8636
L9	29.58-14.67	-2.9857	0.2811	-2.8993	1.6110
L10	14.67-0.00	-3.0899	0.0968	-2.8822	0.6020

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	19	Step Bolts	130.00 - 140.00	1.0000	1.0000
L1	20	Safety Line 3/8	130.00 - 140.00	1.0000	1.0000
L2	1	Black Cable .4"	110.00 - 127.00	1.0000	1.0000
L2	2	PWRT-608-S(13/16")	110.00 - 127.00	1.0000	1.0000
L2	15	LCF114-50J(1-1/4")	110.00 - 116.00	1.0000	1.0000
L2	16	HCS 6X12 4AWG(1-5/8)	110.00 - 116.00	1.0000	1.0000
L2	17	Black Cable .32"	110.00 - 116.00	1.0000	1.0000
L2	19	Step Bolts	110.00 - 130.00	1.0000	1.0000
L2	20	Safety Line 3/8	110.00 - 130.00	1.0000	1.0000
L3	1	Black Cable .4"	95.83 - 110.00	1.0000	1.0000
L3	2	PWRT-608-S(13/16")	95.83 - 110.00	1.0000	1.0000
L3	15	LCF114-50J(1-1/4")	95.83 - 110.00	1.0000	1.0000
L3	16	HCS 6X12 4AWG(1-5/8)	95.83 - 110.00	1.0000	1.0000
L3	17	Black Cable .32"	95.83 - 110.00	1.0000	1.0000
L3	19	Step Bolts	95.83 - 110.00	1.0000	1.0000
L3	20	Safety Line 3/8	95.83 - 110.00	1.0000	1.0000
L5	1	Black Cable .4"	61.00 - 81.00	1.0000	1.0000
L5	2	PWRT-608-S(13/16")	61.00 - 81.00	1.0000	1.0000
L5	8	RF 1 5/8 inch-50(1-5/8")	61.00 - 80.00	1.0000	1.0000
L5	9	FLC 114-50J(1-1/4")	61.00 - 80.00	1.0000	1.0000
L5	15	LCF114-50J(1-1/4")	61.00 - 81.00	1.0000	1.0000
L5	16	HCS 6X12 4AWG(1-5/8)	61.00 - 81.00	1.0000	1.0000
L5	17	Black Cable .32"	61.00 - 81.00	1.0000	1.0000
L5	19	Step Bolts	61.00 - 81.00	1.0000	1.0000
L5	20	Safety Line 3/8	61.00 - 81.00	1.0000	1.0000
L6	1	Black Cable .4"	47.83 - 61.00	1.0000	1.0000
L6	2	PWRT-608-S(13/16")	47.83 - 61.00	1.0000	1.0000
L6	8	RF 1 5/8 inch-50(1-5/8")	47.83 - 61.00	1.0000	1.0000
L6	9	FLC 114-50J(1-1/4")	47.83 - 61.00	1.0000	1.0000
L6	15	LCF114-50J(1-1/4")	47.83 - 61.00	1.0000	1.0000
L6	16	HCS 6X12 4AWG(1-5/8)	47.83 - 61.00	1.0000	1.0000
L6	17	Black Cable .32"	47.83 - 61.00	1.0000	1.0000
L6	19	Step Bolts	47.83 - 61.00	1.0000	1.0000
L6	20	Safety Line 3/8	47.83 - 61.00	1.0000	1.0000
L8	1	Black Cable .4"	29.58 - 34.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L8	2	PWRT-608-S(13/16")	29.58 - 34.00	1.0000	1.0000
L8	8	RF 1 5/8 inch-50(1-5/8")	29.58 - 34.00	1.0000	1.0000
L8	9	FLC 114-50J(1-1/4")	29.58 - 34.00	1.0000	1.0000
L8	15	LCF114-50J(1-1/4")	29.58 - 34.00	1.0000	1.0000
L8	16	HCS 6X12 4AWG(1-5/8)	29.58 - 34.00	1.0000	1.0000
L8	17	Black Cable .32"	29.58 - 34.00	1.0000	1.0000
L8	19	Step Bolts	29.58 - 34.00	1.0000	1.0000
L8	20	Safety Line 3/8	29.58 - 34.00	1.0000	1.0000
L8	26	WT6x25 Reinforcement	29.58 - 31.00	1.0000	1.0000
L8	27	WT6x25 Reinforcement	29.58 - 31.00	1.0000	1.0000
L8	28	WT6x25 Reinforcement	29.58 - 31.00	1.0000	1.0000
L8	29	WT6x25 Reinforcement	29.58 - 31.00	1.0000	1.0000
L9	1	Black Cable .4"	14.67 - 29.58	1.0000	1.0000
L9	2	PWRT-608-S(13/16")	14.67 - 29.58	1.0000	1.0000
L9	8	RF 1 5/8 inch-50(1-5/8")	14.67 - 29.58	1.0000	1.0000
L9	9	FLC 114-50J(1-1/4")	14.67 - 29.58	1.0000	1.0000
L9	15	LCF114-50J(1-1/4")	14.67 - 29.58	1.0000	1.0000
L9	16	HCS 6X12 4AWG(1-5/8)	14.67 - 29.58	1.0000	1.0000
L9	17	Black Cable .32"	14.67 - 29.58	1.0000	1.0000
L9	19	Step Bolts	14.67 - 29.58	1.0000	1.0000
L9	20	Safety Line 3/8	14.67 - 29.58	1.0000	1.0000
L9	22	WT6x25 Reinforcement	14.67 - 15.94	1.0000	1.0000
L9	23	WT6x25 Reinforcement	14.67 - 15.94	1.0000	1.0000
L9	24	WT6x25 Reinforcement	14.67 - 15.94	1.0000	1.0000
L9	25	WT6x25 Reinforcement	14.67 - 15.94	1.0000	1.0000
L9	26	WT6x25 Reinforcement	14.67 - 29.58	1.0000	1.0000
L9	27	WT6x25 Reinforcement	14.67 - 29.58	1.0000	1.0000
L9	28	WT6x25 Reinforcement	14.67 - 29.58	1.0000	1.0000
L9	29	WT6x25 Reinforcement	14.67 - 29.58	1.0000	1.0000
L10	1	Black Cable .4"	0.00 - 14.67	1.0000	1.0000
L10	2	PWRT-608-S(13/16")	0.00 - 14.67	1.0000	1.0000
L10	8	RF 1 5/8 inch-50(1-5/8")	0.00 - 14.67	1.0000	1.0000
L10	9	FLC 114-50J(1-1/4")	0.00 - 14.67	1.0000	1.0000
L10	15	LCF114-50J(1-1/4")	0.00 - 14.67	1.0000	1.0000
L10	16	HCS 6X12 4AWG(1-5/8)	0.00 - 14.67	1.0000	1.0000
L10	17	Black Cable .32"	0.00 - 14.67	1.0000	1.0000
L10	19	Step Bolts	12.25 - 14.67	1.0000	1.0000
L10	20	Safety Line 3/8	12.25 - 14.67	1.0000	1.0000
L10	22	WT6x25 Reinforcement	0.00 - 14.67	1.0000	1.0000
L10	23	WT6x25 Reinforcement	0.00 - 14.67	1.0000	1.0000
L10	24	WT6x25 Reinforcement	0.00 - 14.67	1.0000	1.0000
L10	25	WT6x25 Reinforcement	0.00 - 14.67	1.0000	1.0000
L10	26	WT6x25 Reinforcement	0.00 - 14.67	1.0000	1.0000
L10	27	WT6x25 Reinforcement	0.00 - 14.67	1.0000	1.0000
L10	28	WT6x25 Reinforcement	0.00 - 14.67	1.0000	1.0000
L10	29	WT6x25 Reinforcement	0.00 - 14.67	1.0000	1.0000

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *K*
GPS_A	C	From Leg	4.00	0.0000	40.00	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
3' Stand Off	C	From Leg	2.00	0.0000	40.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
**********									
BXA-171063-8BF-EDIN-X w/ Mount Pipe	A	From Leg	4.00	0.0000	80.00	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	80.00	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	80.00	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-70063-6CF-EDIN-X w/ Mount Pipe	A	From Leg	4.00	0.0000	80.00	No Ice	7.81	5.80	0.04
			0.00			1/2" Ice	8.36	6.95	0.10
			0.00			1" Ice	8.87	7.82	0.17
BXA-70063-6CF-EDIN-X w/ Mount Pipe	B	From Leg	4.00	0.0000	80.00	No Ice	7.81	5.80	0.04
			0.00			1/2" Ice	8.36	6.95	0.10
			0.00			1" Ice	8.87	7.82	0.17
BXA-70063-6CF-EDIN-X w/ Mount Pipe	C	From Leg	4.00	0.0000	80.00	No Ice	7.81	5.80	0.04
			0.00			1/2" Ice	8.36	6.95	0.10
			0.00			1" Ice	8.87	7.82	0.17
BXA-171063-12CF-EDIN-X w/ Mount Pipe	A	From Leg	4.00	0.0000	80.00	No Ice	5.03	5.29	0.04
			0.00			1/2" Ice	5.58	6.46	0.09
			0.00			1" Ice	6.10	7.35	0.14
BXA-171063-12CF-EDIN-X w/ Mount Pipe	B	From Leg	4.00	0.0000	80.00	No Ice	5.03	5.29	0.04
			0.00			1/2" Ice	5.58	6.46	0.09
			0.00			1" Ice	6.10	7.35	0.14
BXA-171063-12CF-EDIN-X w/ Mount Pipe	C	From Leg	4.00	0.0000	80.00	No Ice	5.03	5.29	0.04
			0.00			1/2" Ice	5.58	6.46	0.09
			0.00			1" Ice	6.10	7.35	0.14
BXA-70063-6CF-EDIN-X w/ Mount Pipe	A	From Leg	4.00	0.0000	80.00	No Ice	7.81	5.80	0.04
			0.00			1/2" Ice	8.36	6.95	0.10
			0.00			1" Ice	8.87	7.82	0.17
BXA-70063-6CF-EDIN-X w/ Mount Pipe	B	From Leg	4.00	0.0000	80.00	No Ice	7.81	5.80	0.04
			0.00			1/2" Ice	8.36	6.95	0.10
			0.00			1" Ice	8.87	7.82	0.17
BXA-70063-6CF-EDIN-X w/ Mount Pipe	C	From Leg	4.00	0.0000	80.00	No Ice	7.81	5.80	0.04
			0.00			1/2" Ice	8.36	6.95	0.10
			0.00			1" Ice	8.87	7.82	0.17
RRH2x40-AWS	A	From Leg	4.00	0.0000	80.00	No Ice	2.16	1.42	0.04
			0.00			1/2" Ice	2.36	1.59	0.06
			0.00			1" Ice	2.57	1.77	0.08
RRH2x40-AWS	B	From Leg	4.00	0.0000	80.00	No Ice	2.16	1.42	0.04
			0.00			1/2" Ice	2.36	1.59	0.06
			0.00			1" Ice	2.57	1.77	0.08
RRH2x40-AWS	C	From Leg	4.00	0.0000	80.00	No Ice	2.16	1.42	0.04
			0.00			1/2" Ice	2.36	1.59	0.06
			0.00			1" Ice	2.57	1.77	0.08
RRFDC-3315-PF-48	C	From Leg	0.50	0.0000	80.00	No Ice	3.71	2.19	0.02
			1.00			1/2" Ice	3.95	2.39	0.05
			0.00			1" Ice	4.20	2.61	0.09
13' Low Profile Platform	C	None		0.0000	80.00	No Ice	24.33	24.33	1.65
						1/2" Ice	30.22	30.22	2.03

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Job	Page
9927.CT11077C, Revision 2	9 of 22
Project	**Date**
150' Monopole	07/22/19
Client	**Designed by**
T-Mobile	Ian Marinaccio

