November 18, 2020

Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Regarding: **Notice of Exempt Modification – T-Mobile Site #: CT11769B_Anchor**
Address: **289 Mountain Street, Hartford, CT**

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 90-foot level of the existing 110-foot monopole at the above-referenced address, latitude 41.726600, longitude -72.708200. The tower is operated by American Tower Corporation.

T-Mobile now intends to modify its existing telecommunications facility by adding three (3) antennas, swapping six (6) antennas, adding six (6) remote radio units (RRU), adding three (3) cables, removing ancillary equipment, adding mount modifications and adding structural modifications as more particularly detailed and described on the enclosed Construction Drawings prepared by A.T. Engineering Service, PLLC, last revised September 23, 2020. The centerline height of the existing and proposed antennas is and will remain at 90 feet.

Planned Modifications:

Remove:
- (6) TTA
- (3) Diplexers
- (18) 1-5/8" Coax

Remove and Replace:
- (3) LNX-6514DS-A1M Antennas **(Remove)** – (3) AIR6449 B41 Antennas **(Replace)**
- (3) APXV16DWV-16WV-S-E-A20 **(Remove)** – (3) AIR 3246 B66 Antennas **(Replace)**

Add:
- (3) APXVAARR24_43-U-NA20 Antennas
- (3) Radio 4449 B71 B85A RRU
- (3) RRUS 4415 B25
- (3) 1-1/4" Hybrid Line
- Mount and Structural Modifications

Existing to Remain:
- (3) AIR32 B 66AA/B2A Antennas
- (1) 1-1/4" Hybrid Cables

Please accept this letter as notification pursuant to R.C.S.A §16-50j-73 for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to American Tower Corporation as tower operator, The Honorable Luke Bronin, Mayor of the City of Hartford as chief elected official, Aimee Chambers, Director of Planning for the City of Hartford and Springwhich Cellular Tower Holdings LLC as

underlying property owner. Please note, the original tower approval was requested from the City of Hartford Planning Department. The City confirmed that no such records are on file for this site. I have included the original CSC decision for your reference.

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

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

2. The proposed modifications will not require an 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 modified facility will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. *Please see the RF emissions calculation for T-Mobile's modified facility dated September 9, 2020 and prepared by EBI Consulting enclosed herewith.*

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

6. The existing structure and its foundation can support the proposed loading. *Please see the structural analysis dated September 30, 2020 and prepared by American Tower Corporation enclosed herewith.*

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).

Respectfully submitted,

Jennifer Iliades
Site Acquisition Consultant
Centerline Communications, LLC
750 West Center Street, Suite 301
West Bridgewater, MA 02379
jiliades@clinellc.com

Enclosures:
Exhibit A – Original Facility Approval
Exhibit B – Property Card and GIS
Exhibit C – Construction Drawings, Mount MOD Drawings & Structural MOD Drawings
Exhibit D – Structural Analysis Report
Exhibit E – Mount Analysis
Exhibit F – Power Density/RF Emissions Report

cc: American Tower Corporation, tower operator
The Honorable Luke Bronin, Mayor of the City of Hartford
Aimee Chambers, Director of Planning for the City of Hartford
Springwhich Cellular Tower Holdings LLC, landowner

Exhibit A

Original Facility Approval

DOCKET NO. 40

ORIGINAL

AN APPLICATION SUBMITTED BY THE SOUTHERN NEW ENGLAND TELEPHONE COMPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN THE HARTFORD AND MIDDLESEX COUNTIES.	:	CONNECTICUT SITING COUNCIL
	:	May 15, 1984

D E C I S I O N A N D O R D E R

Pursuant to the foregoing opinion, the Council hereby directs that a certificate of environmental compatibility and public need as required by section 16-50k of the General Statutes of Connecticut, revisions of 1958, revised to 1983, as amended, be issued to Southern New England Telephone for the construction, operation, and maintenance of a telecommunications tower and associated equipment to provide cellular service at each of the following sites:

Shuttle Meadow Road, Southington, Connecticut;
Mountain Street, Hartford, Connecticut;
Prestige Park Road, East Hartford, Connecticut;
Beckley Road, Berlin, Connecticut;
Slicer tract, Niederwerfer Road, South Windsor, Connecticut; and
Kikapoo Road, Middlefield, Connecticut.

The facilities shall be constructed, operated, and maintained as specified in the Council's record on this matter, and subject to the following conditions.

1. The towers shall be no taller than necessary to provide the proposed service and in no event shall exceed

   a) 150 feet at the Southington site,
   b) 100 feet at the Hartford site,
   c) 150 feet at the East Hartford site,
   d) 150 feet at the Berlin site,
   e) 75 feet at the South Windsor site, and
   f) 75 feet at the Middlefield site.

2. A fence not lower than eight feet shall surround each tower and its associated equipment.

3. The applicant or its successor shall notify the Council if and when directional antennas or any other equipment is added to any of these facilities.
4. The applicant or its successor shall permit in accordance with representations made by it during the proceeding public or private entities to share space on the facilities, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
5. Unless necessary to comply with condition number seven, below, no lights shall be installed on any of these towers.
6. The facility construction shall be conducted in accordance with all applicable federal, state, and municipal laws and regulations.
7. The applicant shall submit a development and management plan (D&M) for the South Windsor, Southington, and Berlin sites pursuant to sections 16-50j-85 through 16-50j-87 of the regulations of state agencies, except that irrelevant items in section 16-50j-86 need only be identified as such. The D&M plans shall include appropriate evergreen screening of the sites. The applicant shall comply with the reporting requirements of section 16-50j-87 for all sites. The applicant shall consult with Mrs. Claire Aubin and the Town of South Windsor in the preparation of the South Windsor site D&M.
8. Construction activities shall take place during daylight working hours.
9. This decision and order shall be void and the towers and associated equipment approved herein shall be dismantled and removed,

or reapplication for any new use shall be made to the Connecticut Siting Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction.

10. This decision and order shall be void if all construction authorized is not completed within three years of the issuance of this decision.

Pursuant to section 16-50p(c) of the General Statutes, we hereby direct that a copy of the opinion and decision and order be served on each person listed below. A notice of the issuance shall be published in the Hartford Courant, Journal Inquirer, and the Middletown Press.

The parties to this proceeding are

Southern New England Telephone Company Room 314 227 Church Street New Haven, Connecticut 06506	(Applicant)
ATTN: Mr. Peter J. Tyrrell, Esquire	(its attorney)
Town of South Windsor 1540 Sullivan Avenue South Windsor, Connecticut 06074	represented by: Mr. Richard M. Rittenband Town Attorney 1734 Ellington Road South Windsor, Connecticut 06074
Frank Niederwerfer 260 Niederwerfer Road South Windsor, Connecticut 06074	(service waived)
Claire Aubin 407 Niederwerfer Road South Windsor, Connecticut 06074	(service waived)

Betty S. Kleiner
Chairman
Hartford Audubon Society, Inc.
5 Flintlock Ridge
Simsbury, Connecticut 06070

(service waived)

Roger Thorpe
2916 Ellington Road
South Windsor, Connecticut 06074

Intervenors in this proceeding are

Dwight A. Johnson
Murtha, Cullina, Richter
and Pinney
101 Pearl Street
P.O. Box 3197
Hartford, Connecticut 06103-0197

representing:

Metromedia TeleCommunications
Nutmeg Telecommunications, Inc.
CSI of New Haven
CSI of Stamford
Cellular Communications, Inc.
LIN Cellular Corp.
Cellular Mobile Services
Maxcell TeleCommunications, Inc.
Mobile Cellular Telephone, Inc.
Cellular Dynamics
Connecticut Corridor Cellular
Chase/Post Cellular

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut, this 15th day of May, 1984.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner John Downey Designee: Commissioner Peter G. Boucher	Yes
Commissioner Stanley Pac Designee: Christopher Cooper	Yes
Owen L. Clark	Yes
Fred J. Doocy	~~Yes~~ Abstain
Mortimer A. Gelston	Yes
James G. Horsfall	Absent
Janet Sitty	Yes
Colin C. Tait	Absent

STATE OF CONNECTICUT)
: ss. New Britain, May 15, 1984
COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the decision and order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

Christopher S. Wood, Executive Director
Connecticut Siting Council

Exhibit B

Property Card

Unofficial Property Record Card - Hartford, CT

General Property Data

Parcel ID	144-714-129	**Account Number**	
Prior Parcel ID			
Property Owner	SPRINGWHICH CELLULAR TOWER HOLDINGS LLC	**Property Location**	289-H MOUNTAIN ST
		Property Use	OTHER UTILTY
Mailing Address	909 CHESTNUT, RM 36-M-1	**Most Recent Sale Date**	7/7/2003
	AT & T MOBILITY LLC	**Legal Reference**	04797-0166
City	ST LOUIS	**Grantor**	METROPOLITAN DISTRICT BUREAU OF
Mailing State	MO **Zip** 63101	**Sale Price**	0
ParcelZoning	CAMP	**Land Area**	0.000 acres

Current Property Assessment

Card 1 Value	Building Value	Xtra Features Value	Land Value	Total Value
	18,970	0	0	18,970

Building Description

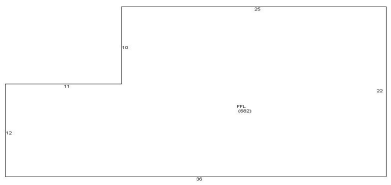
Building Style	MFG/PROCESS	**Foundation Type**	Concrete	**Flooring Type**	COMBINATION
# of Living Units	0	**Frame Type**	Wood Frame	**Basement Floor**	N/A
Year Built	1984	**Roof Structure**	FLAT	**Heating Type**	N/A
Building Grade	Good	**Roof Cover**	Membrane	**Heating Fuel**	N/A
Building Condition	N/A	**Siding**	Brick	**Air Conditioning**	0%
Finished Area (SF)	682	**Interior Walls**	DRYWALL	**# of Bsmt Garages**	0
Number Rooms	0	**# of Bedrooms**	0	**# of Full Baths**	0
# of 3/4 Baths	0	**# of 1/2 Baths**	0	**# of Other Fixtures**	0

Legal Description

Narrative Description of Property

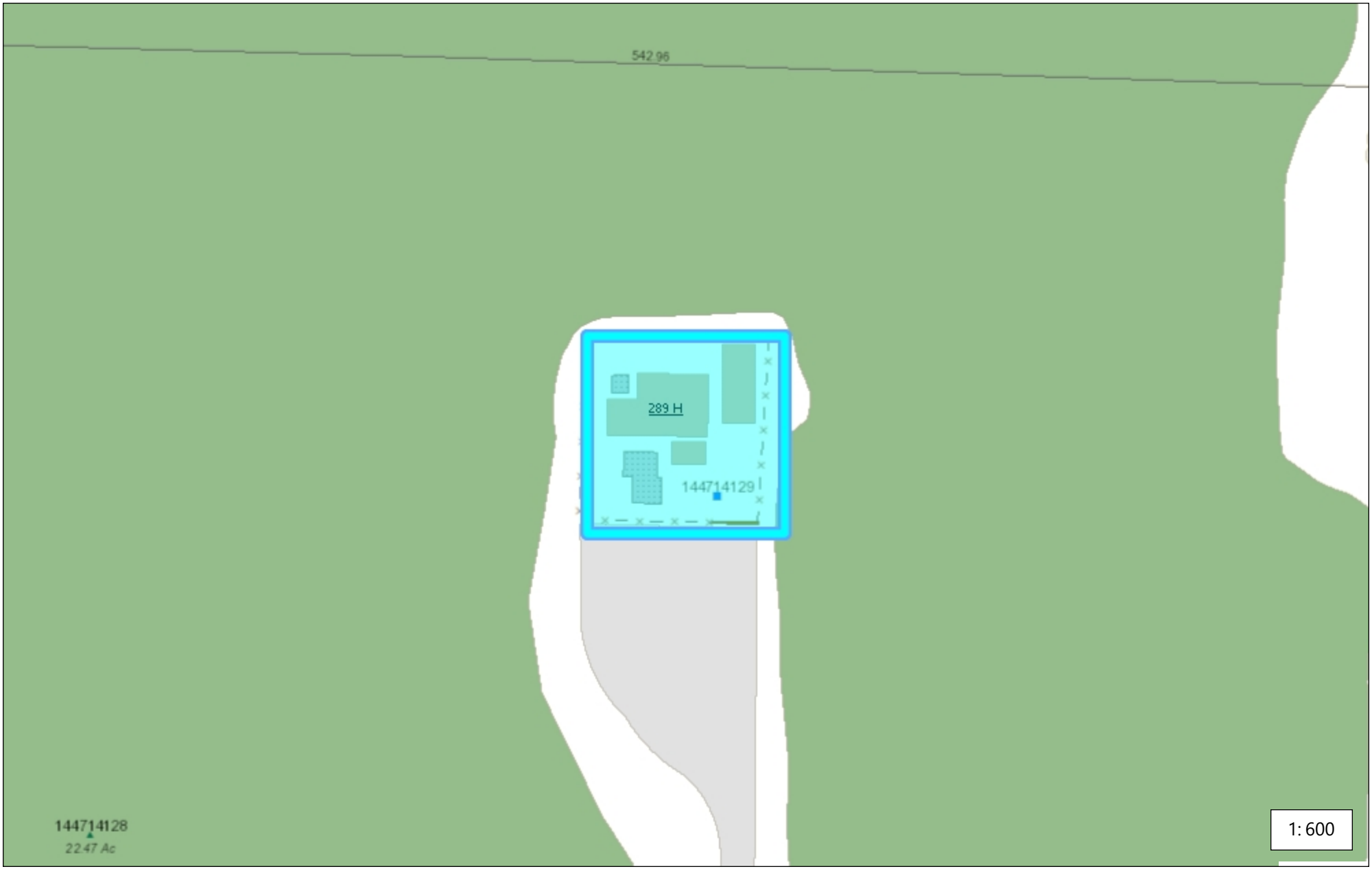
This property contains 0.000 acres of land mainly classified as OTHER UTILTY with a(n) MFG/PROCESS style building, built about 1984 , having Brick exterior and Membrane roof cover, with 0 commercial unit(s) and 0 residential unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 0 half bath(s).

Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranteed.

City of Hartford - Property Map



100 0 50 100 Feet

City of Hartford GIS Services - HartfordGIS

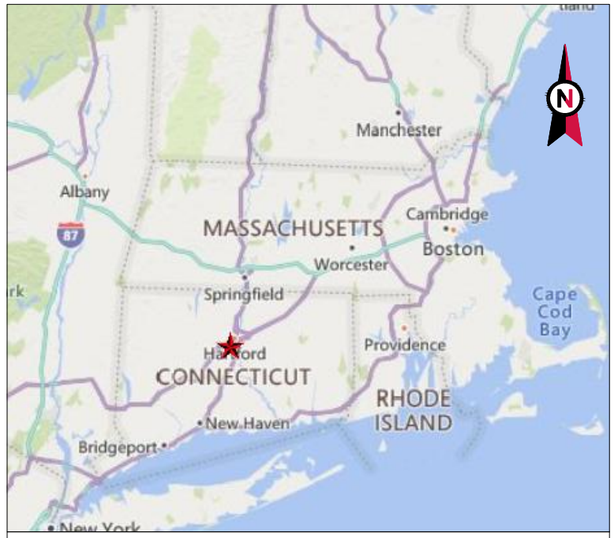
Date Printed: 11/17/2020

The planimetric and topographic information depicted on this map was compiled by The Sanbor Map Company and is based on an aerial flight performed in April 2015. In addition, the City's GIS staff has been updating limited planimetric features on a yearly basis. The intent of this map is to depict a graphical representation of real property information relative to the planimetric features for the City of Hartford and is subject to change as a more accurate survey may disclose. The City of Hartford and the mapping company assume no legal responsibility for the information contained in this data. THIS MAP IS NOT TO BE USED FOR THE TRANSFER OF PROPERTY

N W E S

Exhibit C

Construction Drawings



VICINITY MAP

AMERICAN TOWER®

ATC SITE NAME: HRFR - SOUTH
ATC SITE NUMBER: 302481
T-MOBILE SITE NAME: CT769/SSITE HARTFORD #2
T-MOBILE SITE NUMBER:CT11769B
SITE ADDRESS: 289 MOUNTAIN STREET
HARTFORD, CT 06106

LOCATION MAP

T-MOBILE ANCHOR ANTENNA AMENDMENT PLAN
67D5A992M HYBRID CONFIGURATION

COMPLIANCE CODE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNMENT AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. INTERNATIONAL BUILDING CODE (IBC)
2. NATIONAL ELECTRIC CODE (NEC)
3. LOCAL BUILDING CODE
4. CITY/COUNTY ORDINANCES

UTILITY COMPANIES

POWER COMPANY: CONNECTICUT LIGHT & POWER
PHONE: (800) 286-2000

TELEPHONE COMPANY: AT&T
PHONE: (800) 288-2020

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

PROJECT SUMMARY

SITE ADDRESS:

289 MOUNTAIN STREET

HARTFORD, CT 06106

COUNTY: HARTFORD

GEOGRAPHIC COORDINATES:

LATITUDE: 41.72656944

LONGITUDE: -72.70816944

GROUND ELEVATION: 286' AMSL

PROJECT TEAM

TOWER OWNER:

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

APPLICANT:

T-MOBILE NORTHEAST LLC
12050 BALTIMORE AVENUE
BELTSVILLE, MD 20705

ENGINEER:

ATC TOWER SERVICES, LLC
3500 REGENCY PKWY STE 100
CARY, NC 27518

PROPERTY OWNER:

THE METROPOLITAN DISTRICT
PO BOX 800
HARTFORD, CT 06101

PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES MODIFYING GROUND BASED AND TOWER MOUNTED EQUIPMENT AS INDICATED PER BELOW:

TOWER WORK:

REMOVE (6) ANTENNA(s), (6) TTA(s), (3) DIPLEXERS(s), AND (18) 1-5/8" COAX CABLE(s)

INSTALL (9) ANTENNA(s), (6) RRH(s), (3) 1-1/4" HYBRID CABLE(s), AND MOUNT MODIFICATIONS

EXISTING (3) ANTENNA(s), AND (1) 1-1/4" HYBRID CABLE(s) TO REMAIN

GROUND WORK:

INSTALL (1) 6160 CABINET ENCLOSURE, (1) B160 BATTERY CABINET ENCLOSURE, (6) BB6630, (1) BB6648 AND (1) IXRE ROUTER

EXISTING (1) 6102 CABINET ENCLOSURE AND (1) 3160 CABINET ENCLOSURE TO REMAIN

PROJECT NOTES

1. THE FACILITY IS UNMANNED.
2. A TECHNICIAN WILL VISIT THE SITE APPROXIMATELY ONCE A MONTH FOR ROUTINE INSPECTION AND MAINTENANCE.
3. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT LAND DISTURBANCE OR EFFECT OF STORM WATER DRAINAGE.
4. NO SANITARY SEWER, POTABLE WATER OR TRASH DISPOSAL IS REQUIRED.
5. HANDICAP ACCESS IS NOT REQUIRED.

PROJECT LOCATION DIRECTIONS

FROM HARTFORD TAKE MAPLE AVENUE SOUTH TO WHITE STREET. TURN RIGHT ONTO WHITE STREET AND FOLLOW TO MOUNTAIN ROAD AND TURN LEFT. FOLLOW MOUNTAIN ROAD TO THE END WHERE THE ACCESS GATE WILL BE FOR THE ACCESS ROAD (METROPOLITAN DISTRICT COMMISSION SIGN ON GATE)

SHEET INDEX

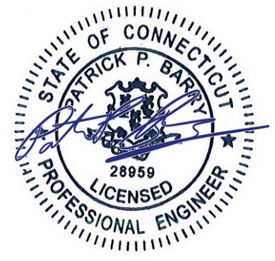
SHEET NO:	DESCRIPTION:	REV:	DATE:	BY:
G-001	TITLE SHEET	1	09/23/20	NG
G-002	GENERAL NOTES	0	09/16/20	NG
C-101	DETAILED SITE PLAN	1	09/23/20	NG
C-102	DETAILED GROUND PLAN	1	09/23/20	NG
C-201	TOWER ELEVATION	0	09/16/20	NG
C-401	ANTENNA INFORMATION & SCHEDULE	0	09/16/20	NG
C-501	CONSTRUCTION DETAILS	1	09/23/20	NG
E-501	GROUNDING DETAILS	0	09/16/20	NG
R-601	SUPPLEMENTAL			
R-602	SUPPLEMENTAL			
R-603	SUPPLEMENTAL			
R-604	SUPPLEMENTAL			
R-605	SUPPLEMENTAL			
R-606	SUPPLEMENTAL			
R-607	SUPPLEMENTAL			
R-608	SUPPLEMENTAL			
-	MOUNT MOD DRAWINGS (7 PAGES)			
-	TOWER MOD DRAWINGS (12 PAGES)			

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	09/16/20
1	GROUND CHANGE	NG	09/23/20

ATC SITE NUMBER:
302481
ATC SITE NAME:
HRFR - SOUTH
T-MOBILE SITE NAME:
CT769/SSITE HARTFORD #2
SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106

SEAL:



T-Mobile

DATE DRAWN:	09/16/20
ATC JOB NO:	13251341
CUSTOMER ID:	CT769/SSITE HARTFORD #2
CUSTOMER #:	CT11769B

TITLE SHEET

SHEET NUMBER:	REVISION:
G-001	1

GENERAL CONSTRUCTION NOTES:

1. OWNER FURNISHED MATERIALS, T-MOBILE "THE COMPANY" WILL PROVIDE AND THE CONTRACTOR WILL INSTALL

   A. BTS EQUIPMENT FRAME (PLATFORM) AND ICEBRIDGE SHELTER (GROUND BUILD/CO-LOCATE ONLY)
   B. AC/TELCO INTERFACE BOX (PPC)
   C. ICE BRIDGE (CABLE TRAY WITH COVER) (GROUND BUILD/CO-LOCATE ONLY, GC TO FURNISH AND INSTALL FOR ROOFTOP INSTALLATION)
   D. TOWERS, MONOPOLES
   E. TOWER LIGHTING
   F. GENERATORS & LIQUID PROPANE TANK
   G. ANTENNA STANDARD BRACKETS, FRAMES AND PIPES FOR MOUNTING
   H. ANTENNAS (INSTALLED BY OTHERS)
   I. TRANSMISSION LINE
   J. TRANSMISSION LINE JUMPERS
   K. TRANSMISSION LINE CONNECTORS WITH WEATHERPROOFING KITS
   L. TRANSMISSION LINE GROUND KITS
   M. HANGERS
   N. HOISTING GRIPS
   O. BTS EQUIPMENT

2. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL OTHER MATERIALS FOR THE COMPLETE INSTALLATION OF THE SITE INCLUDING, BUT NOT LIMITED TO, SUCH MATERIALS AS FENCING, STRUCTURAL STEEL SUPPORTING SUB-FRAME FOR PLATFORM, ROOFING LABOR AND MATERIALS, GROUNDING RINGS, GROUNDING WIRES, COPPER-CLAD OR XIT CHEMICAL GROUND ROD(S), BUSS BARS, TRANSFORMERS AND DISCONNECT SWITCHES WHERE APPLICABLE, TEMPORARY ELECTRICAL POWER, CONDUIT, LANDSCAPING COMPOUND STONE, CRANES, CORE DRILLING, SLEEPERS AND RUBBER MATTING, REBAR, CONCRETE CAISSONS, PADS AND/OR AUGER MOUNTS, MISCELLANEOUS FASTENERS, CABLE TRAYS, NON-STANDARD ANTENNA FRAMES AND ALL OTHER MATERIAL AND LABOR REQUIRED TO COMPLETE THE JOB ACCORDING TO THE DRAWINGS AND SPECIFICATIONS. IT IS THE POSITION OF T-MOBILE TO APPLY FOR PERMITTING AND CONTRACTOR RESPONSIBLE FOR PICKUP AND PAYMENT OF REQUIRED PERMITS.

3. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSI/EIA/TIA-222, AND COMPLY WITH ATC CONSTRUCTION SPECIFICATIONS.

4. CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.

6. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.

7. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.

8. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.

9. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

10. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.

11. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.

12. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE T-MOBILE REP PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE T-MOBILE REP PRIOR TO PROCEEDING.

13. EACH CONTRACTOR SHALL COOPERATE WITH THE T-MOBILE REP, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.

14. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE T-MOBILE CONSTRUCTION MANAGER.

15. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.

16. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR SHALL NOTIFY THE T-MOBILE REP AND ENGINEER OF RECORD IMMEDIATELY.

17. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.

18. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.

19. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH AMERICAN TOWER CORPORATION (ATC) AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.

20. CONTRACTOR SHALL FURNISH T-MOBILE AND AMERICAN TOWER CORPORATION (ATC) WITH A PDF MARKED UP AS-BUILT SET OF DRAWINGS UPON COMPLETION OF WORK.

21. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE REP TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED. ALL ITEMS NOT PROVIDED SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED.

22. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE REP TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY CONTRACTOR. ALL REQUIRED PERMITS NOT OBTAINED BY T-MOBILE MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.

23. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH T-MOBILE SPECIFICATIONS AND REQUIREMENTS.

24. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO T-MOBILE FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.

25. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO T-MOBILE SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.

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

27. CONTRACTOR SHALL NOTIFY T-MOBILE REP A MINIMUM OF 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING ANY UNDERGROUND UTILITIES, FOUNDATIONS OR SEALING ANY WALL, FLOOR OR ROOF PENETRATIONS FOR ENGINEERING REVIEW AND APPROVAL.

28. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS AND RECOMMENDATIONS AND SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE AND PPM AND CONSTRUCTION DEVICES SUCH AS WELDING AND FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.

29. THE CONTRACTOR SHALL PROTECT AT HIS OWN EXPENSE, ALL EXISTING FACILITIES AND SUCH OF HIS NEW WORK LIABLE TO INJURY DURING THE CONSTRUCTION PERIOD. ANY DAMAGE CAUSED BY NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, OR BY THE ELEMENTS DUE TO NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, EITHER TO THE EXISTING WORK, OR TO HIS WORK OR THE WORK OF ANY OTHER CONTRACTOR, SHALL BE REPAIRED AT HIS EXPENSE TO THE OWNER'S SATISFACTION.

30. ALL WORK SHALL BE INSTALLED IN A FIRST CLASS, NEAT AND WORKMANLIKE MANNER BY MECHANICS SKILLED IN THE TRADE INVOLVED. THE QUALITY OF WORKMANSHIP SHALL BE SUBJECT TO THE APPROVAL OF THE T-MOBILE REP. ANY WORK FOUND BY THE T-MOBILE REP TO BE OF INFERIOR QUALITY AND/OR WORKMANSHIP SHALL BE REPLACED AND/OR REWORKED AT CONTRACTOR EXPENSE UNTIL APPROVAL IS OBTAINED.

31. IN ORDER TO ESTABLISH STANDARDS OF QUALITY AND PERFORMANCE, ALL TYPES OF MATERIALS LISTED HEREINAFTER BY MANUFACTURER'S NAMES AND/OR MANUFACTURER'S CATALOG NUMBER SHALL BE PROVIDED BY THESE MANUFACTURERS AS SPECIFIED.

32. T-MOBILE FURNISHED EQUIPMENT SHALL BE PICKED-UP AT THE T-MOBILE WAREHOUSE, NO LATER THAN 48HR AFTER BEING NOTIFIED INSURED, STORED, UNCRATE, PROTECTED AND INSTALLED BY THE CONTRACTOR WITH ALL APPURTENANCES REQUIRED TO PLACE THE EQUIPMENT IN OPERATION, READY FOR USE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EQUIPMENT AFTER PICKING IT UP.

33. T-MOBILE OR HIS ARCHITECT/ENGINEER RESERVES THE RIGHT TO REJECT ANY EQUIPMENT OR MATERIALS WHICH, IN HIS OWN OPINION ARE NOT IN COMPLIANCE WITH THE CONTRACT DOCUMENTS, EITHER BEFORE OR AFTER INSTALLATION AND THE EQUIPMENT SHALL BE REPLACED WITH EQUIPMENT CONFORMING TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS BY THE CONTRACTOR AT NO COST TO T-MOBILE OR THEIR ARCHITECT/ENGINEER.

SPECIAL CONSTRUCTION ANTENNA INSTALLATION NOTES:

1. WORK INCLUDED:

   A. ANTENNA AND COAXIAL CABLES ARE FURNISHED BY T-MOBILE UNDER A SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST ANTENNA INSTALLATION CONTRACTOR IN TERMS OD COORDINATION AND SITE ACCESS. ERECTION SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PERSONNEL AND

   B. INSTALL ANTENNA AS INDICATE ON DRAWINGS AND T-MOBILE SPECIFICATIONS.

   C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS

   D. INSTALL FURNISHED GALVANIZED STEEL OR ALUMINUM WAVEGUIDE AND PROVIDE PRINTOUT OF THAT TEST.

   E. CONTRACTOR SHALL PROVIDE FOUR (4) SETS OF SWEEP TESTS USING ANRITZU-PACKARD 8713B RF SCALAR NETWORK ANALYZER. SUBMIT FREQUENCY DOMAIN REFLECTOMETER(FDR) TESTS RESULTS TO THE PROJECT MANAGER. SWEEP TESTS SHALL BE AS PER ATTACHED RFS "MINIMUM FIELD TESTING RECOMMENDED FOR ANTENNA AND HELIAX COAXIAL CABLE SYSTEMS" DATED 10/5/93. TESTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING SERVICE AND BE BOUND AND SUBMITTED WITHIN ONE WEEK OF WORK COMPLETION.

   F. INSTALL COAXIAL CABLES AND TERMINATING BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTIONS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. TERMINATE ALL COAXIAL CABLE THREE (3) FEET IN EXCESS OF ENTRY PORT LOCATION UNLESS OTHERWISE STATED.

   G. ANTENNA AND COAXIAL CABLE GROUNDING:

2. ALL EXTERIOR #6 GREED GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH RFS CONNECTORS/SPLICE WEATHERPROOFING KIT #221213 OR EQUAL.

3. ALL COAXIAL CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL CABLE (NOT WITHIN BENDS)

ALL DISCREPANCIES FROM WHAT IS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL BE COMMUNICATED TO ATC ENGINEERING IMMEDIATELY FOR CORRECTION OR RE-DESIGN. FAILURE TO COMMUNICATE DIRECTLY WITH ATC ENGINEERING OR ANY CHANGES FROM THE DESIGN CONDUCTED WITHOUT PRIOR APPROVAL FROM ATC ENGINEERING SHALL BE THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	09/16/20

ATC SITE NUMBER:
302481
ATC SITE NAME:
HRFR - SOUTH
T-MOBILE SITE NAME:
CT769/SSITE HARTFORD #2
SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106

SEAL:

T-Mobile

DATE DRAWN:	09/16/20
ATC JOB NO:	13251341
CUSTOMER ID:	CT769/SSITE HARTFORD #2
CUSTOMER #:	CT11769B

GENERAL NOTES

SHEET NUMBER:	REVISION:
G-002	0

SITE PLAN NOTES:

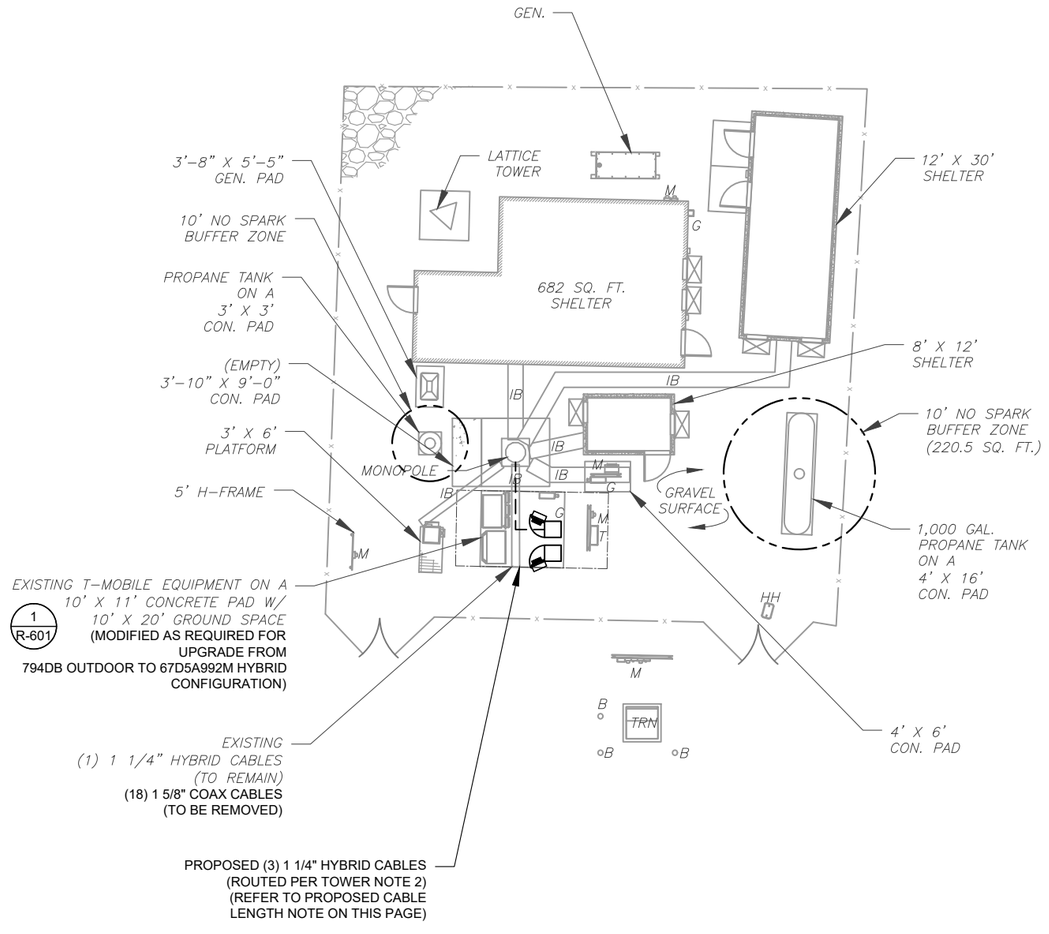
1. THIS SITE PLAN REPRESENTS THE BEST PRESENT KNOWLEDGE AVAILABLE TO THE ENGINEER AT THE TIME OF THIS DESIGN. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION AND VERIFY ALL EXISTING CONDITIONS RELATED TO THE SCOPE OF WORK FOR THIS PROJECT.