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
						1" Ice	36.11	36.11	2.41
**********									
8' x 2" Dia Dipole	C	From Leg	6.00	0.0000	104.00	No Ice	1.60	1.60	0.02
			0.00			1/2" Ice	2.42	2.42	0.03
			4.00			1" Ice	3.24	3.24	0.05
15'x1.25" Dia Whips	A	From Leg	6.00	0.0000	104.00	No Ice	1.88	1.88	0.02
			0.00			1/2" Ice	3.39	3.39	0.04
			7.50			1" Ice	4.93	4.93	0.06
20' x 2" Dia Whips	C	From Leg	6.00	0.0000	104.00	No Ice	4.00	4.00	0.02
			0.00			1/2" Ice	6.03	6.03	0.05
			-10.00			1" Ice	8.07	8.07	0.09
20' x 2" Dia Whips	A	From Leg	6.00	0.0000	104.00	No Ice	4.00	4.00	0.02
			0.00			1/2" Ice	6.03	6.03	0.05
			-10.00			1" Ice	8.07	8.07	0.09
6' Standoff	A	From Leg	3.00	0.0000	104.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
6' Standoff	B	From Leg	3.00	0.0000	104.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
6' Standoff	C	From Leg	3.00	0.0000	104.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
6' Standoff	C	From Face	3.00	0.0000	104.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
(2) Collar Mount	C	None		0.0000	105.00	No Ice	3.30	3.30	0.29
						1/2" Ice	4.13	4.13	0.32
						1" Ice	4.96	4.96	0.35
(2) Collar Mount	C	None		0.0000	106.00	No Ice	3.30	3.30	0.29
						1/2" Ice	4.13	4.13	0.32
						1" Ice	4.96	4.96	0.35
**********									
(2) RADIO 4449 B12/B71	B	From Leg	4.00	0.0000	116.00	No Ice	1.65	1.16	0.07
			0.00			1/2" Ice	1.81	1.30	0.09
			0.00			1" Ice	1.98	1.45	0.11
RADIO 4449 B12/B71	C	From Leg	4.00	0.0000	116.00	No Ice	1.65	1.16	0.07
			0.00			1/2" Ice	1.81	1.30	0.09
			0.00			1" Ice	1.98	1.45	0.11
(4) Twin Style TMA	B	From Leg	4.00	0.0000	116.00	No Ice	6.68	3.48	0.07
			0.00			1/2" Ice	7.07	4.12	0.12
			0.00			1" Ice	7.48	4.78	0.18
(2) Twin Style TMA	C	From Leg	4.00	0.0000	116.00	No Ice	6.68	3.48	0.07
			0.00			1/2" Ice	7.07	4.12	0.12
			0.00			1" Ice	7.48	4.78	0.18
(2) APXVARR24_43-C-NA20 w/ Mount Pipe	B	From Leg	4.00	0.0000	116.00	No Ice	17.38	10.88	0.12
			0.00			1/2" Ice	18.11	12.41	0.24
			0.00			1" Ice	18.85	13.96	0.37
APXVARR24_43-C-NA20 w/ Mount Pipe	C	From Leg	4.00	0.0000	116.00	No Ice	17.38	10.88	0.12
			0.00			1/2" Ice	18.11	12.41	0.24
			0.00			1" Ice	18.85	13.96	0.37
AIR 32 B66Aa B2a w/ Mount Pipe	A	From Leg	4.00	0.0000	116.00	No Ice	6.81	6.14	0.15
			0.00			1/2" Ice	7.30	6.99	0.22
			0.00			1" Ice	7.76	7.73	0.28
AIR 32 B66Aa B2a w/ Mount Pipe	B	From Leg	4.00	0.0000	116.00	No Ice	6.81	6.14	0.15
			0.00			1/2" Ice	7.30	6.99	0.22
			0.00			1" Ice	7.76	7.73	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	C	From Leg	4.00 0.00 0.00	0.0000	116.00	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
SitePro1 HRK12 Handrail kit	C	None		0.0000	116.00	No Ice 1/2" Ice 1" Ice	4.80 6.70 8.60	4.80 6.70 8.60	0.25 0.29 0.34
13' Low-Profile Platform	C	None		0.0000	116.00	No Ice 1/2" Ice 1" Ice	32.03 38.71 45.39	32.03 38.71 45.39	1.34 1.80 2.26
**********									
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	9.22 9.98 10.76	6.25 6.96 7.70	0.07 0.14 0.22
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	9.22 9.98 10.76	6.25 6.96 7.70	0.07 0.14 0.22
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	9.22 9.98 10.76	6.25 6.96 7.70	0.07 0.14 0.22
(2) Powerwave Antenna	A	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) Powerwave Antenna	B	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	8.37 8.93 9.46	6.36 7.54 8.43	0.08 0.14 0.22
(2) Powerwave Antenna	C	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	8.37 8.93 9.46	6.36 7.54 8.43	0.08 0.14 0.22
DC6-48-60-18-8F	C	From Leg	4.00 0.00 0.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06
RRUS 12 B2	A	From Leg	4.00 0.00 3.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	3.14 3.36 3.59	1.28 1.43 1.60	0.05 0.07 0.10
RRUS 12 B2	B	From Leg	4.00 0.00 3.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	3.14 3.36 3.59	1.28 1.43 1.60	0.05 0.07 0.10
RRUS 12 B2	C	From Leg	4.00 0.00 3.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	3.14 3.36 3.59	1.28 1.43 1.60	0.05 0.07 0.10
RRUS 11 B12	A	From Leg	4.00 0.00 3.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	B	From Leg	4.00 0.00 3.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	C	From Leg	4.00 0.00 3.00	0.0000	127.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
13' Low-Profile Platform	C	None		0.0000	127.00	No Ice 1/2" Ice 1" Ice	24.53 29.94 35.35	24.53 29.94 35.35	1.34 1.65 1.96
2" STD Pipe (2.375 OD)x6'-0"	A	From Leg	4.00 0.00 0.00	0.0000	127.00	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
2" STD Pipe (2.375 OD)x6'-0"	B	From Leg	4.00 0.00	0.0000	127.00	No Ice 1/2" Ice	1.43 1.92	1.43 1.92	0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	2.29	2.29	0.05
2" STD Pipe (2.375 OD)x6'-0"	C	From Leg	4.00	0.0000	127.00	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
**********									
RRUS A2 B13	A	From Leg	4.00	0.0000	138.00	No Ice	2.79	1.72	0.08
			0.00			1/2" Ice	3.00	1.90	0.10
			0.00			1" Ice	3.21	2.07	0.13
RRUS A2 B13	B	From Leg	4.00	0.0000	138.00	No Ice	2.79	1.72	0.08
			0.00			1/2" Ice	3.00	1.90	0.10
			0.00			1" Ice	3.21	2.07	0.13
RRUS A2 B13	C	From Leg	4.00	0.0000	138.00	No Ice	2.79	1.72	0.08
			0.00			1/2" Ice	3.00	1.90	0.10
			0.00			1" Ice	3.21	2.07	0.13
RRUS 32 B30	A	From Leg	4.00	0.0000	138.00	No Ice	2.69	1.57	0.06
			0.00			1/2" Ice	2.91	1.76	0.08
			0.00			1" Ice	3.14	1.95	0.10
RRUS 32 B30	B	From Leg	4.00	0.0000	138.00	No Ice	2.69	1.57	0.06
			0.00			1/2" Ice	2.91	1.76	0.08
			0.00			1" Ice	3.14	1.95	0.10
RRUS 32 B30	C	From Leg	4.00	0.0000	138.00	No Ice	2.69	1.57	0.06
			0.00			1/2" Ice	2.91	1.76	0.08
			0.00			1" Ice	3.14	1.95	0.10
DT465B-2XR-V2 w/ Mount Pipe	A	From Leg	4.00	0.0000	138.00	No Ice	5.50	4.38	0.09
			0.00			1/2" Ice	5.97	4.84	0.16
			0.00			1" Ice	6.45	5.30	0.25
DT465B-2XR-V2 w/ Mount Pipe	B	From Leg	4.00	0.0000	138.00	No Ice	5.50	4.38	0.09
			0.00			1/2" Ice	5.97	4.84	0.16
			0.00			1" Ice	6.45	5.30	0.25
DT465B-2XR-V2 w/ Mount Pipe	C	From Leg	4.00	0.0000	138.00	No Ice	5.50	4.38	0.09
			0.00			1/2" Ice	5.97	4.84	0.16
			0.00			1" Ice	6.45	5.30	0.25
APXVSPP18-C-A20_TIA w/ Mount Pipe	A	From Leg	4.00	0.0000	138.00	No Ice	8.26	7.47	0.10
			0.00			1/2" Ice	8.82	8.66	0.17
			0.00			1" Ice	9.35	9.56	0.24
APXVSPP18-C-A20_TIA w/ Mount Pipe	B	From Leg	4.00	0.0000	138.00	No Ice	8.26	7.47	0.10
			0.00			1/2" Ice	8.82	8.66	0.17
			0.00			1" Ice	9.35	9.56	0.24
APXVSPP18-C-A20_TIA w/ Mount Pipe	C	From Leg	4.00	0.0000	138.00	No Ice	8.26	7.47	0.10
			0.00			1/2" Ice	8.82	8.66	0.17
			0.00			1" Ice	9.35	9.56	0.24
FD-RRH-2x50-800	A	From Leg	4.00	0.0000	138.00	No Ice	1.36	3.01	0.05
			0.00			1/2" Ice	1.52	3.22	0.08
			0.00			1" Ice	1.68	3.45	0.10
FD-RRH-2x50-800	B	From Leg	4.00	0.0000	138.00	No Ice	1.36	3.01	0.05
			0.00			1/2" Ice	1.52	3.22	0.08
			0.00			1" Ice	1.68	3.45	0.10
FD-RRH-2x50-800	C	From Leg	4.00	0.0000	138.00	No Ice	1.36	3.01	0.05
			0.00			1/2" Ice	1.52	3.22	0.08
			0.00			1" Ice	1.68	3.45	0.10
RRH4X45-19	A	From Leg	4.00	0.0000	138.00	No Ice	2.31	2.38	0.09
			0.00			1/2" Ice	2.52	2.58	0.11
			0.00			1" Ice	2.73	2.79	0.14
RRH4X45-19	B	From Leg	4.00	0.0000	138.00	No Ice	2.31	2.38	0.09
			0.00			1/2" Ice	2.52	2.58	0.11
			0.00			1" Ice	2.73	2.79	0.14
RRH4X45-19	C	From Leg	4.00	0.0000	138.00	No Ice	2.31	2.38	0.09

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			1/2" Ice	2.52	2.58	0.11
			0.00			1" Ice	2.73	2.79	0.14
13' Low-Profile Platform	C	None		0.0000	138.00	No Ice	44.21	44.21	1.77
						1/2" Ice	53.97	53.97	2.32
						1" Ice	63.73	63.73	2.87
2" STD Pipe (2.375 OD)x6'-0"	A	From Leg	4.00	0.0000	138.00	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
2" STD Pipe (2.375 OD)x6'-0"	B	From Leg	4.00	0.0000	138.00	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
2" STD Pipe (2.375 OD)x6'-0"	C	From Leg	4.00	0.0000	138.00	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
****									
10' x 1.5" Dia Dipole	B	From Leg	4.00	0.0000	149.00	No Ice	0.00	0.00	0.00
			0.00			1/2" Ice	0.00	0.00	0.00
			5.00			1" Ice	0.00	0.00	0.00
10' x 1.5" Dia Dipole	C	From Leg	4.00	0.0000	149.00	No Ice	0.00	0.00	0.00
			0.00			1/2" Ice	0.00	0.00	0.00
			5.00			1" Ice	0.00	0.00	0.00
12' x 3" Dia Whip	A	From Leg	4.00	0.0000	149.00	No Ice	0.00	0.00	0.00
			0.00			1/2" Ice	0.00	0.00	0.00
			5.00			1" Ice	0.00	0.00	0.00
13' T-Arms	C	None		0.0000	149.00	No Ice	0.00	0.00	0.00
						1/2" Ice	0.00	0.00	0.00
						1" Ice	0.00	0.00	0.00
(4) 2" STD Pipe (2.375 OD)x6'-0"	A	From Leg	4.00	0.0000	149.00	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	149.00	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"	C	From Leg	4.00	0.0000	149.00	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

Load Combinations

Comb. No.	*Description*
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice

Comb. No.	Description
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 130	Pole	Max Tension	48	0.00	-0.00	0.00
			Max. Compression	26	-13.09	0.00	-0.24
			Max. Mx	20	-5.25	86.41	-0.06
			Max. My	14	-5.27	-0.05	-86.33
			Max. Vy	20	-9.15	86.41	-0.06
			Max. Vx	14	9.14	-0.05	-86.33
			Max. Torque	6			0.00
L2	130 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.44	-5.05	-12.57
			Max. Mx	8	-12.97	-426.45	-4.65
			Max. My	14	-13.10	-2.87	-422.08
			Max. Vy	20	-23.73	423.44	-1.41
			Max. Vx	14	22.82	-2.87	-422.08

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	18			8.39
L3	110 - 95.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.92	-2.44	-11.90
			Max. Mx	8	-16.05	-648.52	-7.13
			Max. My	14	-16.18	-4.69	-636.43
			Max. Vy	20	-26.53	646.72	0.67
			Max. Vx	14	25.58	-4.69	-636.43
			Max. Torque	18			8.39
L4	95.83 - 81	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.80	-0.36	-11.87
			Max. Mx	8	-20.85	-1209.06	-12.15
			Max. My	14	-20.96	-9.12	-1178.25
			Max. Vy	20	-29.54	1208.65	5.83
			Max. Vx	14	28.58	-9.12	-1178.25
			Max. Torque	6			-7.12
L5	81 - 61	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.60	2.21	-13.29
			Max. Mx	20	-28.39	1909.43	10.10
			Max. My	14	-28.48	-12.94	-1858.61
			Max. Vy	20	-36.64	1909.43	10.10
			Max. Vx	14	35.65	-12.94	-1858.61
			Max. Torque	6			-7.11
L6	61 - 47.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.57	3.04	-13.79
			Max. Mx	20	-30.33	2169.39	11.58
			Max. My	14	-30.41	-14.25	-2111.44
			Max. Vy	20	-37.58	2169.39	11.58
			Max. Vx	14	36.59	-14.25	-2111.44
			Max. Torque	8			-6.93
L7	47.83 - 34	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-75.78	5.95	-15.48
			Max. Mx	20	-37.96	2951.03	15.75
			Max. My	14	-38.01	-17.77	-2872.80
			Max. Vy	20	-40.38	2951.03	15.75
			Max. Vx	14	39.42	-17.77	-2872.80
			Max. Torque	8			-7.07
L8	34 - 29.5833	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-78.06	6.56	-15.73
			Max. Mx	20	-39.63	3130.72	16.79
			Max. My	14	-39.67	-18.56	-3048.01
			Max. Vy	20	-40.91	3130.72	16.79
			Max. Vx	14	39.95	-18.56	-3048.01
			Max. Torque	8			-7.07
L9	29.5833 - 14.67	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-88.57	9.20	-16.09
			Max. Mx	20	-47.91	3755.23	20.60
			Max. My	14	-47.93	-20.62	-3656.56
			Max. Vy	20	-42.68	3755.23	20.60
			Max. Vx	14	41.73	-20.62	-3656.56
			Max. Torque	8			-7.07
L10	14.67 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-101.68	12.54	-15.73
			Max. Mx	20	-58.98	4395.24	24.81
			Max. My	14	-58.98	-21.82	-4279.77
			Max. Vy	20	-44.30	4395.24	24.81
			Max. Vx	16	43.87	2353.61	-3999.26
			Max. Torque	8			-7.06

Maximum Reactions

Location	*Condition*	*Gov. Load Comb.*	*Vertical K*	*Horizontal, X K*	*Horizontal, Z K*
Pole	Max. Vert	26	101.68	0.00	-0.00
	Max. H_x	20	58.99	44.28	0.23
	Max. H_z	4	58.99	-25.65	43.85
	Max. M_x	2	4273.59	0.23	43.34
	Max. M_z	8	4383.19	-44.28	-0.23
	Max. Torsion	20	7.06	44.28	0.23
	Min. Vert	13	44.25	-22.34	-37.65
	Min. H_x	8	58.99	-44.28	-0.23
	Min. H_z	16	58.99	25.65	-43.85
	Min. M_x	14	-4279.77	-0.23	-43.34
	Min. M_z	20	-4395.24	44.28	0.23
	Min. Torsion	8	-7.06	-44.28	-0.23

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	49.16	0.00	0.00	2.48	4.97	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	58.99	-0.23	-43.34	-4273.59	33.91	1.62
0.9 Dead+1.6 Wind 0 deg - No Ice	44.25	-0.23	-43.34	-4234.64	32.11	1.59
1.2 Dead+1.6 Wind 30 deg - No Ice	58.99	25.65	-43.85	-3993.12	-2341.51	3.24
0.9 Dead+1.6 Wind 30 deg - No Ice	44.25	25.65	-43.85	-3958.04	-2321.92	3.16
1.2 Dead+1.6 Wind 60 deg - No Ice	58.99	41.72	-23.49	-2214.54	-3960.56	6.62
0.9 Dead+1.6 Wind 60 deg - No Ice	44.25	41.72	-23.49	-2195.19	-3925.94	6.53
1.2 Dead+1.6 Wind 90 deg - No Ice	58.99	44.28	0.23	30.92	-4383.19	7.06
0.9 Dead+1.6 Wind 90 deg - No Ice	44.25	44.28	0.23	29.83	-4343.86	6.98
1.2 Dead+1.6 Wind 120 deg - No Ice	58.99	38.46	21.87	2165.37	-3809.10	5.31
0.9 Dead+1.6 Wind 120 deg - No Ice	44.25	38.46	21.87	2144.44	-3775.10	5.25
1.2 Dead+1.6 Wind 150 deg - No Ice	58.99	22.34	37.65	3720.60	-2212.81	2.13
0.9 Dead+1.6 Wind 150 deg - No Ice	44.25	22.34	37.65	3685.20	-2193.67	2.11
1.2 Dead+1.6 Wind 180 deg - No Ice	58.99	0.23	43.34	4279.77	-21.82	-1.62
0.9 Dead+1.6 Wind 180 deg - No Ice	44.25	0.23	43.34	4239.18	-23.07	-1.59
1.2 Dead+1.6 Wind 210 deg - No Ice	58.99	-25.65	43.85	3999.26	2353.61	-3.24
0.9 Dead+1.6 Wind 210 deg - No Ice	44.25	-25.65	43.85	3962.55	2330.97	-3.16
1.2 Dead+1.6 Wind 240 deg - No Ice	58.99	-41.72	23.49	2220.64	3972.65	-6.62

Load Combination	*Vertical*	*Shear$_x$*	*Shear$_z$*	*Overturning Moment, M$_x$*	*Overturning Moment, M$_z$*	*Torque*
	K	*K*	*K*	*kip-ft*	*kip-ft*	*kip-ft*
0.9 Dead+1.6 Wind 240 deg - No Ice	44.25	-41.72	23.49	2199.67	3934.97	-6.53
1.2 Dead+1.6 Wind 270 deg - No Ice	58.99	-44.28	-0.23	-24.81	4395.24	-7.06
0.9 Dead+1.6 Wind 270 deg - No Ice	44.25	-44.28	-0.23	-25.35	4352.86	-6.98
1.2 Dead+1.6 Wind 300 deg - No Ice	58.99	-38.46	-21.87	-2159.23	3821.13	-5.31
0.9 Dead+1.6 Wind 300 deg - No Ice	44.25	-38.46	-21.87	-2139.93	3784.09	-5.25
1.2 Dead+1.6 Wind 330 deg - No Ice	58.99	-22.34	-37.65	-3714.41	2224.86	-2.13
0.9 Dead+1.6 Wind 330 deg - No Ice	44.25	-22.34	-37.65	-3680.66	2202.67	-2.11
1.2 Dead+1.0 Ice+1.0 Temp	101.68	-0.00	0.00	15.73	12.54	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	101.68	-0.03	-10.42	-1086.41	16.05	0.16
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	101.68	5.87	-10.10	-985.90	-570.86	0.80
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	101.68	9.51	-5.42	-548.22	-980.10	1.62
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	101.68	10.53	0.03	19.27	-1103.85	1.74
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	101.68	9.13	5.23	569.92	-956.00	1.43
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	101.68	5.29	9.04	972.11	-548.61	0.72
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	101.68	0.03	10.42	1118.06	9.16	-0.17
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	101.68	-5.87	10.10	1017.54	596.07	-0.81
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	101.68	-9.51	5.42	579.86	1005.32	-1.63
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	101.68	-10.53	-0.03	12.37	1129.06	-1.75
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	101.68	-9.13	-5.23	-538.28	981.21	-1.43
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	101.68	-5.29	-9.04	-940.46	573.82	-0.73
Dead+Wind 0 deg - Service	49.16	-0.05	-9.27	-908.04	10.95	0.35
Dead+Wind 30 deg - Service	49.16	5.49	-9.38	-848.54	-494.95	0.69
Dead+Wind 60 deg - Service	49.16	8.93	-5.03	-469.71	-839.71	1.42
Dead+Wind 90 deg - Service	49.16	9.47	0.05	8.49	-929.61	1.52
Dead+Wind 120 deg - Service	49.16	8.23	4.68	462.99	-807.37	1.14
Dead+Wind 150 deg - Service	49.16	4.78	8.06	794.13	-467.44	0.46
Dead+Wind 180 deg - Service	49.16	0.05	9.27	913.16	-0.91	-0.35
Dead+Wind 210 deg - Service	49.16	-5.49	9.38	853.65	504.99	-0.69
Dead+Wind 240 deg - Service	49.16	-8.93	5.03	474.82	849.75	-1.42
Dead+Wind 270 deg - Service	49.16	-9.47	-0.05	-3.37	939.65	-1.52
Dead+Wind 300 deg - Service	49.16	-8.23	-4.68	-457.88	817.40	-1.14
Dead+Wind 330 deg - Service	49.16	-4.78	-8.06	-789.01	477.47	-0.46

Solution Summary

	Sum of Applied Forces			*Sum of Reactions*			
Load Comb.	*PX*	*PY*	*PZ*	*PX*	*PY*	*PZ*	*% Error*
	K	*K*	*K*	*K*	*K*	*K*	
1	0.00	-49.16	0.00	0.00	49.16	-0.00	0.000%

	Sum of Applied Forces			*Sum of Reactions*			
Load Comb.	*PX* *K*	*PY* *K*	*PZ* *K*	*PX* *K*	*PY* *K*	*PZ* *K*	*% Error*
2	-0.23	-58.99	-43.34	0.23	58.99	43.34	0.000%
3	-0.23	-44.25	-43.34	0.23	44.25	43.34	0.000%
4	25.65	-58.99	-43.85	-25.65	58.99	43.85	0.000%
5	25.65	-44.25	-43.85	-25.65	44.25	43.85	0.000%
6	41.72	-58.99	-23.49	-41.72	58.99	23.49	0.000%
7	41.72	-44.25	-23.49	-41.72	44.25	23.49	0.000%
8	44.28	-58.99	0.23	-44.28	58.99	-0.23	0.000%
9	44.28	-44.25	0.23	-44.28	44.25	-0.23	0.000%
10	38.46	-58.99	21.87	-38.46	58.99	-21.87	0.000%
11	38.46	-44.25	21.87	-38.46	44.25	-21.87	0.000%
12	22.34	-58.99	37.65	-22.34	58.99	-37.65	0.000%
13	22.34	-44.25	37.65	-22.34	44.25	-37.65	0.000%
14	0.23	-58.99	43.34	-0.23	58.99	-43.34	0.000%
15	0.23	-44.25	43.34	-0.23	44.25	-43.34	0.000%
16	-25.65	-58.99	43.85	25.65	58.99	-43.85	0.000%
17	-25.65	-44.25	43.85	25.65	44.25	-43.85	0.000%
18	-41.72	-58.99	23.49	41.72	58.99	-23.49	0.000%
19	-41.72	-44.25	23.49	41.72	44.25	-23.49	0.000%
20	-44.28	-58.99	-0.23	44.28	58.99	0.23	0.000%
21	-44.28	-44.25	-0.23	44.28	44.25	0.23	0.000%
22	-38.46	-58.99	-21.87	38.46	58.99	21.87	0.000%
23	-38.46	-44.25	-21.87	38.46	44.25	21.87	0.000%
24	-22.34	-58.99	-37.65	22.34	58.99	37.65	0.000%
25	-22.34	-44.25	-37.65	22.34	44.25	37.65	0.000%
26	0.00	-101.68	0.00	0.00	101.68	-0.00	0.000%
27	-0.03	-101.68	-10.42	0.03	101.68	10.42	0.000%
28	5.87	-101.68	-10.10	-5.87	101.68	10.10	0.000%
29	9.51	-101.68	-5.42	-9.51	101.68	5.42	0.000%
30	10.53	-101.68	0.03	-10.53	101.68	-0.03	0.000%
31	9.13	-101.68	5.23	-9.13	101.68	-5.23	0.000%
32	5.29	-101.68	9.04	-5.29	101.68	-9.04	0.000%
33	0.03	-101.68	10.42	-0.03	101.68	-10.42	0.000%
34	-5.87	-101.68	10.10	5.87	101.68	-10.10	0.000%
35	-9.51	-101.68	5.42	9.51	101.68	-5.42	0.000%
36	-10.53	-101.68	-0.03	10.53	101.68	0.03	0.000%
37	-9.13	-101.68	-5.23	9.13	101.68	5.23	0.000%
38	-5.29	-101.68	-9.04	5.29	101.68	9.04	0.000%
39	-0.05	-49.16	-9.27	0.05	49.16	9.27	0.000%
40	5.49	-49.16	-9.38	-5.49	49.16	9.38	0.000%
41	8.93	-49.16	-5.03	-8.93	49.16	5.03	0.000%
42	9.47	-49.16	0.05	-9.47	49.16	-0.05	0.000%
43	8.23	-49.16	4.68	-8.23	49.16	-4.68	0.000%
44	4.78	-49.16	8.06	-4.78	49.16	-8.06	0.000%
45	0.05	-49.16	9.27	-0.05	49.16	-9.27	0.000%
46	-5.49	-49.16	9.38	5.49	49.16	-9.38	0.000%
47	-8.93	-49.16	5.03	8.93	49.16	-5.03	0.000%
48	-9.47	-49.16	-0.05	9.47	49.16	0.05	0.000%
49	-8.23	-49.16	-4.68	8.23	49.16	4.68	0.000%
50	-4.78	-49.16	-8.06	4.78	49.16	8.06	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	5	0.00000001	0.00010301

3	Yes	5	0.00000001	0.00004579
4	Yes	6	0.00000001	0.00015413
5	Yes	6	0.00000001	0.00004586
6	Yes	6	0.00000001	0.00012941
7	Yes	6	0.00000001	0.00003789
8	Yes	5	0.00000001	0.00061243
9	Yes	5	0.00000001	0.00026798
10	Yes	6	0.00000001	0.00015539
11	Yes	6	0.00000001	0.00004680
12	Yes	6	0.00000001	0.00014030
13	Yes	6	0.00000001	0.00004175
14	Yes	5	0.00000001	0.00021393
15	Yes	5	0.00000001	0.00009468
16	Yes	6	0.00000001	0.00013638
17	Yes	6	0.00000001	0.00003968
18	Yes	6	0.00000001	0.00015942
19	Yes	6	0.00000001	0.00004791
20	Yes	5	0.00000001	0.00049569
21	Yes	5	0.00000001	0.00021720
22	Yes	6	0.00000001	0.00013347
23	Yes	6	0.00000001	0.00003944
24	Yes	6	0.00000001	0.00014616
25	Yes	6	0.00000001	0.00004389
26	Yes	4	0.00000001	0.00029454
27	Yes	6	0.00000001	0.00011315
28	Yes	6	0.00000001	0.00016167
29	Yes	6	0.00000001	0.00015417
30	Yes	6	0.00000001	0.00012160
31	Yes	6	0.00000001	0.00017059
32	Yes	6	0.00000001	0.00016292
33	Yes	6	0.00000001	0.00011943
34	Yes	6	0.00000001	0.00016715
35	Yes	6	0.00000001	0.00017582
36	Yes	6	0.00000001	0.00012234
37	Yes	6	0.00000001	0.00015382
38	Yes	6	0.00000001	0.00015785
39	Yes	4	0.00000001	0.00023290
40	Yes	5	0.00000001	0.00006053
41	Yes	4	0.00000001	0.00099935
42	Yes	4	0.00000001	0.00076277
43	Yes	5	0.00000001	0.00006078
44	Yes	5	0.00000001	0.00004443
45	Yes	4	0.00000001	0.00026187
46	Yes	5	0.00000001	0.00004499
47	Yes	5	0.00000001	0.00006818
48	Yes	4	0.00000001	0.00073304
49	Yes	4	0.00000001	0.00098167
50	Yes	5	0.00000001	0.00004955

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
L1	150 - 130	23.209	46	1.2362	0.0079
L2	130 - 110	18.047	46	1.2216	0.0079
L3	110 - 95.83	13.098	46	1.1231	0.0064
L4	101 - 81	11.054	46	1.0424	0.0049
L5	81 - 61	6.998	46	0.8711	0.0033
L6	61 - 47.83	3.831	46	0.6343	0.0019

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L7	54 - 34	2.967	46	0.5430	0.0015
L8	34 - 29.5833	1.084	46	0.3286	0.0008
L9	29.5833 - 14.67	0.806	46	0.2716	0.0006
L10	14.67 - 0	0.189	46	0.1230	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	10' x 1.5" Dia Dipole	46	22.950	1.2362	0.0079	129959
138.00	RRUS A2 B13	46	20.103	1.2331	0.0080	54149
127.00	HPA-65R-BUU-H6 w/ Mount Pipe	46	17.282	1.2140	0.0078	20923
116.00	(2) RADIO 4449 B12/B71	46	14.534	1.1656	0.0071	8873
106.00	(2) Collar Mount	46	12.173	1.0882	0.0057	7280
105.00	(2) Collar Mount	46	11.946	1.0790	0.0056	7421
104.00	8' x 2" Dia Dipole	46	11.721	1.0698	0.0054	7556
80.00	BXA-171063-8BF-EDIN-X w/ Mount Pipe	46	6.816	0.8613	0.0032	5172
40.00	GPS_A	46	1.547	0.3966	0.0010	4645

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 130	108.352	16	5.7779	0.0372
L2	130 - 110	84.289	16	5.7097	0.0371
L3	110 - 95.83	61.218	16	5.2512	0.0297
L4	101 - 81	51.680	16	4.8764	0.0229
L5	81 - 61	32.732	16	4.0774	0.0153
L6	61 - 47.83	17.924	16	2.9692	0.0090
L7	54 - 34	13.884	16	2.5421	0.0071
L8	34 - 29.5833	5.071	16	1.5383	0.0038
L9	29.5833 - 14.67	3.772	16	1.2712	0.0030
L10	14.67 - 0	0.885	16	0.5758	0.0012

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	10' x 1.5" Dia Dipole	16	107.143	5.7779	0.0373	28472
138.00	RRUS A2 B13	16	93.871	5.7635	0.0375	11862
127.00	HPA-65R-BUU-H6 w/ Mount Pipe	16	80.723	5.6740	0.0367	4555
116.00	(2) RADIO 4449 B12/B71	16	67.916	5.4484	0.0334	1955
106.00	(2) Collar Mount	16	56.905	5.0893	0.0267	1600
105.00	(2) Collar Mount	16	55.845	5.0467	0.0259	1629
104.00	8' x 2" Dia Dipole	16	54.793	5.0038	0.0252	1657

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
80.00	BXA-171063-8BF-EDIN-X w/ Mount Pipe	16	31.883	4.0312	0.0151	1114
40.00	GPS_A	16	7.237	1.8566	0.0047	994

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 130 (1)	TP27.25x23.61x0.2813	20.00	0.00	0.0	24.4279	-5.24	1743.92	0.003
L2	130 - 110 (2)	TP30.89x27.25x0.2813	20.00	0.00	0.0	27.7250	-12.97	1884.92	0.007
L3	110 - 95.83 (3)	TP33.469x30.89x0.2813	14.17	0.00	0.0	29.2087	-16.05	1941.05	0.008
L4	95.83 - 81 (4)	TP35.6055x31.9655x0.375	20.00	0.00	0.0	42.5408	-20.85	3058.53	0.007
L5	81 - 61 (5)	TP39.2455x35.6055x0.375	20.00	0.00	0.0	46.9361	-28.39	3254.69	0.009
L6	61 - 47.83 (6)	TP41.6425x39.2455x0.375	13.17	0.00	0.0	48.4745	-30.19	3318.04	0.009
L7	47.83 - 34 (7)	TP43.4095x39.7695x0.4375	20.00	0.00	0.0	60.5368	-37.81	4284.32	0.009
L8	34 - 29.5833 (8)	TP44.2134x43.4095x0.4375	4.42	0.00	0.0	61.6693	-39.49	4334.66	0.009
L9	29.5833 - 14.67 (9)	TP46.9276x44.2134x0.58	14.91	0.00	0.0	86.5588	-47.83	6380.25	0.007
L10	14.67 - 0 (10)	TP49.5976x46.9276x0.7	14.67	0.00	0.0	110.2150	-58.98	8123.96	0.007

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 130 (1)	TP27.25x23.61x0.2813	86.47	955.77	0.090	0.00	955.77	0.000
L2	130 - 110 (2)	TP30.89x27.25x0.2813	427.79	1173.93	0.364	0.00	1173.93	0.000
L3	110 - 95.83 (3)	TP33.469x30.89x0.2813	649.85	1274.16	0.510	0.00	1274.16	0.000
L4	95.83 - 81 (4)	TP35.6055x31.9655x0.375	1209.97	2189.32	0.553	0.00	2189.32	0.000
L5	81 - 61 (5)	TP39.2455x35.6055x0.375	1909.46	2572.97	0.742	0.00	2572.97	0.000
L6	61 - 47.83 (6)	TP41.6425x39.2455x0.375	2176.59	2709.85	0.803	0.00	2709.85	0.000
L7	47.83 - 34 (7)	TP43.4095x39.7695x0.4375	3019.85	3742.35	0.807	0.00	3742.35	0.000
L8	34 - 29.5833 (8)	TP44.2134x43.4095x0.4375	3217.72	3857.86	0.834	0.00	3857.86	0.000
L9	29.5833 - 14.67 (9)	TP46.9276x44.2134x0.58	3914.22	5997.07	0.653	0.00	5997.07	0.000
L10	14.67 - 0 (10)	TP49.5976x46.9276x0.7	4640.43	8041.86	0.577	0.00	8041.86	0.000

Reactions used to check reinforcing members

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

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Project	**Date**
150' Monopole	07/22/19
Client	**Designed by**
T-Mobile	Ian Marinaccio

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 130 (1)	TP27.25x23.61x0.2813	9.16	871.96	0.011	0.00	1944.85	0.000
L2	130 - 110 (2)	TP30.89x27.25x0.2813	23.72	942.46	0.025	4.79	2387.76	0.002
L3	110 - 95.83 (3)	TP33.469x30.89x0.2813	26.51	970.52	0.027	4.99	2591.24	0.002
L4	95.83 - 81 (4)	TP35.6055x31.9655x0.375	29.52	1529.27	0.019	4.99	4455.24	0.001
L5	81 - 61 (5)	TP39.2455x35.6055x0.375	36.64	1627.35	0.023	6.93	5234.23	0.001
L6	61 - 47.83 (6)	TP41.6425x39.2455x0.375	39.78	1659.02	0.024	4.53	5512.11	0.001
L7	47.83 - 34 (7)	TP43.4095x39.7695x0.4375	44.34	2142.16	0.021	3.95	7614.46	0.001
L8	34 - 29.5833 (8)	TP44.2134x43.4095x0.4375	45.23	2167.33	0.021	3.86	7848.99	0.000
L9	29.5833 - 14.67 (9)	TP46.9276x44.2134x0.58	48.15	3190.12	0.015	3.56	12211.58	0.000
L10	14.67 - 0 (10)	TP49.5976x46.9276x0.7	50.82	4061.98	0.013	3.26	16385.17	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 130 (1)	0.003	0.090	0.000	0.011	0.000	0.094 ✔	1.000	4.8.2 ✔
L2	130 - 110 (2)	0.007	0.364	0.000	0.025	0.002	0.372 ✔	1.000	4.8.2 ✔
L3	110 - 95.83 (3)	0.008	0.510	0.000	0.027	0.002	0.519 ✔	1.000	4.8.2 ✔
L4	95.83 - 81 (4)	0.007	0.553	0.000	0.019	0.001	0.560 ✔	1.000	4.8.2 ✔
L5	81 - 61 (5)	0.009	0.742	0.000	0.023	0.001	0.751 ✔	1.000	4.8.2 ✔
L6	61 - 47.83 (6)	0.009	0.803	0.000	0.024	0.001	0.813 ✔	1.000	4.8.2 ✔
L7	47.83 - 34 (7)	0.009	0.807	0.000	0.021	0.001	0.816 ✔	1.000	4.8.2 ✔
L8	34 - 29.5833 (8)	0.009	0.834	0.000	0.021	0.000	0.844 ✔	1.000	4.8.2 ✔
L9	29.5833 - 14.67 (9)	0.007	0.653	0.000	0.015	0.000	0.660 ✔	1.000	4.8.2 ✔
L10	14.67 - 0 (10)	0.007	0.577	0.000	0.013	0.000	0.584 ✔	1.000	4.8.2 ✔