2. ICE BRIDGE, CABLE LADDER, COAX PORT, AND COAX CABLE ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL PROPOSED AND EXISTING EQUIPMENT AND STRUCTURES DEPICTED ON THIS PLAN. BEFORE UTILIZING EXISTING CABLE SUPPORTS, COAX PORTS, INSTALLING NEW PORTS OR ANY OTHER EQUIPMENT, CONTRACTOR SHALL VERIFY ALL ASPECTS OF THE COMPONENTS MEET THE ATC SPECIFICATIONS.

3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE T-MOBILE REPRESENTATIVE AND LOCAL UTILITY COMPANY FOR THE INSTALLATION OF CONDUITS, CONDUCTORS, BREAKERS, DISCONNECTS, OR ANY OTHER EQUIPMENT REQUIRED FOR ELECTRICAL SERVICE. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LATEST EDITION OF THE STATE AND NATIONAL CODES, ORDINANCES AND REGULATIONS APPLICABLE TO THIS PROJECT.

LEGEND

⊗	GROUNDING TEST WELL
ATS	AUTOMATIC TRANSFER SWITCH
B	BOLLARD
CSC	CELL SITE CABINET
D	DISCONNECT
E	ELECTRICAL
F	FIBER
GEN	GENERATOR
G	GENERATOR RECEPTACAL
HH, V	HAND HOLE, VAULT
IB	ICE BRIDGE
K	KENTROX BOX
LC	LIGHTING CONTROL
M	METER
PB	PULL BOX
PP	POWER POLE
T	TELCO
TRN	TRANSFORMER
x	CHAINLINK FENCE



1 DETAILED SITE PLAN

0 20' 40'

SCALE: 1"=20' (11X17)
1"=10' (22X34)

PROPOSED CABLE LENGTH:

1. ESTIMATED LENGTH OF PROPOSED CABLE IS **130'**. ESTIMATED LENGTH OF CABLE WAS PROVIDED BY CUSTOMER OR CALCULATED BY ADDING THE RAD CENTER AND THE DISTANCE FROM THE SHELTER ENTRY PLATE TO THE TOWER (ALONG THE ICE BRIDGE) AND A SAFETY FACTOR MEASUREMENT OF 15% (OF THE TWO PREVIOUS VALUES), CDS DEFER TO GREATEST CABLE LENGTH.
2. ROUTE PROPOSED CABLES ALONG SAME PATH AS EXISTING CABLES AND IN ACCORDANCE WITH STRUCTURAL ANALYSIS. IF ADEQUATE SPACE EXISTS, ROUTE CABLES THROUGH ENTRY PORT HOLE, UP INSIDE OF MONOPOLE, AND THROUGH EXIT PORT HOLE. IF ROUTING OUTSIDE THE MONOPOLE, ATTACH CABLES USING STAND-OFF ADAPTERS MOUNTED TO TOWER USING STAINLESS STEEL BANDING. ADEQUATELY SECURE CABLES USING EITHER APPROPRIATELY SIZED STAINLESS STEEL SNAP-INS OR MOUNTING HARDWARE AND BRACKETS AS SPECIFIED BY CABLE MANUFACTURER.

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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	09/16/20
1	GROUND CHANGE	NG	09/23/20

ATC SITE NUMBER:
302481

ATC SITE NAME:
HRFR - SOUTH

T-MOBILE SITE NAME:
CT769/SSITE HARTFORD #2

SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106

SEAL:

T-Mobile

DATE DRAWN:	09/16/20
ATC JOB NO:	13251341
CUSTOMER ID:	CT769/SSITE HARTFORD #2
CUSTOMER #:	CT11769B

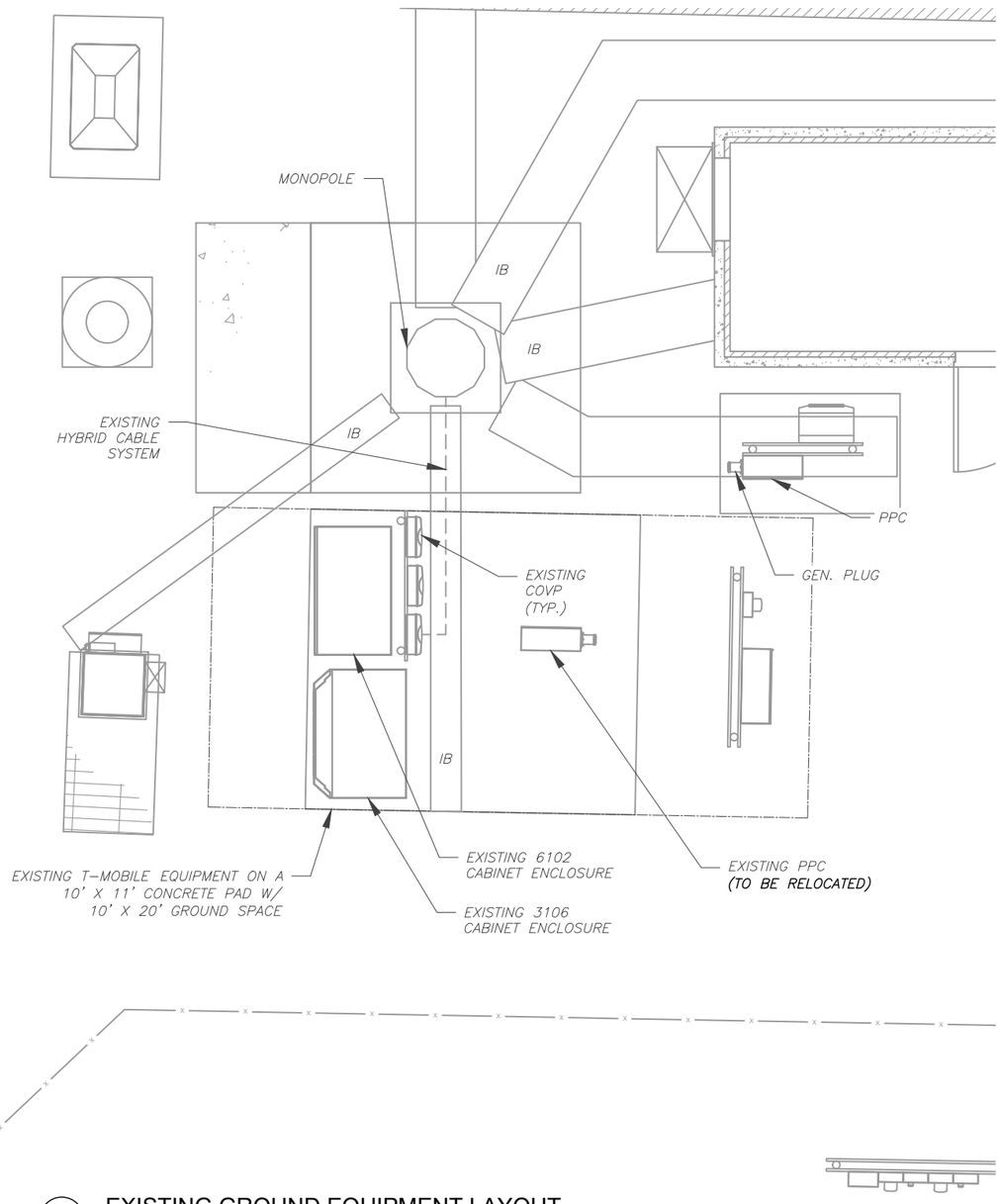
DETAILED SITE PLAN

SHEET NUMBER: C-101

REVISION: 1

SITE PLAN NOTES:

1. CONTRACTOR TO VERIFY THERE IS NO LIVE AAV FIBER RUNNING THROUGH EXISTING DEAD EQUIPMENT. IF SO, THIS WILL NEED TO BE RERUN THROUGH CONDUIT PRIOR TO REMOVING DEAD 2G (6201 CABS) EQUIPMENT.
2. REMOVE EXISTING 2G CABINETS, AND POWER / TELCO WHIPS ASSOCIATED WITH THE DEAD EQUIPMENT IF APPLICABLE.
3. ALL OPEN PORTS NEED TO BE SEALED / WEATHERPROOFED PROPERLY
4. ALL UNNEEDED / EXCESS EQUIPMENT AND GARBAGE TO BE REMOVED FROM EQUIPMENT AREA. DISPOSE OF MATERIALS PROPERLY OFF SITE.

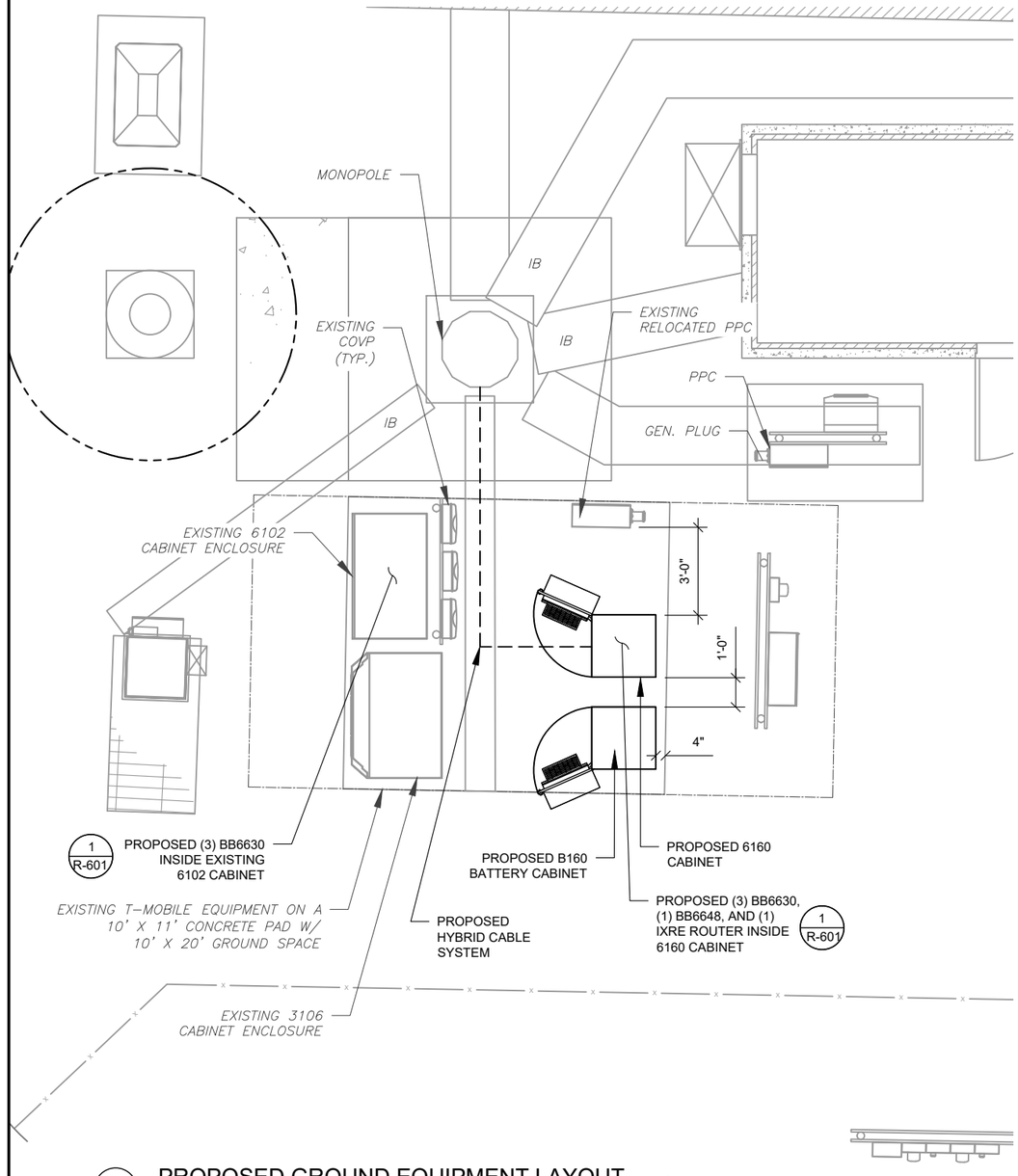


1 EXISTING GROUND EQUIPMENT LAYOUT

0 5' 10'

SCALE: 1"=5' (11X17)
1"=2.5' (22X34)

T-MOBILE CM APPROVAL REQUIRED BEFORE INSTALLING CABINETS



2 PROPOSED GROUND EQUIPMENT LAYOUT

0 5' 10'

SCALE: 1"=5' (11X17)
1"=2.5' (22X34)

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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	09/16/20
1	GROUND CHANGE	NG	09/23/20

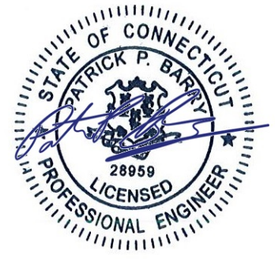
ATC SITE NUMBER:
302481

ATC SITE NAME:
HRFR - SOUTH

T-MOBILE SITE NAME:
CT769/SSITE HARTFORD #2

SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106

SEAL:



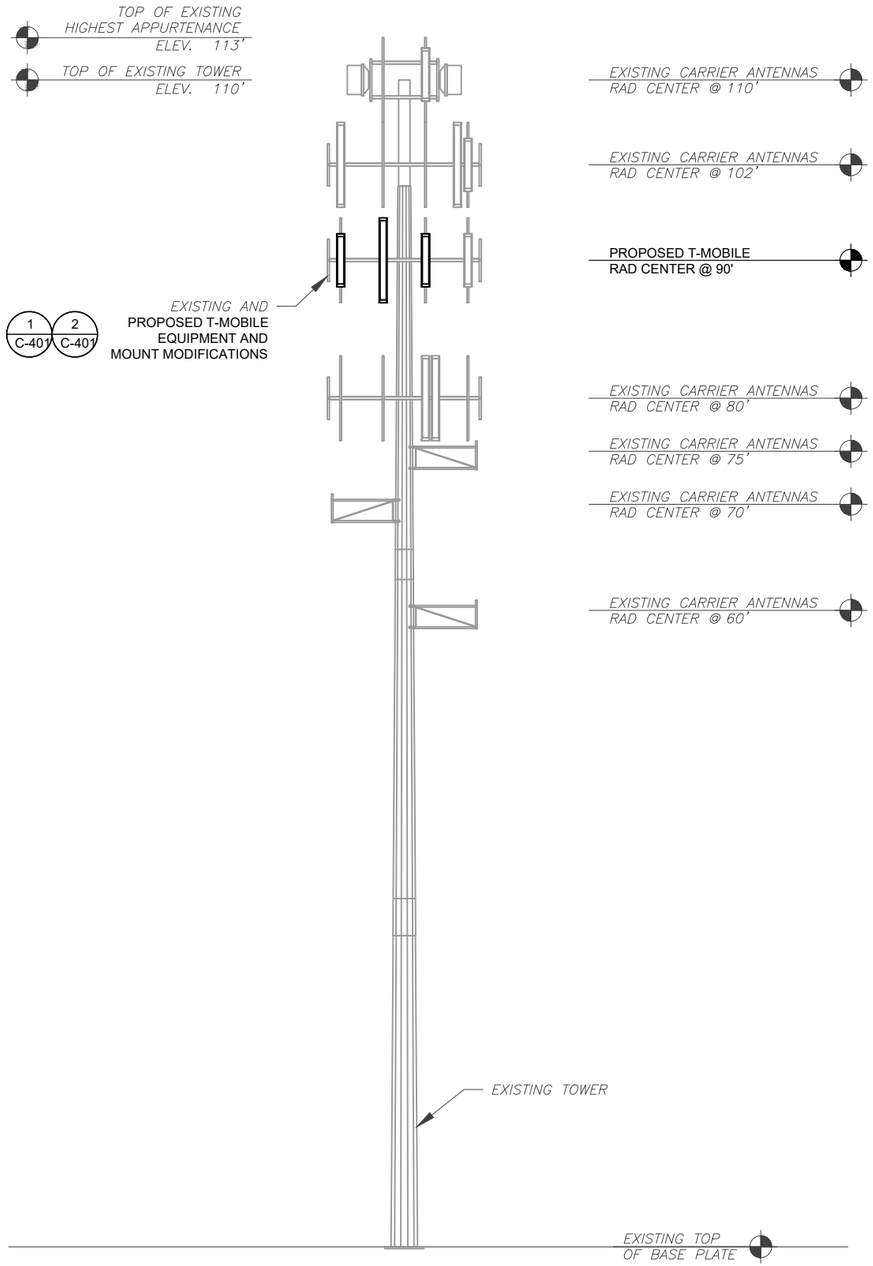
T-Mobile

DATE DRAWN:	09/16/20
ATC JOB NO:	13251341
CUSTOMER ID:	CT769/SSITE HARTFORD #2
CUSTOMER #:	CT11769B

DETAILED GROUND PLAN

SHEET NUMBER:	REVISION:
C-102	1

PER MOUNT ANALYSIS COMPLETED BY TEP, DATED 08/10/20, THE EXISTING MOUNT CAN NOT ADEQUATELY SUPPORT THE PROPOSED LOADING. THE MOUNT MODIFICATION PROPOSED IN THE MOUNT ANALYSIS, INCLUDED AT THE END OF THIS PLAN SET, MUST BE INSTALLED PRIOR TO THE INSTALLATION OF THE PROPOSED ANTENNAS AND OTHER EQUIPMENT



1 TOWER ELEVATION
SCALE: N.T.S.

TOWER NOTE:
1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM WITH THE AMERICAN TOWER CONSTRUCTION MANAGER THAT THEY HAVE THE MOST RECENT VERSION OF THE STRUCTURAL ANALYSIS BEFORE COMMENCING WORK. EXISTING AND PROPOSED TOWER APPURTENANCES, MOUNTS, AND ANTENNAS ARE SHOWN BASED ON THE STRUCTURAL ANALYSIS.
2. ROUTE PROPOSED CABLES ALONG SAME PATH AS EXISTING CABLES AND IN ACCORDANCE WITH STRUCTURAL ANALYSIS. IF ADEQUATE SPACE EXISTS, ROUTE CABLES THROUGH ENTRY PORT HOLE, UP INSIDE OF MONOPOLE, AND THROUGH EXIT PORT HOLE. IF ROUTING OUTSIDE THE MONOPOLE, ATTACH CABLES USING STAND-OFF ADAPTERS MOUNTED TO TOWER USING STAINLESS STEEL BANDING. ADEQUATELY SECURE CABLES USING EITHER APPROPRIATELY SIZED STAINLESS STEEL SNAP-INS OR MOUNTING HARDWARE AND BRACKETS AS SPECIFIED BY CABLE MANUFACTURER.
3. TOWER ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE TO MATCH STRUCTURAL ANALYSIS. ELEVATIONS DO NOT REFLECT TRUE ABOVE GROUND LEVEL (A.G.L.)

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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	09/16/20

ATC SITE NUMBER:
302481
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HRFR - SOUTH
T-MOBILE SITE NAME:
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SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106

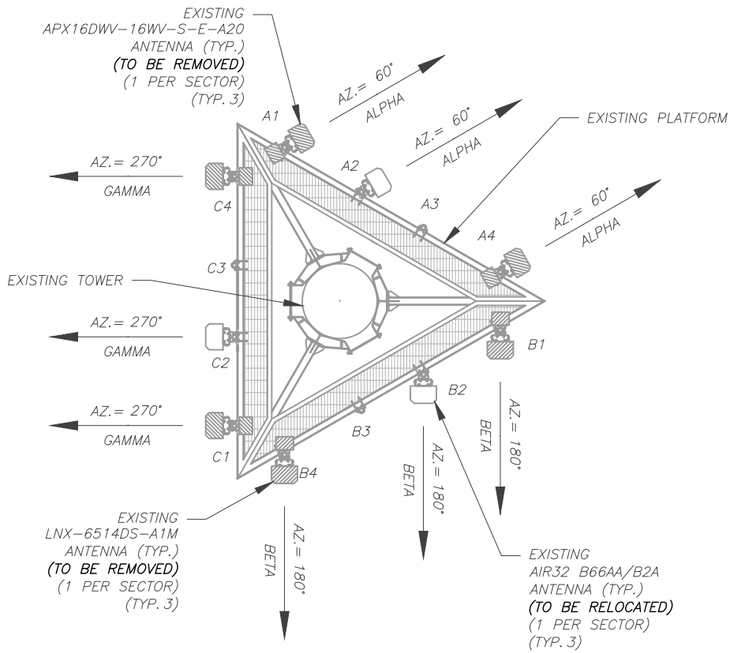
SEAL:

T-Mobile

DATE DRAWN:	09/16/20
ATC JOB NO:	13251341
CUSTOMER ID:	CT769/SSITE HARTFORD #2
CUSTOMER #:	CT11769B

TOWER ELEVATION

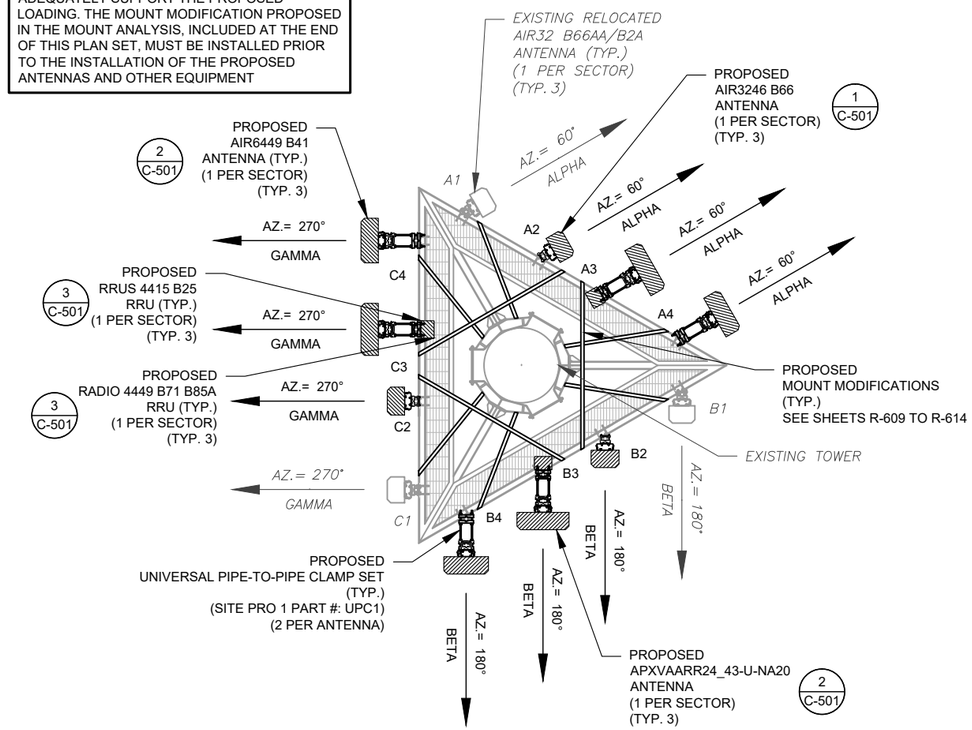
SHEET NUMBER:	REVISION:
C-201	0



1 EXISTING ANTENNA PLAN

SCALE: N.T.S.

PER MOUNT ANALYSIS COMPLETED BY TEP, DATED 08/10/20, THE EXISTING MOUNT CAN NOT ADEQUATELY SUPPORT THE PROPOSED LOADING. THE MOUNT MODIFICATION PROPOSED IN THE MOUNT ANALYSIS, INCLUDED AT THE END OF THIS PLAN SET, MUST BE INSTALLED PRIOR TO THE INSTALLATION OF THE PROPOSED ANTENNAS AND OTHER EQUIPMENT



2 FINAL ANTENNA PLAN

SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

LOCATION			ANTENNA SUMMARY					NON ANTENNA SUMMARY	
SECTOR	RAD	AZ	POS	ANTENNA	BAND	MECH/ELEC D-TILT	STATUS	ADDITIONAL TOWER MOUNTED EQUIPMENT	STATUS
ALPHA	90'	60°	A1	APXV16DWV-16WV-S-E-A20	L700/L600/N600/L1900	0°/8°	RMV	KRY 112 489/1 KRY 112 144/1	RMV
			A2	AIR32 B66AA/B2A	L2100	0°/2°	REL	–	–
			A3	–	–	–	–	–	–
			A4	LNX-6514DS-A1M	L700/L1900	0°/8°	RMV	SMART BIAS TEE	RMV
BETA	90'	180°	B1	APXV16DWV-16WV-S-E-A20	L700/L600/N600/L1900	2°/8°	RMV	KRY 112 489/1 KRY 112 144/1	RMV
			B2	AIR32 B66AA/B2A	L2100	0°/8°	RMN	–	–
			B3	–	–	–	–	–	–
			B4	LNX-6514DS-A1M	L700/L1900	0°/2°	RMV	SMART BIAS TEE	RMV
GAMMA	90'	270°	C1	APXV16DWV-16WV-S-E-A20	L700/L600/N600/L1900	2°/8°	RMV	KRY 112 489/1 KRY 112 144/1	RMV
			C2	AIR32 B66AA/B2A	L2100	0°/8°	RMN	–	–
			C3	–	–	–	–	–	–
			C4	LNX-6514DS-A1M	L700/L1900	0°/2°	RMV	SMART BIAS TEE	RMV

NOTES

1. CONFIRM WITH T-MOBILE REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS FOR NSN CONFIGURATION (CONFIG). GC TO CAP ALL UNUSED PORTS.
2. CONFIRM SPACING OF PROPOSED EQUIP DOES NOT CAUSE TOWER CONFLICTS NOR IMPEDE TOWER CLIMBING PEGS.

STATUS ABBREVIATIONS

RMV: TO BE REMOVED
RMN: TO REMAIN
REL: TO BE RELOCATED
ADD: TO BE ADDED

CABLE LENGTHS FOR JUMPERS

JUNCTION BOX TO RRU: 15'
RRU TO ANTENNA: 10'

FINAL ANTENNA SCHEDULE

LOCATION			ANTENNA SUMMARY					NON ANTENNA SUMMARY	
SECTOR	RAD	AZ	POS	ANTENNA	BAND	MECH/ELEC D-TILT	STATUS	ADDITIONAL TOWER MOUNTED EQUIPMENT	STATUS
ALPHA	90'	60°	A1	AIR32 B66AA/B2A	L2100	0°/0°	REL	-	-
			A2	AIR 3246 B66	L2100	0°/0°	ADD	-	-
			A3	APXVAARR24_43-U-NA20	L700/L600/N600/L1900	0°/0°	ADD	RADIO 4449 B71 B85A RRUS 4415 B25	ADD
			A4	AIR6449 B41	2500/N2500	0°/0°	ADD	-	-
BETA	90'	180°	B1	AIR32 B66AA/B2A	L2100	0°/0°	REL	-	-
			B2	AIR 3246 B66	L2100	0°/0°	ADD	-	-
			B3	APXVAARR24_43-U-NA20	L700/L600/N600/L1900	0°/0°	ADD	RADIO 4449 B71 B85A RRUS 4415 B25	ADD
			B4	AIR6449 B41	2500/N2500	0°/0°	ADD	-	-
GAMMA	90'	270°	C1	AIR32 B66AA/B2A	L2100	0°/0°	REL	-	-
			C2	AIR 3246 B66	L2100	0°/0°	ADD	-	-
			C3	APXVAARR24_43-U-NA20	L700/L600/N600/L1900	0°/0°	ADD	RADIO 4449 B71 B85A RRUS 4415 B25	ADD
			C4	AIR6449 B41	2500/N2500	0°/0°	ADD	-	-

EXISTING FIBER DISTRIBUTION/OVP BOX		EXISTING CABLING SUMMARY		
MODEL NUMBER	STATUS	COAX	HYBRID	STATUS
–	–	–	(1) 1-1/4"	RMN
–	–	(18) 1-5/8"	–	RMV

FINAL FIBER DISTRIBUTION / OVP BOX		FINAL CABLING SUMMARY		
MODEL NUMBER	STATUS	COAX	HYBRID	STATUS
-	-	-	(1) 1-1/4"	RMN
-	-	-	(3) 1-1/4"	ADD

3 EQUIPMENT SCHEDULES

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
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SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	09/16/20

ATC SITE NUMBER:
302481
ATC SITE NAME:
HRFR - SOUTH
T-MOBILE SITE NAME:
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SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106

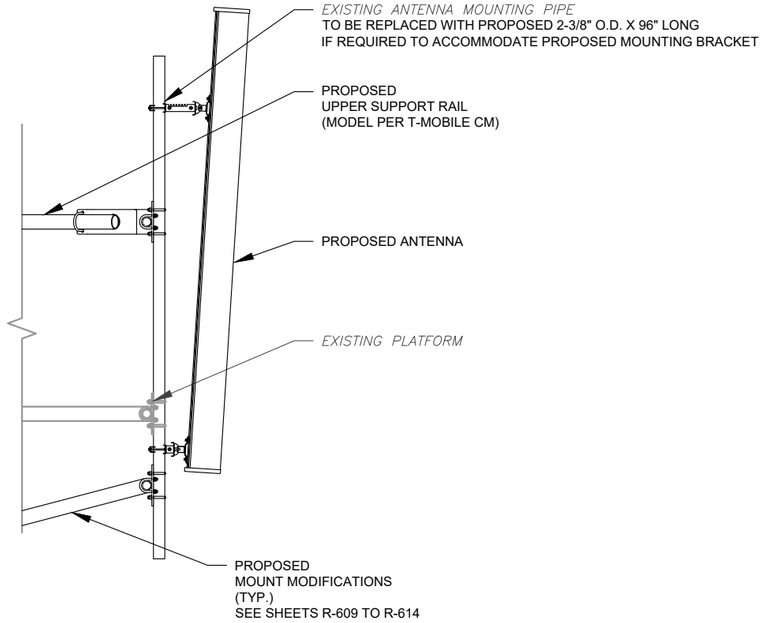
SEAL:

T-Mobile

DATE DRAWN:	09/16/20
ATC JOB NO:	13251341
CUSTOMER ID:	CT769/SSITE HARTFORD #2
CUSTOMER #:	CT11769B

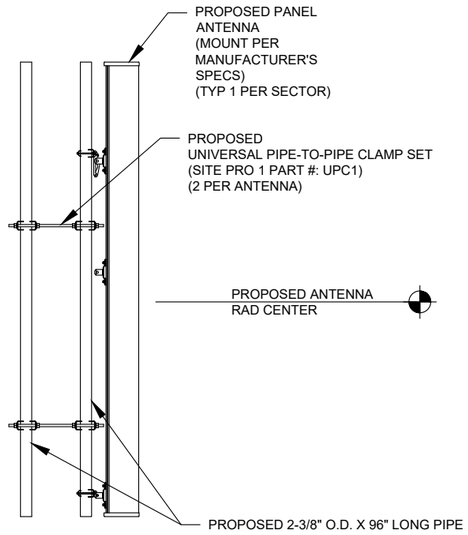
ANTENNA INFORMATION & SCHEDULE

SHEET NUMBER:	REVISION:
C-401	0



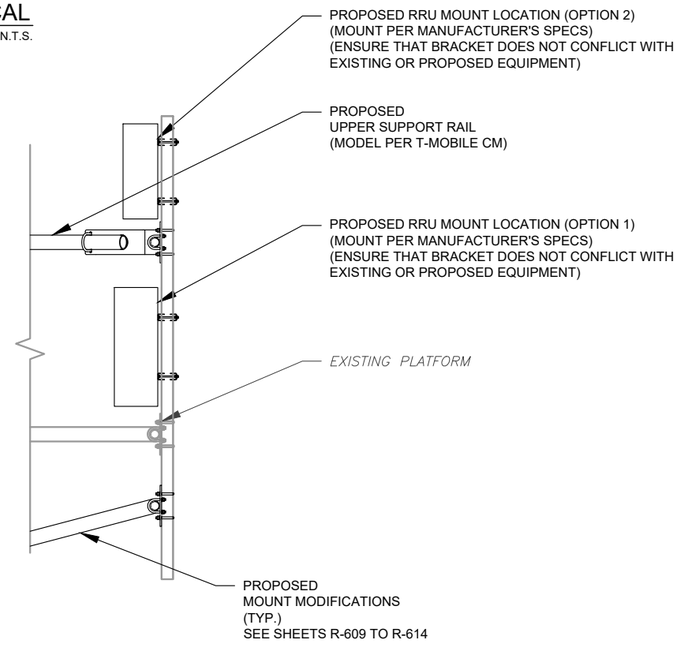
1 PROPOSED ANTENNA MOUNTING DETAIL - TYPICAL

SCALE: N.T.S.