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Project	**Date**
150' Monopole	07/22/19
Client	**Designed by**
T-Mobile	Ian Marinaccio

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 130	Pole	TP27.25x23.61x0.2813	1	-5.24	1743.92	9.4	Pass
L2	130 - 110	Pole	TP30.89x27.25x0.2813	2	-12.97	1884.92	37.2	Pass
L3	110 - 95.83	Pole	TP33.469x30.89x0.2813	3	-16.05	1941.05	51.9	Pass
L4	95.83 - 81	Pole	TP35.6055x31.9655x0.375	4	-20.85	3058.53	56.0	Pass
L5	81 - 61	Pole	TP39.2455x35.6055x0.375	5	-28.39	3254.69	75.1	Pass
L6	61 - 47.83	Pole	TP41.6425x39.2455x0.375	6	-30.19	3318.04	81.3	Pass
L7	47.83 - 34	Pole	TP43.4095x39.7695x0.4375	7	-37.81	4284.32	81.6	Pass
L8	34 - 29.5833	Pole	TP44.2134x43.4095x0.4375	8	-39.49	4334.66	84.4	Pass
L9	29.5833 - 14.67	Pole	TP46.9276x44.2134x0.58	9	-47.83	6380.25	98.6	Pass
L10	14.67 - 0	Pole	TP49.5976x46.9276x0.7	10	-58.98	8123.96	86.4	Pass
							Summary	
						Pole (L8)	84.4	Pass
						RATING =	**98.6**	**Pass**

Reinforcing member capacity governs over pole shaft. See attached calculations

W.O.	9927.CT11077C	Report Date:	7/22/2019
Client:	T-Mobile / Northeast Site Solutions	Revision:	2
Site Name:	Fairfield Fire Rescue #5	Prepared By:	IM

CHECK FOR REINFORCING MEMBER

SECTION	0'-14.67'	
Fy	65	ksi
Moment @ Base	4640.43	kip-ft
Y_{POLE} @ Bottom	24.81	in
Y_{REINF} @ Bottom	30.13	in

Reinf. Member	(8) WT6x25	
Area	7.30	in^2
Capacity	327.6	kips

POLE ELEVATION	Moment of Inertia (in^4)		
	w/o Reinforcement	w/Reinforcement	Reinforcement
Base	21396	43283	21887

Moment distribution within the pole and the reinforcing plates

AT BASE	Ratios of the moments	Approx Moment Distribution (kip-ft)	Axial Force in Plate (kips)
Pole Section	0.49	2294	
Reinforcing Plate	0.51	2347	283

Max Percentage Stress of the reinforcing member = 86.4% Pass

W.O.	9927.CT11077C	Report Date:	7/22/2019
Client:	T-Mobile / Northeast Site Solutions	Revision:	2
Site Name:	Fairfield Fire Rescue #5	Prepared By:	IM

CHECK FOR REINFORCING MEMBER

SECTION	14.67'-31'	
Fy	65	ksi
Moment @ Base	3914.22	kip-ft
Y_{POLE} @ Bottom	23.4375	in
Y_{REINF} @ Bottom	28.50	in

Reinf. Member	(4) WT6x25	
Area	7.30	in^2
Capacity	327.6	kips

POLE ELEVATION	Moment of Inertia (in^4)		
	w/o Reinforcement	w/Reinforcement	Reinforcement
@ 14.67	18084	30239	12155

Moment distribution within the pole and the reinforcing plates

AT BASE	Ratios of the moments	Approx Moment Distribution (kip-ft)	Axial Force in Plate (kips)
Pole Section	0.60	2341	
Reinforcing Plate	0.40	1573	323

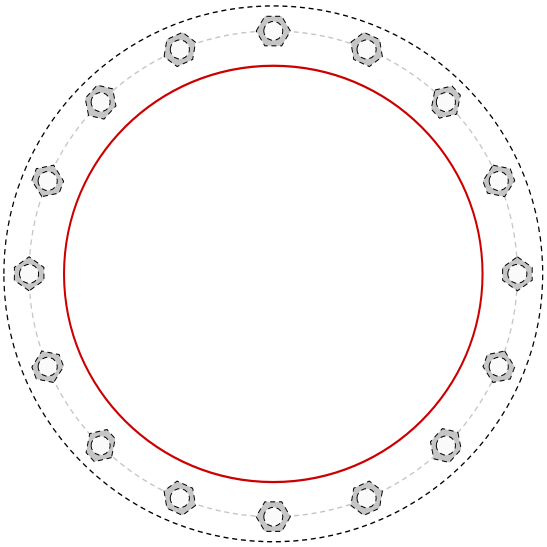
Max Percentage Stress of the reinforcing member = 98.6% Pass

Monopole Base Plate Connection

Site Info	
Site Name	Fairfield Fire Rescue #5
Order #	9927.CT11077C, Rev 2

Analysis Considerations	
TIA-222 Revision	G
Grout Considered:	Yes
l_{ar} (in)	0
Eta Factor, η	0.55

Applied Loads	
Moment (kip-ft)	4640.00
Axial Force (kips)	59.00
Shear Force (kips)	51.00



Connection Properties

Anchor Rod Data

(16) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 57.85" BC

Base Plate Data

63.85" OD x 2.75" Plate (A633 Gr. E; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

49.597566" x 0.4375" 12-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_t = 236.79	ϕPn_t = 260	**Stress Rating**
Vu = 3.19	ϕVn = n/a	**93.3%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	33.34	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**61.7%**	**Pass**

Drilled Pier Foundation

Site Name:	Fairfield Fire Rescue #5
Order Number:	9927.CT11077C, Rev 2

TIA-222 Revison:	G
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	4640	
Axial Force (kips)	59	
Shear Force (kips)	51	

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	26.5	ft
Ext. Above Grade	1	ft
Pier Section 1		
From 1' above grade to 26.5' below grade		
Pier Diameter	7	ft
Rebar Quantity	40	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	4	

Analysis Results		
Soil Lateral Capacity	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	6.71	-
Soil Safety Factor	1.47	-
Max Moment (kip-ft)	4940.70	-
Rating	*90.3%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	262.46	-
End Bearing (kips)	0.00	-
Weight of Concrete (kips)	129.98	-
Total Capacity (kips)	262.46	-
Axial (kips)	188.98	-
Rating	*72.0%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.90	-
Critical Moment (kip-ft)	4940.16	-
Critical Moment Capacity	9145.49	-
Rating	*54.0%*	-

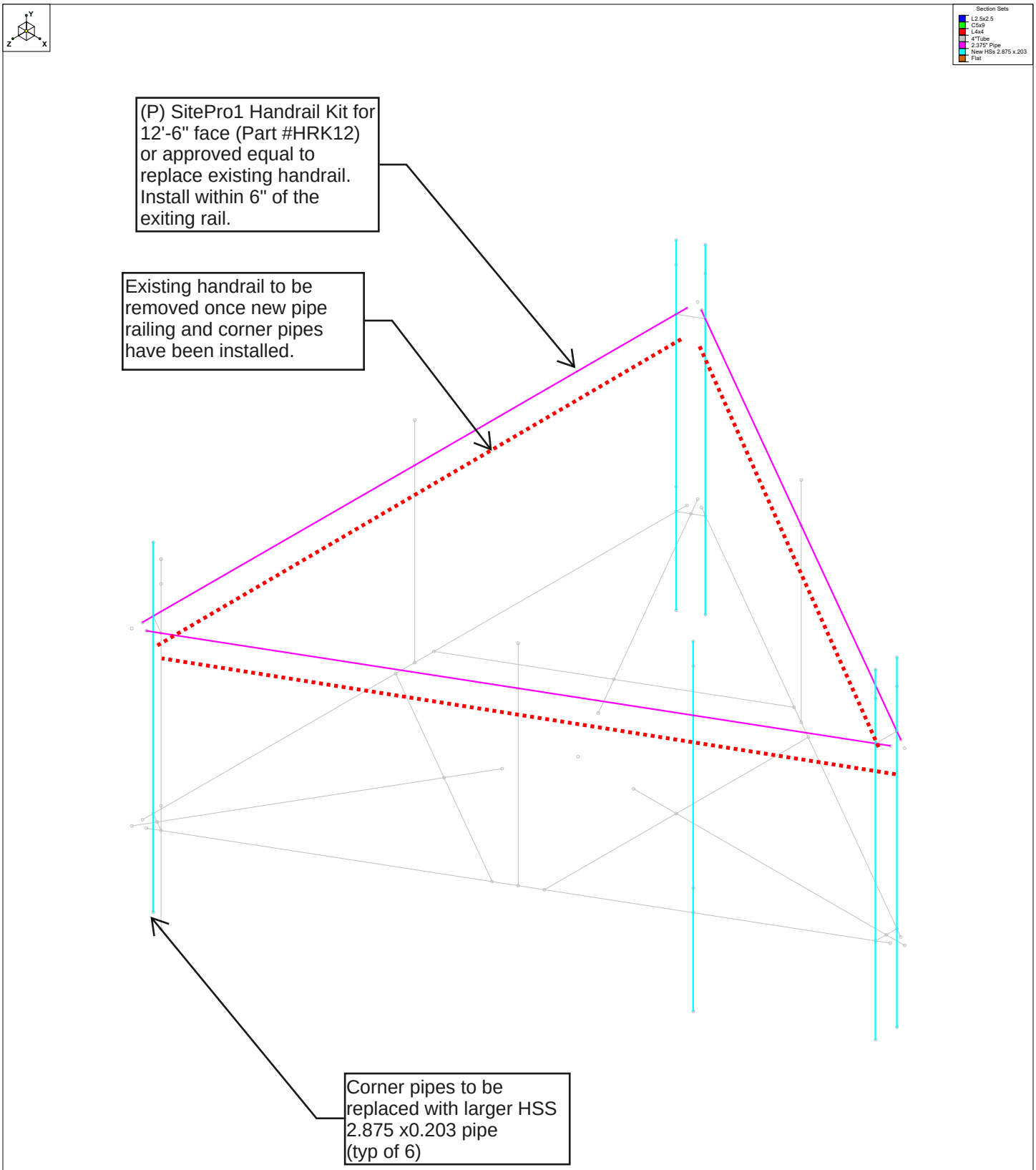
Soil Interaction Rating	**90.3%**
Structural Foundation Rating	**54.0%**

Soil Profile

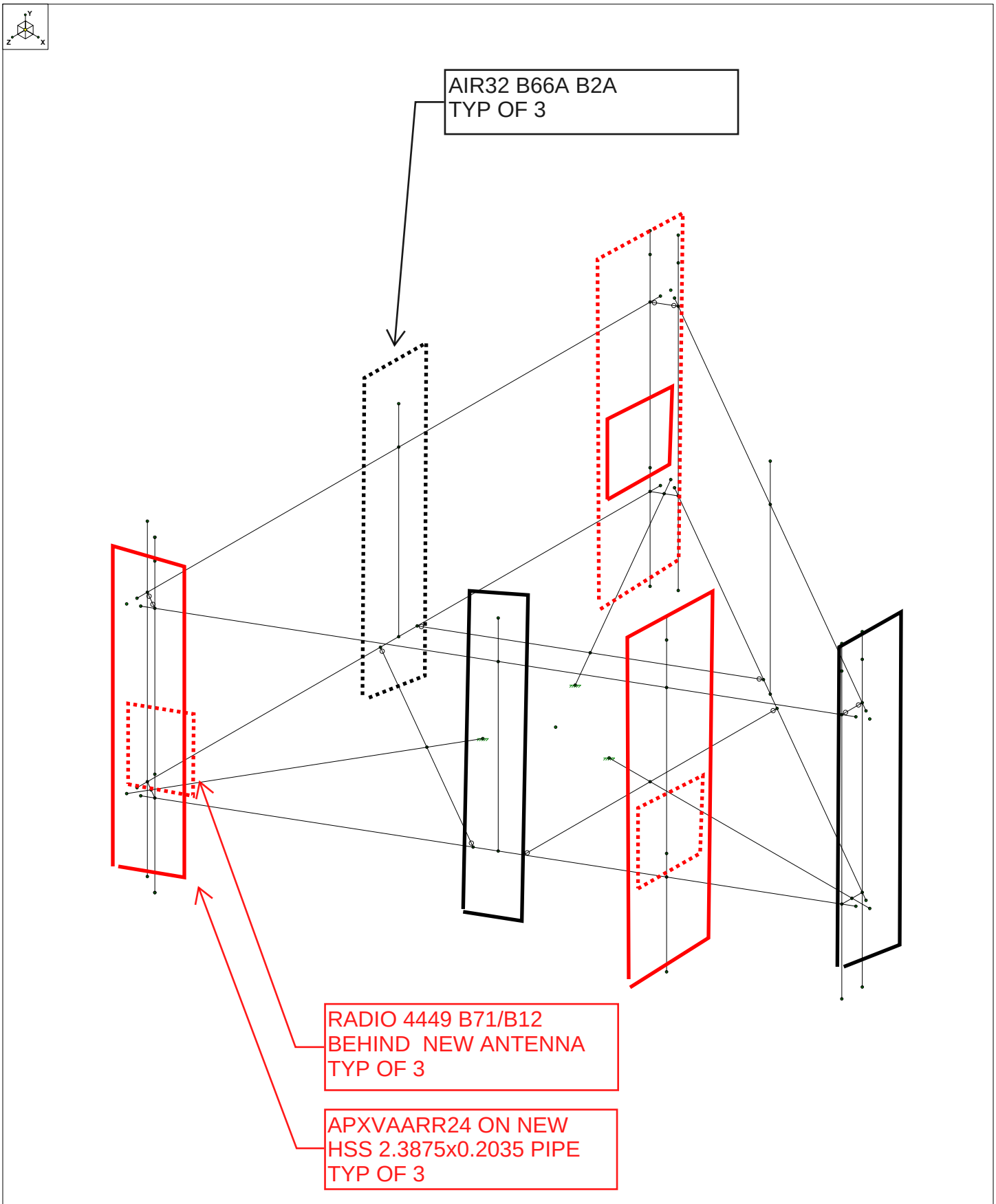
Groundwater Depth	5.5	ft	
# of Layers	3		

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	4	4	120	150	0	0	0.000	0.000	0.00	0.00		0	Cohesionless
2	4	5.5	1.5	120	150	0	35	0.687	0.687				20	Cohesionless
3	5.5	26.5	21	42.6	87.6	0	30	0.709	0.709			0	10	Cohesionless