2 PROPOSED PIPE-TO-PIPE ANTENNA MOUNTING DETAIL - TYPICAL

SCALE: N.T.S.



3 PROPOSED RRU MOUNTING DETAIL - TYPICAL

SCALE: N.T.S.

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SUITE 100
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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	09/16/20
1	NOTE CHANGE	NG	09/23/20

ATC SITE NUMBER:

302481

ATC SITE NAME:

HRFR - SOUTH

T-MOBILE SITE NAME:

CT769/SSITE HARTFORD #2

SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106

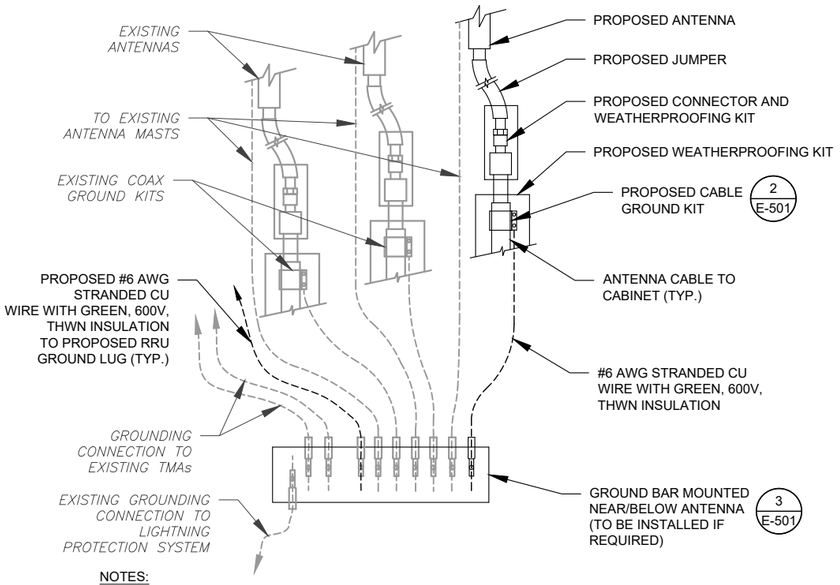
SEAL:

T-Mobile

DATE DRAWN:	09/16/20
ATC JOB NO:	13251341
CUSTOMER ID:	CT769/SSITE HARTFORD #2
CUSTOMER #:	CT11769B

CONSTRUCTION DETAILS

SHEET NUMBER:	REVISION:
C-501	1

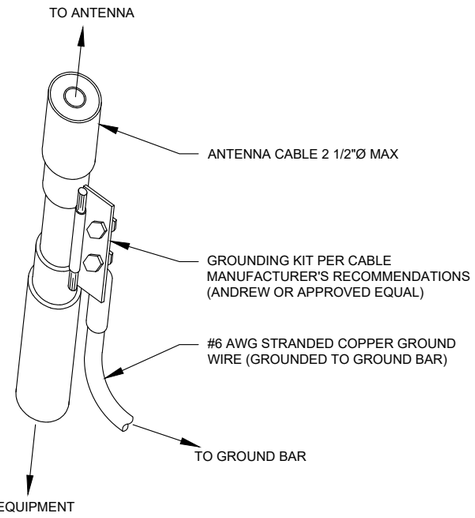


NOTES:

1. THIS DETAIL IS INTENDED TO SHOW THE GENERAL GROUNDING REQUIREMENTS. SLIGHT ADJUSTMENTS MAY BE REQUIRED BASED ON EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS AS NEEDED AND INFORM THE CONSTRUCTION MANAGER OF ANY CONFLICTS.
2. SITE GROUNDING SHALL COMPLY WITH T-MOBILE GROUNDING STANDARDS, LATEST EDITION, AND COMPLY WITH T-MOBILE GROUNDING CHECKLIST, LATEST VERSION. WHEN NATIONAL AND LOCAL GROUNDING CODES ARE MORE STRINGENT THEY SHALL GOVERN.

1 TYPICAL ANTENNA GROUNDING DIAGRAM

SCALE: N.T.S.

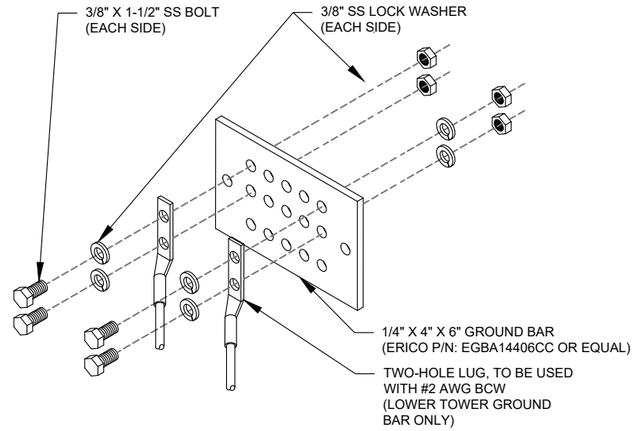


GROUND KIT NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. CONTRACTOR SHALL PROVIDE WEATHERPROOFING KIT (ANDREW PART NUMBER 221213) AND INSTALL/TAPE PER MANUFACTURER'S SPECIFICATIONS.

2 CABLE GROUND KIT CONNECTION DETAIL

SCALE: N.T.S.



GROUND BAR NOTES:

1. GROUND BAR KITS COME WITH ALL HARDWARE, NUTS, BOLTS, WASHERS, ETC. EXCEPT THE STRUCTURAL MOUNTING MEMBER(S).
2. GROUND BAR TO BE BONDED DIRECTLY TO TOWER.

3 TOWER GROUND BAR DETAIL

SCALE: N.T.S.

ELECTRICAL NOTES:

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE T-MOBILE REPRESENTATIVE AND LOCAL UTILITY COMPANY FOR THE INSTALLATION OF CONDUITS, CONDUCTORS, BREAKERS, DISCONNECTS, OR ANY OTHER EQUIPMENT REQUIRED FOR ELECTRICAL SERVICE. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LATEST EDITION OF THE STATE AND NATIONAL CODES, ORDINANCES AND REGULATIONS APPLICABLE TO THIS PROJECT.
2. ATC HAS NOT VERIFIED ANY EXISTING T-MOBILE GROUND EQUIPMENT OR ELECTRICAL LOADING. PROPOSED WORK BASED ON INSTALLATION CONFIGURATION PROVIDED BY T-MOBILE. CONTRACTOR TO VERIFY EXISTING T-MOBILE PANEL HAS SUFFICIENT SPACE FOR PROPOSED BREAKER. PROPOSED CABLE AND CONDUIT SHALL BE MINIMUM SIZE PER BELOW:

OCPD SIZE	WIRE SIZE	GROUND SIZE	CONDUIT SIZE
80A/2P	2#3 AWG	#8 AWG	1-1/4"
100/2P	2#2 AWG	#8 AWG	1-1/4"
125A/2P	2#1 AWG	#8 AWG	1-1/2"
150A/2P	2#1/0 AWG	#8 AWG	1-1/2"

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	NG	09/16/20

ATC SITE NUMBER:
302481
ATC SITE NAME:
HRFR - SOUTH
T-MOBILE SITE NAME:
CT769/SSITE HARTFORD #2
SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106

SEAL:

T-Mobile

DATE DRAWN:	09/16/20
ATC JOB NO:	13251341
CUSTOMER ID:	CT769/SSITE HARTFORD #2
CUSTOMER #:	CT11769B

GROUNDING DETAILS

SHEET NUMBER:	REVISION:
E-501	0

RAN Template:	A&L Template:
67D5A992M Hybrid	67D5992M_3xAIR+1OP

CT11769B_Anchor_4_draft

Print Name: Standard
PORs: Anchor_Phase 3
AAS_CMP4
L700_CMP4 - 4x2

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 794DB Outdoor (evolved from 4B)

Enclosure	1	2
Enclosure Type	RBS 6102	Ancillary Equipment (Ericsson)
Baseband	DUW30 **(x 2)** DUG20 DUS41	
Hybrid Cable System		Ericsson 6x12 HCS *Select Length & AWG*
Radio	RUS01 B2 **(x 6)** RUS01 B4 **(x 6)**	RRUS11 B12 **(x 3)**

Proposed RAN Equipment

Template: 67D5A992M Hybrid

Enclosure	1	2	3	4
Enclosure Type	RBS 6102	Ancillary Equipment (Ericsson)	Enclosure 6160	B160
Baseband	DUW30 U2100; DUW30; DUG20 G1900; BB 6630 L700 L600 L1900; BB 6630 L2100; BB 6630 N600		BB 6630 **(x 3)** L2500; BB 6648 N2500	
Hybrid Cable System		Ericsson 6x12 HCS *Select Length & AWG* **(x 2)**; Ericsson 6x12 HCS *Select AWG & Length*	Ericsson 6x12 HCS *Select AWG & Length*	
Radio	RUS01 B2 **(x 6)** RUS01 B4 **(x 6)**			

RAN Scope of Work:

*** Existing 3106 on site with batteries. ***

Add Emerson Cabinet.

Check Breaker Sizes.

All cabinet radios will become dark.

Remove XMU from existing RBS6102 Cabinet if present.

Replace BB5216 in existing RBS6102 Cabinet with (1) BB6630 for L1900 (both carriers), L700, and L600 (to be installed in existing RBS6102 Cabinet), if not already completed.

Add (1) BB6630 for L2100 M-MIMO to existing cabinet.

Add (1) Enclosure 6160.

Add (1) Battery Cabinet B160.

Add (1) iXRe Router to new Enclosure 6160.

Add (3) BB6630 for L2500 to new Enclosure 6160.

Add (1) BB6648 for N2500 to new Enclosure 6160.

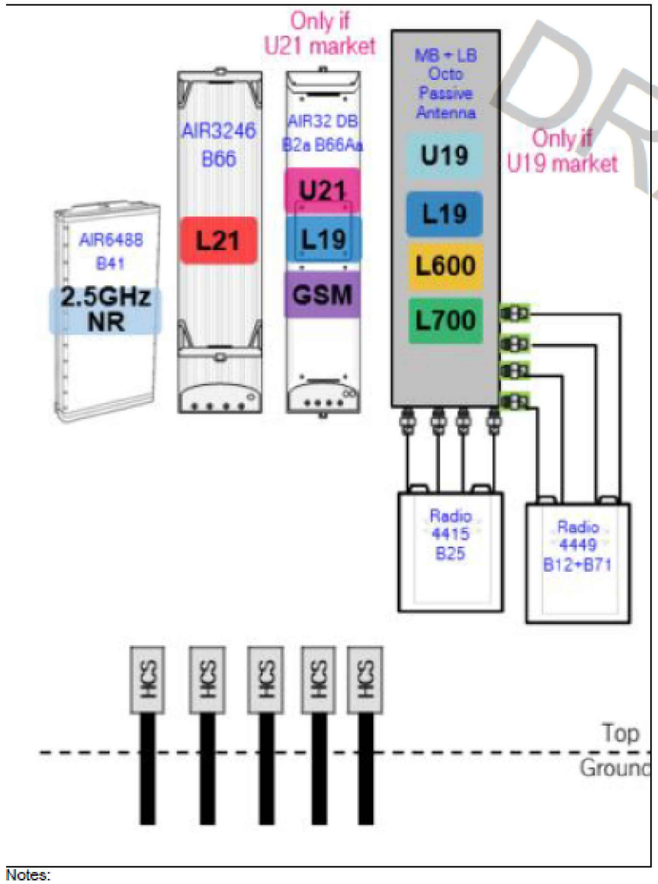
Existing: (18) Coaxial Lines; (1) 6X12 HCS.

Remove all (18) Coaxial Lines.

Add (3) 6x12 HCS.

1 CABINET CONFIGURATION
SCALE: NOT TO SCALE

67D5992M.JPG



Notes:

2 ANTENNA CONFIGURATION
SCALE: NOT TO SCALE

NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-601	0

August 10, 2020

Geoff Middlebrooks
American Tower Corporation
3500 Regency Pkwy, Suite 100
Cary, NC 27518
(919) 466-5149

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
Structures@tepgroup.net

Subject: Appurtenance Mount Modification Analysis Report

Carrier Designation:	***T-Mobile* Reconfiguration**	
	Site Number:	CT11769B
	Site Name:	CT769/SSite Hartford #2
ATC Designation:	**ATC Site Number:**	302481
	ATC Site Name:	Hrfr – South
Engineering Firm Designation:	**TEP Project Number:**	68513.435981
Site Data:	**289 Mountain St., Hartford, Hartford County, CT 06106** **Latitude *41° 43' 35.76"*, Longitude *-72° 42' 29.52"*** **110 ± Foot - Monopole Tower**	

Table 1 - Mount Analysis Specification

Ultimate Wind Speed (MPH)	Radial Ice (in.)	Ice Wind Speed (MPH)	Exposure Category	Risk Category	Topo Procedure	K_{zt}
118	*1.5*	*50*	*B*	*II*	*Method 2*	*1.434*

Based on our analysis we have determined the stress level for the mount structure to be:

LC2: Existing + Proposed + Reserved Loading with Proposed Modifications **Sufficient Capacity**
Note: See Table 2 for the existing, proposed, and reserved loading

The analysis has been performed in accordance with the ANSI/TIA-222-H-2017 Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures.

Structural analysis prepared by: Roger W. Martel

Respectfully submitted by:

Aaron T. Rucker, P.E.

STATE OF CONNECTICUT · AARON THOMAS RUCKER · 32608 · LICENSED PROFESSIONAL ENGINEER

08/10/2020

RECOMMENDATIONS

1) If the load differs from that described in Table 2 of this report or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The modifications depicted in Appendix C shall be installed and, upon completion, inspected. The mount has sufficient capacity to support the final antenna configuration once the proposed modifications are completed.
3) Modification of the existing mount would require the following parts:
   a) (1) SitePro HRK14-HD Heavy Duty Handrail Kit
   b) (1) SitePro PRK-SFS-L Kicker Kit
   c) (12) SitePro SCX2-K Crossover Kit
   d) (3) SitePro P30174 Support Pipe
   Total estimated costs of the modification to including the modification drawings, materials, and required labor is $19,000.
4) Should the customer elect to forgo installation of the aforementioned modifications, a mount replacement will be required, SitePro model RMQP-496, or approved equivalent.
   a) Total estimated costs of the replacement including the replacement mount analysis, materials, and required labor is $25,000.
5) TEP was not provided a mount mapping and had to base geometry assumptions off photos. If any of these assumptions are not accurate this analysis is not valid. TEP recommends completing a mount mapping to confirm the mount geometry.

ANALYSIS ASSUMPTIONS

1) The mount was built in accordance with the manufacturer's specifications.
2) The mount has been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Table 2. All mount components have been assumed to be in sufficient condition to carry their full design capacity for this analysis. Refer to the issued mapping for any structural and/or maintenance issues found during our site visit.
4) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
5) TEP did not analyze the collar mount connection to the pole and assumes it to have sufficient structural capacity to transfer the applied forces from the mount to the tower.
6) All material grades used for this analysis, unless verified by mount manufacturer design, were assumed per AISC Table 2-4, 15th Edition. See RISA 3-D output for confirmation on grades used in this analysis.

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

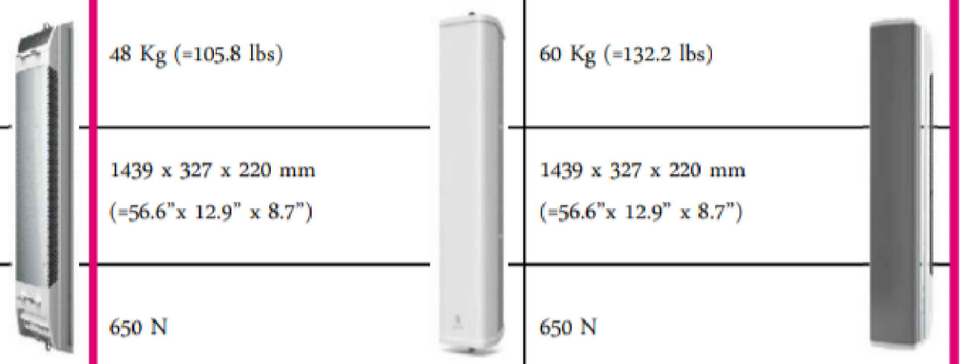
NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT. PLEASE REFERENCE THE MOUNT ANALYSIS REPORT FOR COMPLETE MOUNT ANALYSIS CALCULATIONS AND DETAILS. SUPPLEMENTAL PAGES INCLUDED IN THE CONSTRUCTION DRAWINGS ARE FOR REFERENCE ONLY. GENERAL CONTRACTOR IS TO VERYIFY THEY HAVE THE MOST RECENT MOUNT ANALYSIS PRIOR TO CONTRUCTION.

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-602	0

Dimension Comparison: RRUS01, RRUS11 and RRUS32

Mechanical	AIR21 B4a B2p	AIR32 Single Band (SB) B4a B2p	AIR32 Dual Band (DB) B66Aa B2a
Weight **(without mounting brackets)**	41 Kg (=90.4 lbs)	48 Kg (=105.8 lbs)	60 Kg (=132.2 lbs)
Dimensions **(H x W x D)**	1427 x 307 x 200 mm (=56.2"x 12.1"x 7.9")	1439 x 327 x 220 mm (=56.6"x 12.9" x 8.7")	1439 x 327 x 220 mm (=56.6"x 12.9" x 8.7")
Frontal Wind load @ 150 km/h (=42 m/s) wind speed	580 N	650 N	650 N



17% (SB) and 46% (DB) heavier than AIR21

Just 6.5% thicker but almost the same height

1 EQUIPMENT SPECIFICATIONS
SCALE: N.T.S.

NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

SUPPLEMENTAL

SHEET NUMBER: R-603

REVISION: 0

PRODUCT DATASHEET

APXVAARR24_43-U-NA20

RADIO FREQUENCY SYSTEMS
The Clear Choice®

Dual Slant Polarized Quad Band (8 Port) Antenna, 617-746/617-746/1695-2200/1695-2200MHz, 65deg, 15/15/18/18dBi, 2.4m (8ft), VET, RET, 0-12°/0-12°/2-12°/2-12°

FEATURES / BENEFITS

This antenna provides a 8 Port multi-band flexible platform for advanced use for flexible use in deployment scenarios for encompassing 600MHz, 700MHz, AWS & PCS applications.

- 24 Inch Width For Easier Zoning
- Field Replaceable (Integrated) AISG RET platform for reduced environmental exposure and long lasting quality
- Superior elevation pattern performance across the entire electrical down tilt range
- Includes three AISG RET motors - Includes 0.5m AISG jumper for optional diasy chain of two high band RET motors for one single AISG point of high band tilt control.
- Low band arrays driven by a single RET motor

Technical Features

LOW BAND LEFT ARRAY (617-746 MHZ) [R1]

Frequency Band	MHz	617-698	698-746
Gain	dBi	15.1	15.5
Horizontal Beamwidth @3dB	Deg	65	62
Vertical Beamwidth @3dB	Deg	11.4	10.4
Electrical Downtilt Range	Deg	0-12	0-12
Upper Side Lobe Suppression 0 to +20	dB	19	20
Front-to-Back, at +/-30°, Copolar	dB	25	24
Cross Polar Discrimination (XPD) @ Boresight	dB	19	19
Cross Polar Discrimination (XPD) @ +/-60	dB	5	3
3rd Order PIM 2 x 43dBm	dBc		-153
VSWR	-	1.5:1	1.5:1
Cross Polar Isolation	dB	25	25
Maximum Effective Power per Port	Watt	250	250

LOW BAND RIGHT ARRAY (617-746 MHZ) [R2]

Frequency Band	MHz	617-698	698-746
Gain	dBi	14.8	15.1
Horizontal Beamwidth @3dB	Deg	65	62
Vertical Beamwidth @3dB	Deg	11.4	10.3
Electrical Downtilt Range	Deg	0-12	0-12
Upper Side Lobe Suppression 0 to +20	dB	19	20
Front-to-Back, at +/-30°, Copolar	dB	25	23
Cross Polar Discrimination (XPD) @ Boresight	dB	19	19
Cross Polar Discrimination (XPD) @ +/-60	dB	5	3
3rd Order PIM 2 x 43dBm	dBc		-153
VSWR	-	1.5:1	1.5:1
Cross Polar Isolation	dB	25	25
Maximum Effective Power per Port	Watt	250	250

1 EQUIPMENT SPECIFICATIONS
SCALE: N.T.S.

NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

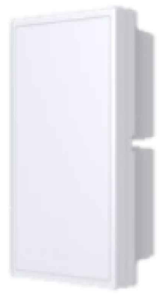
SUPPLEMENTAL

SHEET NUMBER: R-604

REVISION: 0

PRODUCT DESCRIPTION

Frequency Range	LTE TDD B41: 2496 – 2690 MHz
Instantaneous BW	DL 194 MHz
Antenna Ports	64T64R
Technology	NR, LTE and NR+LTE MSMM
Antenna Elements	192
Output RF Power	300 W (=64 TRX x 4.6875W)
Data Ports	4 x 25Gb/s CPRI
5G NR Support	YES
DC Feed	-48V DC power connector
Cooling	Passive cooling (vs. active cooling on AIR32 DB)
Dimensions (H x W x D)	33.1" x 20.6" x 8.6" inches (=841 x 524 x 217 mm)
Weight	104 lbs (=47 kg)
Electrical downtilt	-3 to 11 degrees
Horizontal beamwidth	+/- 65 degrees
HW/SW Availability	July 2020
Material SAP #	34105 – AIR 6449 B41



WARRANTY: 1 Year

SPARES: 2% of install base. Additional units can be requested as per need.

Baseband Requirements

For a typical 3-sector site,

- LTE: one dedicated BB6630 per site
- NR: one dedicated BB6648 (see its NPI) per site

Supplementary/Ancillary Materials

SKU	Description	Qty
34106	AIR6449 Mandatory Install KIT	1 per AIR6449
34110	AIR6449 25G SFP	8 per AIR6449

LINKS

- Ericsson New T-Mobile Anchor Network Playbook
- AIR 6488 vs. AIR 6449 Comparison

CONTACTS

Jacob Madian	Assoc. Engineer, RAN Architecture
Weston Berry	Engineer, RAN Architecture

1 EQUIPMENT SPECIFICATIONS
SCALE: N.T.S.

NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

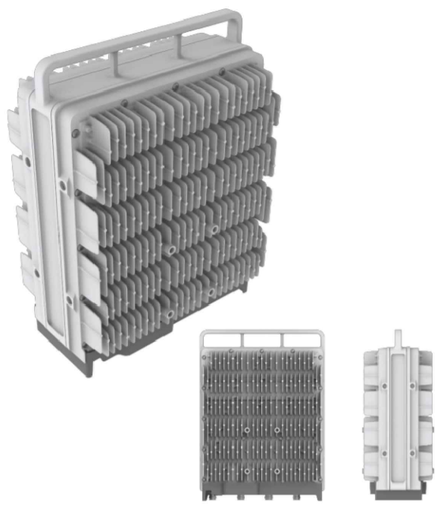
SUPPLEMENTAL

SHEET NUMBER: R-605

REVISION: 0

Radio 4449 B71 B85A

- 4TX/4RX – 320W FDD
  - 4x40W B71 + 4x40W B85A
- IBW:
  - Full band support in each of the bands
- 4 Antenna ports, each port shared by two bands
  - 4.3-10 plus (f) or equivalent
- LTE, NR, NB-IoT
- Carrier per port per band:
  - Up to 4 carriers (DL/UL) in each band
    - Up to 4 LTE carriers
    - NB-IoT
      - Up to 2 Standalone carrier
      - In-Band & Guard Band as per legacy requirements
    - NR carrier up to 35 MHz (B71)
- 2.5; 4.9; 9.8; 10.1 Gbit/s CPRI
- 380mm x 335mm x 267mm (< 34 liter, < 75 lb (34 kg))
- -48 VDC (Two DC feeds, 2x 20A Breakers)
- AISG TMA & RET support
- Convection cooling
- 2 external alarms supported
- IP 65, -40 to +55°C



RRUS 4415 B25

- B25
  - TX = 1930 – 1995 MHz
  - RX = 1850 – 1915 MHz
- CPRI 2 ports x 2.5/4.9/9.8/10.1 Gbps. Install 2 SFPs and connect 2 fiber pair to the RRUS 4415 during initial install.
- Only use Ericsson supplied and approved SFPs RDH10265/25
  Exception: SFP7 RDH 10265/3 for CPRI 1.4km to 10km
  Exception: SFP7 (pair): RDH 102 70/1 and RDH 102 70/2 for CPRI > 10km
- 2 external alarm inputs
- Max wind load @ 50m/sec = 260N
- Breaker size = 25A, DC Power Consumption = 670 W (for dimensioning)
- 200mm horizontal separation required for side by side mounting
- 200mm separation required from antenna backplane to radio
- 400mm vertical outdoor/indoor separation required between 2 radios
- 500mm vertical separation below antenna
- Min, Max DC cable size from squid to radio = 10,8 AWG
  - Adapter is required for 2-wire connection
  - Shielded DC cable is required
- Ground cable size = 2AWG
- Dimensions (incl. handles, feet and sunshield, w/o fan unit)
  - Height: 16.5" (420 mm)
  - Width: 13.4" (342 mm)
  - Depth: 5.9" (149 mm)
- Weight, excl. mounting hardware = 46 lbs (21 kg)

1 EQUIPMENT SPECIFICATIONS
SCALE: N.T.S.

NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-606	0

Enclosure 6160 AC

The Enclosure 6160 is a multi-purpose site cabinet designed to support a multitude of equipment such as ERS Baseband, Transport, Li-Ion battery and 3PP vendor equipment. It also provides a highly capable power system and battery back-up - all in a streamlined design and minimized footprint to support cost efficient expansion of mobile broadband.

Being an all-in-one enclosure, the Enclosure 6160 is a very fitting choice for all types of sites where the capacity need is large or room for future expansion is needed. It is ideally used for modernizing existing sites or in greenfield scenarios to match both current and future needs.

With a robust design, IP65 compliance and a sealed Heat Exchanger (HEX) climate system the Enclosure 6160 ensures optimal environmental protection of the active equipment - enabling them for a long-lasting service. The complete system is also integrated and verified for the entire Ericsson Radio System and ensures best-in-class service.

The power system offers 31,5kW of power in total and provides 24kW of -48V DC power for both internal and external consumers.

The equipment space allows 19U of rack space ensuring well enough capacity for existing need and future expansion.

One of the main advantages of the Enclosure 6160 is its default integration with ENM - allowing for advanced remote monitoring and control such a fault management (alarms), inventory management and performance measurements. The cabinet also provides an open O&M interface for integration to 3PP O&M systems.

Preliminary technical specification for Enclosure 6160 AC

CAPACITY	
Rack space user equipment	19U (19" rack)
Hardware capabilities	**Power and CPRI support for multi**-standard remote radios (RRU or AIR)
	ERS Baseband and Transport units
	Li-Ion batteries
	3PP equipment
	Additional power feed available as option
MECHANICAL SPECIFICATION	
Weight	145 kg (excluding active equipment) 320 lbs (excluding active equipment)
Dimension (H x W x D)	1600 x 650 x 650 mm (incl. Base frame) 63 x 26 x 26 in. (incl. Base frame)
Base frame height	150 mm 6 in.
Mounting position	Ground
Enclosure material	Aluminum
Color	Power paint NCS 2002-B
Door	Front access
Rack type	19" (IEC 60297-3-100)
Locking type	Pad lock or Cylinder
POWER SYSTEM	
Input voltage	3P+N+PE: 346/200-415/240 VAC 2P+N+PE: 208/120-220/127 VAC 1P+N+PE: 200-250 VAC
Input power	<33kW
Output load (-48VDC)	24kW
Total capacity (-48VDC)	31.5kW
AC SPD	Class 2/Type 2
DC SPD	Class 2/Type 2
PSU Slots	9x
Service outlet	Optional
Priority load	8x Circuit Breaker
LLVD 1	6x Circuit Breaker
LLVD 2	6x Circuit Breaker
CB ratings	3A / 5A / 10A / 15A / 20A / 25A / 30A / 40A / 50A / 60A / 80A / 100A
Battery Interface	2x Circuit Breaker
Battery Circuit Breaker rating	125A 2pol (200A)
PSU capacity	3500W

1 EQUIPMENT SPECIFICATIONS
SCALE: N.T.S.

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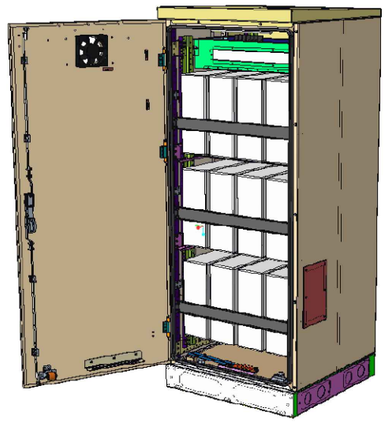
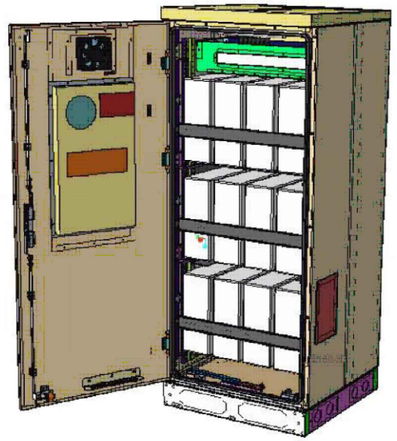
SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-607	0

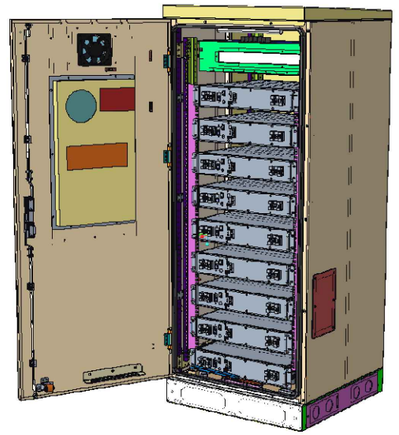
Enclosure B160



Enclosure B160
AirCon + VRLA



Enclosure B160
AirCon + Li-Ion



Enclosure B160
Convection Cooling
+ VRLA

Enclosure B160

Capacity
- VRLA 12V: 100Ah / 150Ah / 170Ah / 190Ah / 210Ah
- Li-Ion: 24U 19" / 23"
- Sodium-Nickel: 3x FIAMM

Electrical specification
- DC Output: -48VDC/200A
- Battery breakers: 2x 125/2p
- Alarms: Door open, Climate failure, MCB Connection

Mechanical specification
- Weight: 134kg
- Dimensions: 63 x 26 x 26 in. (incl. Base frame)
- Base frame height: 6 in.
- Material: Galvanized steel (180g/m^2)
- Color: Powder paint NCS 2002-B
- Door: Front access
- Locking type: Pad lock / cylinder

Environmental specification
- Ingress protection: VRLA/Sodium IP44
Li-Ion IP55
- Relative humidity: 15-100%

Climate system
- Air Conditioner
  - Fan type: DC
  - Cooling capacity: 500W @L35/L35
- Convection cooling
  - Emergency fan

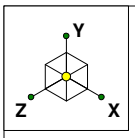
1 EQUIPMENT SPECIFICATIONS
SCALE: N.T.S.

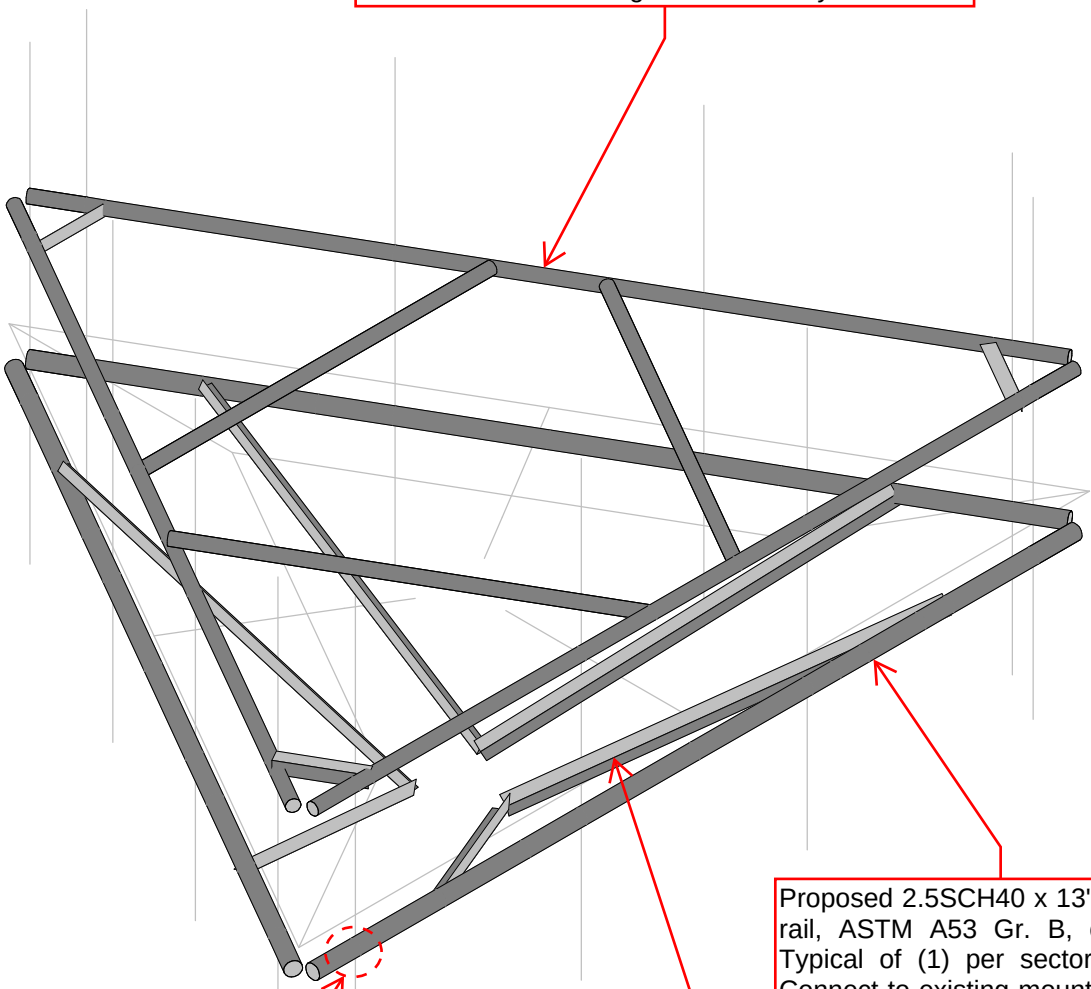
NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

SUPPLEMENTAL

SHEET NUMBER: R-608

REVISION: 0





Proposed SitePro HRK14-HD Kit, or approved equivalent. Typical of (1) total. Connect to existing mount pipes. Connection hardware included in kit. Contractor to cut to length as necessary.