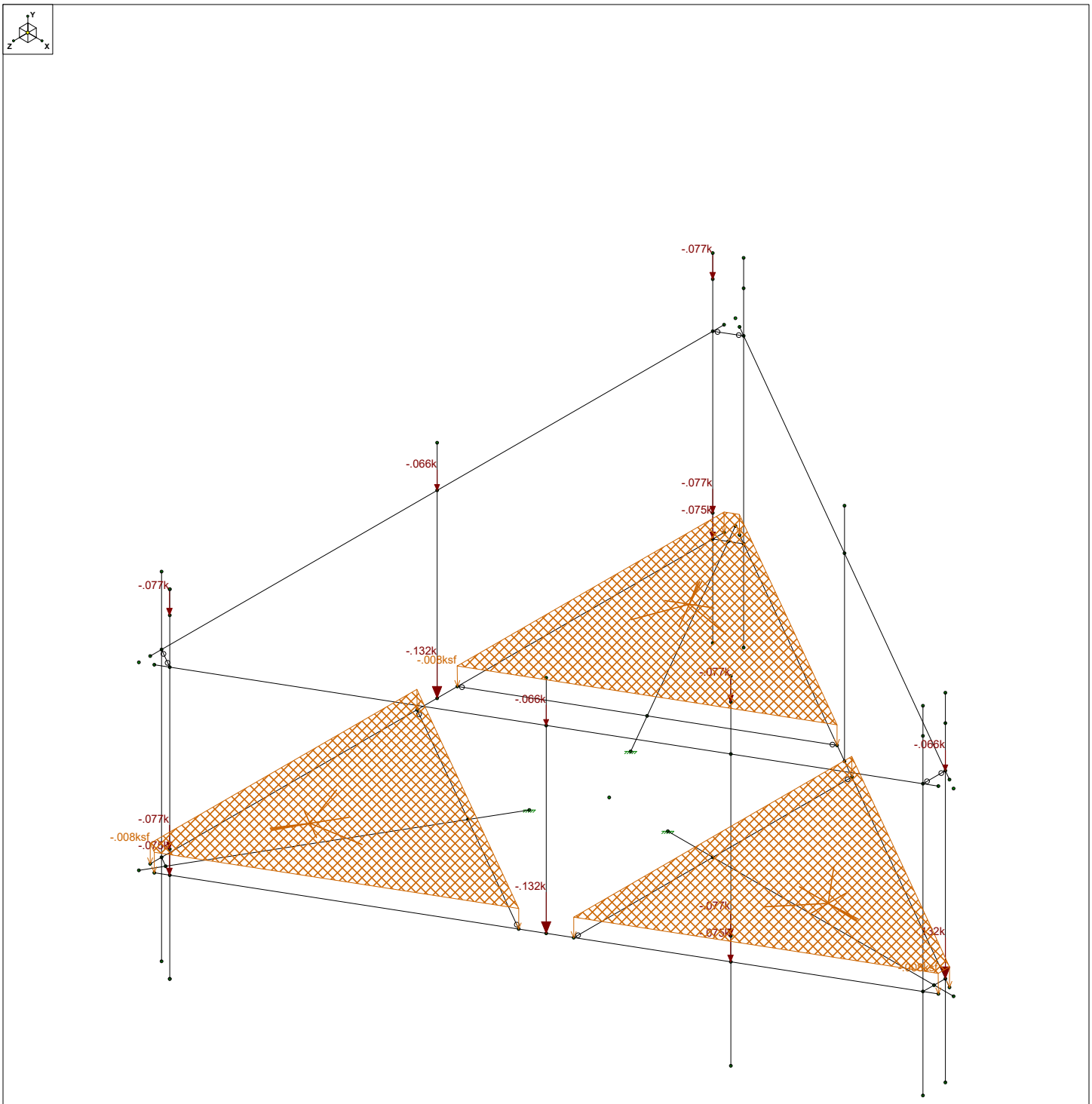
MOUNT ANALYSIS



Tectonic		
Ian Marinaccio	Low-Profile Platform	July 22, 2019 at 3:04 PM
9927.CT11077C, Rev 2		9927.CT11077C_Mod.r2.r3d

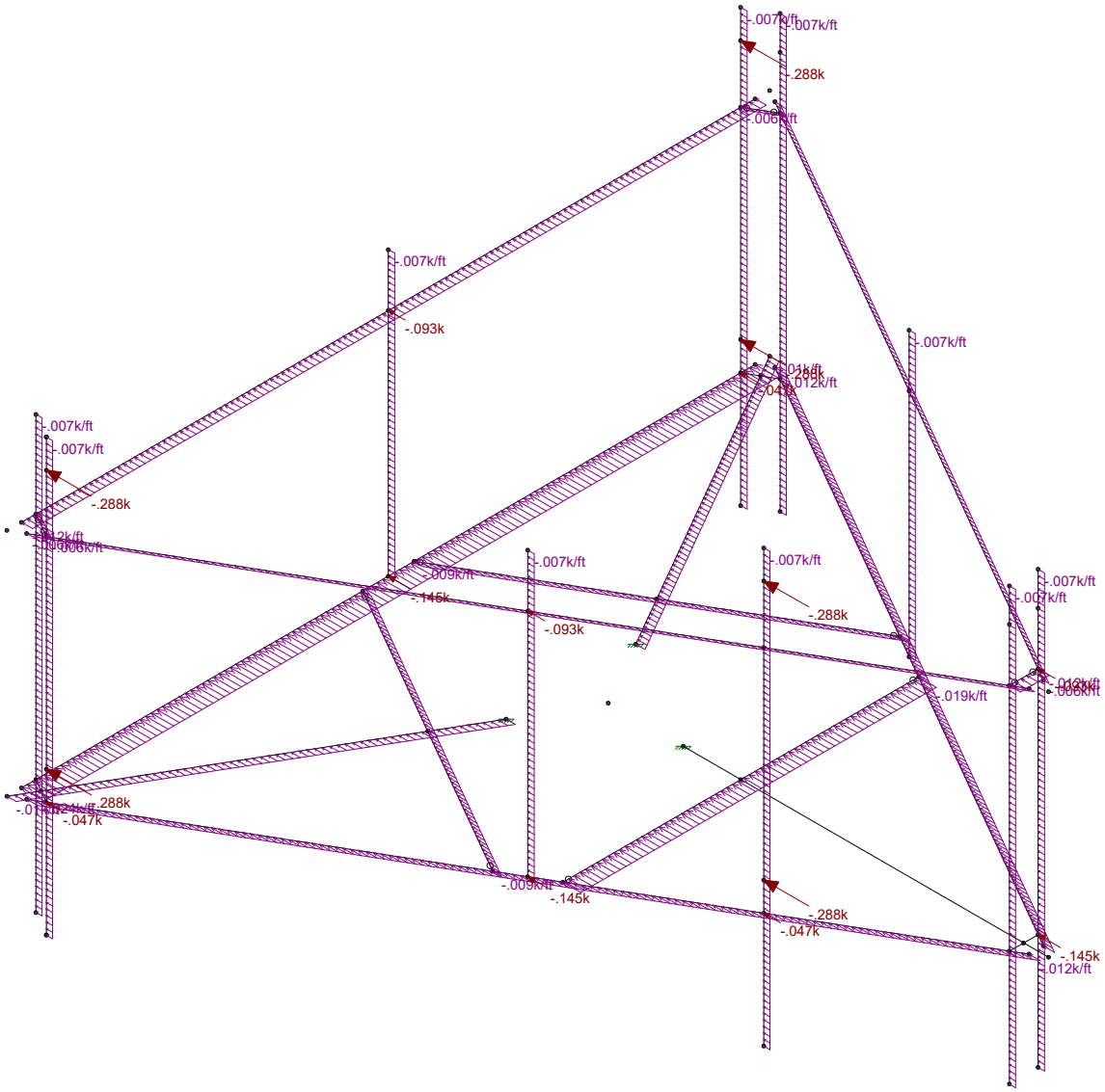


Tectonic	Low-Profile Platform	
Ian Marinaccio		July 22, 2019 at 3:04 PM
9927.CT11077C, Rev 2		9927.CT11077C_Mod.r2.r3d



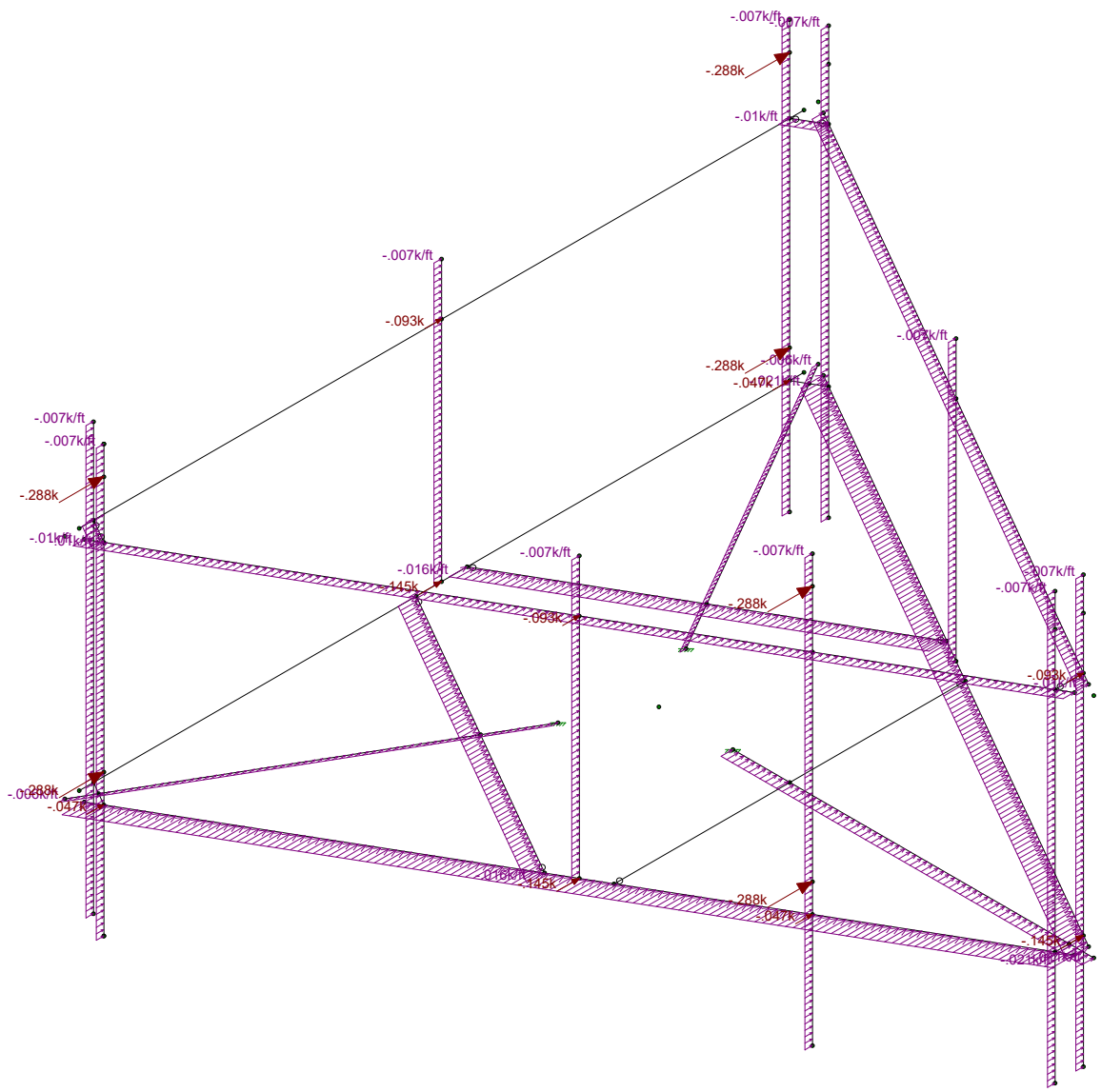
Loads: BLC 1, DL

Tectonic		
Ian Marinaccio	Low-Profile Platform	July 22, 2019 at 3:04 PM
9927.CT11077C, Rev 2		9927.CT11077C_Mod.r2.r3d



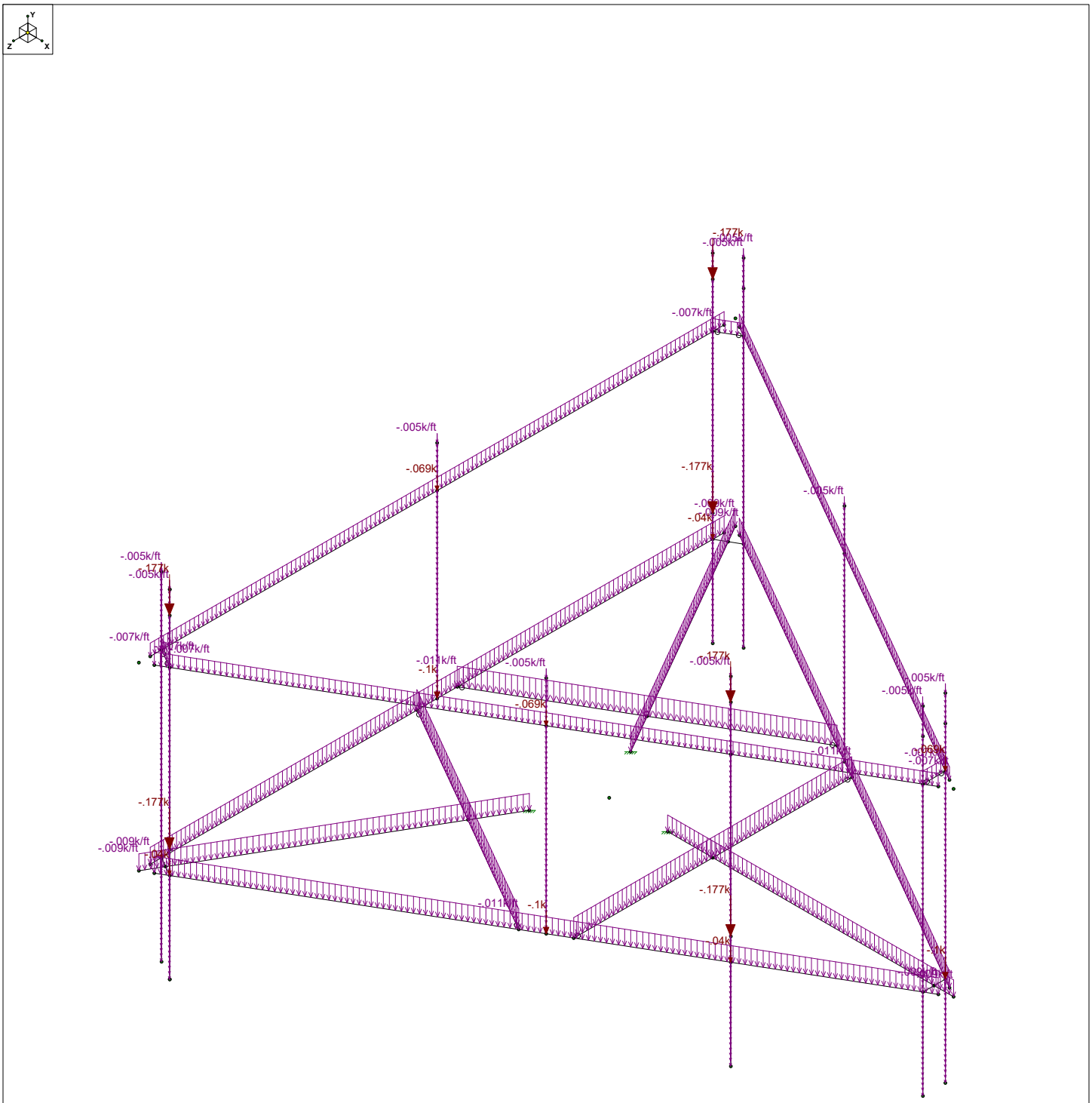
Loads: BLC 2, WLX

Tectonic		
Ian Marinaccio	Low-Profile Platform	July 22, 2019 at 3:04 PM
9927.CT11077C, Rev 2		9927.CT11077C_Mod.r2.r3d



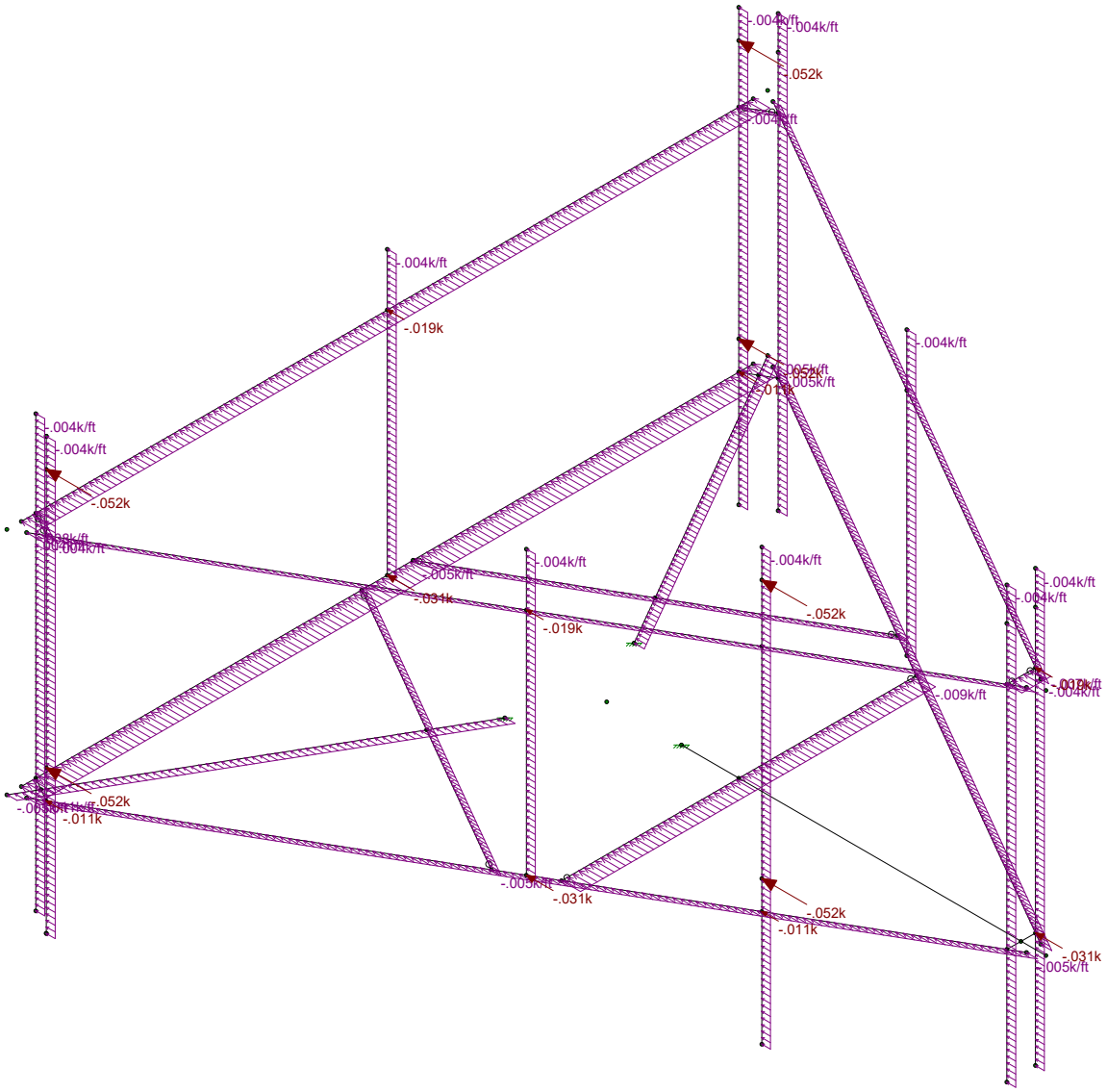
Loads: BLC 3, WLZ

Tectonic	Low-Profile Platform	
Ian Marinaccio		July 22, 2019 at 3:04 PM
9927.CT11077C, Rev 2		9927.CT11077C_Mod.r2.r3d



Loads: BLC 4, DL (ICE)

Tectonic		
Ian Marinaccio	Low-Profile Platform	July 22, 2019 at 3:05 PM
9927.CT11077C, Rev 2		9927.CT11077C_Mod.r2.r3d



Loads: BLC 5, WLX (ICE)

Tectonic		
Ian Marinaccio	Low-Profile Platform	July 22, 2019 at 3:05 PM
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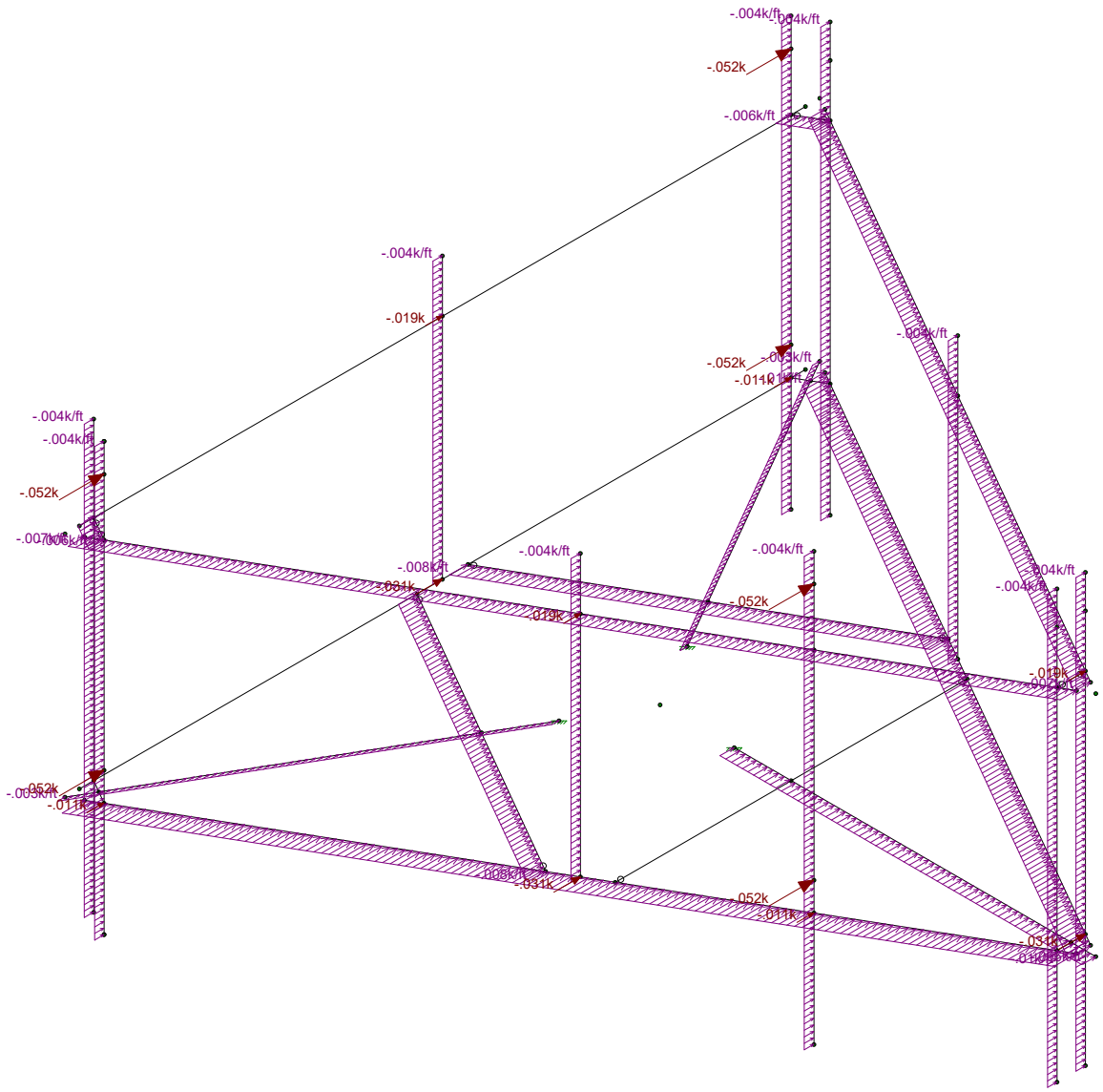
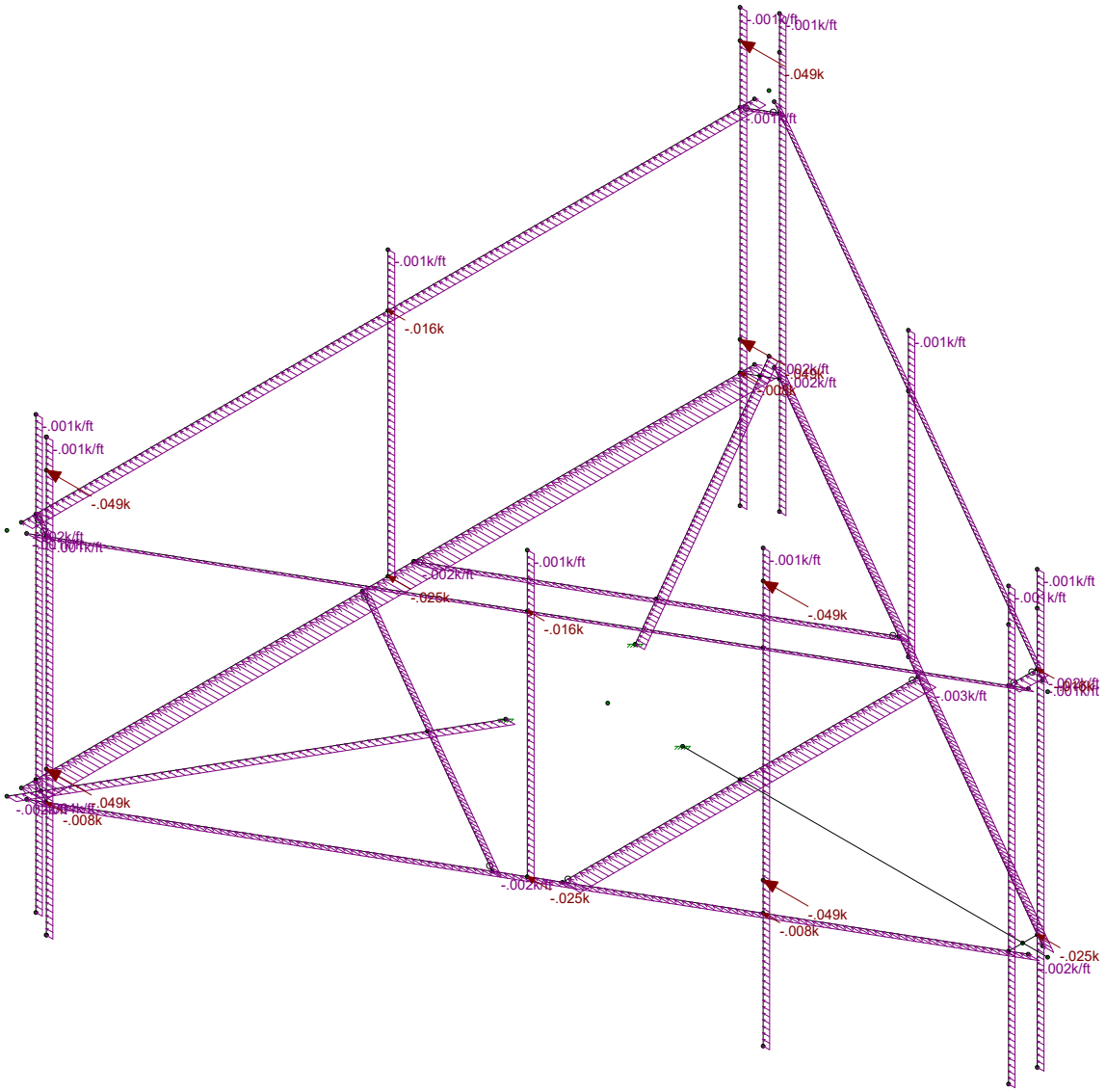


Loads: BLC 6, WLZ (ICE)

Tectonic	Low-Profile Platform	
Ian Marinaccio		July 22, 2019 at 3:05 PM
9927.CT11077C, Rev 2		9927.CT11077C_Mod.r2.r3d



Loads: BLC 7, WLX (MAINT)

Tectonic		
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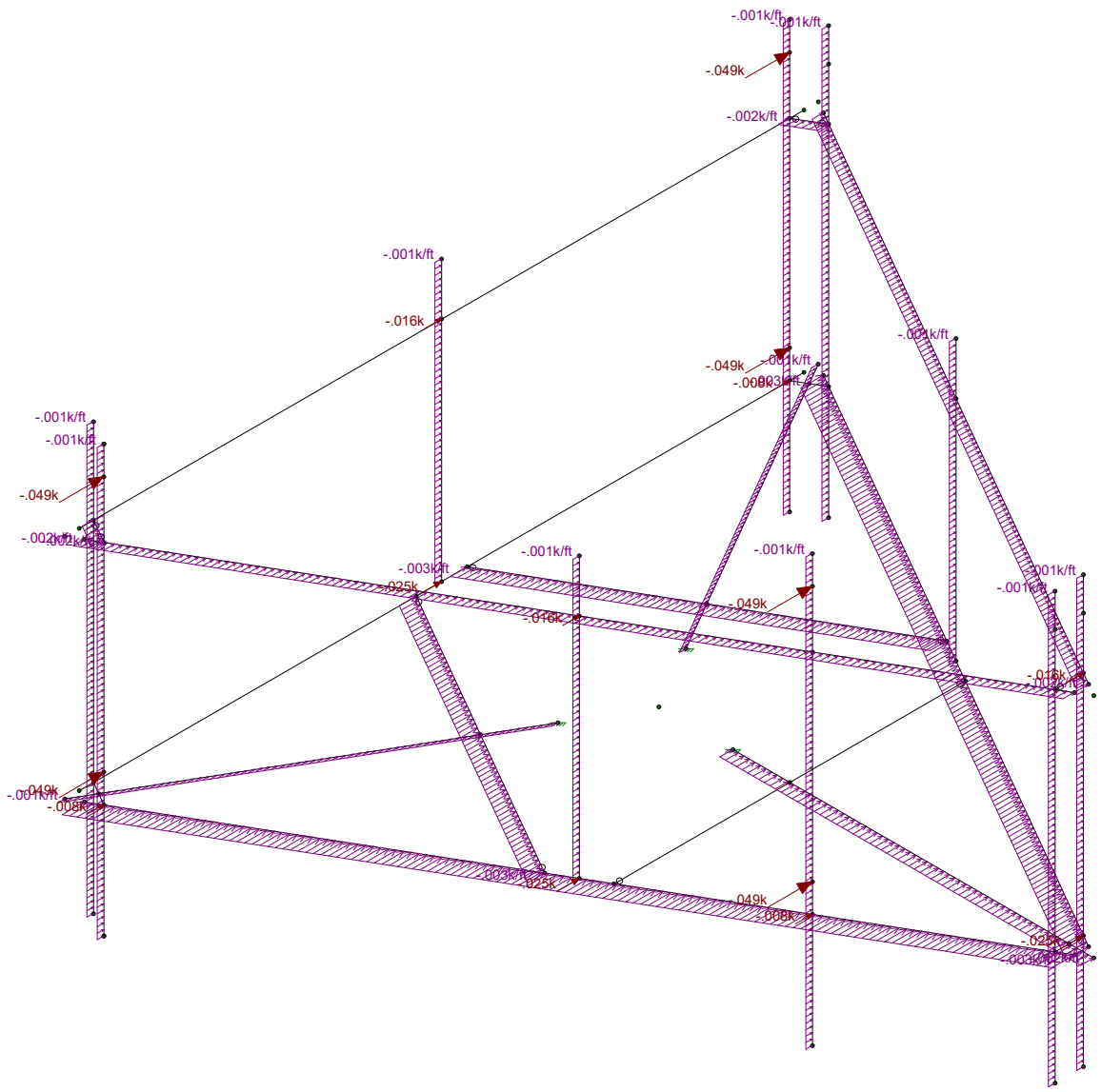
9927.CT11077C, Rev 2		9927.CT11077C_Mod.r2.r3d



Loads: BLC 8, WLZ (MAINT)