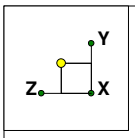
Proposed 2.5SCH40 x 13'-6" support rail, ASTM A53 Gr. B, or greater. Typical of (1) per sector, (3) total. Connect to existing mount pipes with proposed crossover plate kits.

Proposed SitePro PRK-SFS-L Platform reinforcement kit, or approved equivalent. Typical of (1) total. Connect to proposed bottom support rail. Connection hardware provided with kit.

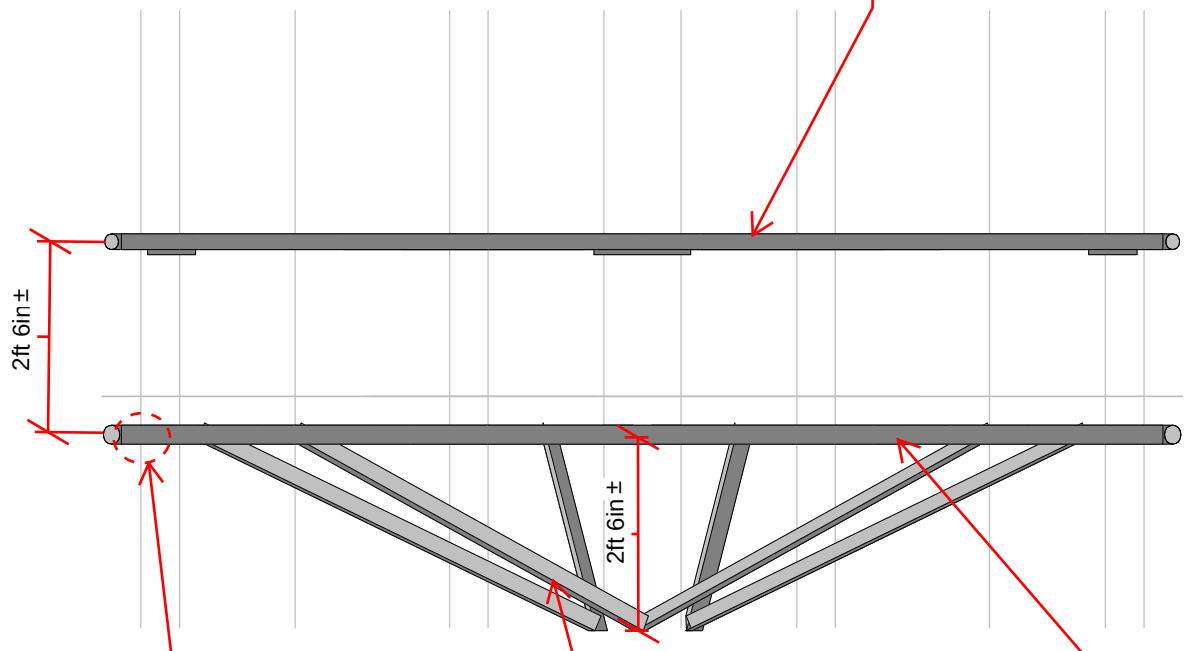
Proposed SitePro SCX2-K Crossover Plate Kit, or approved equivalent. Typical of (4) per sector, (12) total.

Envelope Only Solution

Tower Engineering Profes...	302481 - Hrfr - South	ISO View C - 1
RWM		Aug 6, 2020 at 2:33 PM
TEP No. 68513.435981		Mount Rev H.r3d



Proposed SitePro HRK14-HD Kit, or approved equivalent. Typical of (1) total. Connect to existing mount pipes. Connection hardware included in kit. Contractor to cut to length as necessary.



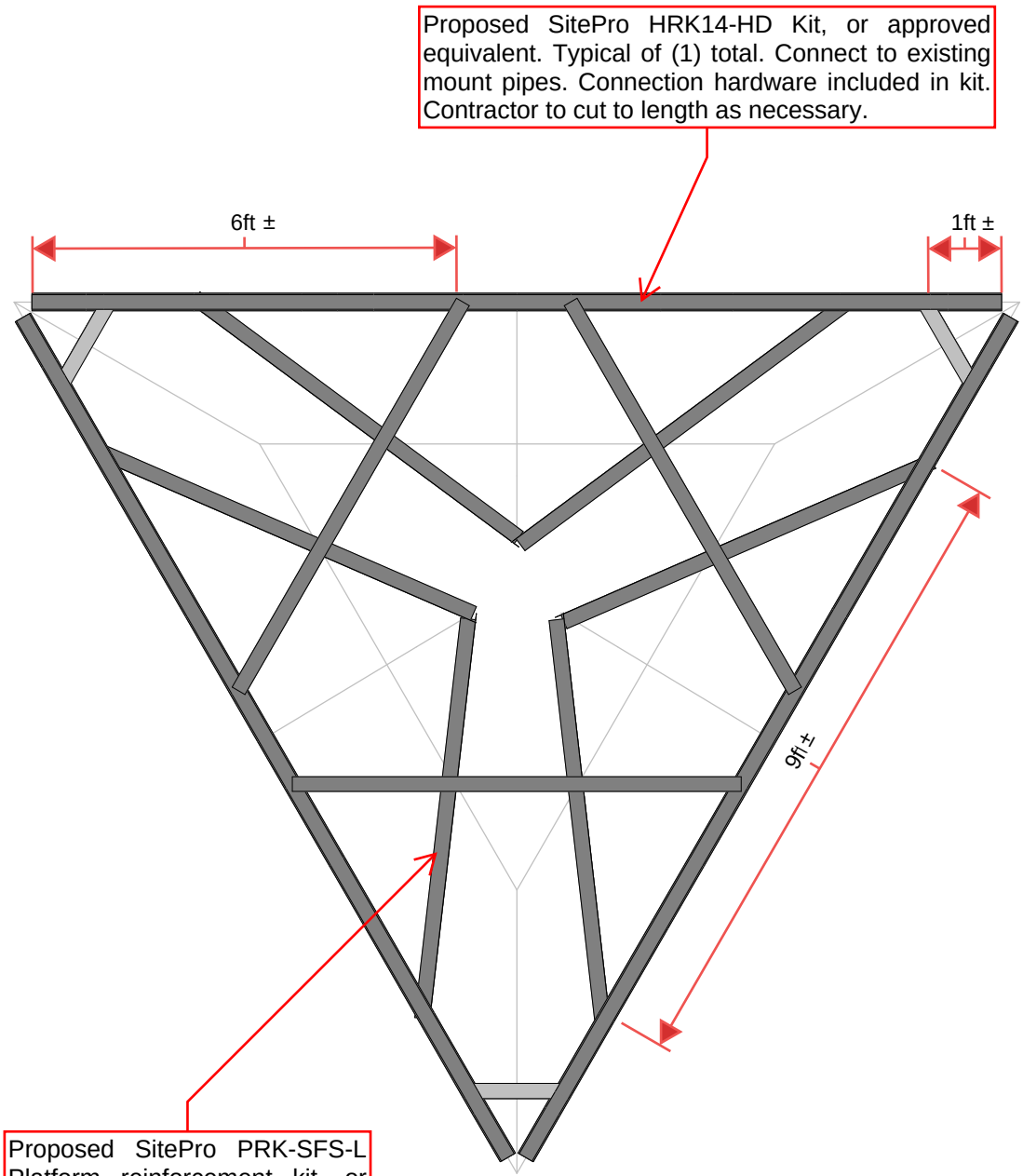
Proposed SitePro SCX2-K Crossover Plate Kit, or approved equivalent. Typical of (4) per sector, (12) total.

Proposed SitePro PRK-SFS-L Platform reinforcement kit, or approved equivalent. Typical of (1) total. Connect to proposed bottom support rail. Connection hardware provided with kit.

Proposed 2.5SCH40 x 13'-6" support rail, ASTM A53 Gr. B or greater. Typical of (1) per sector, (3) total. Connect to existing mount pipes with proposed crossover plate kits.

Envelope Only Solution

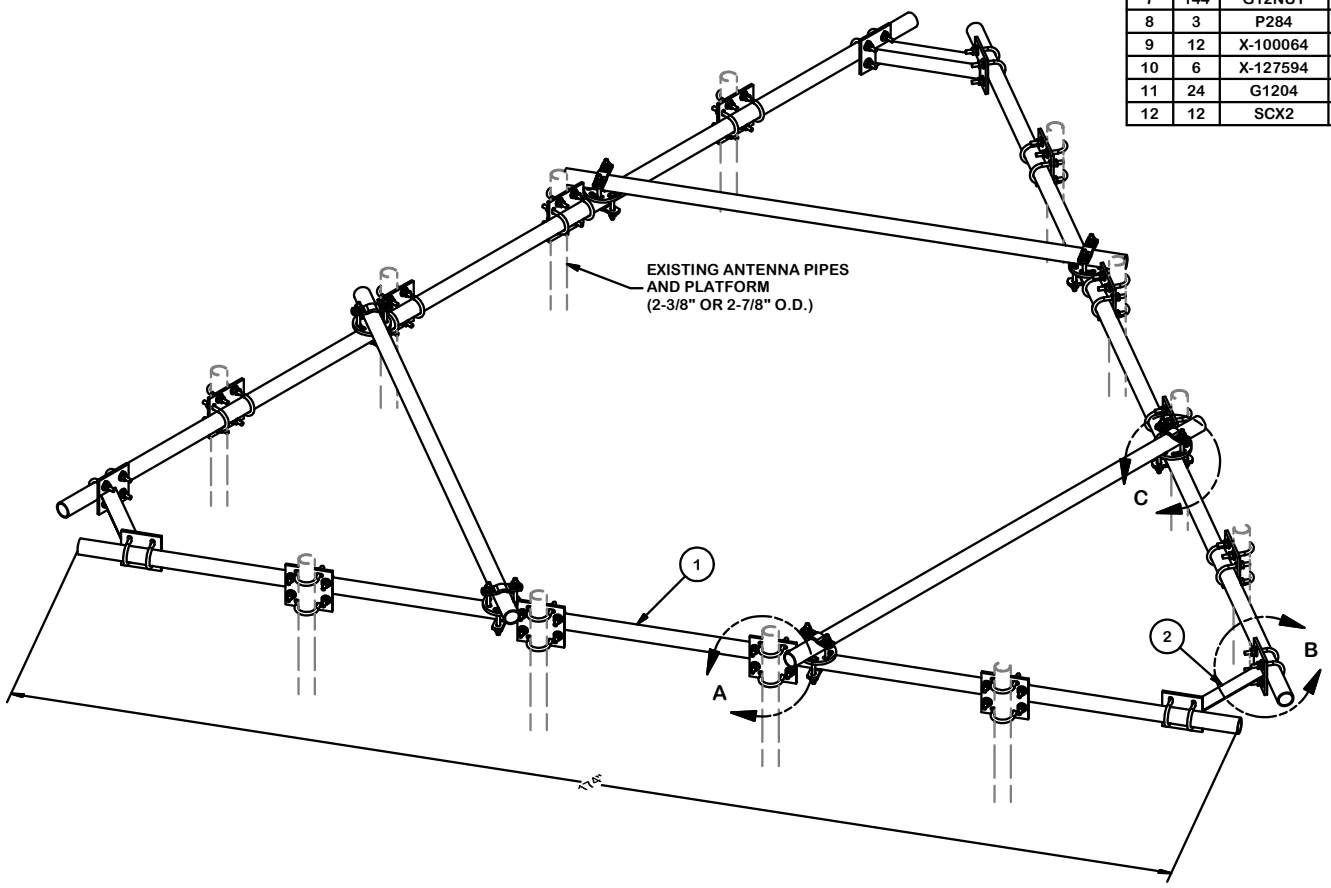
Tower Engineering Profes...	302481 - Hrfr - South	Elevation View C - 2
RWM		Aug 6, 2020 at 2:34 PM
TEP No. 68513.435981		Mount Rev H.r3d

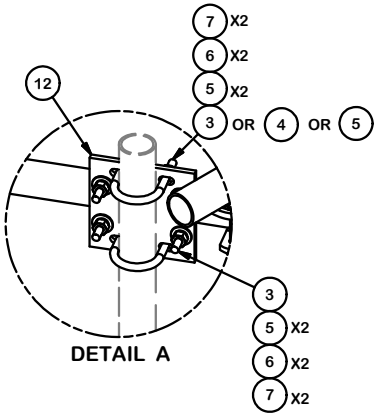


Envelope Only Solution

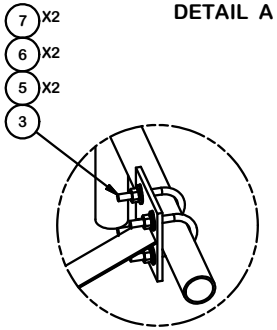
Tower Engineering Profes...	302481 - Hrfr - South	Plan View C - 3
RWM		Aug 6, 2020 at 2:34 PM
TEP No. 68513.435981		Mount Rev H.r3d

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2174	2-3/8" OD X 174" SCH 40 GALVANIZED PIPE	174 in	55.75	167.24
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.26	15.42
4	24	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.26	6.17
5	144	G12FW	1/2" HDG USS FLATWASHER		0.03	4.91
6	144	G12LW	1/2" HDG LOCKWASHER		0.01	2.00
7	144	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	10.31
8	3	P284	2-3/8" X 84" SCH 40 GALVANIZED PIPE	84 in	26.91	80.74
9	12	X-100064	CLAMP (S) (4" V-CLAMP) GALVANIZED		0.91	10.95
10	6	X-127594	FLAT DISK CLAMP PLATE 4" CENTERS (GALV.)		2.48	14.90
11	24	G1204	1/2" x 4" HDG HEX BOLT GR5 FULL THREAD	4 in	0.27	6.48
12	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
					TOTAL WT. #	448.08

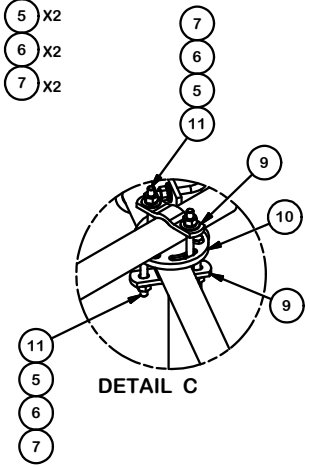




DETAIL A



DETAIL B



DETAIL C

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
HEAY DUTY HANDRAIL KIT
FOR 14' PLATFORMS WITH
2-3/8" OR 2-7/8" ANTENNA PIPES

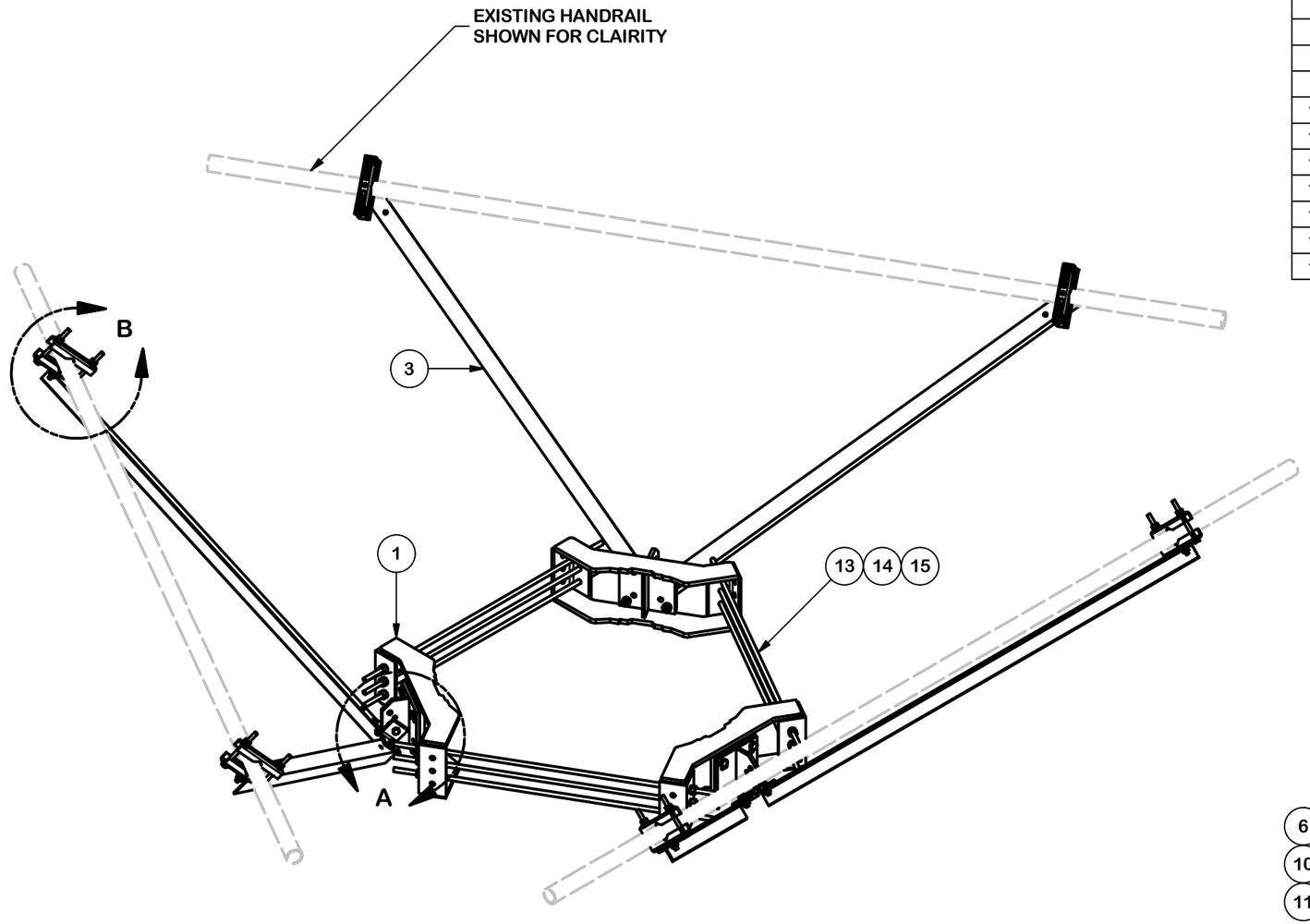
SITE PRO 1
A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	CEK 3/31/2015		HRK14-HD	1 OF 1

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 3/31/2015	HRK14-HD



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	3	X-TBW	T-BRACKET WELDMENT		13.60	40.80
3	6	X-254924	DIAGONAL ANGLE - SITE PRO 1	72 in	19.71	118.24
4	12	X-STU	STIFF ARM CHANNEL BRACKET	8 1/2 in	1.37	16.46
5	6	SHCM-T	CHAIN MOUNT TIGHTENER BRACKET	3 in	1.86	11.15
6	12	G12112	1/2" x 1-1/2" HDG HEX BOLT GR5	1/2 in	0.15	1.77
7	3	G12212	1/2" x 2-1/2" HDG HEX BOLT GR5	2 1/2 in	0.20	0.61
8	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
9	24	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	0.82
10	27	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.38
11	27	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.93
12	12	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	3.75
13	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)	24 in	0.40	3.59
13	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)	48 in	0.40	3.59
14	30	G58LW	5/8" HDG LOCKWASHER		0.03	0.78
15	30	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	3.90
					TOTAL WT. #	642.04

DETAIL A

DETAIL B

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	CHANGED MAX. DIA. FOR HANDRAIL CONNECTION	SP1	BC	10/25/2017

REVISION HISTORY

TOLERANCE NOTES

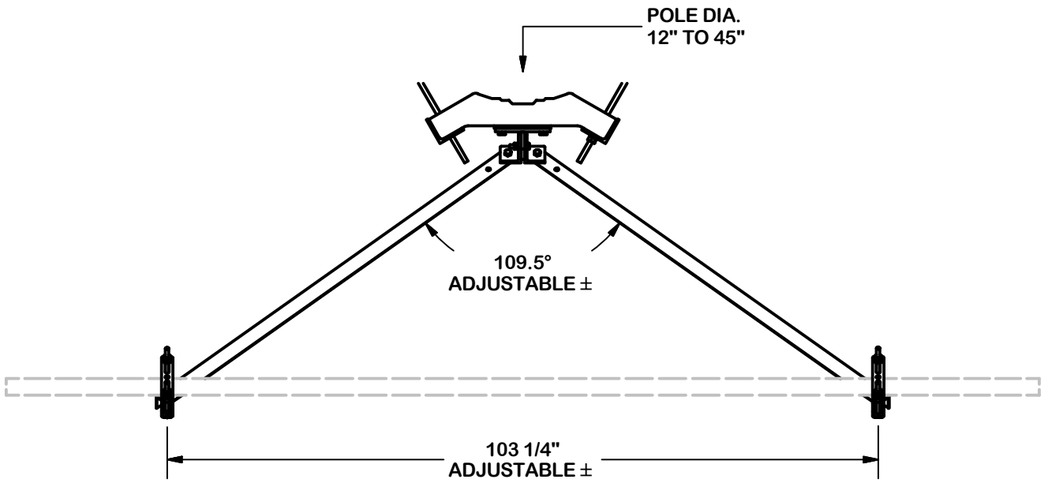
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES (± 0.030")
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

DESCRIPTION: HANDRAIL REINFORCEMENT KIT (LONG)

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
SP1	CSL3 2/23/2017	3RD PARTY	PRK-SFS-L

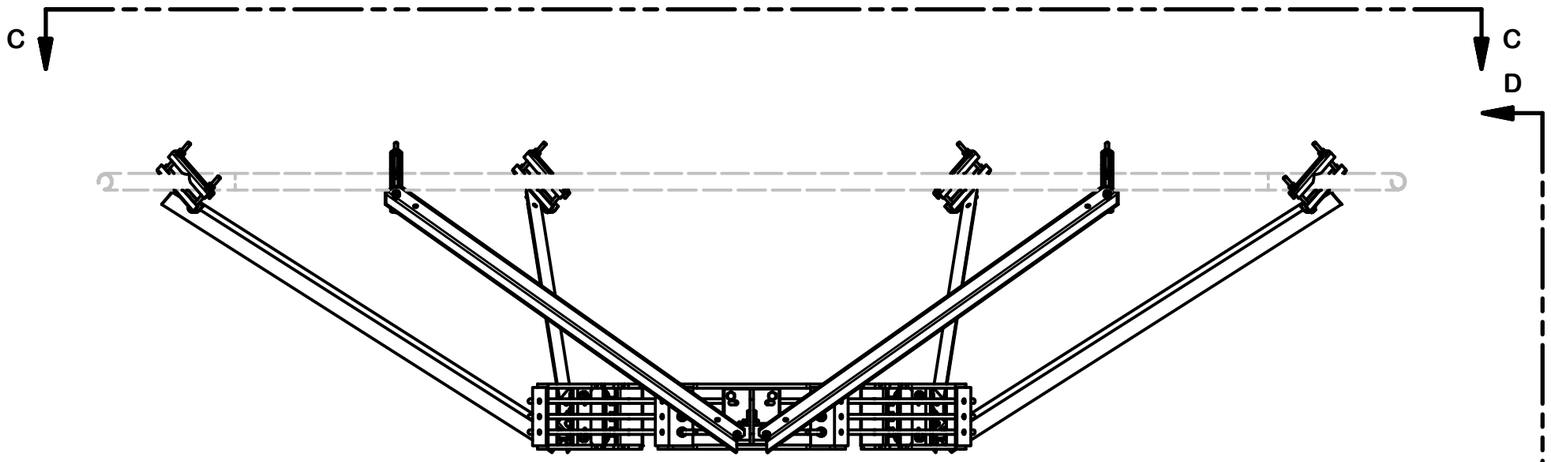
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	SHOP	BMC 9/8/2017	PRK-SFS-L

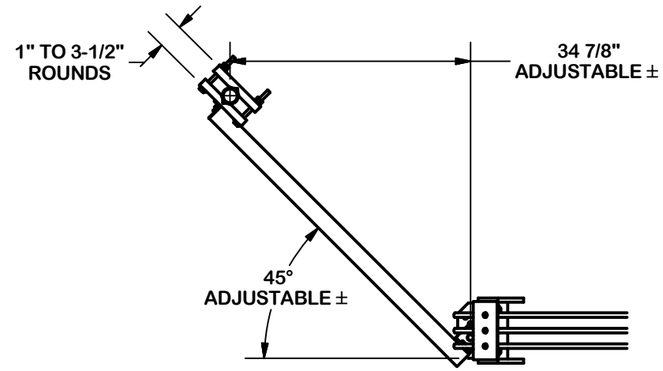
SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX



PARTIAL VIEW C-C

VERTICAL POSITION





PARTIAL VIEW D-D

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	CHANGED MAX. DIA. FOR HANDRAIL CONNECTION	SP1	BC	10/25/2017

REVISION HISTORY

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES (± 0.030")
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

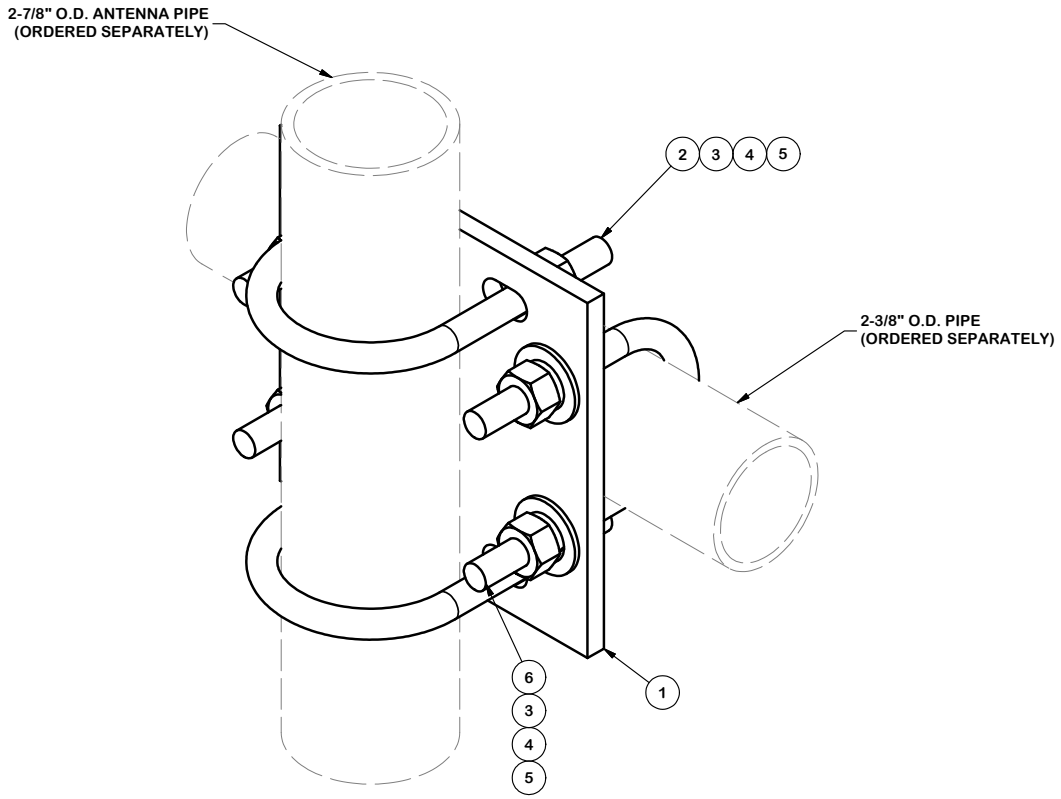
DESCRIPTION: HANDRAIL REINFORCEMENT KIT (LONG)

SITE PRO 1 — A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
SP1	CSL3 2/23/2017	3RD PARTY	PRK-SFS-L

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	SHOP	BMC 9/8/2017	PRK-SFS-L

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	SCX2	CROSSOVER PLATE	7 in	4.80	4.80
2	2	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.66	1.31
3	8	G12FW	1/2" HDG USS FLATWASHER		0.03	0.27
4	8	G12LW	1/2" HDG LOCKWASHER		0.01	0.11
5	8	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	0.57
6	2	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	1.25
					TOTAL WT. #	8.39



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: CROSSOVER PLATE KIT

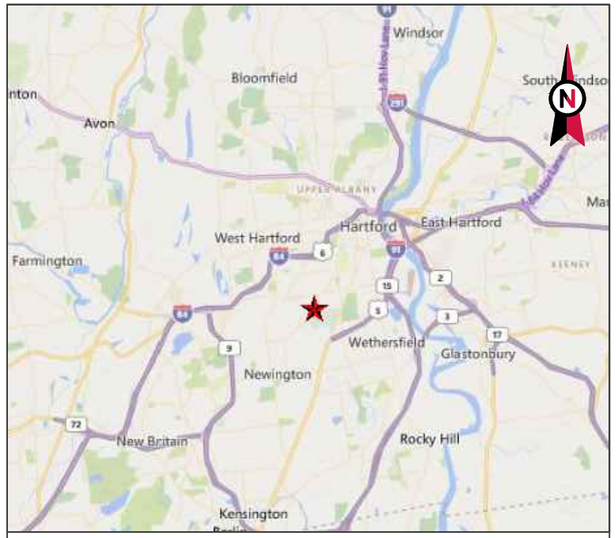
SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	CEK 6/30/2011		SCX2-K	1 OF 1

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
		SHOP	BMC 7/1/2011	SCX2-K



VICINITY MAP

AMERICAN TOWER®

SITE NAME: HRFR - SOUTH
SITE NUMBER: 302481
ATC PROJECT NUMBER: 13251341_C6_06
SITE ADDRESS: 289 MOUNTAIN STREET
HARTFORD, CT 06106

LOCATION MAP

110 FT MONOPOLE MODIFICATIONS

PROJECT TEAM

TOWER OWNER

AMERICAN TOWER
10 PRESIDENTAL WAY
WOBURN, MA 01801

ENGINEERED BY

ATC TOWER SERVICES
3500 REGENCY PARKWAY, SUITE 100
CARY, NC 27518

CARRIER INFORMATION

CARRIER: T-MOBILE
CARRIER SITE NAME: CT769/SSITE HARTFORD #2
CARRIER SITE NUMBER: CT11769B

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

PROJECT DESCRIPTION

THE MODIFICATIONS PRESENTED ON THESE DRAWINGS ARE BASED ON THE RECOMMENDATIONS OUTLINED IN THE STRUCTURAL ANALYSIS COMPLETED UNDER ENGINEERING PROJECT NUMBER 13251341_C3_02 DATED 08/14/20. SATISFACTORY COMPLETION OF THE WORK INDICATED ON THESE DRAWINGS WILL RESULT IN THE STRUCTURE MEETING THE REQUIREMENTS OF THE SPECIFICATIONS UNDER WHICH THE STRUCTURAL WAS COMPLETED.

COMPLIANCE CODE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNMENT AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. ANSI/TIA/EIA: STRUCTURAL STANDARDS (222-H EDITION)
2. INTERNATIONAL BUILDING CODE (2015 IBC)
3. CONNECTICUT STATE BUILDING CODE (2018)

PROJECT LOCATION

GEOGRAPHIC COORDINATES

LATITUDE: 41.72656944

LONGITUDE: -72.70816944

SHEET	SHEET TITLE	REV.
G-002	IBC GENERAL NOTES	0
G-003	SPECIAL INSPECTION CHECKLIST	0
G-004	BILL OF MATERIALS	0
C-101	DETAILED SITE PLAN	0
S-201	MODIFICATION PROFILE	0
S-501	STIFFENER INSTALLATION DETAILS	0
S-502	PLATE REINFORCEMENT INSTALLATION DETAILS [EL: 20'-0" TO 75'-0"]	0
S-503	PLATE REINFORCEMENT INSTALLATION DETAILS [EL: 20'-0" TO 75'-0"] (CONT'D)	0
S-504	PLATE REINFORCEMENT INSTALLATION DETAILS [EL: 85'-0" TO 95'-0"]	0
S-505	FLAT PLATE STEP BOLT BRACKET FABRICATION & INSTALLATION DETAILS	0
Z-501	STIFFENER AND PLATE REINFORCEMENT FABRICATION DETAILS	0

AMERICAN TOWER®
A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	MJS	09/04/20

ATC SITE NUMBER:
302481

ATC SITE NAME:
HRFR - SOUTH

CONNECTICUT

SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106

DRAWN BY:	MJS
APPROVED BY:	IPD
DATE DRAWN:	09/04/20
ATC JOB NO:	13251341_C6_06

COVER

SHEET NUMBER:	REVISION:
G-001	0

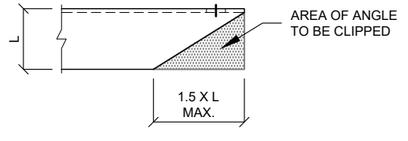
GENERAL

1. ALL WORK TO BE COMPLETED PER APPLICABLE LOCAL, STATE, FEDERAL CODES AND ORDINANCES AND COMPLY WITH ATC CONSTRUCTION SPECIFICATIONS FOR WIRELESS TOWER SITES. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND ABIDING BY ALL REQUIRED PERMITS.
2. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN TOWER AND FOUNDATION CONSTRUCTION.
3. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD IMMEDIATELY OF ANY INSTALLATION INTERFERENCES. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. DETAILS NOT SPECIFICALLY SHOWN ON THE DRAWINGS SHALL FOLLOW SIMILAR DETAILS FOR THIS JOB.
4. ANY SUBSTITUTIONS SHALL CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
5. ANY MANUFACTURED DESIGN ELEMENTS SHALL CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS AND SHOULD BE SIMILAR TO THOSE SHOWN. THESE DESIGN ELEMENTS MUST BE STAMPED BY AN ENGINEER PROFESSIONALLY REGISTERED IN THE STATE OF THE PROJECT, AND SUBMITTED TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO FABRICATION.
6. ALL WORK SHALL BE DONE IN ACCORDANCE WITH LOCAL CODES AND OSHA SAFETY REGULATIONS.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY, PER ANSI/TIA-322 AND ANSI/ASSE A10.48, TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS.
8. CONTRACTOR'S PROPOSED INSTALLATION SHALL NOT INTERFERE, NOR DENY ACCESS TO, ANY EXISTING OPERATIONAL AND SAFETY EQUIPMENT.

STRUCTURAL STEEL

1. ALL DETAILING, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AISC SPECIFICATIONS, LATEST EDITION.
2. ALL EXPOSED STRUCTURAL STEEL MEMBERS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123. EXPOSED STEEL HARDWARE AND ANCHOR BOLTS SHALL BE GALVANIZED PER ASTM A153 OR B695.
3. ALL U-BOLTS SHALL BE ASTM A36 OR EQUIVALENT, WITH LOCKING DEVICE, UNLESS NOTED OTHERWISE.
4. FIELD CUT EDGES, EXCEPT DRILLED HOLES, SHALL BE GROUND SMOOTH.
5. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES & GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.
6. ALL STRUCTURAL STEEL EMBEDDED IN THE CONCRETE SHALL BE APPLIED WITH (2) BRUSHED COATS OF POLYGUARD CA-9 MASTIC OR EQUIVALENT. REFER TO THE MANUFACTURER SPECIFICATIONS FOR SURFACE PREPARATION AND APPLICATION. APPLICATION OF POLYGUARD 400 WRAP IS NOT ESSENTIAL.
7. CONTRACTOR SHALL PERFORM WORK ON ONLY ONE (1) TOWER FACE AND REPLACE/REINFORCE ONE (1) BOLT/MEMBER AT A TIME.
8. ALL FIELD DRILLED HOLES TO BE USED FOR FIELD BOLTING INSTALLATION SHALL BE STANDARD HOLES, AS DEFINED BY AISC, UNLESS NOTED OTHERWISE.

MAXIMUM ALLOWABLE ANGLE CLIP



PAINT

1. AS REQUIRED, CLEAN AND PAINT PROPOSED STEEL ACCORDING TO FAA ADVISORY CIRCULAR AC 70/7460-1L.

WELDING

1. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
2. ALL WELDS SHALL BE INSPECTED VISUALLY. IF DIRECTED BY ENGINEER OF RECORD, 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE (100% IF REJECTABLE DEFECTS ARE FOUND) TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. REPAIR ALL WELDS AS NECESSARY.
3. INSPECTION SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
4. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER AND/OR BASE METAL, PER AWS D1.1, UNLESS NOTED OTHERWISE.
5. IN CASES WHERE BASE METAL GRADE IS UNKNOWN, ALL WELDING ON LATTICE TOWERS SHALL BE DONE WITH E70XX ELECTRODES; ALL WELDING ON POLE STRUCTURES SHALL BE DONE WITH E80XX ELECTRODES, UNLESS NOTED OTHERWISE.
6. PRIOR TO FIELD WELDING GALVANIZED MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING 1/2" BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL GROUND AND WELDED SURFACES WITH ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.

BOLT TIGHTENING PROCEDURE

1. STRUCTURAL CONNECTIONS TO BE ASSEMBLED AND INSPECTED IN ACCORDANCE WITH RCSC SPECIFICATIONS.
2. FLANGE BOLTS SHALL BE INSTALLED AND TIGHTENED USING DIRECT TENSION INDICATING (DTI) SQUIRTER WASHERS. DTI SQUIRTER WASHERS ARE TO BE INSTALLED AND ORIENTED / TIGHTENED PER MANUFACTURER SPECIFICATIONS TO ACHIEVE DESIRED LEVEL OF BOLT PRE-TENSION.
3. IN LIEU OF USING DTI SQUIRTER WASHERS, FLANGE BOLTS MAY BE TIGHTENED USING AISC / RCSC "TURN-OF-THE-NUT" METHOD, PENDING APPROVAL BY THE ENGINEER OF RECORD (EOR). TIGHTEN FLANGE BOLTS USING THE CHART BELOW:

BOLT LENGTHS UP TO AND INCLUDING FOUR DIAMETERS

1/2"	BOLTS UP TO AND INCLUDING 2.0 INCH LENGTH	+1/3 TURN BEYOND SNUG TIGHT
5/8"	BOLTS UP TO AND INCLUDING 2.5 INCH LENGTH	+1/3 TURN BEYOND SNUG TIGHT
3/4"	BOLTS UP TO AND INCLUDING 3.0 INCH LENGTH	+1/3 TURN BEYOND SNUG TIGHT
7/8"	BOLTS UP TO AND INCLUDING 3.5 INCH LENGTH	+1/3 TURN BEYOND SNUG TIGHT
1"	BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH	+1/3 TURN BEYOND SNUG TIGHT
1-1/8"	BOLTS UP TO AND INCLUDING 4.5 INCH LENGTH	+1/3 TURN BEYOND SNUG TIGHT
1-1/4"	BOLTS UP TO AND INCLUDING 5.0 INCH LENGTH	+1/3 TURN BEYOND SNUG TIGHT
1-3/8"	BOLTS UP TO AND INCLUDING 5.5 INCH LENGTH	+1/3 TURN BEYOND SNUG TIGHT
1-1/2"	BOLTS UP TO AND INCLUDING 6.0 INCH LENGTH	+1/3 TURN BEYOND SNUG TIGHT

BOLT LENGTHS OVER FOUR DIAMETERS BUT NOT EXCEEDING EIGHT DIAMETERS

1/2"	BOLTS 2.25 TO 4.0 INCH LENGTH	+1/2 TURN BEYOND SNUG TIGHT
5/8"	BOLTS 2.75 TO 5.0 INCH LENGTH	+1/2 TURN BEYOND SNUG TIGHT
3/4"	BOLTS 3.25 TO 6.0 INCH LENGTH	+1/2 TURN BEYOND SNUG TIGHT
7/8"	BOLTS 3.75 TO 7.0 INCH LENGTH	+1/2 TURN BEYOND SNUG TIGHT
1"	BOLTS 4.25 TO 8.0 INCH LENGTH	+1/2 TURN BEYOND SNUG TIGHT
1-1/8"	BOLTS 4.75 TO 9.0 INCH LENGTH	+1/2 TURN BEYOND SNUG TIGHT
1-1/4"	BOLTS 5.25 TO 10.0 INCH LENGTH	+1/2 TURN BEYOND SNUG TIGHT
1-3/8"	BOLTS 5.75 TO 11.0 INCH LENGTH	+1/2 TURN BEYOND SNUG TIGHT
1-1/2"	BOLTS 6.25 TO 12.0 INCH LENGTH	+1/2 TURN BEYOND SNUG TIGHT

4. SPLICE BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8.2.1 OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS", LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS:

   FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8.2.1 THROUGH 8.2.4.

   8.2.1 TURN-OF-NUT PRETENSIONING
   BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1, UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED ABOVE. DURING THE TIGHTENING OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.

5. ALL OTHER BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1 OF THE SPECIFICATION.

   ALL BOLT HOLES SHALL BE ALIGNED TO PERMIT INSERTION OF THE BOLTS WITHOUT UNDUE DAMAGE TO THE THREADS. BOLTS SHALL BE PLACED IN ALL HOLES WITH WASHERS POSITIONED AS REQUIRED AND NUTS THREADED TO COMPLETE THE ASSEMBLY. COMPACTING THE JOINT TO THE SNUG-TIGHT CONDITION SHALL PROGRESS SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT. THE SNUG-TIGHTENED CONDITION IS THE TIGHTNESS THAT IS ATTAINED WITH A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH TO BRING THE CONNECTED PLIES INTO FIRM CONTACT.

APPLICABLE CODES AND STANDARDS

1. ANSI/TIA: STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES, 222-H EDITION.
2. 2018 CONNECTICUT STATE BUILDING CODE.
3. 2015 INTERNATIONAL BUILDING CODE.
4. ACI 318: AMERICAN CONCRETE INSTITUTE, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE. REFERENCE LATEST APPROPRIATE EDITION TO MATCH LOCAL AND/OR INTERNATIONAL BUILDING CODE(S) LISTED ABOVE.
5. CRSI: CONCRETE REINFORCING STEEL INSTITUTE, MANUAL OF STANDARD PRACTICE, LATEST EDITION.
6. AISC: AMERICAN INSTITUTE OF STEEL CONSTRUCTION, MANUAL OF STEEL CONSTRUCTION, LATEST EDITION.
7. AWS: AMERICAN WELDING SOCIETY D1.1, STRUCTURAL WELDING CODE, LATEST EDITION.

SPECIAL INSPECTION

1. A QUALIFIED INDEPENDENT TESTING LABORATORY, EMPLOYED BY THE OWNER, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH IBC 2015, SECTION 1704 AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK:
   a) STRUCTURAL WELDING (CONTINUOUS INSPECTION OF FIELD WELD ONLY)
   b) HIGH STRENGTH BOLTS (PERIODIC INSPECTION OF A325 EXTENSION FLANGE BOLTS TO BE TIGHTENED PER "TURN-OF-THE-NUT" METHOD)
2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER IN ACCORDANCE WITH IBC 2015, SECTION 1704, UNLESS THE FABRICATOR IS APPROVED BY THE BUILDING OFFICIAL TO PERFORM SUCH WORK WITHOUT THE SPECIAL INSPECTIONS.

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3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	MJS	09/04/20

ATC SITE NUMBER:
302481

ATC SITE NAME:
HRFR - SOUTH

CONNECTICUT

SITE ADDRESS:
289 MOUNTAIN STREET
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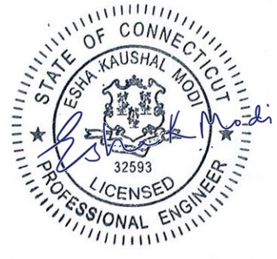

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APPROVED BY:	IPD
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ATC JOB NO:	13251341_C6_06

IBC GENERAL NOTES

SHEET NUMBER:	REVISION:
G-002	0

MODIFICATION INSPECTION NOTES

THE SPECIAL INSPECTION (SI) PROCEDURE IS INTENDED TO CONFIRM THAT CONSTRUCTION AND INSTALLATION MEETS ENGINEERING DESIGN, ATC PROCEDURES AND ATC STANDARD SPECIFICATIONS FOR WIRELESS TOWER SITES.

TO ENSURE THAT THE REQUIREMENTS OF THE SI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR AND THE INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED FROM AMERICAN TOWER CORPORATION (ATC). IT IS EXPECTED THAT EACH PARTY WILL PROACTIVELY REACH OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR AMERICAN TOWER POINT OF CONTACT.

SPECIAL INSPECTOR

THE SPECIAL INSPECTOR IS REQUIRED TO CONTACT THE GENERAL CONTRACTOR AS SOON AS RECEIVING A PO FROM ATC. UPON RECEIVING A PO FROM ATC THE SPECIAL INSPECTOR AT A MINIMUM MUST:

- REVIEW THE REQUIREMENTS OF THE SI CHECKLIST.
- WORK WITH THE GENERAL CONTRACTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
- ANY CONCERNS WITH THE SCOPE OF WORK OR PROJECT COMMITMENT MUST BE RELAYED TO THE ATC POINT OF CONTACT IMMEDIATELY.

THE SPECIAL INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR INSPECTION AND TEST REPORTS, REVIEWING THESE DOCUMENTS FOR ADHERENCE TO CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE SI REPORT TO AMERICAN TOWER CORPORATION.

GENERAL CONTRACTOR

THE GENERAL CONTRACTOR IS REQUIRED TO CONTACT THE SI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE SI CHECKLIST.
- WORK WITH THE SI TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.

THE GENERAL CONTRACTOR SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE SI CHECKLIST.

SPECIAL INSPECTION CHECKLIST

INSPECTION DOCUMENT	DESCRIPTION	INSPECTION TESTING REQUIRED	RESPONSIBILITY	SI REVIEW REQUIRED			INSPECTION FREQUENCY	
				PRE CX	DURING CX	POST CX	PERIODIC	CONTINUOUS
SPECIAL INSPECTION FIELD WORK & REPORT	DOCUMENTATION AND SITE VISIT CONDUCTED BY AN ATC APPROVED SPECIAL INSPECTOR AS REQUIRED BY ATC AND OTHER AUTHORITIES HAVING JURISDICTION. INSPECTION PARAMETERS TO FOLLOW ATC'S STANDARD SPECIFICATION FOR WIRELESS TOWER SITES.	✔	SI			✔		
ENGINEERING ASSEMBLY DRAWINGS	GC SHALL SUBMIT DRAWINGS TO SI FOR INCLUSION IN SI REPORT	✔	GC	✔				
FABRICATED MATERIAL VERIFICATION & INSPECTION	MTR AND OR MILL CERTIFICATIONS FOR SUPPLIED MATERIALS GC SHALL SUPPLY SI WITH REPORTS TO BE INCLUDED IN SI REPORT WHEN REQUIRED BY ATC	✔	SI	✔				
CERTIFIED WELD INSPECTION	INSPECTION AND REPORT OF STRUCTURAL WELDING PERFORMED DURING PROJECT COMPLETED BY A CWI AND INCLUDED WITHIN SI REPORT	✔	GC / TA			✔	✔	
FOUNDATION INSPECTION & VERIFICATION	VISUAL OBSERVATION AND APPROVAL OF FOUNDATION EXCAVATION, REBAR PLACEMENT, CASING/SHORING/FORMING PLACEMENT, AND ANCHOR TEMPLATE AND ANCHOR PLACEMENT - TO BE SI APPROVED PRIOR TO CONCRETE POUR AND DOCUMENTED IN THE SI REPORT		SI					
ANCHOR, ROCK ANCHOR OR HELICAL PULL-OUT TEST	PULL TESTING OF INSTALLED ANCHORS TO BE COMPLETED AND DOCUMENTED IN SI REPORT		GC / TA					
CONCRETE INSPECTION & VERIFICATION	CONCRETE MIX DESIGN, SLUMP TEST, COMPRESSIVE TESTING, AND SAMPLE GATHERING TECHNIQUES ARE TO BE PROVIDED FOR INCLUSION IN THE SI REPORT. SI SHALL VERIFY CONCRETE PLACEMENT AS REQUIRED BY THE DESIGN DOCUMENTS (INSPECTION FREQUENCY IS MARKED CONTINUOUS)		GC / TA					
DYWIDAG PLACEMENT/ANCHOR BOLT EMBEDMENT - EPOXY/GROUT INSTALL	ANCHOR/BAR EMBEDMENT, HOLE SIZE, EPOXY/GROUT TYPE, INSTALLATION TEMPERATURE AND INSTALLATION SHALL BE VERIFIED BY THE SI AND INCLUDED IN THE SI REPORT		GC / SI					
BASE PLATE GROUT INSPECTION & VERIFICATION	BASE PLATE GROUTING TYPE AND PLACEMENT SHALL BE CONFIRMED BY THE SI AND INCLUDED IN THE SI REPORT		GC / SI					
EARTHWORK INSPECTION & VERIFICATION	EXCAVATION, FILL, SLOPE, GRADE AND OTHER EARTHWORK REQUIREMENTS PER PLANS SHALL BE VERIFIED BY THE SI AND INCLUDED IN THE SI REPORT		GC / TA					
COMPACTION VERIFICATION	CONTRACTOR SHALL PROVIDE AN INDEPENDENT THIRD PARTY CERTIFIED INSPECTION WHICH PROVIDES TEST RESULTS FOR COMPACTION TEST OF SOILS IN PLACE TO ASTM STANDARDS.		GC / TA					
GROUND TESTING & VERIFICATION	GC SHALL PROVIDE DOCUMENTATION SHOWING THAT THE GROUNDING SYSTEM SHALL HAVE A MEASURED RESISTANCE TO THE GROUND OF NOT MORE THAN THE RECOMMENDED 10 OHMS. PER THE ATC CONSTRUCTION SPECIFICATION UNDER SECTION 2.15 THIS DOCUMENTATION MUST BE AN INDEPENDENT CERTIFICATION.		GC					
STEEL CONSTRUCTION INSPECTION & VERIFICATION	VISUAL OBSERVATION AND APPROVAL OF STEEL CONSTRUCTION TO BE PERFORMED BY THE SI. INSPECTION TO INCLUDE VERIFICATION OF NEW CONSTRUCTION OR MODIFICATION OF EXISTING CONSTRUCTION PER ENGINEERED PLANS. DETAILED VERIFICATION SHALL BE INCLUDED IN SI REPORT.	✔	SI			✔	✔	
ON-SITE COLD GALVANIZING VERIFICATION	SI SHALL VERIFY WITH GC ALL COLD GALVANIZATION TYPE AND APPLICATION AND INCLUDE SUMMARY IN SI REPORT	✔	GC			✔	✔	
GUY WIRE TENSIONING & TOWER ALIGNMENT REPORT	GC SHALL PROVIDE SI EVIDENCE OF PROPER GUY TENSIONING AND TOWER PLUMB PER PLANS. SI SHALL VERIFY AND INCLUDE PLUMB AND TENSION REPORTING IN SI REPORT.		GC					
GC AS-BUILT DRAWINGS WITH CONSTRUCTION RED-LINES	GC SHALL SUBMIT "AS-BUILT" DRAWINGS INDICATING ANY APPROVED CHANGES TO ENGINEERED PLANS TO SI FOR APPROVAL/REVIEW AND INCLUSION IN SI REPORT	✔	GC			✔		
SI AS-BUILT DRAWINGS WITH INSPECTION RED-LINES (AS REQUIRED)	SI SHALL SUBMIT "AS-BUILT" DRAWINGS INDICATING ANY APPROVED CHANGES TO ENGINEERED PLANS WITHIN SI REPORT	✔	SI			✔		
TIA INSPECTION	SI SHALL COMPLETE TIA INSPECTION AND PROVIDE SEPARATE TIA INSPECTION DOCUMENTATION TO ATC CM		SI					
PHOTOGRAPHS	PHOTOGRAPHIC EVIDENCE OF SPECIAL INSPECTION, ON SITE REMEDIATION, AND ITEMS FAILING INSPECTION & REQUIRING FOLLOW UP TO BE INCLUDED WITHIN THE SI REPORT. COMPLETE PHOTO LOG IS TO BE SUBMITTED WITHIN SI REPORT.	✔	GC / SI			✔		

NOTE: SPECIAL INSPECTIONS ARE INTENDED TO BE A COLLABORATIVE EFFORT BETWEEN GC AND SI. WHENEVER POSSIBLE GC IS TO PROVIDE SI WITH PHOTOGRAPHIC OR OTHER ACCEPTABLE EVIDENCE OF PROPER INSTALLATION IF PERIODIC INSPECTION FREQUENCY IS ACCEPTABLE. THE GC AND SI SHALL WORK TO COMPILE EVIDENCE OF PROPER CONSTRUCTION AND LIMIT THE NUMBER OF SI SITE VISITS REQUIRED.

TABLE KEY:
SI - ATC APPROVED SPECIAL INSPECTOR
GC - GENERAL CONTRACTOR
TA - 3RD PARTY TESTING AGENCY
CX - CONSTRUCTION
CM - CONSTRUCTION MANAGER
ATC - AMERICAN TOWER CORPORATION

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302481

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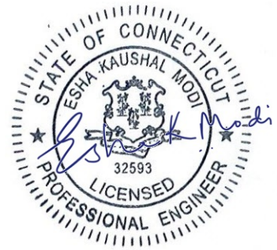
HRFR - SOUTH CONNECTICUT

SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106



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ATC JOB NO:	13251341_C6_06

SPECIAL INSPECTION CHECKLIST

SHEET NUMBER:	REVISION:
G-003	0

BILL OF MATERIALS

QUANTITY REQUIRED	QUANTITY PROVIDED	PART NUMBER	DESCRIPTION	LENGTH	SHEET LIST	PART WEIGHT	WEIGHT (lb)	NOTES
			STIFFENER MATERIAL & HARDWARE					
8	8	302481-1	PL 3/4" X 7"	1'-3"	S-501, Z-501	57.0	456	
			PLATE REINFORCEMENT MATERIAL & HARDWARE					
16	16	302481-2	PL 1 1/4" X 6"	4'-6 1/4"	S-502, S-503, Z-501	121.1	1938	
8	8	302481-3	PL 1 1/4" X 6"	20'-0"	S-502, S-503, Z-501	535.9	4287	
4	4	302481-4	PL 1 1/4" X 6"	16'-0"	S-502, S-503, Z-501	428.8	1715	
4	4	302481-5	PL 1 1/4" X 5"	4'-6 1/4"	S-504, Z-501	101.0	404	
4	4	302481-6	PL 1 1/4" X 5"	10'-0"	S-504, Z-501	223.3	893	
116	122	NG-1438-1875-A490	NEXGEN2 BLIND BOLT ASSEMB., M20 W/ SPRING SLEEVE, A490	----	----	----	----	ALLFASTENERS - 2NG2048
336	353	NG-2688-3750-A490	NEXGEN2 BLIND BOLT ASSEMB., M20 W/ SPRING SLEEVE, A490	----	----	----	----	ALLFASTENERS - 2NG2096
52	57	FPSB	FLAT PLATE STEP BOLT WELDMENT	0'-7 1/4"	S-505	2.0	114	
							TOTAL WEIGHT (lb)	**9,807**

PAGE 1 OF 1

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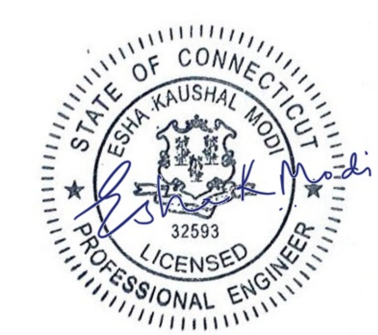

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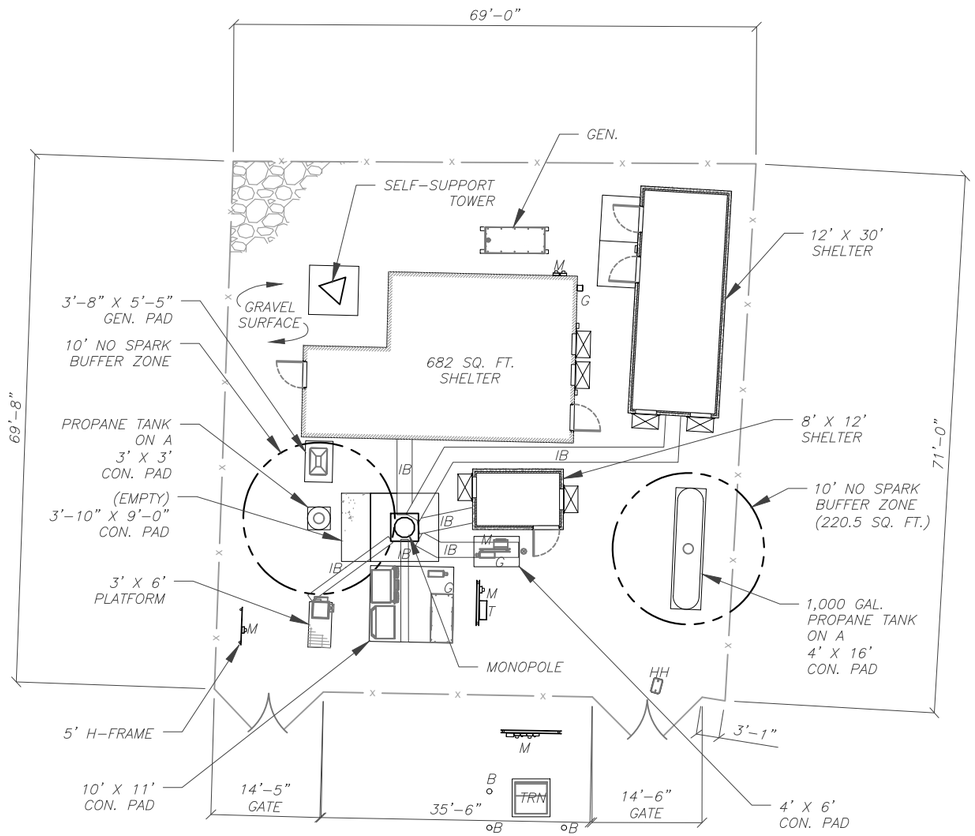
ATC JOB NO:	13251341_C6_06

BILL OF MATERIALS

SHEET NUMBER: G-004
REVISION: 0

LEGEND

⊗	GROUNDING TEST WELL
AV, A/V	AIR VENT
ATS	AUTOMATIC TRANSFER SWITCH
B	BOLLARD
C	CABINET
CS	COAX SHROUD
CSC	CELL SITE CABINET
D	DISCONNECT
E	ELECTRICAL
F	FIBER
GEN	GENERATOR
G	GENERATOR RECEPTACLE
HH, V	HAND HOLE, VAULT
HFC	HYDROGEN FUEL CELL
HSM	HYDROGEN STORAGE MATERIAL
IB	ICE BRIDGE
K	KENTROX BOX
LC	LIGHTING CONTROL
LPG	LIQUID PROPANE GAS
M	METER
OHW	OVERHEAD WIRE
P	POWER
PB	PULL BOX
PP	POWER POLE
T	TELCO
TRN	TRANSFORMER
	PROPERTY LINE
	ADJACENT PROPERTY LINE
	LEASE AREA
	EASEMENT
	WOOD FENCE
	WIRE FENCE
	METAL FENCE
	GUARD RAIL
	CHAINLINK FENCE
	ROAD (DIRT)
	ROAD (STONE)
	ROAD (PAVED)



0 20' 40'

SCALE: 1"=20' (11X17)
1"=10' (22X34)

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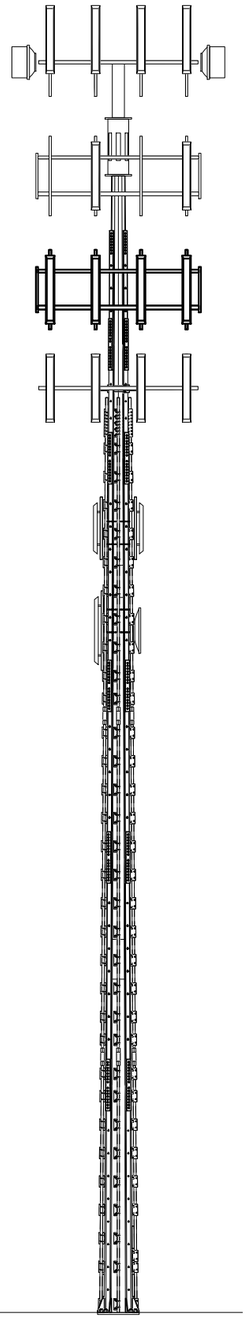
DETAILED SITE PLAN

SHEET NUMBER:	REVISION:
C-101	0



INSTALL (4) PLATE REINFORCEMENT [PL 1 1/4" X 5"] FROM EL: 85.0'± TO 95.0'±. SEE SHEET S-504 & S-505 FOR INSTALLATION DETAILS.

MOUNTS MAY REQUIRE SUPPORT AND RE-MOUNTING DURING INSTALLATION. SEE PHOTO AND NOTE BELOW.

DISH LOCATED WITHIN MODIFICATION AREA. SEE PHOTO AND NOTE BELOW.

INSTALL (4) PLATE REINFORCEMENT [PL 1 1/4" X 6"] FROM EL: 20.0'± TO 75.0'±. SEE SHEET S-502, S-503 & S-505 FOR INSTALLATION DETAILS.

INSTALL STIFFENERS [PL 3/4" X 7" X 15"] AT EL: 0.0'. SEE SHEET S-501 FOR INSTALLATION DETAILS.