Tectonic	Low-Profile Platform	
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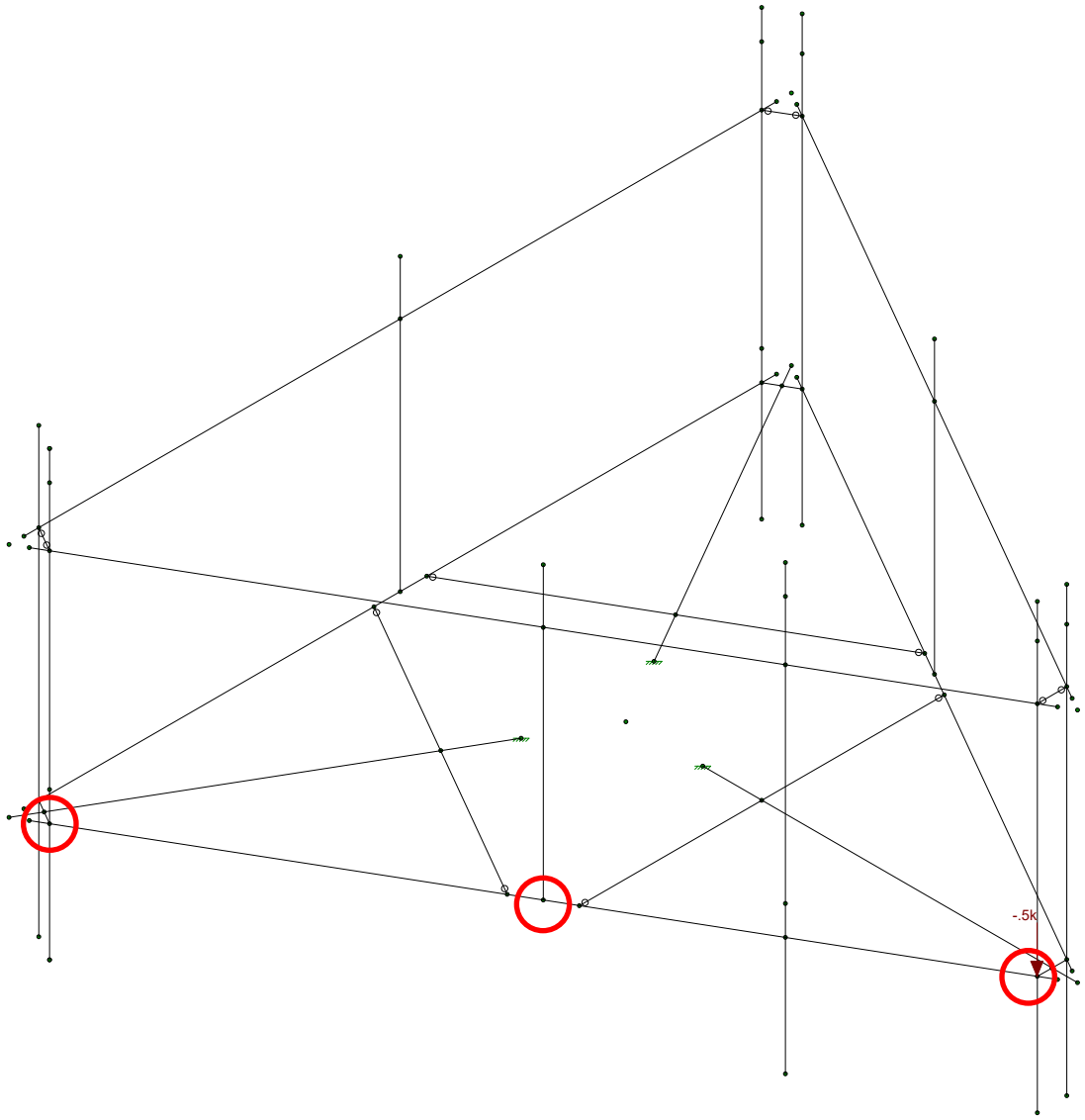
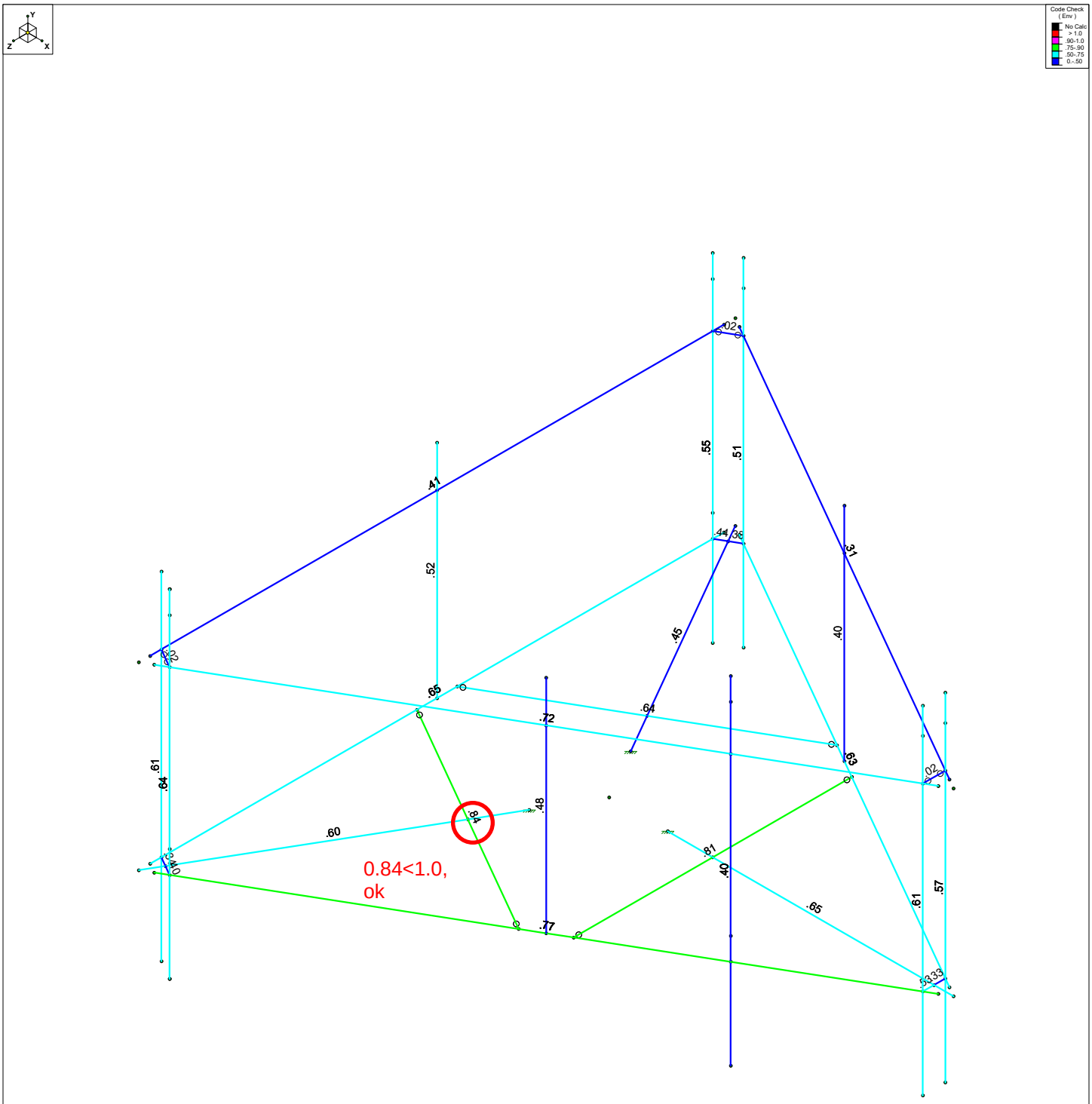


500 LB MAN LOAD

Loads: BLC 9, Lm1

Tectonic	Low-Profile Platform	
Ian Marinaccio		July 22, 2019 at 3:05 PM
9927.CT11077C, Rev 2		9927.CT11077C_Mod.r2.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Tectonic		
Ian Marinaccio	Low-Profile Platform	July 22, 2019 at 3:05 PM
9927.CT11077C, Rev 2		9927.CT11077C_Mod.r2.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1...	Density[k/f...	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 Gravi...	Y Gravi...	Z Gravity	Joint	Point	Distrib...	Area(Memb...	Surface(...
1	DL	DL		-1.05		18			3	
2	WLX	WL+X				18		25		
3	WLZ	WL+Z				18		25		
4	DL (ICE)	SL				18		25		
5	WLX (ICE)	WL+X				18		25		
6	WLZ (ICE)	WL+Z				18		25		
7	WLX (MAINT)	WL+X				18		25		
8	WLZ (MAINT)	WL+Z				18		25		
9	Lm1	OL1				1				
10	Lm2	OL2				1				
11	Lm3	OL3				1				
12	BLC 1 Transient Area Loa...	None						66		

Load Combinations

	Description	Sol...	P...	SRSS	BLC	Fa...	B...	Factor	BLC	Factor	B...	Fact...	B...	Fa...	B...	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 Deg	Yes	Y		1	1.2	2	1.6								
5	1.2D+1.6(WLX+WLZ) - 30 Deg	Yes	Y		1	1.2	2	1.385	3	.8						
6	1.2D+1.6(WLX+WLZ) - 60 Deg	Yes	Y		1	1.2	2	.8	3	1.385						
7	1.2D+1.6(WLX+WLZ) - 90 Deg	Yes	Y		1	1.2	2		3	1.6						
8	1.2D+1.6(WLX+WLZ) - 120 Deg	Yes	Y		1	1.2	2	-.8	3	1.385						
9	1.2D+1.6(WLX+WLZ) - 150 Deg	Yes	Y		1	1.2	2	-1.385	3	.8						
10	1.2D+1.6(WLX+WLZ) - 180 Deg	Yes	Y		1	1.2	2	-1.6	3							
11	1.2D+1.6(WLX+WLZ) - 210 Deg	Yes	Y		1	1.2	2	-1.385	3	-.8						
12	1.2D+1.6(WLX+WLZ) - 240 Deg	Yes	Y		1	1.2	2	-.8	3	-1.385						
13	1.2D+1.6(WLX+WLZ) - 270 Deg	Yes	Y		1	1.2	2		3	-1.6						
14	1.2D+1.6(WLX+WLZ) - 300 Deg	Yes	Y		1	1.2	2	.8	3	-1.385						
15	1.2D+1.6(WLX+WLZ) - 330 Deg	Yes	Y		1	1.2	2	1.385	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+WLZi) - 0 Deg	Yes	Y		1	1.2	4	1	5	1	6					
20	1.2D+1.0Di+1.0(WLXi+WLZi) - 30 Deg	Yes	Y		1	1.2	4	1	5	.87	6	.5				
21	1.2D+1.0Di+1.0(WLXi+WLZi) - 60 Deg	Yes	Y		1	1.2	4	1	5	.5	6	.87				
22	1.2D+1.0Di+1.0(WLXi+WLZi) - 90 Deg	Yes	Y		1	1.2	4	1	5		6	1				
23	1.2D+1.0Di+1.0(WLXi+WLZi) - 120 Deg	Yes	Y		1	1.2	4	1	5	-.5	6	.87				
24	1.2D+1.0Di+1.0(WLXi+WLZi) - 150 Deg	Yes	Y		1	1.2	4	1	5	-.87	6	.5				
25	1.2D+1.0Di+1.0(WLXi+WLZi) - 180 Deg	Yes	Y		1	1.2	4	1	5	-1	6					
26	1.2D+1.0Di+1.0(WLXi+WLZi) - 210 Deg	Yes	Y		1	1.2	4	1	5	-.87	6	-.5				
27	1.2D+1.0Di+1.0(WLXi+WLZi) - 240 Deg	Yes	Y		1	1.2	4	1	5	-.5	6	-.87				
28	1.2D+1.0Di+1.0(WLXi+WLZi) - 270 Deg	Yes	Y		1	1.2	4	1	5		6	-1				

Load Combinations (Continued)

	Description	Sol..	P...	SRSS	BLC	Fa...	B...	Factor	BLC	Factor	B...	Fact...	B...	Fa...	B...	Fa...
29	1.2D+1.0Di+1.0(WLXi+WLZi) - 300 Deg	Yes	Y		1	1.2	4	1	5	.5	6	-.87				
30	1.2D+1.0Di+1.0(WLXi+WLZi) - 330 Deg	Yes	Y		1	1.2	4	1	5	.87	6	-.5				
31	**Maintenance Load (With Service Load)**		Y													
32	1.2D+1.5Lm1+1.0WLX (service)	Yes	Y		1	1.2	9	1.5	7	1	8					
33	1.2D+1.5Lm1+1.0WLZ (service)	Yes	Y		1	1.2	9	1.5	7		8	1				
34	1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 0...	Yes	Y		1	1.2	9	1.5	7	1	8					
35	1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 3...	Yes	Y		1	1.2	9	1.5	7	.87	8	.5				
36	1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 6...	Yes	Y		1	1.2	9	1.5	7	.5	8	.87				
37	1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 9...	Yes	Y		1	1.2	9	1.5	7		8	1				
38	1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 1...	Yes	Y		1	1.2	9	1.5	7	-.5	8	.87				
39	1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 1...	Yes	Y		1	1.2	9	1.5	7	-.87	8	.5				
40	1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 1...	Yes	Y		1	1.2	9	1.5	7	-1	8					
41	1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 2...	Yes	Y		1	1.2	9	1.5	7	-.87	8	-.5				
42	1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 2...	Yes	Y		1	1.2	9	1.5	7	-.5	8	-.87				
43	1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 2...	Yes	Y		1	1.2	9	1.5	7		8	-1				
44	1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 3...	Yes	Y		1	1.2	9	1.5	7	.5	8	-.87				
45	1.2D+1.5Lm1+1.0(WLX+WLZ, Service) - 3...	Yes	Y		1	1.2	9	1.5	7	.87	8	-.5				
46	**Maintenance Load (With Service Load)**		Y													
47	1.2D+1.5Lm2+1.0WLX (service)	Yes	Y		1	1.2	10	1.5	7	1	8					
48	1.2D+1.5Lm2+1.0WLZ (service)	Yes	Y		1	1.2	10	1.5	7		8	1				
49	1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 0...	Yes	Y		1	1.2	10	1.5	7	1	8					
50	1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 3...	Yes	Y		1	1.2	10	1.5	7	.87	8	.5				
51	1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 6...	Yes	Y		1	1.2	10	1.5	7	.5	8	.87				
52	1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 9...	Yes	Y		1	1.2	10	1.5	7		8	1				
53	1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 1...	Yes	Y		1	1.2	10	1.5	7	-.5	8	.87				
54	1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 1...	Yes	Y		1	1.2	10	1.5	7	-.87	8	.5				
55	1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 1...	Yes	Y		1	1.2	10	1.5	7	-1	8					
56	1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 2...	Yes	Y		1	1.2	10	1.5	7	-.87	8	-.5				
57	1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 2...	Yes	Y		1	1.2	10	1.5	7	-.5	8	-.87				
58	1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 2...	Yes	Y		1	1.2	10	1.5	7		8	-1				
59	1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 3...	Yes	Y		1	1.2	10	1.5	7	.5	8	-.87				
60	1.2D+1.5Lm2+1.0(WLX+WLZ, Service) - 3...	Yes	Y		1	1.2	10	1.5	7	.87	8	-.5				
61	**Maintenance Load (With Service Load)**		Y													
62	1.2D+1.5Lm3+1.0WLX (service)	Yes	Y		1	1.2	11	1.5	7	1	8					
63	1.2D+1.5Lm3+1.0WLZ (service)	Yes	Y		1	1.2	11	1.5	7		8	1				
64	1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 0...	Yes	Y		1	1.2	11	1.5	7	1	8					
65	1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 3...	Yes	Y		1	1.2	11	1.5	7	.87	8	.5				
66	1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 6...	Yes	Y		1	1.2	11	1.5	7	.5	8	.87				
67	1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 9...	Yes	Y		1	1.2	11	1.5	7		8	1				
68	1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 1...	Yes	Y		1	1.2	11	1.5	7	-.5	8	.87				
69	1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 1...	Yes	Y		1	1.2	11	1.5	7	-.87	8	.5				
70	1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 1...	Yes	Y		1	1.2	11	1.5	7	-1	8					
71	1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 2...	Yes	Y		1	1.2	11	1.5	7	-.87	8	-.5				
72	1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 2...	Yes	Y		1	1.2	11	1.5	7	-.5	8	-.87				
73	1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 2...	Yes	Y		1	1.2	11	1.5	7		8	-1				
74	1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 3...	Yes	Y		1	1.2	11	1.5	7	.5	8	-.87				
75	1.2D+1.5Lm3+1.0(WLX+WLZ, Service) - 3...	Yes	Y		1	1.2	11	1.5	7	.87	8	-.5				

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Desig...	A [in2]	Iyy [i...	Izz [i...	J [in4]
1	L2.5x2.5	L2.5x2.5x3	None	None	A36 Gr.36	Typical	.901	.535	.535	.011
2	C5x9	C5X9	None	None	A36 Gr.36	Typical	2.64	.624	8.89	.109
3	L4x4	L4X4X4	None	None	A36 Gr.36	Typical	1.93	3	3	.044
4	4"Tube	HSS4X4X3	None	None	A500 Gr.B R...	Typical	2.58	6.21	6.21	10
5	2.375" Pipe	HSS2.375X0.154	None	None	A53 Gr.B	Typical	1	.627	.627	1.25

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Desig...	A [in2]	Iyy [i...	Izz [i...	J [in4]
6	New HSs 2.875 x.2...	HSS2.875X0.203	None	None	A53 Gr.B	Typical	1.59	1.45	1.45	2.89
7	Flat	10	None	None	A36 Gr.36	Typical	5	.104	41.667	.404