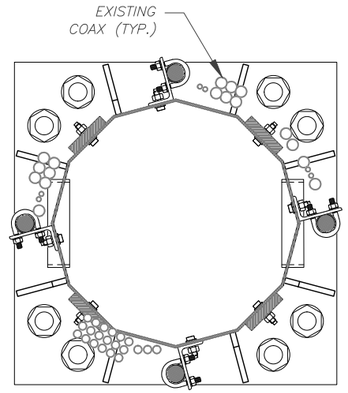
TOWER ELEVATION VIEW

ADDITIONAL TOWER INFORMATION:

1. PRE-MOD MAPPING WAS COMPLETED FOR THIS PROJECT.

MODIFICATION INTERFERENCE
EL: 60'-0"±

MODIFICATION INTERFERENCE
EL: 69'-0"±



COAX DISTRIBUTION
EXTERIOR ONLY

NOTES:

1. **PROPOSED T-MOBILE COAX TO BE INSTALLED INSIDE MONOPOLE.**
2. **BASE FLANGE WELD AND STIFFENER PLATE WELDS (WHEN PRESENT) ARE TO BE INSPECTED VISUALLY AND BY NDT METHODS BY A CERTIFIED WELD INSPECTOR WITH NDT LEVEL II CERTIFICATION. RESULTS ARE TO BE SENT TO PMI@AMERICANTOWER.COM .**
3. **CONTACT AMERICAN TOWER FIELD OPERATIONS WHEN EXISTING EQUIPMENT INTERFERES WITH INSTALLATION OF MODIFICATIONS. ONCE APPROVED, EXISTING EQUIPMENT MAY BE TEMPORARILY MOVED DURING INSTALLATION & REINSTALLED TO THE ORIGINAL HEIGHT & LOCATION BY CONTRACTOR POST COMPLETION OF MODIFICATIONS.**

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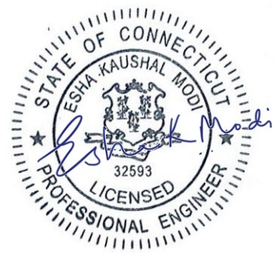

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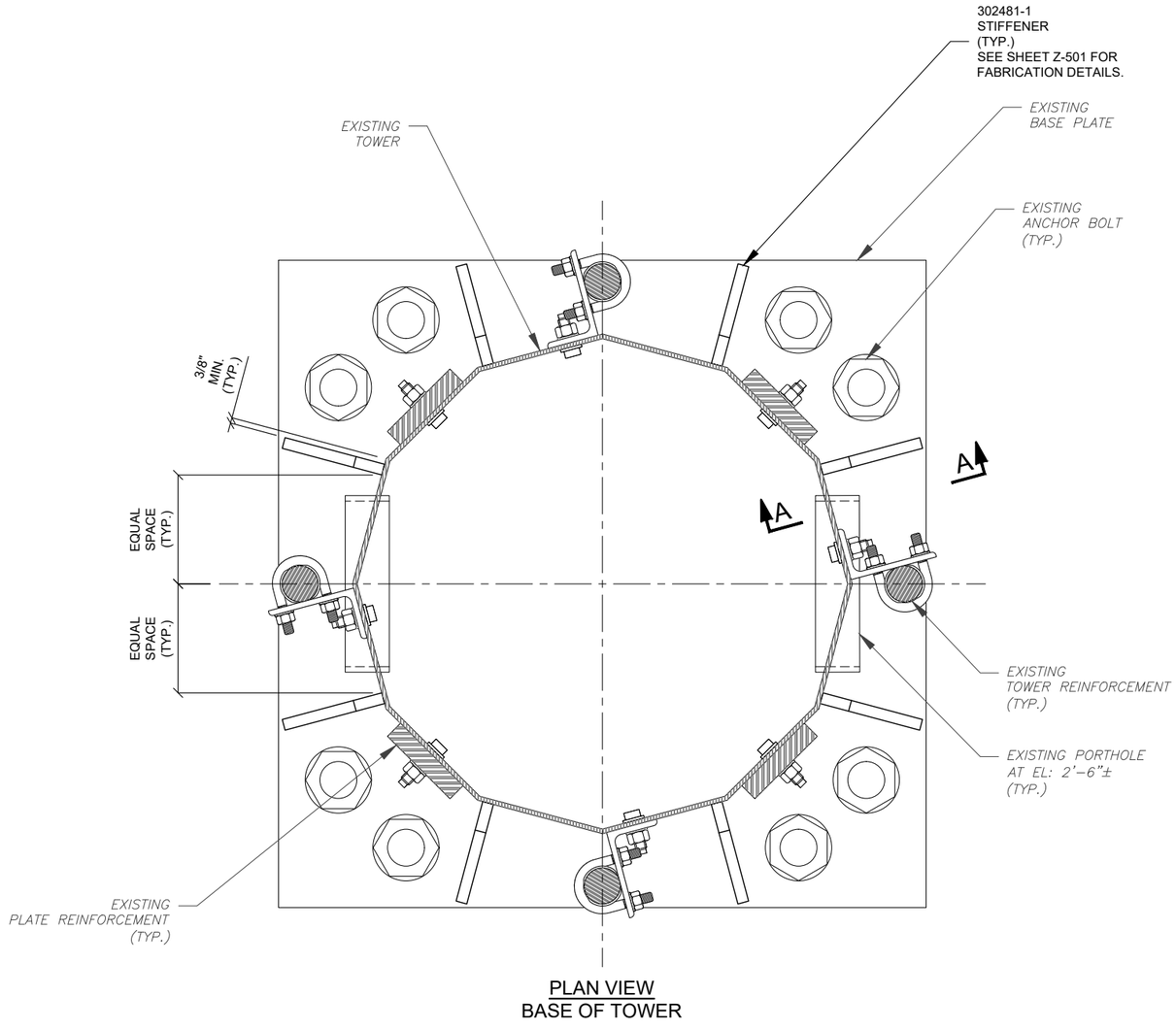
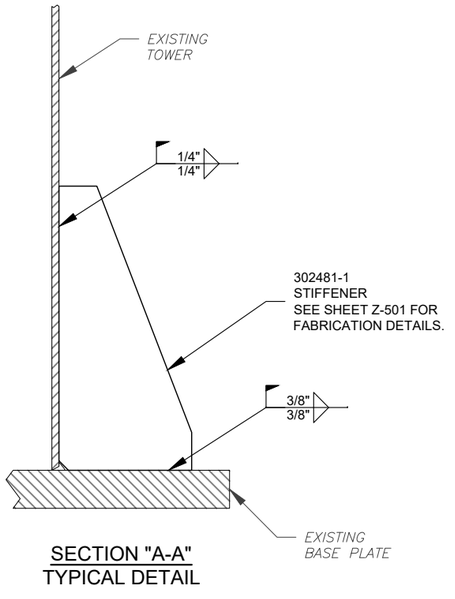
MODIFICATION PROFILE

SHEET NUMBER:	REVISION:
S-201	0



PLAN VIEW
BASE OF TOWER



SECTION "A-A"
TYPICAL DETAIL

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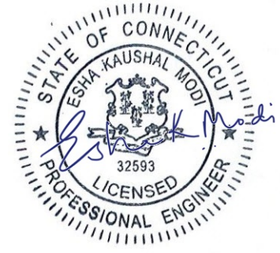

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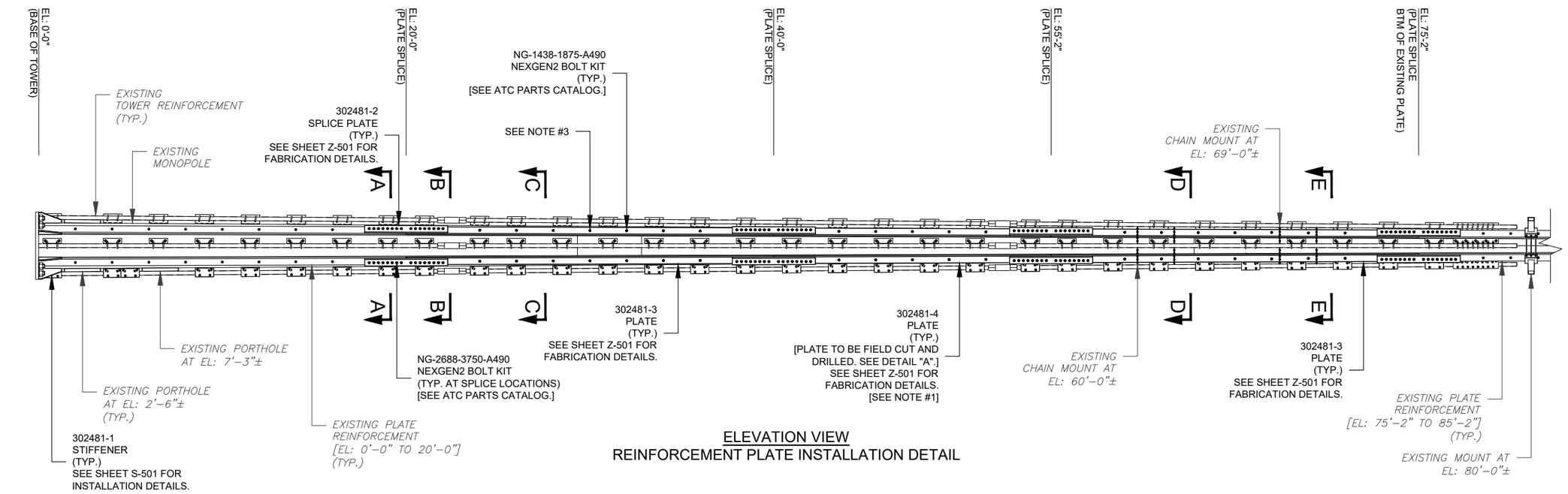
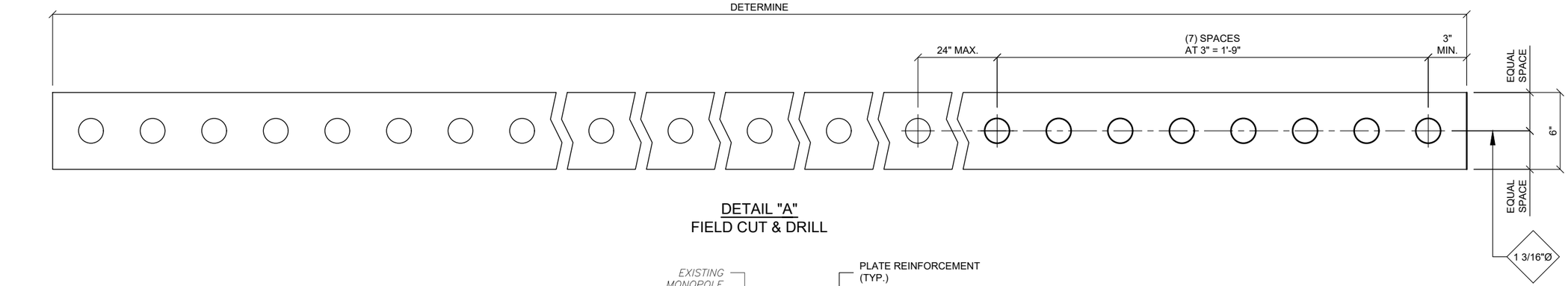
STIFFENER
INSTALLATION DETAILS

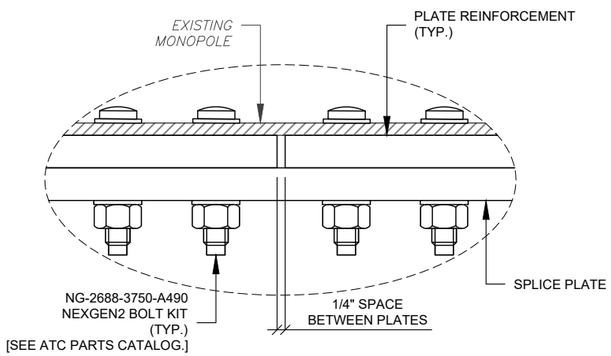
SHEET NUMBER:	REVISION:
S-501	0



ELEVATION VIEW
REINFORCEMENT PLATE INSTALLATION DETAIL



DETAIL "A"
FIELD CUT & DRILL



SPLICE PLATE GAP
TYPICAL DETAIL

NOTES:

1. **INSTALL PLATE [302481-3] FROM EL: 20'-0" TO 40'-0" FIRST AND INSTALL PLATE [302481-3] FROM EL: 55'-2" TO 75'-2" UNDER CHAIN MOUNT LOCATIONS. INSTALL PLATE [302481-4] LASTLY IN BETWEEN SPLICE LOCATIONS AT EL: 40'-0" AND 55'-2" TO VERIFY EXACT LENGTH OF PLATE REQUIRED. FIELD CUT AND DRILL TOP PORTION OF PLATE [302481-4] AS REQUIRED FOR FIT.**
2. **SEE SHEET S-503 FOR SECTIONS "A-A" THROUGH "E-E".**
3. **NG-2688-3750-A490 NEXGEN2 BOLT KITS ARE SUPPLIED AS REQUIRED FOR PLATE REINFORCEMENT CONNECTIONS THAT FALL WITHIN SLIP JOINT LOCATIONS.**

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3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
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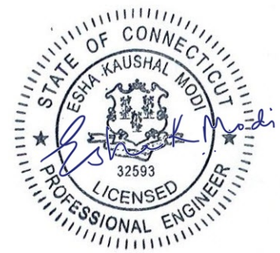
COA: PEC.0001553

REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	MJS	09/04/20

ATC SITE NUMBER:
302481

ATC SITE NAME:
HRFR - SOUTH CONNECTICUT

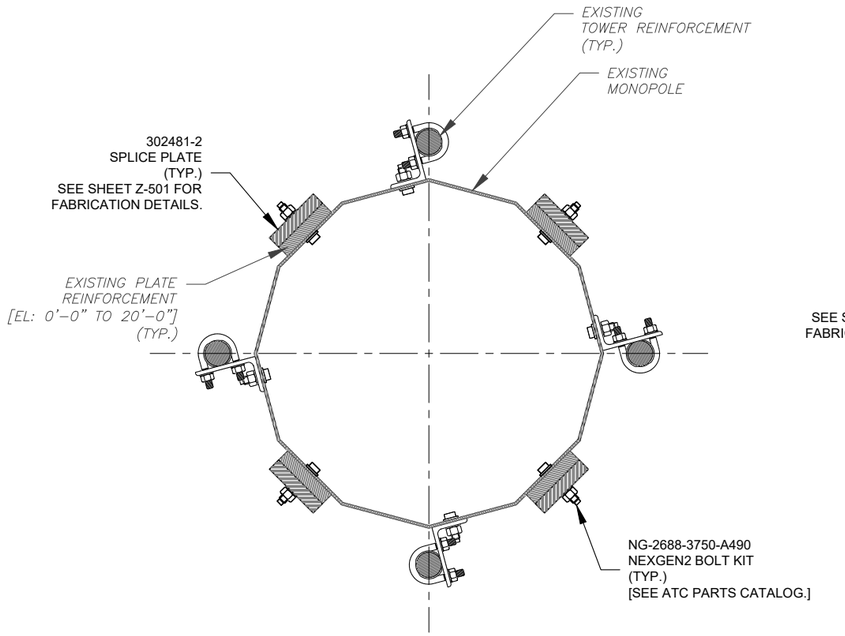
SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106



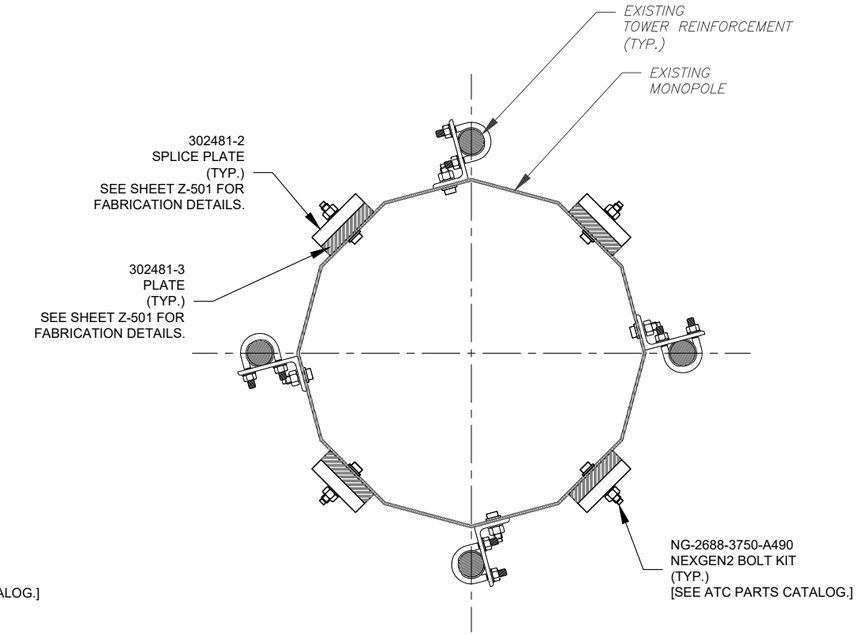
DRAWN BY:	MJS
APPROVED BY:	IPD
DATE DRAWN:	09/04/20
ATC JOB NO:	13251341_C6_06

PLATE REINFORCEMENT INSTALLATION DETAILS [EL: 20'-0" TO 75'-0"]

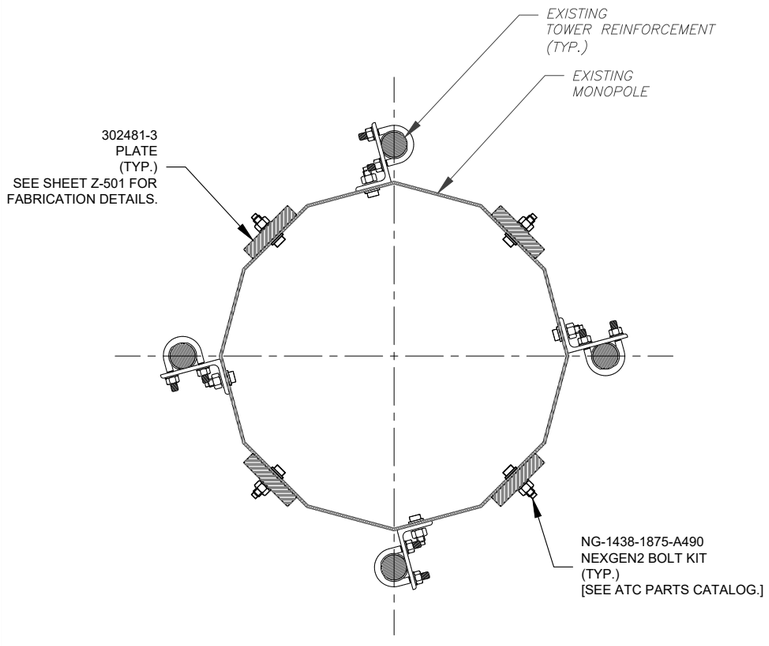
SHEET NUMBER:	REVISION:
S-502	0



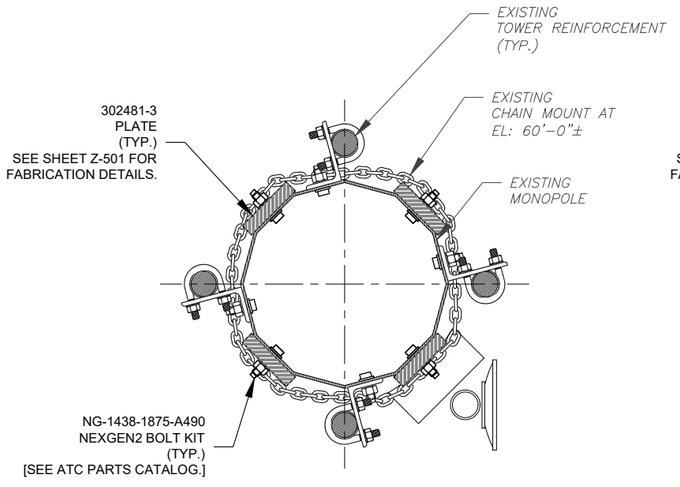
SECTION "A-A"
TYPICAL DETAIL



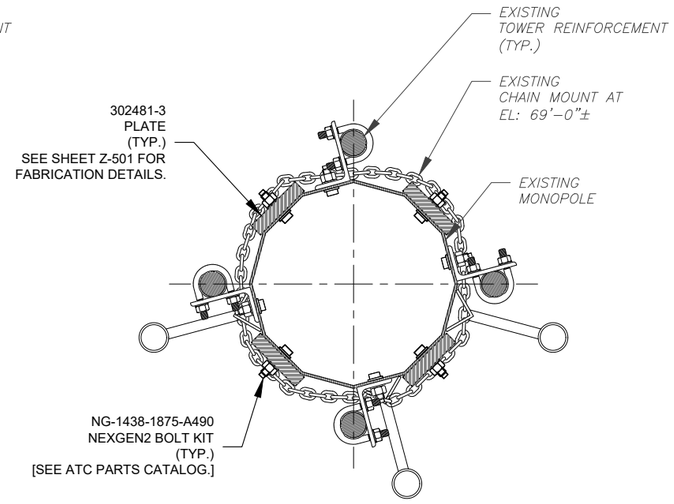
SECTION "B-B"
TYPICAL DETAIL



SECTION "C-C"
TYPICAL DETAIL



SECTION "D-D"
TYPICAL DETAIL



SECTION "E-E"
TYPICAL DETAIL

NOTE:
SEE SHEET S-502 FOR ELEVATION VIEW AND ADDITIONAL DETAILS.

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3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
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REV.	DESCRIPTION	BY	DATE
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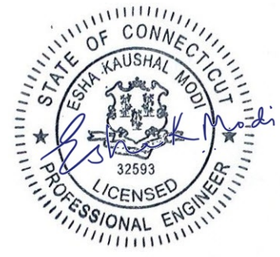
ATC SITE NUMBER:
302481

ATC SITE NAME:
HRFR - SOUTH

CONNECTICUT

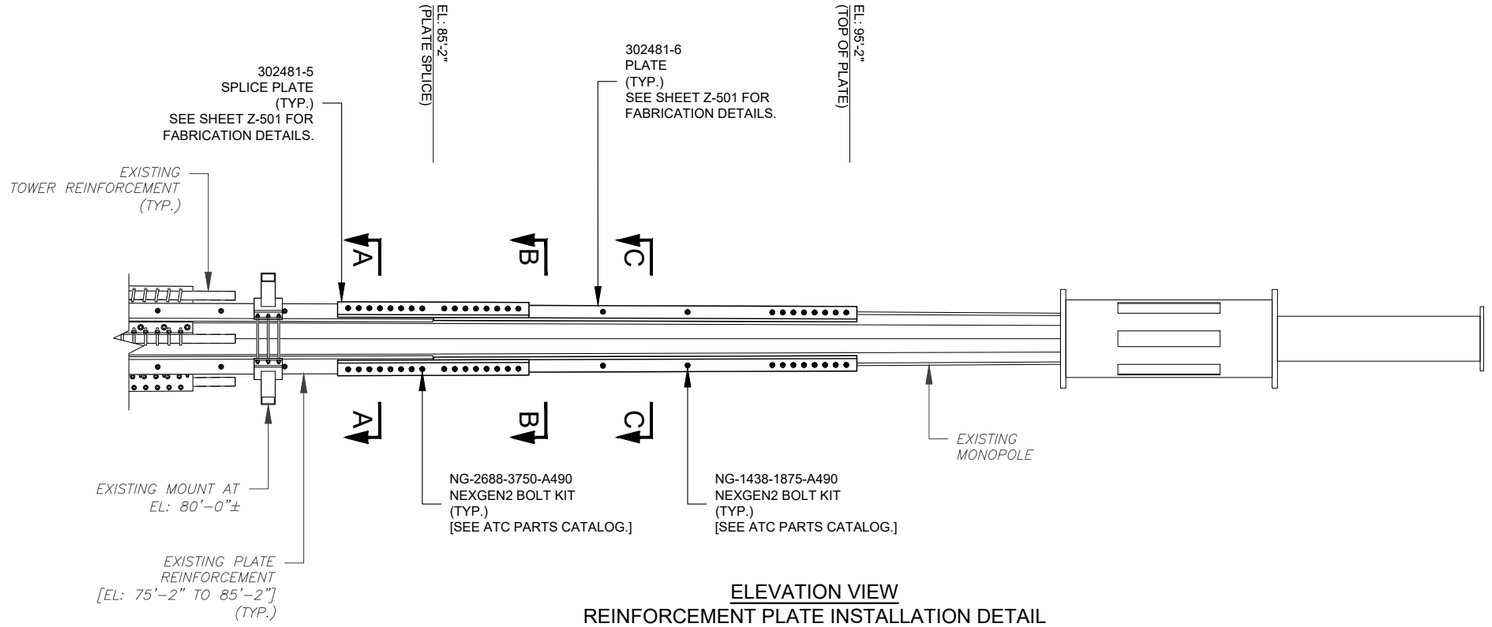
SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106



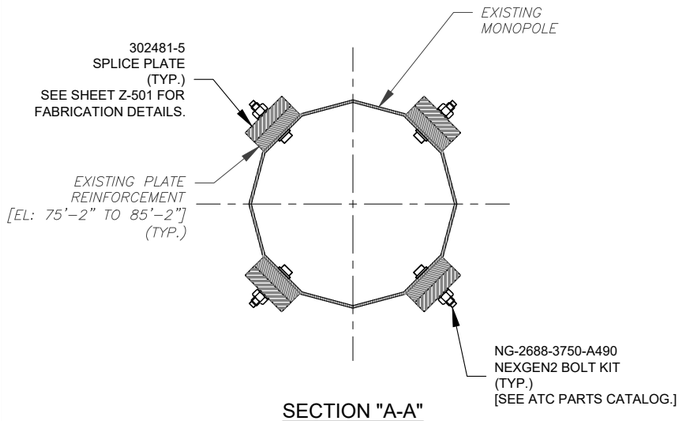
DRAWN BY:	MJS
APPROVED BY:	IPD
DATE DRAWN:	09/04/20
ATC JOB NO:	13251341_C6_06

PLATE REINFORCEMENT
INSTALLATION DETAILS
[EL: 20'-0" TO 75'-0"]
(CONT'D)

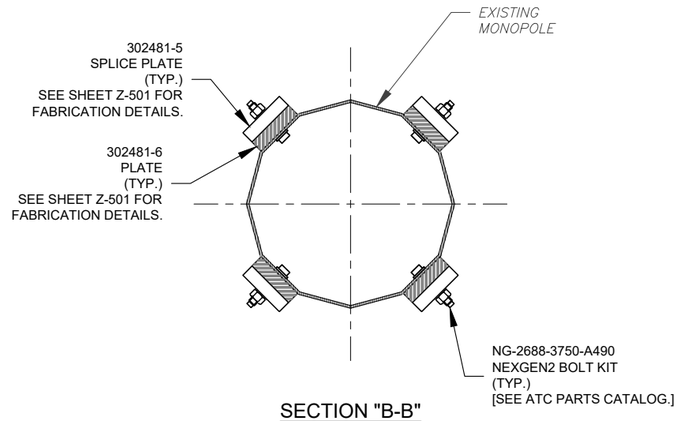
SHEET NUMBER:	REVISION:
S-503	0



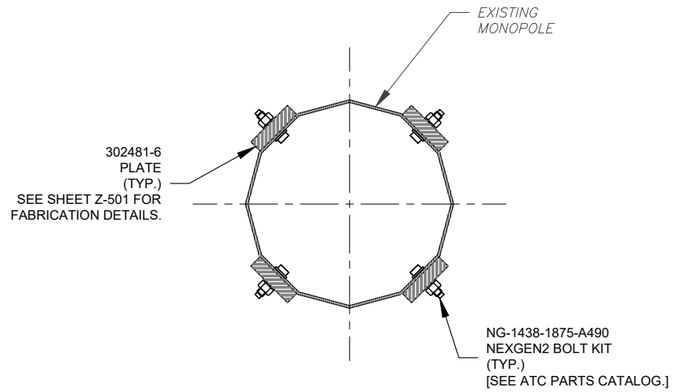
ELEVATION VIEW
REINFORCEMENT PLATE INSTALLATION DETAIL



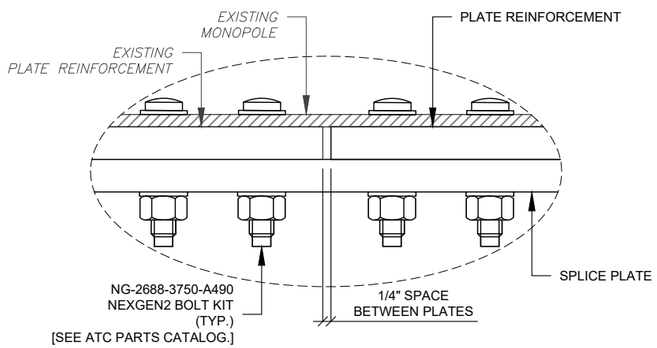
SECTION "A-A"
TYPICAL DETAIL



SECTION "B-B"
TYPICAL DETAIL



SECTION "C-C"
TYPICAL DETAIL



SPLICE PLATE GAP
TYPICAL DETAIL

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0	FIRST ISSUE	MJS	09/04/20

ATC SITE NUMBER:
302481

ATC SITE NAME:
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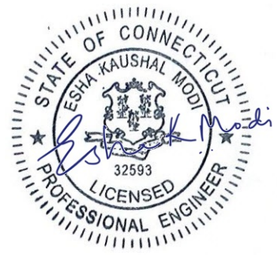
CONNECTICUT

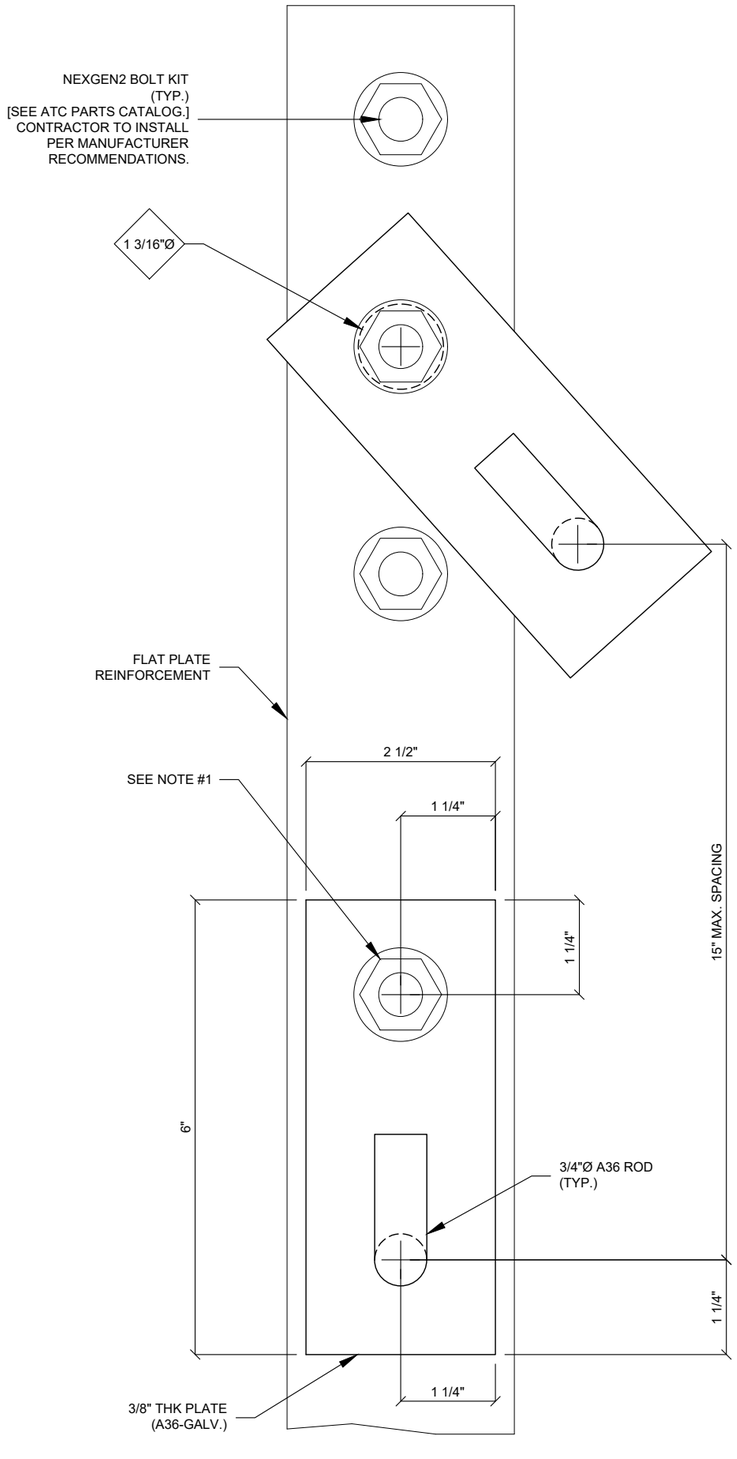
SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106



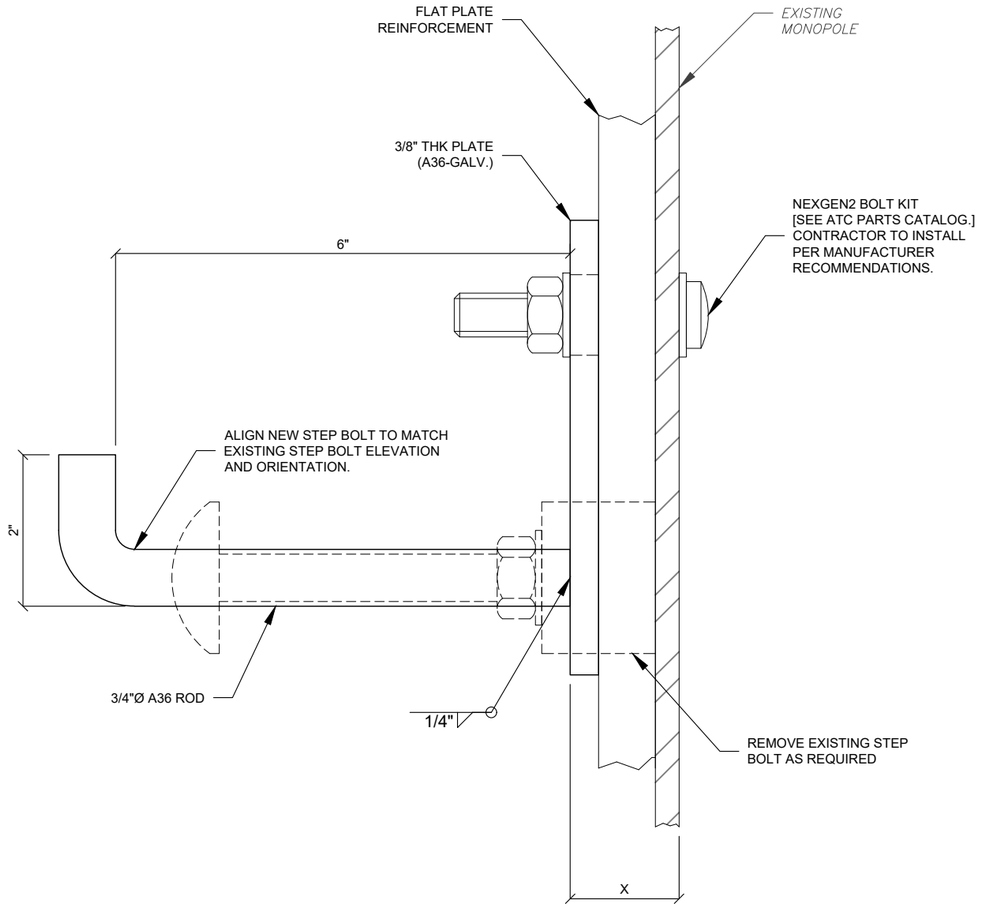
DRAWN BY:	MJS
APPROVED BY:	IPD
DATE DRAWN:	09/04/20
ATC JOB NO:	13251341_C6_06

PLATE REINFORCEMENT
INSTALLATION DETAILS
[EL: 85'-0" TO 95'-0"]

SHEET NUMBER:	REVISION:
S-504	0



FRONT VIEW



SIDE VIEW

NEXGEN2 BLIND BOLTS (A490)		
ATC KIT NUMBER	ALLFASTENER	RANGE (IN)
NG-0625-0875-A490	2NG2060	0.625-0.875
NG-0938-1438-A490	2NG2036	0.9375-1.4375
NG-1438-1875-A490	2NG2048	1.4375-1.875
NG-1875-2250-A490	2NG2057	1.875-2.25
NG-2250-2688-A490	2NG2068	2.25-2.6875
NG-2688-3750-A490	2NG2096	2.6875-3.75
NG-3750-5000-A490	2NG2127	3.75-5
NG-5000-8313-A490	2NG2212	5-8.3125

NOTES:

1. **BLIND BOLT LENGTHS TO BE VERIFIED PRIOR TO FLAT PLATE AND STEP BOLT INSTALLATION. USE NEXGEN2 BLIND BOLT CHART.**
2. **STEP PEG SPACING IS NOT TO EXCEED 15" MAX. STAGGERED OR 30" MAX. ON ANY SINGLE SIDE OF THE FLAT PLATE.**

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A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
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REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	MJS	09/04/20

ATC SITE NUMBER:

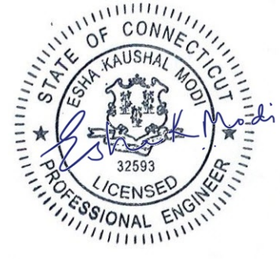
302481

ATC SITE NAME:

HRFR - SOUTH

CONNECTICUT

SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106



DRAWN BY:	MJS
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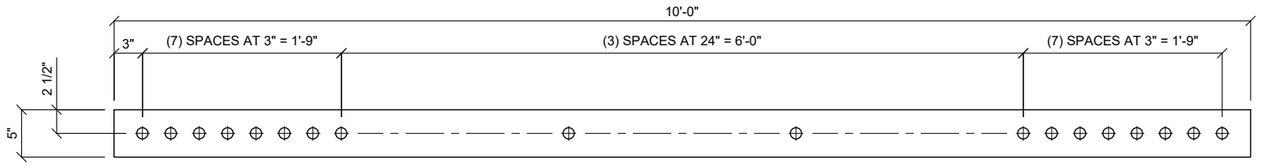
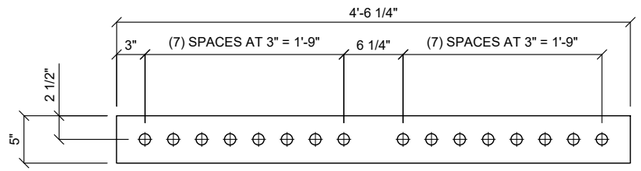
DATE DRAWN:	09/04/20
ATC JOB NO:	13251341_C6_06

FLAT PLATE STEP BOLT BRACKET FABRICATION & INSTALLATION DETAILS

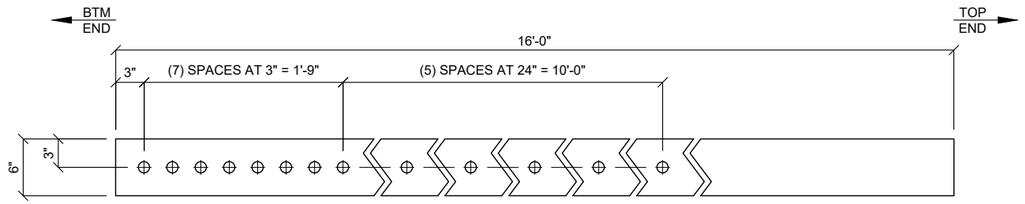
SHEET NUMBER:	REVISION:
S-505	0



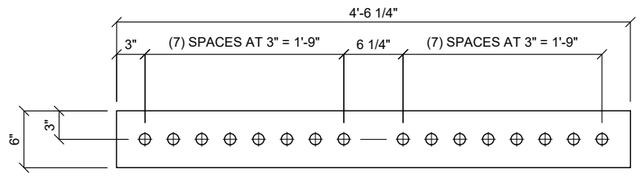
302481-6
PLATE



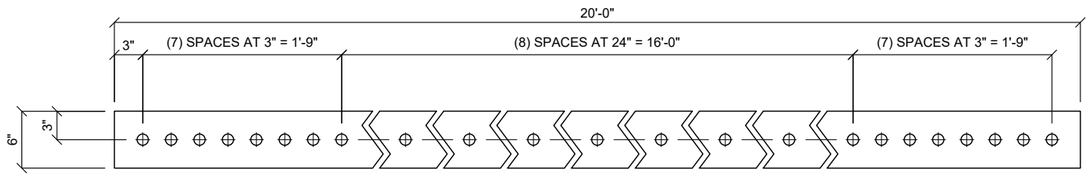
302481-5
PLATE



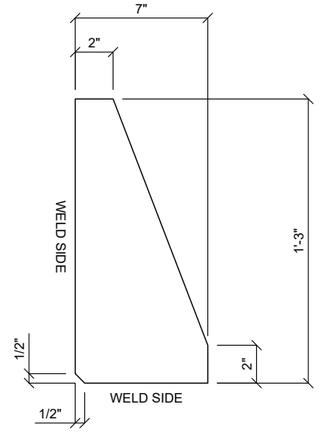
302481-4
PLATE



302481-2
PLATE



302481-3
PLATE



302481-1
STIFFENER

302481-6	PL 1 1/4" X 5"	10'-0"		212.7#	223.3#
302481-5	PL 1 1/4" X 5"	4'-6 1/4"		96.1#	101.0#
302481-4	PL 1 1/4" X 6"	16'-0"		408.3#	428.8#
302481-3	PL 1 1/4" X 6"	20'-0"		510.4#	535.9#
302481-2	PL 1 1/4" X 6"	4'-6 1/4"		115.4#	121.1#
302481-1	PL 3/4" X 7"	1'-3"	A572 GR 50	54.3#	57.0#
PART NO.	**DESCRIPTION**	**LENGTH**	**NOTES**	**BLK WT**	**GALV WT**
MATERIAL: A572 GR 65 U.N.O.		**FINISH:** GALVANIZED		**HOLES:** 1-3/16"Ø	

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A.T. ENGINEERING SERVICE, PLLC
3500 REGENCY PARKWAY
SUITE 100
CARY, NC 27518
PHONE: (919) 468-0112
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REV.	DESCRIPTION	BY	DATE
0	FIRST ISSUE	MJS	09/04/20

ATC SITE NUMBER:
302481

ATC SITE NAME:
HRFR - SOUTH CONNECTICUT

SITE ADDRESS:
289 MOUNTAIN STREET
HARTFORD, CT 06106

DRAWN BY:	MJS
APPROVED BY:	IPD
DATE DRAWN:	09/04/20
ATC JOB NO:	13251341_C6_06

STIFFENER AND PLATE REINFORCEMENT FABRICATION DETAILS

SHEET NUMBER:	REVISION:
Z-501	0

Exhibit D

Structural Analysis Report

AMERICAN TOWER®
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Post Modification Structural Analysis Report

Structure	:	**110 ft Monopole**
ATC Site Name	:	**Hrfr - South, CT**
ATC Asset Number	:	**302481**
Engineering Number	:	**13251341_C4_07**
Proposed Carrier	:	**T-MOBILE**
Carrier Site Name	:	**CT769/SSite Hartford #2**
Carrier Site Number	:	**CT11769B**
Site Location	:	**289 Mountain Street** **Hartford, CT 06106-4121** **41.726600, -72.708200**
County	:	**Hartford**
Date	:	**September 30, 2020**
Max Usage	:	**99%**
Result	:	**Pass**

Prepared By:
Isaac P. Dodson
Structural Engineer III

Reviewed By:

COA: PEC.0001553

AMERICAN TOWER®
CORPORATION

Table of Contents

Introduction

The purpose of this report is to summarize results of a post modification structural analysis performed on the 110 ft monopole to reflect the change in loading by T-MOBILE.

Supporting Documents

Tower Drawings	Mapped by Smith Cullum Site #CT-0017(A), dated June 6, 2001
Foundation Drawing	Girard & Co Engineering Job #39902, dated April 29, 1988
Geotechnical Report	TEP Project #071162.01, dated July 23, 2007
Modifications	ATC Project #42719232, dated January 12, 2009 ATC Project #43595333, dated July 1, 2009 ATC Project #43930034, dated September 15, 2009 ATC Project #44662232, dated March 30, 2010 ATC Project #OAA739695_C6_06, dated February 25, 2019 ATC Project #13251341_C6_06, dated September 4, 2020 (Pending)
Site Specific Study	ICE Wind Study for Site 302481, dated May 22, 2020

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	112 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	49 mph (3-Second Gust) w/ 1 1/4" radial ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 3
Topographic Category:	4
Crest Height (H):	148 ft
Spectral Response:	Ss = 0.19, S_1 = 0.05
Site Class:	D - Stiff Soil

****Wind load and Ice thickness have been reduced by applicable existing structure load modification factors in accordance with TIA-222-H, Annex S.**

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report. If the pending modifications cited in the supporting documents table are not completed, the results of this analysis are no longer valid, and T-Mobile should contact American Tower's Site Manager for further direction on how to proceed.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
110.0	1	Generic 12" x 12" Junction Box	Side Arm	(3) 1/2" Coax (1) 2" conduit (6) 5/16" Coax	CLEARWIRE CORPORATION
	3	DragonWave Horizon Compact			
	2	DragonWave A-ANT-11G-2.5-C			
	3	Argus LLPX310R			
	3	NextNet BTS-2500			
	1	DragonWave A-ANT-23G-1-C			
102.0	3	Ericsson RRUS 4426 B66	Platform with Handrails	(4) 0.39" Fiber Trunk (12) 0.78" 8 AWG 6 (24) 1 5/8" Coax (1) 3" conduit	AT&T MOBILITY
	3	Ericsson RRUS 4478 B5			
	3	Ericsson RRUS 4478 B14			
	3	Ericsson RRUS-11 (50 lbs.)			
	3	Ericsson RRUS 32 B2			
	3	Ericsson RRUS-32 (77 lbs)			
	3	Powerwave Allgon 7770.00			
	2	Quintel QS66512-2			
	2	Raycap DC6-48-60-18-8F(32.8 lbs)			
	1	Raycap DC6-48-60-0-8F (24" Height)			
	6	Powerwave Allgon LGP21401			
	6	Kaelus DBCT108F1V92-1			
	6	CCI TPX-070821			
	6	Powerwave Allgon 7020.00 Dual Band RET			
	2	CCI OPA-65R-LCUU-H6			
	1	Kathrein Scala 80010966			
	2	Kathrein Scala 80010965			
	1	CCI TPA-65R-LCUUUU-H8			
	1	CCI OPA-65R-LCUU-H8 (92.7")			
90.0	3	Ericsson AIR32 B66Aa/B2a	Low Profile Platform	(3) 1 1/4" Fiber (6) 1 5/8" Coax*	T-MOBILE
	3	Ericsson Air 3246 B66			
	3	RFS APXVAARR24_43-U-NA20			
80.0	1	Raycap RVZDC-6627-PF-48	Low Profile Platform	(12) 1 5/8" Coax (2) 1 5/8" Hybriflex	VERIZON WIRELESS
	3	Alcatel-Lucent B66A RRH 4x45			
	3	Alcatel-Lucent B13 RRH4x30-4R			
	3	Alcatel-Lucent B25 RRH4x30			
	3	Nokia AirScale RRH 4T4R B5 160W AHCA			
	6	Commscope JAHH-65B-R3B (63.3 lb)			
77.0	1	Scala 840 10212	Stand-Off	(1) 7/8" Coax	TOWN OF WEST HARTFORD
	1	TX RX Systems 421-86A-10-18-12-N			
70.0	3	RFS APXV18-206517S-C	Side Arm	(6) 1 5/8" Coax	METRO PCS INC
60.0	1	Scala 840 10212	Stand-Off	(2) 0.41" LMR-400 (1) 1/4" Coax (1) 7/8" Coax	TOWN OF WEST HARTFORD
	1	Generic Radio/ODU			
	1	Radio Waves SP2-4.7			
	1	Radio Waves SP2-4.7 w/ Radome			

*(6) 1 5/8" Coax are considered as contracted loading but are to be removed during construction.

Equipment to be Removed

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
90.0	3	Kathrein Scala Smart Bias Tee	-	(12) 1 5/8" Coax	T-MOBILE
	3	Ericsson Radio 4449 B12,B71			
	3	Ericsson KRY 112 489/1			
	3	Ericsson KRY 112 144/1			

Proposed Equipment

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
90.0	3	Ericsson Radio 4449 B71 B85A	Low Profile Platform	(1) 1 1/4" Fiber	T-MOBILE
	3	Ericsson RRUS 4415 B25			
	3	Ericsson Air6449 B41			

[1] Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed coax inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	61%	Pass
Shaft	73%	Pass
Base Plate	95%	Pass
Reinforcement	99%	Pass
Flanges	45%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	2,469.7	85%
Axial (Kips)	79.8	6%
Shear (Kips)	33.5	51%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
110.0	DragonWave A-ANT-23G-1-C	CLEARWIRE CORPORATION	1.506	1.321
	DragonWave A-ANT-11G-2.5-C			
90.0	Ericsson Radio 4449 B12,B71	T-MOBILE	1.063	1.181
	Ericsson Radio 4449 B71 B85A			
	Ericsson RRUS 4415 B25			
	Ericsson Air6449 B41			
	Ericsson AIR32 B66Aa/B2a			
	Ericsson Air 3246 B66			
	RFS APXVAARR24_43-U-NA20			
60.0	Radio Waves SP2-4.7 w/ Radome	TOWN OF WEST HARTFORD	0.514	0.908
	Radio Waves SP2-4.7			

***Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-H**

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CORPORATION

Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

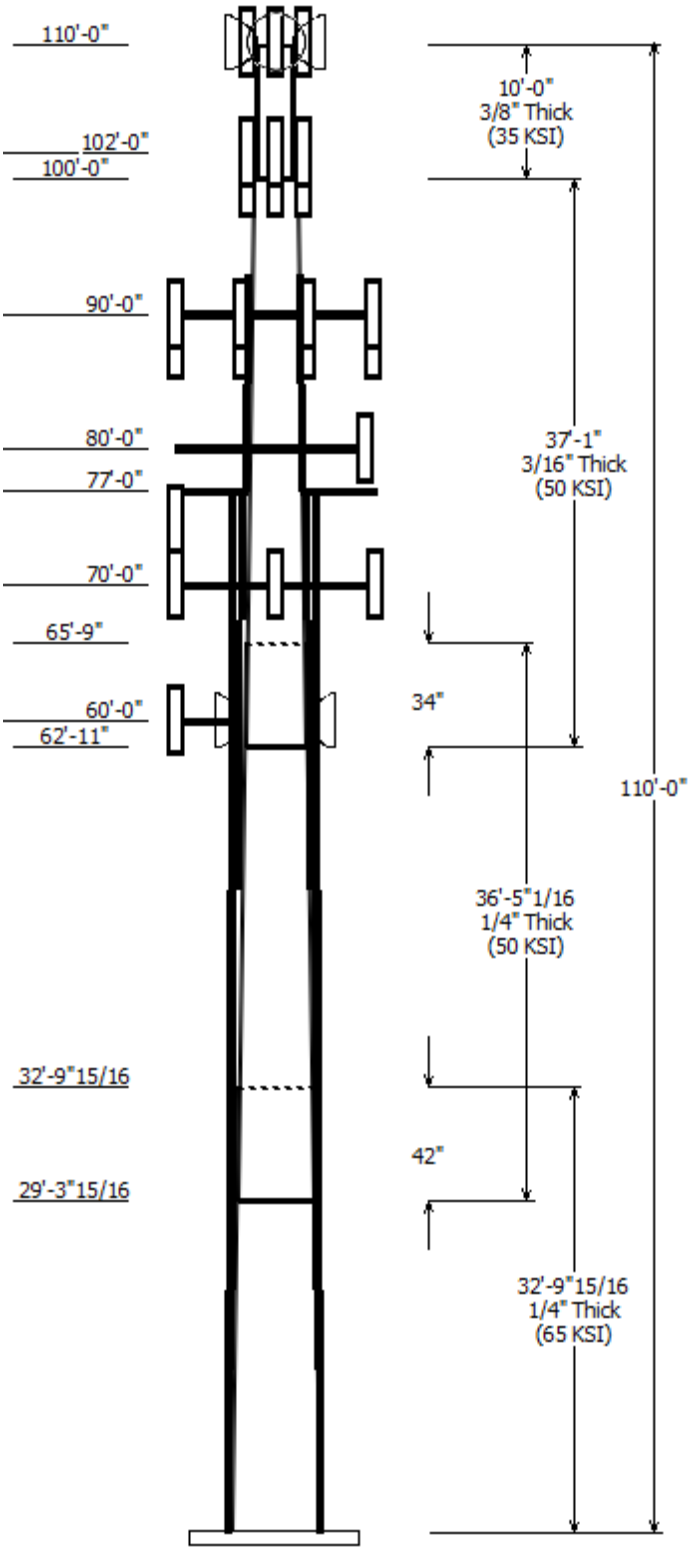
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.



Job Information

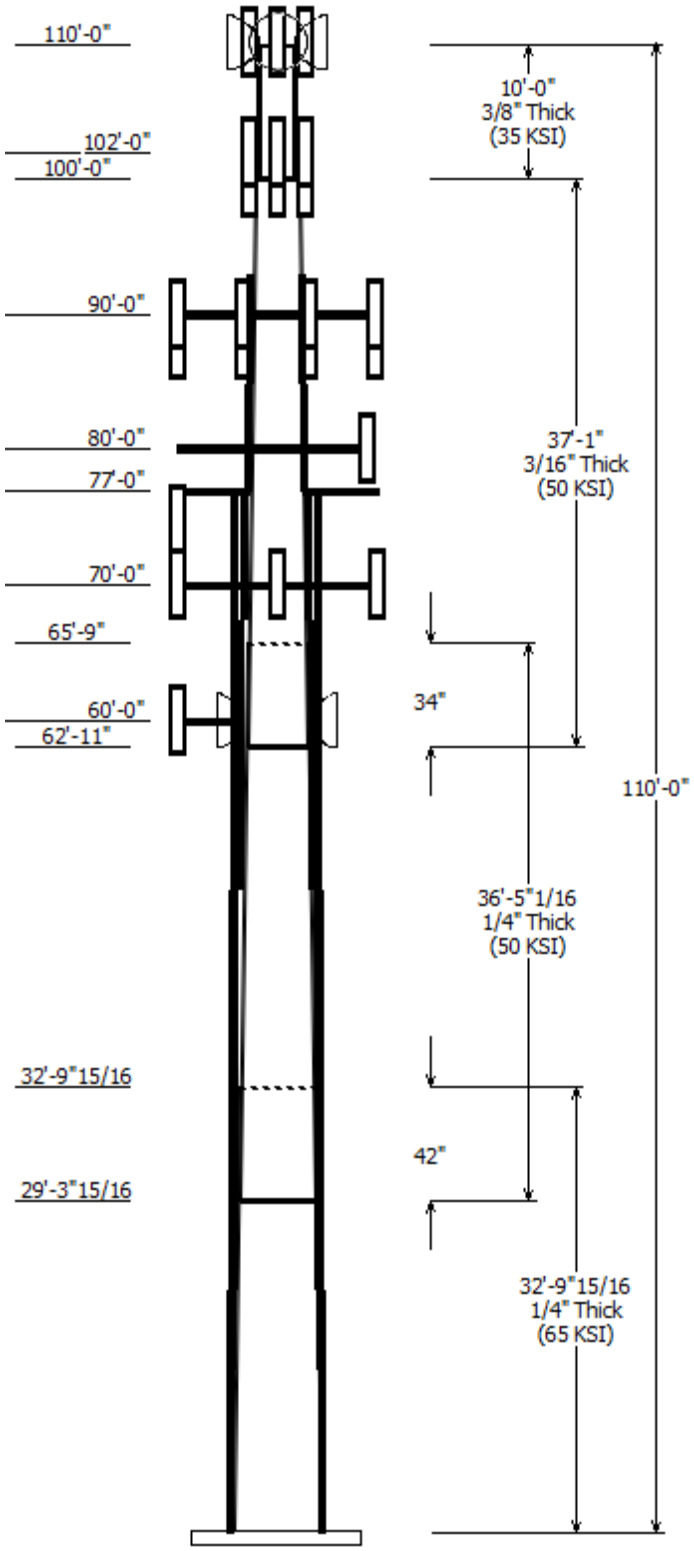
Client :	T-MOBILE		
Pole :	302481	Code:	ANSI/TIA-222-H
Location :	Hrfr - South, CT		
Description :	110 ft ITT Meyer Monopole	Risk Category :	II
Shape :	12 Sides	Exposure :	B
Height :	110.00 (ft)	Topo Method :	Method 3
Base Elev (ft):	0.00	Topographic Category :	4
Taper:	0.164000 (in/ft)		

Sections Properties

Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Shape	Steel Grade (ksi)
1	32.830	24.62	30.00	0.250		0.000	12 Sides	65
2	36.420	19.73	25.69	0.250	Slip Joint	42.000	12 Sides	50
3	37.083	14.50	20.57	0.188	Slip Joint	34.000	12 Sides	50
4	10.000	12.75	12.75	0.375	Butt Joint	0.000	Round	35

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
110.000	110.000	1	Clearwirre Side Arm
110.000	110.000	2	DragonWave A-ANT-11G-2.5-C
110.000	110.000	3	Argus LLPX310R
110.000	110.000	3	NextNet BTS-2500
110.000	110.000	1	DragonWave A-ANT-23G-1-C
110.000	110.000	1	Generic 12" x 12" Junction Box
110.000	110.000	3	DragonWave Horizon Compact
102.000	102.000	1	Small Platform with Handrails
102.000	102.000	1	Kathrein Scala 80010966
102.000	102.000	2	Kathrein Scala 80010965
102.000	100.000	1	CCI TPA-65R-LCUUUU-H8
102.000	100.000	1	CCI OPA-65R-LCUU-H8 (92.7")
102.000	100.000	2	CCI OPA-65R-LCUU-H6
102.000	100.000	2	Quintel QS66512-2
102.000	100.000	3	Powerwave Allgon 7770.00
102.000	100.000	3	Ericsson RRUS-32 (77 lbs)
102.000	100.000	3	Ericsson RRUS 32 B2
102.000	100.000	3	Ericsson RRUS-11 (50 lbs.)
102.000	102.000	3	Ericsson RRUS 4478 B14
102.000	102.000	3	Ericsson RRUS 4478 B5
102.000	102.000	3	Ericsson RRUS 4426 B66
102.000	100.000	2	Raycap DC6-48-60-18-8F(32.8 lb
102.000	102.000	1	Raycap DC6-48-60-0-8F (24" Hei
102.000	100.000	6	Powerwave Allgon LGP21401
102.000	102.000	6	Kaelus DBCT108F1V92-1
102.000	100.000	6	CCI TPX-070821
102.000	102.000	6	Powerwave Allgon 7020.00
90.000	90.000	1	Generic Flat Low Profile Platf
90.000	90.000	3	Ericsson Radio 4449 B12,B71
90.000	87.000	3	Ericsson AIR32 B66Aa/B2a
90.000	90.000	3	RFS APXVAARR24_43-U-NA20
90.000	90.000	3	Ericsson Air 3246 B66
90.000	90.000	3	Ericsson Air6449 B41
90.000	90.000	3	Ericsson RRUS 4415 B25
90.000	90.000	3	Ericsson Radio 4449 B71 B85A
80.000	80.000	1	Round Low Profile Platform
80.000	80.000	6	Commscope JAHH-65B-R3B
80.000	80.000	1	Raycap RVZDC-6627-PF-48
80.000	80.000	3	Alcatel-Lucent B66A RRH 4x45
80.000	80.000	3	Alcatel-Lucent B13 RRH4x30-4R
80.000	80.000	3	Alcatel-Lucent B25 RRH4x30
80.000	80.000	3	Nokia AirScale RRH 4T4R B5 160
77.000	77.000	2	Stand Offs
77.000	75.000	1	TX RX Systems 421-86A-10-18-



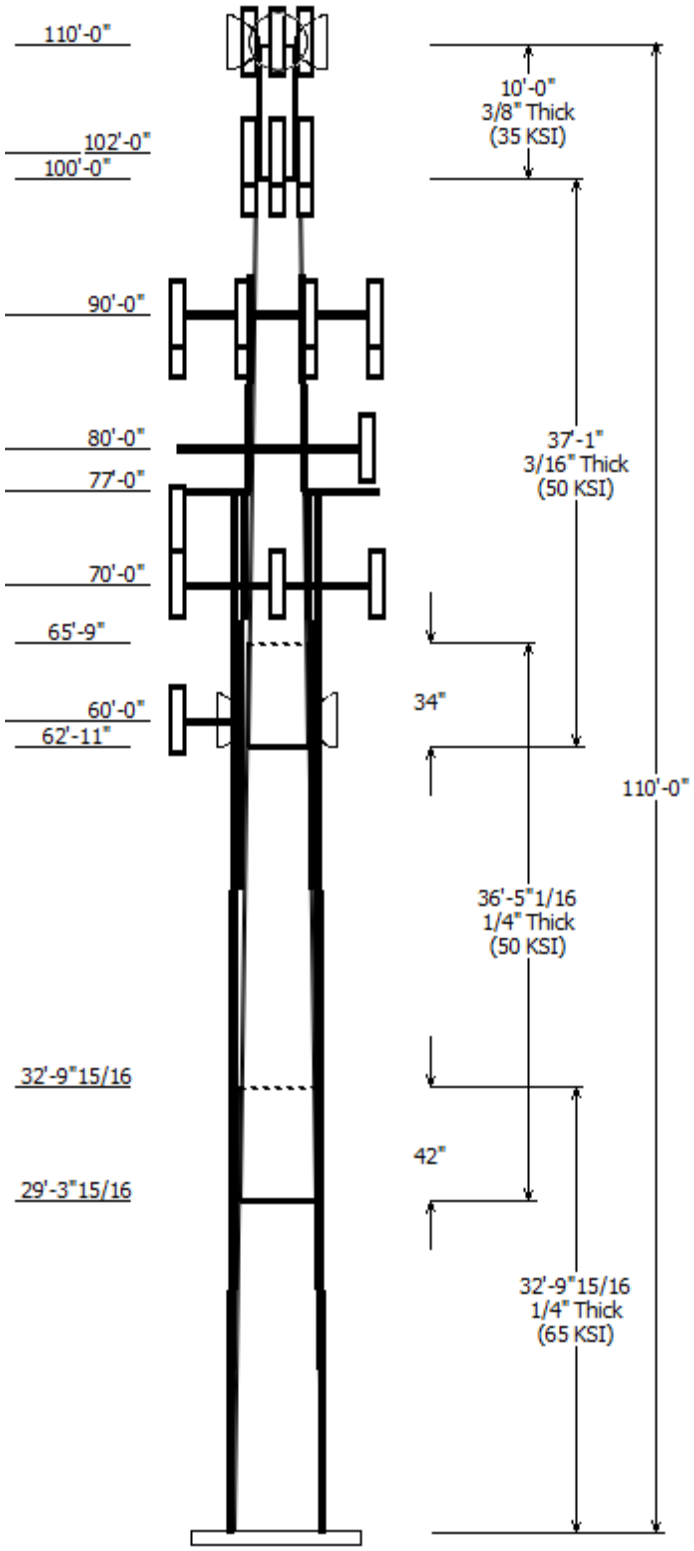
77.000	75.000	1	Scala 840 10212
70.000	70.000	3	Round Side Arms
70.000	70.000	3	RFS APXV18-206517S-C
60.000	60.000	1	Stand Off
60.000	60.000	1	Radio Waves SP2-4.7
60.000	60.000	1	Radio Waves SP2-4.7 w/
60.000	60.000	1	Scala 840 10212
60.000	60.000	1	Generic Radio/ODU

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
87.000	97.000	1.25" Thick Flat	Yes
87.000	97.000	1.25" Thick Flat	Yes
87.000	97.000	1.25" Thick Flat	Yes
87.000	97.000	1.25" Thick Flat	Yes
75.000	87.000	1.25" Thick Flat	Yes
75.000	87.000	1.25" Thick Flat	Yes
75.000	87.000	1.25" Thick Flat	Yes
75.000	87.000	1.25" Thick Flat	Yes
20.000	80.000	1.25" Thick Flat	Yes
20.000	80.000	1.25" Thick Flat	Yes
20.000	80.000	1.25" Thick Flat	Yes
20.000	80.000	1.25" Thick Flat	Yes
0.000	81.000	#20 DYWIDAG	Yes
0.000	81.000	#20 DYWIDAG	Yes
0.000	81.000	#20 DYWIDAG	Yes
0.000	81.000	#20 DYWIDAG	Yes
0.000	20.000	1.25" Thick Flat	Yes
0.000	20.000	1.25" Thick Flat	Yes
0.000	20.000	1.25" Thick Flat	Yes
0.000	20.000	1.25" Thick Flat	Yes
0.000	60.000	0.41" (10.3mm)	Yes
0.000	60.000	1/4" Coax	Yes
0.000	60.000	7/8" Coax	Yes
0.000	70.000	1 5/8" Coax	Yes
0.000	77.000	7/8" Coax	Yes
0.000	80.000	1 5/8" Coax	No
0.000	80.000	1 5/8" Hybriflex	Yes
0.000	102.0	0.39" (10mm)	No
0.000	102.0	0.39" (10mm)	No
0.000	102.0	0.39" (10mm)	Yes
0.000	102.0	0.78" (19.7mm) 8	No
0.000	102.0	0.78" (19.7mm) 8	Yes
0.000	102.0	0.78" (19.7mm) 8	No
0.000	102.0	1 5/8" Coax	No
0.000	102.0	1 5/8" Coax	Yes
0.000	102.0	1 5/8" Coax	No
0.000	102.0	3" conduit	No
0.000	110.0	1/2" Coax	Yes
0.000	110.0	2" conduit	Yes
0.000	110.0	5/16" (0.31"-	No
0.000	90.000	1 1/4" (1.25"-	No
0.000	90.000	1 1/4" (1.25"-	No
0.000	90.000	1 5/8" Coax	No

Load Cases

1.2D + 1.0W	112 mph with No Ice
0.9D + 1.0W	112 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	49 mph with 1.27 in Radial Ice
1.2D + 1.0Ev + 1.0Eh	Seismic



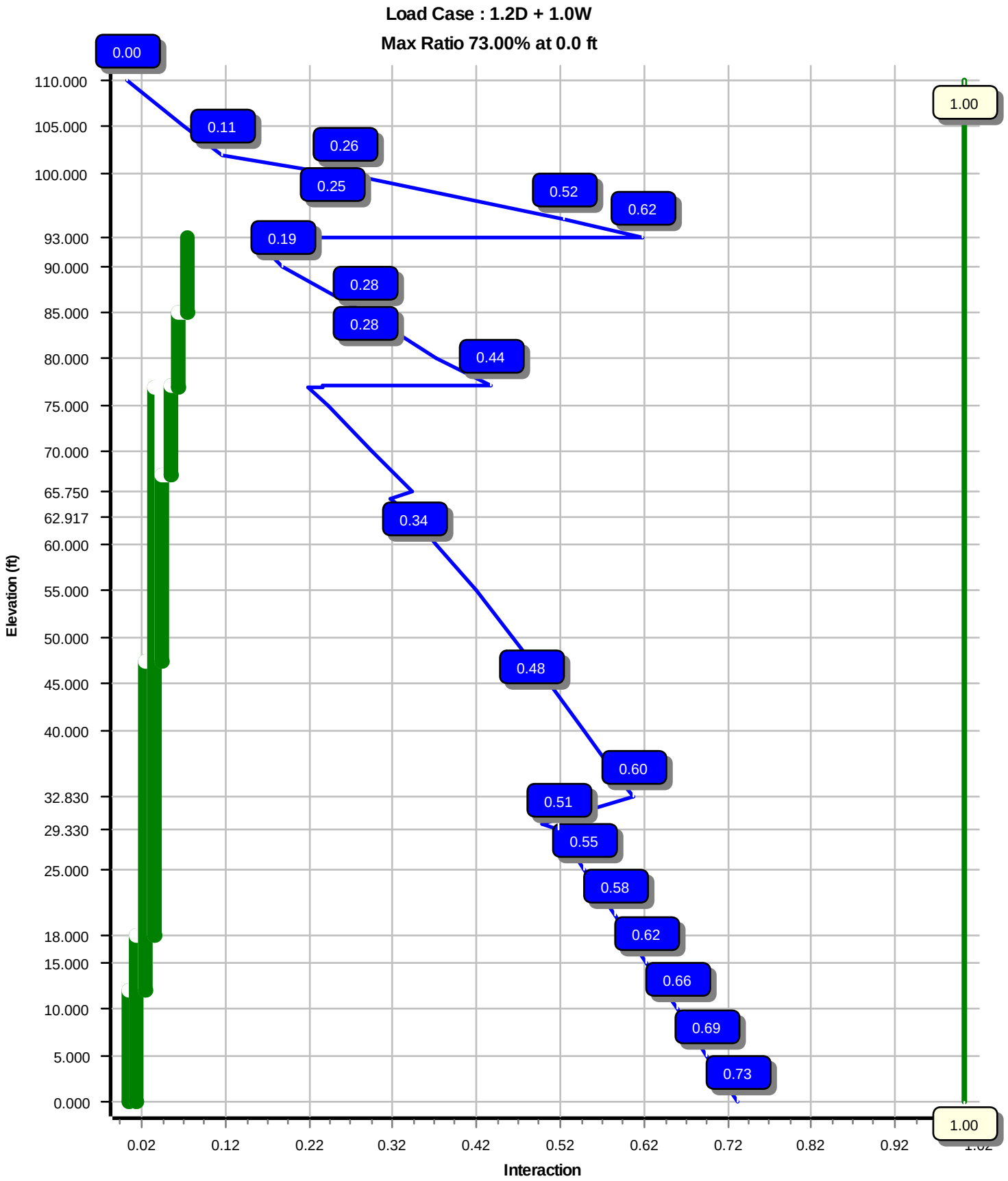
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	Serviceability 60 mph

Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.0W	2469.70	33.51	48.92
0.9D + 1.0W	2438.17	33.47	36.66
1.2D + 1.0Di + 1.0Wi	754.10	9.78	79.83
1.2D + 1.0Ev + 1.0Eh	106.57	1.23	48.68
0.9D - 1.0Ev + 1.0Eh	104.87	1.23	33.70
1.0D + 1.0W	631.39	8.66	40.85

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	60.00	6.166	0.908
1.0D + 1.0W	60.00	6.166	0.908
1.0D + 1.0W	110.00	18.076	1.321
1.0D + 1.0W	110.00	18.076	1.321