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	N34A	max	2.06	15	2.674	29	2.559	8	2.023	7	1.656	5	1.967	10
2		min	-2.541	9	-.106	8	-1.774	14	-6.043	13	-1.807	11	-3.839	2
3	N33A	max	4.112	4	2.567	10	1.933	7	2.658	7	1.837	13	6.454	10
4		min	-3.201	10	-.076	2	-1.908	13	-3.17	13	-1.666	3	-1.872	2
5	N32A	max	1.23	6	2.209	6	2.736	6	4.335	7	.603	8	2.333	10
6		min	-1.673	12	-.346	12	-3.56	12	-1.833	13	-.661	13	-3.968	2
7	Totals:	max	6.906	4	6.47	30	6.723	7						
8		min	-6.906	10	3.448	2	-6.723	13						

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

	Member	Shape	Co...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*...	phi*...	phi*Mn y-y [k-ft]	phi*...	...	Eqn
1	M1	C5X9	.649	5.844	4	.112	5.977	z	10	6.022	85.5...	1.909	11.0...	...	H1-...
2	M2	C5X9	.626	6.906	9	.083	5.977	y	7	6.022	85.5...	1.909	10.6...	...	H1-...
3	M3	C5X9	.766	3.453	12	.160	3.32	y	6	6.022	85.5...	1.909	11.8...	...	H1-...
4	M4	HSS2.375X0.1...	.408	12.484	13	.165	6.375		14	6.051	31.5	1.872	1.872	...	H1-...
5	M5	HSS2.375X0.1...	.308	12.484	11	.214	6.375		6	6.051	31.5	1.872	1.872	...	H1-...
6	M6	HSS2.375X0.1...	.724	9.43	6	.272	12.484		12	6.051	31.5	1.872	1.872	...	H1-...
7	M12	HSS2.375X0.1...	.397	4.917	5	.194	4.917		6	23.7...	31.5	1.872	1.872	...	H1-...
8	M16A	HSS4X4X3	.449	6.35	6	.291	6.35	y	4	90.8...	106....	12.662	12.6...	...	H1-...
9	M17A	HSS4X4X3	.650	6.35	8	.364	6.35	z	13	90.8...	106....	12.662	12.6...	...	H3-6
10	M18A	HSS4X4X3	.605	6.35	12	.359	6.35	y	12	90.8...	106....	12.662	12.6...	...	H3-6
11	M19	L4X4X4	.806	3.089	26	.113	3.089	y	12	39.0...	62.5...	3.138	6.025	...	H2-1
12	M20	L4X4X4	.637	3.089	7	.091	3.024	y	5	39.0...	62.5...	3.138	6.016	...	H2-1
13	M21	L4X4X4	.842	3.089	29	.113	3.089	y	12	39.0...	62.5...	3.138	6.007	...	H2-1
14	M26	L2.5x2.5x3	.017	.25	11	.466	0	y	6	28.0...	29.1...	.873	1.972	...	H2-1
15	M26A	10	.333	0	13	.903	0	y	4	158....	162	1.688	33.6...	...	H1-...
16	M27A	10	.332	.25	9	.969	.25	y	12	158....	162	1.688	33.6...	...	H1-...
17	M28	10	.534	0	5	1.112	0	y	7	158....	162	1.688	33.3...	...	H1-...
18	M30	10	.345	0	10	1.106	0	y	12	158....	162	1.688	33.75	...	H1-...
19	M31	HSS2.375X0.1...	.521	4.917	13	.172	4.917		7	23.7...	31.5	1.872	1.872	...	H1-...
20	M29A	HSS2.875X0.2...	.554	5.469	10	.132	5.469		5	31.7...	50.0...	3.596	3.596	...	H1-...
21	M29B	L2.5x2.5x3	.019	.26	5	.452	.5	y	10	28.0...	29.1...	.873	1.972	...	H2-1
22	M30A	10	.444	.25	11	.930	.25	y	10	158....	162	1.688	33.51	...	H1-...
23	M31A	HSS2.875X0.2...	.403	5.469	15	.278	5.469		6	31.7...	50.0...	3.596	3.596	...	H1-...
24	M31B	HSS2.375X0.1...	.484	4.917	9	.114	4.917		9	23.7...	31.5	1.872	1.872	...	H1-...
25	M29	L2.5x2.5x3	.018	.271	13	.549	0	y	6	28.0...	29.1...	.873	1.972	...	H2-1
26	M30B	10	.396	.25	7	1.158	.25	y	6	158....	162	1.688	33.47	...	H1-...
27	M31C	HSS2.875X0.2...	.608	5.469	6	.132	5.469		10	31.7...	50.0...	3.596	3.596	...	H1-...
28	M28A	HSS2.875X0.2...	.567	5.469	6	.119	5.469		5	31.7...	50.0...	3.596	3.596	...	H1-...
29	M29C	HSS2.875X0.2...	.506	5.469	10	.127	5.469		11	31.7...	50.0...	3.596	3.596	...	H1-...
30	M30C	HSS2.875X0.2...	.639	5.469	6	.180	5.469		6	31.7...	50.0...	3.596	3.596	...	H1-...
31	M31D	HSS2.875X0.2...	.609	5.469	6	.275	5.469		6	31.7...	50.0...	3.596	3.596	...	H3-6

Maximum member stress is at 84% of its capacity; therefore, the existing mount members are adequate to support the proposed installation. In order for the results of this analysis to be valid, a handrail kit (SitePro1 #HRK12, or approved equal) must be installed prior to the installation of the proposed equipment.

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No. 9927.CT11077C, Rev 2
Calculated By: IM Date : 7/22/19
Checked By: EI Date : 7/22/19

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

Connection Details

Bolts

Quantity =	4	
Diameter =	0.625	
Vertical Spacing =	6	in (assumed)
Horizontal Spacing =	6	in (assumed)
Grade =	A325	
F_{nt} =	90	ksi
F_{nv} =	54	ksi

Loading Details
Node N33A

Shear, Z =	1.933	k
Shear, Y =	2.567	k
Tension, X =	4.112	k
Mz =	6.454	k-ft
My =	1.837	k-ft
Mx =	3.17	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 =	0.307	in^2
φR_{nt} =	20.72	k
T_{max} =	9.32	k

Rnt > Tmax
45%
OK

2 - Shear Capacity

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

φ =	0.75	
F_{nv} =	54	ksi
A_b =	0.307	in^2
φR_{nv} =	12.43	k
V_{max} =	5.29	k

Rnv > Vmax
43%
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} =	79	ksi
A_b =	0.307	in^2
$\varphi R'_{nt}$ =	18.13	k
T_{max} =	9.32	k

R'nt > Tmax
51%
OK

Exhibit E

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: CT11077C

Fairfield Fire Rescue #5
3965 Congress Street
Fairfield, Connecticut 06824

May 22, 2019

EBI Project Number: 6219001727

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**24.19%**

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

May 22, 2019

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

Emissions Analysis for Site: CT11077C - Fairfield Fire Rescue #5

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **3965 Congress Street** in **Fairfield, 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 3965 Congress Street in Fairfield, 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 B66A_B2A for the 2100 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz / 1900 MHz channel(s) in Sector A, the Ericsson AIR32 B66A_B2A for the 2100 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the Ericsson AIR32 B66A_B2A for the 2100 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerline of the proposed antennas is 116 feet above ground level (AGL).

11) 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.

12) 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 B66A_B2A	Make / Model:	Ericsson AIR32 B66A_B2A	Make / Model:	Ericsson AIR32 B66A_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):	116 feet	Height (AGL):	116 feet	Height (AGL):	116 feet
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 %:	**2.33%**	Antenna B1 MPE %:	**2.33%**	Antenna C1 MPE %:	**2.33%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
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 / 1900 MHz	Frequency Bands:	600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 700 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd
Height (AGL):	116 feet	Height (AGL):	116 feet	Height (AGL):	116 feet
Channel Count:	10	Channel Count:	10	Channel Count:	10
Total TX Power (W):	300 Watts	Total TX Power (W):	300 Watts	Total TX Power (W):	300 Watts
ERP (W):	9,477.59	ERP (W):	9,477.59	ERP (W):	9,477.59
Antenna A2 MPE %:	**3.40%**	Antenna B2 MPE %:	**3.40%**	Antenna C2 MPE %:	**3.40%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	5.73%
AT&T	2.35%
Sprint	3.58%
Nextel	0.51%
Town	0.13%
Verizon	11.89%
Site Total MPE % :	24.19%

T-Mobile Sector A Total:	5.73%
T-Mobile Sector B Total:	5.73%
T-Mobile Sector C Total:	5.73%
Site Total:	24.19%

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 AWS	2	2307.55	116.0	12.33	2100 MHz LTE AWS	1000	1.23%
T-Mobile 1900 MHz LTE PCS	2	2056.61	116.0	10.99	1900 MHz LTE PCS	1000	1.10%
T-Mobile 600 MHz LTE	2	591.73	116.0	3.16	600 MHz LTE	400	0.79%
T-Mobile 700 MHz LTE	2	648.82	116.0	3.47	700 MHz LTE	467	0.74%
T-Mobile 1900 MHz GSM	4	1101.85	116.0	11.78	1900 MHz GSM	1000	1.18%
T-Mobile 2100 MHz UMTS	2	1294.56	116.0	6.92	2100 MHz UMTS	1000	0.69%
						Total:	**5.73%**

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

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	5.73%
Sector B:	5.73%
Sector C:	5.73%
T-Mobile Maximum MPE % (Sector A):	5.73%
Site Total:	24.19%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **24.19%** 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.

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: CT11077C

Fairfield Fire Rescue #5
3965 Congress Street
Fairfield, Connecticut 06824

May 22, 2019

EBI Project Number: 6219001727

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**24.19%**

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

May 22, 2019

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

Emissions Analysis for Site: CT11077C - Fairfield Fire Rescue #5

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **3965 Congress Street** in **Fairfield, 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.

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T-Mobile Site Inventory and Power Data

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Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR32 B66A_B2A	Make / Model:	Ericsson AIR32 B66A_B2A	Make / Model:	Ericsson AIR32 B66A_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):	116 feet	Height (AGL):	116 feet	Height (AGL):	116 feet
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 %:	**2.33%**	Antenna B1 MPE %:	**2.33%**	Antenna C1 MPE %:	**2.33%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
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 / 1900 MHz	Frequency Bands:	600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 700 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd
Height (AGL):	116 feet	Height (AGL):	116 feet	Height (AGL):	116 feet
Channel Count:	10	Channel Count:	10	Channel Count:	10
Total TX Power (W):	300 Watts	Total TX Power (W):	300 Watts	Total TX Power (W):	300 Watts
ERP (W):	9,477.59	ERP (W):	9,477.59	ERP (W):	9,477.59
Antenna A2 MPE %:	**3.40%**	Antenna B2 MPE %:	**3.40%**	Antenna C2 MPE %:	**3.40%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	5.73%
AT&T	2.35%
Sprint	3.58%
Nextel	0.51%
Town	0.13%
Verizon	11.89%
Site Total MPE % :	24.19%

T-Mobile Sector A Total:	5.73%
T-Mobile Sector B Total:	5.73%
T-Mobile Sector C Total:	5.73%
Site Total:	24.19%

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 AWS	2	2307.55	116.0	12.33	2100 MHz LTE AWS	1000	1.23%
T-Mobile 1900 MHz LTE PCS	2	2056.61	116.0	10.99	1900 MHz LTE PCS	1000	1.10%
T-Mobile 600 MHz LTE	2	591.73	116.0	3.16	600 MHz LTE	400	0.79%
T-Mobile 700 MHz LTE	2	648.82	116.0	3.47	700 MHz LTE	467	0.74%
T-Mobile 1900 MHz GSM	4	1101.85	116.0	11.78	1900 MHz GSM	1000	1.18%
T-Mobile 2100 MHz UMTS	2	1294.56	116.0	6.92	2100 MHz UMTS	1000	0.69%
						Total:	**5.73%**

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

Summary

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

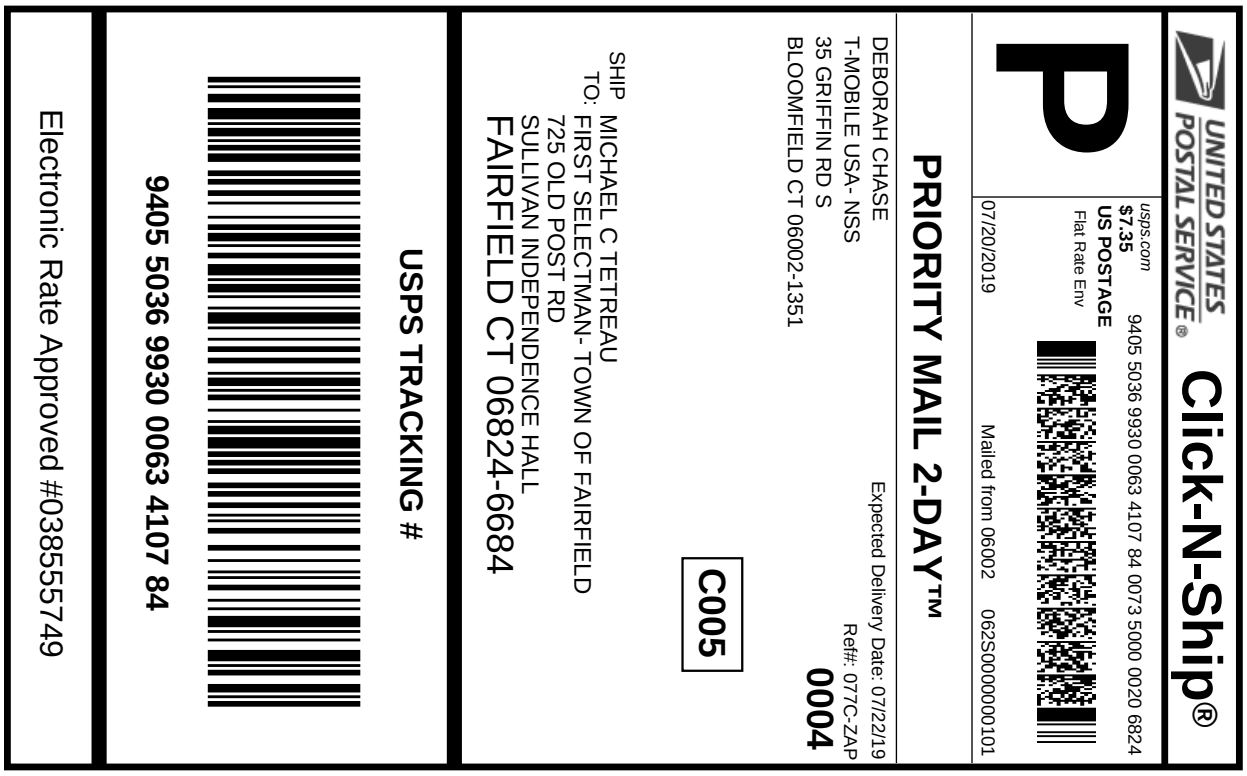
The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	5.73%
Sector B:	5.73%
Sector C:	5.73%
T-Mobile Maximum MPE % (Sector A):	5.73%
Site Total:	24.19%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **24.19%** 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 F



Cut on dotted line.

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1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0063 4107 84

Trans. #:	468594895
Print Date:	07/19/2019
Ship Date:	07/20/2019
Expected Delivery Date:	07/22/2019

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

From: DEBORAH CHASE
T-MOBILE USA- NSS
35 GRIFFIN RD S
BLOOMFIELD CT 06002-1351

Ref#: 077C-ZAP

To: MICHAEL C TETREAU
FIRST SELECTMAN- TOWN OF FAIRFIELD
725 OLD POST RD
SULLIVAN INDEPENDENCE HALL
FAIRFIELD CT 06824-6684

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

9405 5036 9930 0063 4107 91 0073 5000 0020 6824

usps.com
$7.35
US POSTAGE
Flat Rate Env

07/20/2019 Mailed from 06002 062S0000000101

P

PRIORITY MAIL 2-DAY™

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

Expected Delivery Date: 07/22/19
Ref#: 077C ZAP

0004

Carrier -- Leave if No Response

C005

SHIP TO: JIM WENDT
PLANNING DIRECTOR-TOWN OF FAIRFIELD
725 OLD POST RD
SULLIVAN INDEPENDENCE HALL
FAIRFIELD CT 06824-6684

USPS TRACKING #

9405 5036 9930 0063 4107 91

Electronic Rate Approved #038555749

Cut on dotted line.

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