Load Case : 1.2D + 1.0W
Max Ratio 73.00% at 0.0 ft
0.00
0.11
0.26
0.25
0.52
0.62
0.19
0.28
0.28
0.44
0.34
0.48
0.60
0.51
0.55
0.58
0.62
0.66
0.69
0.73
1.00
1.00
110.000
105.000
100.000
93.000
90.000
85.000
80.000
75.000
70.000
65.750
62.917
60.000
55.000
50.000
45.000
40.000
32.830
29.330
25.000
18.000
15.000
10.000
5.000
0.000
Elevation (ft)
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
Interaction

Site Number: 302481 Code: ANSI/TIA-222-H

Site Name: Hrfr - South, CT Engineering Number:13251341_C4_07 9/30/2020 11:38:04 AM

Customer: T-MOBILE

Analysis Parameters

Location :	Hartford County, CT	Height (ft) :	110
Code :	ANSI/TIA-222-H	Base Diameter (in) :	30.00
Shape :	12 Sides. Sect 4: Round	Top Diameter (in) :	12.75
Pole Type :	Custom	Taper (in/ft) :	0.164
Pole Manfacturer :	ITT Meyer	Rotation (deg) :	0.00
Kd (non-service) :	0.95	Ke :	0.99

Ice & Wind Parameters

Exposure Category:	B	Design Wind Speed Without Ice:	112 mph
Risk Category:	II	Design Wind Speed With Ice:	49 mph
Topographic Factor Procedure:	Method 3	Operational Wind Speed:	60 mph
Topographic Category:	4	Design Ice Thickness:	1.27 in
Crest Height:	148 ft	HMSL:	286.00 ft

Seismic Parameters

Analysis Method:	Equivalent Lateral Force Method				
Site Class:	D - Stiff Soil				
Period Based on Rayleigh Method (sec):	2.07				
T_L (sec):	6	p:	1	C_s:	0.030
S_s:	0.192	S_1:	0.055	C_s Max:	0.030
F_a:	1.600	F_v:	2.400	C_s Min:	0.030
S_{ds}:	0.205	S_{d1}:	0.088		

Load Cases

1.2D + 1.0W	112 mph with No Ice
0.9D + 1.0W	112 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	49 mph with 1.27 in Radial Ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	Serviceability 60 mph

Site Number: 302481 Code: ANSI/TIA-222-H

Site Name: Hrfr - South, CT Engineering Number:13251341_C4_07 9/30/2020 11:38:04 AM

Customer: T-MOBILE

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-12	32.830	0.2500	65		0.00	2,434	30.00	0.00	23.95	2705.5	29.47	120.00	24.62	32.83	19.62	1487.9	23.71	98.50	0.163750
2-12	36.420	0.2500	50	Slip	42.00	2,241	25.69	29.33	20.49	1693.2	24.86	102.79	19.73	65.75	15.68	759.9	18.47	78.93	0.163750
3-12	37.083	0.1875	50	Slip	34.00	1,322	20.57	62.92	12.31	652.8	26.72	109.72	14.50	100.00	8.64	225.9	18.04	77.33	0.163750
4-R	10.000	0.3750	35	Butt	0.00	496	12.75	100.00	14.58	279.3	0.00	34.00	12.75	110.00	14.58	279.3	0.00	34.00	0.000000
				Shaft Weight		6,493													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor
110.00	DragonWave Horizon Compact	3	0.80	0.000	10.60	0.721	0.50	31.87	1.259	0.50
110.00	Generic 12" x 12" Junction Box	1	0.80	0.000	10.00	1.200	1.00	49.39	1.886	1.00
110.00	DragonWave A-ANT-23G-1-C	1	1.00	0.000	15.00	1.610	1.00	48.42	2.326	1.00
110.00	NextNet BTS-2500	3	0.80	0.000	35.00	1.817	0.50	78.86	2.684	0.50
110.00	Argus LLPX310R	3	0.80	0.000	28.60	4.292	0.63	113.83	5.856	0.63
110.00	Clearwirre Side Arm	1	1.00	0.000	560.00	8.500	0.67	928.97	14.100	0.67
110.00	DragonWave A-ANT-11G-2.5-C	2	1.00	0.000	47.60	8.670	1.00	215.17	10.304	1.00
102.00	Powerwave Allgon 7020.00 Dual	6	0.75	0.000	2.20	0.339	0.50	11.88	0.727	0.50
102.00	CCI TPX-070821	6	0.75	-2.000	7.50	0.469	0.50	19.00	0.923	0.50
102.00	Kaelus DBCT108F1V92-1	6	0.75	0.000	13.90	0.633	0.50	37.76	1.150	0.50
102.00	Powerwave Allgon LGP21401	6	0.75	-2.000	14.10	1.104	0.50	37.75	1.781	0.50
102.00	Raycap DC6-48-60-0-8F (24"	1	0.75	0.000	32.80	1.470	0.50	134.32	2.132	0.50
102.00	Raycap DC6-48-60-18-8F(32.8	2	0.75	-2.000	32.80	1.470	0.50	91.28	2.132	0.50
102.00	Ericsson RRUS 4426 B66	3	0.75	0.000	48.40	1.650	0.50	90.72	2.455	0.50
102.00	Ericsson RRUS 4478 B5	3	0.75	0.000	59.90	1.842	0.50	112.31	2.692	0.50
102.00	Ericsson RRUS 4478 B14	3	0.75	0.000	59.40	2.021	0.50	117.57	2.915	0.50
102.00	Ericsson RRUS-11 (50 lbs.)	3	0.75	-2.000	50.00	2.566	0.50	114.62	3.559	0.50
102.00	Ericsson RRUS 32 B2	3	0.75	-2.000	53.00	2.743	0.50	122.72	3.852	0.50
102.00	Ericsson RRUS-32 (77 lbs)	3	0.75	-2.000	77.00	3.314	0.50	169.19	4.531	0.50
102.00	Powerwave Allgon 7770.00	3	0.75	-2.000	35.00	5.508	0.65	161.30	6.504	0.65
102.00	Quintel QS66512-2	2	0.75	-2.000	111.00	8.133	0.74	299.89	10.775	0.74
102.00	CCI OPA-65R-LCUU-H6	2	0.75	-2.000	73.00	9.658	0.66	265.92	12.286	0.66
102.00	CCI OPA-65R-LCUU-H8 (92.7")	1	0.75	-2.000	88.00	12.746	0.67	323.35	16.155	0.67
102.00	CCI TPA-65R-LCUUUU-H8	1	0.75	-2.000	81.60	13.298	0.69	343.97	16.837	0.69
102.00	Kathrein Scala 80010965	2	0.75	0.000	97.60	13.814	0.72	350.31	16.706	0.72
102.00	Kathrein Scala 80010966	1	0.75	0.000	114.60	17.363	0.69	418.97	20.860	0.69
102.00	Small Platform with Handrails	1	1.00	0.000	2,000.00	34.800	1.00	3,320.72	57.780	1.00
90.00	Ericsson Radio 4449 B12,B71	3	0.80	0.000	74.00	1.640	0.50	127.32	2.444	0.50
90.00	Ericsson Radio 4449 B71 B85A	3	0.80	0.000	75.00	1.650	0.50	132.28	2.459	0.50
90.00	Ericsson RRUS 4415 B25	3	0.80	0.000	46.00	1.650	0.50	87.23	2.459	0.50
90.00	Ericsson Air6449 B41	3	0.80	0.000	104.00	5.682	0.63	233.80	7.194	0.63
90.00	Ericsson AIR32 B66Aa/B2a	3	0.80	-3.000	132.20	6.510	0.50	284.21	8.596	0.50
90.00	Ericsson Air 3246 B66	3	0.80	0.000	180.00	7.940	0.69	2,755.45	10.100	0.69
90.00	RFS APXVAARR24_43-U-NA20	3	0.80	0.000	127.90	20.240	0.63	501.81	23.772	0.63
90.00	Generic Flat Low Profile Platform	1	1.00	0.000	1,875.00	26.100	1.00	2,646.34	44.284	1.00
80.00	Nokia AirScale RRH 4T4R B5	3	0.80	0.000	35.30	1.286	0.50	72.87	2.005	0.50
80.00	Alcatel-Lucent B25 RRH4x30	3	0.80	0.000	53.00	2.120	0.50	110.67	3.068	0.50
80.00	Alcatel-Lucent B13 RRH4x30-4R	3	0.80	0.000	57.80	2.140	0.50	123.70	3.094	0.50
80.00	Alcatel-Lucent B66A RRH 4x45	3	0.80	0.000	67.00	2.580	0.50	134.96	3.658	0.50
80.00	Raycap RVZDC-6627-PF-48	1	0.80	0.000	32.00	3.781	0.50	136.77	5.044	0.50
80.00	Commscope JAHH-65B-R3B	6	0.80	0.000	63.30	9.113	0.69	256.59	11.764	0.69
80.00	Round Low Profile Platform	1	1.00	0.000	1,500.00	21.700	1.00	2,118.98	40.042	1.00
77.00	Scala 840 10212	1	0.90	-2.000	6.70	2.175	0.50	54.73	3.207	0.50
77.00	TX RX Systems 421-86A-10-18-	1	0.90	-2.000	15.00	2.217	0.50	59.77	3.161	0.50
77.00	Stand Offs	2	1.00	0.000	75.00	2.500	1.00	109.97	3.433	1.00
70.00	Round Side Arms	3	1.00	0.000	100.00	4.000	0.67	146.73	6.003	0.67
70.00	RFS APXV18-206517S-C	3	0.80	0.000	26.40	5.160	0.68	115.19	7.427	0.68

60.00	Generic Radio/ODU	1	1.00	0.000	30.00	1.600	0.50	79.13	2.408	0.50
60.00	Scala 840 10212	1	1.00	0.000	6.70	2.175	0.50	54.95	3.211	0.50
60.00	Stand Off	1	1.00	0.000	75.00	2.500	1.00	110.13	3.755	1.00
60.00	Radio Waves SP2-4.7 w/ Radome	1	1.00	0.000	26.00	2.710	1.00	105.97	3.479	1.00
60.00	Radio Waves SP2-4.7	1	1.00	0.000	22.00	5.228	1.00	75.22	6.715	1.00
Totals	Num Loadings:52	129			12,576.90			33,670.68		

Linear Appurtenance Properties

Load Case Azimuth (deg) :

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Flat	Max Coax / Row	Dist Between Rows (in)	Dist Between Cols (in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	110.00	3	1/2" Coax	0.63	0.15	N	1	0.00	0.00	290	0.50	Y	CLEARWIRE
0.00	110.00	1	2" conduit	2.38	3.65	N	1	0.00	0.00	280	0.00	Y	CLEARWIRE
0.00	110.00	6	5/16" (0.31"-7.9mm)	0.31	0.05	N	0	0.00	0.00	0	0.00	N	CLEARWIRE
0.00	102.00	2	0.39" (10mm) Fiber	0.39	0.06	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	102.00	1	0.39" (10mm) Fiber	0.39	0.06	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	102.00	1	0.39" (10mm) Fiber	0.39	0.06	N	1	0.00	0.00	8	0.50	Y	AT&T MOBILITY
0.00	102.00	6	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	102.00	2	0.78" (19.7mm) 8 AWG	0.78	0.59	N	2	0.50	0.50	13	0.50	Y	AT&T MOBILITY
0.00	102.00	4	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	102.00	12	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	102.00	6	1 5/8" Coax	1.98	0.82	N	3	0.00	0.00	218	0.50	Y	AT&T MOBILITY
0.00	102.00	6	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	102.00	1	3" conduit	3.50	7.58	N	1	0.00	0.00	0	0.00	N	AT&T MOBILITY
87.00	97.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	120	0.00	Y	
87.00	97.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	300	0.00	Y	
87.00	97.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	30	0.00	Y	
87.00	97.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	210	0.00	Y	
0.00	90.00	3	1 1/4" (1.25"- 31.8mm)	1.25	1.05	N	0	0.00	0.00	0	0.00	N	T-MOBILE
0.00	90.00	1	1 1/4" (1.25"- 31.8mm)	1.25	1.05	N	0	0.00	0.00	0	0.00	N	T-MOBILE
0.00	90.00	18	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	T-MOBILE
75.00	87.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	120	0.00	Y	
75.00	87.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	300	0.00	Y	
75.00	87.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	30	0.00	Y	
75.00	87.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	210	0.00	Y	
0.00	81.00	1	#20 DYWIDAG	4.00	0.00	N	1	0.00	0.00	90	0.00	Y	
0.00	81.00	1	#20 DYWIDAG	4.00	0.00	N	1	0.00	0.00	270	0.00	Y	
0.00	81.00	1	#20 DYWIDAG	4.00	0.00	N	1	0.00	0.00	180	0.00	Y	
0.00	81.00	1	#20 DYWIDAG	4.00	0.00	N	1	0.00	0.00	0	0.00	Y	
0.00	80.00	12	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	VERIZON WIRELESS
0.00	80.00	2	1 5/8" Hybriflex	1.98	1.30	N	2	0.25	0.25	65	0.50	Y	VERIZON WIRELESS
20.00	80.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	120	0.00	Y	
20.00	80.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	300	0.00	Y	
20.00	80.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	30	0.00	Y	
20.00	80.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	210	0.00	Y	
0.00	77.00	1	7/8" Coax	1.09	0.33	N	1	0.00	0.00	79	0.50	Y	TOWN OF WEST
0.00	70.00	6	1 5/8" Coax	1.98	0.82	N	3	0.50	0.50	310	0.50	Y	METRO PCS INC
0.00	60.00	2	0.41" (10.3mm) LMR-	0.41	0.07	N	2	0.25	0.25	73	0.50	Y	TOWN OF WEST
0.00	60.00	1	1/4" Coax	0.34	0.06	N	1	0.00	0.00	66	0.50	Y	TOWN OF WEST

0.00	60.00	1	7/8" Coax	1.09	0.33	N	1	0.00	0.00	69	0.50	Y	TOWN OF WEST
0.00	20.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	120	0.00	Y	
0.00	20.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	300	0.00	Y	
0.00	20.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	30	0.00	Y	
0.00	20.00	1	1.25" Thick Flat Plate	1.25	0.00	Y	1	0.00	0.00	210	0.00	Y	

Additional Steel

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Offset (in)	Intermediate Connections Description	Spacing (in)	Len (in)	Connectors	Continuation?
0.00	12.00	4	SOL #20 All Thread	80	2.31	6" Angle Bracket	39.0	3.31	5/8" A36 U-Bolt	No
0.00	18.00	4	PL PL 6 x 1.25	65	0.00	AJAX M20 Class	24.0	3.00	AJAX M20 Class	No
12.00	47.50	4	SOL #20 All Thread	80	2.31	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	Yes
18.00	77.00	4	PL PL 6 x 1.25	65	0.00	AJAX M20 Class	24.0	0.00	AJAX M20 Class	Yes
47.50	67.50	4	SOL #20 All Thread	80	2.31	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	Yes
67.50	77.04	4	SOL #20 All Thread	80	2.31	6" Angle Bracket	30.0	3.31	5/8" A36 U-Bolt	Yes
77.00	85.00	4	PL PL 5" x 1.25"	65	0.00	AJAX M20 Class	24.0	3.00	AJAX M20 Class	No
85.00	93.00	4	PL PL 5" x 1.25"	65	0.00	AJAX M20 Class	24.0	3.00	AJAX M20 Class	Yes

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)	Additional Reinforcing Area (in^2)	Additional Reinforcing Ix (in^4)	Additional Reinforcing Weight (lb)
0.00		0.2500	30.000	23.949	2,705.5	29.47	120.00	72.6	174.2	0.0	0.0	49.64	7,171	0.0
5.00		0.2500	29.181	23.290	2,488.2	28.60	116.72	73.5	164.7	0.0	401.9	49.64	6,828	844.0
10.00		0.2500	28.362	22.631	2,282.9	27.72	113.45	74.5	155.5	0.0	390.6	49.64	6,492	844.0
12.00	Reinf. Top Reinf	0.2500	28.035	22.367	2,204.0	27.37	112.14	74.9	151.9	0.0	153.1	49.64	6,361	337.6
15.00		0.2500	27.544	21.971	2,089.2	26.84	110.18	75.4	146.5	0.0	226.3	49.64	6,166	506.4
18.00	Reinf. Top Reinf	0.2500	27.052	21.576	1,978.4	26.32	108.21	76.0	141.3	0.0	222.3	49.64	5,974	506.4
20.00		0.2500	26.725	21.312	1,906.7	25.96	106.90	76.4	137.8	0.0	145.9	49.64	5,848	337.6
25.00		0.2500	25.906	20.653	1,735.2	25.09	103.63	77.4	129.4	0.0	357.0	49.64	5,538	844.0
29.33	Bot - Section 2	0.2500	25.197	20.083	1,595.3	24.33	100.79	78.2	122.3	0.0	300.1	49.64	5,277	730.9
30.00		0.2500	25.087	19.994	1,574.4	24.21	100.35	78.3	121.2	0.0	92.3	49.64	5,420	113.1
32.83	Top - Section 1	0.2500	25.124	20.024	1,581.3	24.25	100.50	62.7	121.6	0.0	385.4	49.64	5,250	477.7
35.00		0.2500	24.769	19.738	1,514.5	23.87	99.07	63.0	118.1	0.0	146.8	49.64	5,122	366.3
40.00		0.2500	23.950	19.078	1,367.8	22.99	95.80	63.0	110.3	0.0	330.2	49.64	4,833	844.0
45.00		0.2500	23.131	18.419	1,230.9	22.11	92.53	63.0	102.8	0.0	319.0	49.64	4,553	844.0
47.50	Reinf. Top Reinf	0.2500	22.722	18.090	1,166.0	21.67	90.89	63.0	99.1	0.0	155.3	49.64	4,416	422.0
50.00		0.2500	22.313	17.760	1,103.4	21.23	89.25	63.0	95.5	0.0	152.5	49.64	4,281	422.0
55.00		0.2500	21.494	17.101	985.1	20.36	85.97	63.0	88.5	0.0	296.6	49.64	4,017	844.0
60.00		0.2500	20.675	16.442	875.5	19.48	82.70	63.0	81.8	0.0	285.4	49.64	3,762	844.0
62.92	Bot - Section 3	0.2500	20.197	16.058	815.5	18.97	80.79	63.0	78.0	0.0	161.3	49.64	3,618	492.3
65.00		0.2500	19.856	15.783	774.4	18.60	79.43	63.0	75.3	0.0	199.4	49.64	3,628	351.7
65.75	Top - Section 2	0.1875	20.108	12.027	609.2	26.06	107.25	61.4	58.5	0.0	70.9	49.64	3,591	126.6
67.50	Reinf. Top Reinf	0.1875	19.822	11.854	583.3	25.65	105.72	61.7	56.8	0.0	71.1	49.64	3,506	295.4
70.00		0.1875	19.413	11.607	547.6	25.06	103.53	62.1	54.5	0.0	99.8	49.64	3,386	422.0
75.00		0.1875	18.594	11.113	480.6	23.89	99.17	63.0	49.9	0.0	193.3	49.64	3,153	844.0
77.00	Reinf. Top Reinf	0.1875	18.266	10.915	455.4	23.42	97.42	63.0	48.2	0.0	75.0	49.64	3,111	643.6
77.04	Reinf. Top	0.1875	18.259	10.911	454.8	23.41	97.38	63.0	48.1	0.0	1.5	44.64	2,803	6.3
80.00		0.1875	17.775	10.618	419.2	22.72	94.80	63.0	45.6	0.0	108.4	25.00	1,158	252.1
85.00	Reinf. Top Reinf	0.1875	16.956	10.124	363.4	21.55	90.43	63.0	41.4	0.0	176.5	25.00	1,063	426.0
90.00		0.1875	16.138	9.630	312.7	20.38	86.07	63.0	37.4	0.0	168.0	25.00	972.4	426.0
93.00	Reinf. Top	0.1875	15.646	9.333	284.7	19.68	83.45	63.0	35.2	0.0	96.8	25.00	919.8	255.6
95.00		0.1875	15.319	9.135	267.0	19.21	81.70	63.0	33.7	0.0	62.8			
100.0	Top - Section 3	0.1875	14.500	8.641	225.9	18.04	77.33	63.0	30.1	0.0	151.2			
100.0	Bot - Section 4	0.3750	12.750	14.579	279.3	0.00	34.00	35.0	43.8	57.4				
102.0		0.3750	12.750	14.579	279.3	0.00	34.00	35.0	43.8	57.4	99.2			
105.0		0.3750	12.750	14.579	279.3	0.00	34.00	35.0	43.8	57.4	148.8			
110.0		0.3750	12.750	14.579	279.3	0.00	34.00	35.0	43.8	57.4	248.0			
											6,492.7			14,669.

Site Number: 302481 Code: ANSI/TIA-222-H

Site Name: Hrfr - South, CT Engineering Number: 13251341_C4_07 9/30/2020 11:38:04 AM

Customer: T-MOBILE

Load Case: 1.2D + 1.0W 112 mph with No Ice 22 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 1.20
Wind Load Factor : 1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		475.2	0.0					0.0	0.0	475.2	0.0	0.0	0.0
5.00		919.7	482.2					215.6	1,469.8	1,135.4	1,952.0	0.0	0.0
10.00		614.3	468.8					209.8	1,469.8	824.1	1,938.5	0.0	0.0
12.00	Reinf. Top Reinf	416.1	183.7					82.3	587.9	498.4	771.6	0.0	0.0
15.00		483.1	271.6					121.9	881.9	605.0	1,153.4	0.0	0.0
18.00	Reinf. Top Reinf	389.5	266.7					120.1	881.9	509.7	1,148.6	0.0	0.0
20.00		517.4	175.1					79.2	587.9	596.6	763.0	0.0	0.0
25.00		661.8	428.4					194.7	1,469.8	856.5	1,898.2	0.0	0.0
29.33	Bot - Section 2	342.5	360.1					165.1	1,272.8	507.5	1,632.9	0.0	0.0
30.00		235.4	110.8					25.3	197.0	260.6	307.7	0.0	0.0
32.83	Top - Section 1	334.2	462.4					107.0	831.9	441.2	1,294.3	0.0	0.0
35.00		470.6	176.2					82.4	637.9	552.9	814.1	0.0	0.0
40.00		643.4	396.2					191.1	1,469.8	834.5	1,866.0	0.0	0.0
45.00		471.7	382.8					192.4	1,469.8	664.2	1,852.5	0.0	0.0
47.50	Reinf. Top Reinf	306.7	186.3					96.6	734.9	403.3	921.2	0.0	0.0
50.00		447.7	183.0					96.8	734.9	544.5	917.9	0.0	0.0
55.00		579.9	355.9					193.9	1,469.8	773.9	1,825.6	0.0	0.0
60.00	Appurtenance(s)	444.6	342.4	641.2	0.0	0.0	191.6	194.3	1,469.8	1,280.1	2,003.8	0.0	0.0
62.92	Bot - Section 3	274.6	193.5					113.4	855.5	388.0	1,049.0	0.0	0.0
65.00		154.8	239.3					81.0	611.1	235.8	850.4	0.0	0.0
65.75	Top - Section 2	134.3	85.1					29.2	220.0	163.5	305.1	0.0	0.0
67.50	Reinf. Top Reinf	225.0	85.3					68.0	513.3	293.0	598.7	0.0	0.0
70.00	Appurtenance(s)	384.9	119.8	850.5	0.0	0.0	455.0	97.1	733.3	1,332.5	1,308.1	0.0	0.0
75.00		351.7	231.9					190.2	1,437.1	541.9	1,669.0	0.0	0.0
77.00	Reinf. Top Reinf	100.1	89.9	358.4	0.0	-203.4	206.0	76.0	942.0	534.5	1,238.0	0.0	0.0
77.04	Reinf. Top	143.5	1.9					1.6	11.1	145.1	13.0	0.0	0.0
80.00	Appurtenance(s)	371.1	130.0	3,233.5	0.0	0.0	3,061.3	112.2	552.3	3,716.8	3,743.7	0.0	0.0
85.00	Reinf. Top Reinf	435.9	211.7					181.7	858.8	617.6	1,070.6	0.0	0.0
90.00	Appurtenance(s)	330.3	201.7	4,675.0	0.0	-1,191.8	4,910.8	12.6	858.8	5,017.8	5,971.3	0.0	0.0
93.00	Reinf. Top	206.8	116.1					7.5	447.0	214.3	563.2	0.0	0.0
95.00		290.3	75.4					5.0	93.6	295.3	169.0	0.0	0.0
100.00	Top - Section 3	256.1	181.5					12.5	233.9	268.6	415.4	0.0	0.0
102.00	Appurtenance(s)	121.3	119.1	6,112.5	0.0	-5,448.1	5,184.1	4.9	93.6	6,238.7	5,396.7	0.0	0.0
105.00		193.4	178.6					0.0	15.8	193.4	194.4	0.0	0.0
110.00	Appurtenance(s)	120.7	297.7	1,746.5	0.0	0.0	1,083.4	0.0	26.4	1,867.2	1,407.4	0.0	0.0
								Totals:		33,827.4	49,024.1	0.00	0.00

Site Number: 302481 Code: ANSI/TIA-222-H

Site Name: Hrfr - South, CT Engineering Number: 13251341_C4_07 9/30/2020 11:38:11 AM

Customer: T-MOBILE

Load Case: 1.2D + 1.0W 112 mph with No Ice 22 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 1.20
Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-48.92	-33.51	0.00	-2,469.70	0.00	2,469.70	1,564.13	420.30	1,179.53	948.21	0.00	0.00	0.730
5.00	-46.78	-32.64	0.00	-2,302.18	0.00	2,302.18	1,541.15	408.73	1,115.51	908.35	0.19	-0.34	0.693
10.00	-44.72	-31.99	0.00	-2,138.97	0.00	2,138.97	1,517.03	397.17	1,053.29	868.61	0.73	-0.68	0.656
12.00	-43.86	-31.61	0.00	-2,075.00	0.00	2,075.00	1,507.06	392.54	1,028.90	852.76	1.05	-0.82	0.642
12.00	-43.86	-31.61	0.00	-2,075.00	0.00	2,075.00	1,507.06	392.54	1,028.90	852.76	1.05	-0.82	0.642
15.00	-42.60	-31.13	0.00	-1,980.18	0.00	1,980.18	1,491.77	385.60	992.85	829.06	1.63	-1.02	0.620
18.00	-41.38	-30.72	0.00	-1,886.78	0.00	1,886.78	1,476.07	378.66	957.44	805.43	2.34	-1.22	0.598
18.00	-41.38	-30.72	0.00	-1,886.78	0.00	1,886.78	1,476.07	378.66	957.44	805.43	2.34	-1.22	0.598
20.00	-40.51	-30.27	0.00	-1,825.34	0.00	1,825.34	1,465.38	374.03	934.19	789.74	2.88	-1.35	0.583
25.00	-38.48	-29.56	0.00	-1,673.99	0.00	1,673.99	1,437.85	362.47	877.32	750.71	4.48	-1.68	0.546
29.33	-36.78	-29.10	0.00	-1,545.99	0.00	1,545.99	1,413.10	352.45	829.52	717.20	6.13	-1.95	0.515
30.00	-36.43	-28.90	0.00	-1,526.49	0.00	1,526.49	1,409.19	350.90	822.24	712.04	6.40	-1.99	0.497
32.83	-35.08	-28.50	0.00	-1,444.71	0.00	1,444.71	1,130.07	270.32	634.36	571.86	7.64	-2.16	0.605
35.00	-34.19	-28.04	0.00	-1,382.85	0.00	1,382.85	1,119.12	266.46	616.37	558.15	8.65	-2.29	0.585
40.00	-32.23	-27.29	0.00	-1,242.63	0.00	1,242.63	1,081.75	257.56	575.90	521.31	11.21	-2.57	0.545
45.00	-30.32	-26.64	0.00	-1,106.20	0.00	1,106.20	1,044.38	248.66	536.82	485.73	14.05	-2.84	0.504
47.50	-29.36	-26.26	0.00	-1,039.60	0.00	1,039.60	1,025.69	244.21	517.79	468.42	15.57	-2.97	0.483
47.50	-29.36	-26.26	0.00	-1,039.60	0.00	1,039.60	1,025.69	244.21	517.79	468.42	15.57	-2.97	0.483
50.00	-28.39	-25.76	0.00	-973.95	0.00	973.95	1,007.01	239.76	499.10	451.41	17.17	-3.10	0.461
55.00	-26.51	-24.99	0.00	-845.17	0.00	845.17	969.64	230.87	462.76	418.35	20.55	-3.34	0.417
60.00	-24.51	-23.66	0.00	-720.22	0.00	720.22	932.27	221.97	427.79	386.54	24.17	-3.56	0.370
62.92	-23.45	-23.25	0.00	-651.20	0.00	651.20	910.47	216.78	408.02	368.57	26.39	-3.69	0.343
65.00	-22.59	-22.98	0.00	-602.76	0.00	602.76	894.90	213.07	394.19	355.99	28.02	-3.77	0.316
65.75	-22.28	-22.82	0.00	-585.52	0.00	585.52	664.38	162.37	305.14	269.42	28.61	-3.80	0.341
67.50	-21.67	-22.52	0.00	-545.59	0.00	545.59	658.03	160.03	296.43	262.98	30.02	-3.86	0.322
67.50	-21.67	-22.52	0.00	-545.59	0.00	545.59	658.03	160.03	296.43	262.98	30.02	-3.86	0.322
70.00	-20.41	-21.14	0.00	-489.30	0.00	489.30	648.81	156.70	284.20	253.83	32.07	-3.95	0.292
75.00	-18.75	-20.52	0.00	-383.58	0.00	383.58	629.79	150.02	260.52	235.80	36.30	-4.11	0.239
77.00	-17.54	-19.91	0.00	-342.54	0.00	342.54	618.88	147.35	251.33	227.55	38.03	-4.17	0.216
77.00	-17.54	-19.91	0.00	-342.54	0.00	342.54	618.88	147.35	251.33	227.55	38.03	-4.17	0.234
77.04	-17.52	-19.77	0.00	-341.72	0.00	341.72	618.65	147.30	251.14	227.38	38.07	-4.17	0.233
77.04	-17.52	-19.77	0.00	-341.72	0.00	341.72	618.65	147.30	251.14	227.38	38.07	-4.17	0.435
80.00	-14.02	-15.83	0.00	-283.22	0.00	283.22	602.07	143.35	237.86	215.29	40.68	-4.25	0.369
85.00	-12.95	-15.17	0.00	-204.08	0.00	204.08	574.04	136.68	216.24	195.61	45.26	-4.47	0.285
85.00	-12.95	-15.17	0.00	-204.08	0.00	204.08	574.04	136.68	216.24	195.61	45.26	-4.47	0.285
90.00	-7.38	-9.71	0.00	-128.22	0.00	128.22	546.01	130.00	195.65	176.87	50.03	-4.64	0.186
93.00	-6.82	-9.46	0.00	-99.08	0.00	99.08	529.19	126.00	183.79	166.09	52.97	-4.71	0.150
93.00	-6.82	-9.46	0.00	-99.08	0.00	99.08	529.19	126.00	183.79	166.09	52.97	-4.71	0.615
95.00	-6.65	-9.17	0.00	-80.16	0.00	80.16	517.98	123.33	176.08	159.08	54.95	-4.75	0.522
100.00	-6.23	-8.89	0.00	-34.30	0.00	34.30	489.95	116.66	157.55	142.23	60.11	-5.06	0.260
100.00	-6.23	-8.89	0.00	-34.30	0.00	34.30	459.24	137.77	149.89	150.79	60.11	-5.06	0.245
102.00	-1.41	-2.20	0.00	-16.52	0.00	16.52	459.24	137.77	149.89	150.79	62.24	-5.12	0.113
105.00	-1.23	-1.99	0.00	-9.93	0.00	9.93	459.24	137.77	149.89	150.79	65.47	-5.16	0.069

Site Number:	302481	Code: ANSI/TIA-222-H	
Site Name:	Hrfr - South, CT	Engineering Number: 13251341_C4_07	9/30/2020 11:38:11 AM
Customer:	T-MOBILE		

Load Case: 1.2D + 1.0W — 112 mph with No Ice — 22 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 1.20
Wind Load Factor : 1.00

110.00	0.00	-1.87	0.00	0.00	0.00	0.00	459.24	137.77	149.89	150.79	70.89	-5.19	0.000

Site Number: 302481 Code: ANSI/TIA-222-H

Site Name: Hrfr - South, CT Engineering Number: 13251341_C4_07 9/30/2020 11:38:11 AM

Customer: T-MOBILE

Load Case: 0.9D + 1.0W 112 mph with No Ice (Reduced DL) 22 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 0.90
Wind Load Factor : 1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		475.2	0.0					0.0	0.0	475.2	0.0	0.0	0.0
5.00		919.7	361.7					215.6	1,102.3	1,135.4	1,464.0	0.0	0.0
10.00		614.3	351.6					209.8	1,102.3	824.1	1,453.9	0.0	0.0
12.00	Reinf. Top Reinf	416.1	137.8					82.3	440.9	498.4	578.7	0.0	0.0
15.00		483.1	203.7					121.9	661.4	605.0	865.1	0.0	0.0
18.00	Reinf. Top Reinf	389.5	200.0					120.1	661.4	509.7	861.4	0.0	0.0
20.00		517.4	131.3					79.2	440.9	596.6	572.3	0.0	0.0
25.00		661.8	321.3					194.7	1,102.3	856.5	1,423.6	0.0	0.0
29.33	Bot - Section 2	342.5	270.1					165.1	954.6	507.5	1,224.7	0.0	0.0
30.00		235.4	83.1					25.3	147.7	260.6	230.8	0.0	0.0
32.83	Top - Section 1	334.2	346.8					107.0	623.9	441.2	970.7	0.0	0.0
35.00		470.6	132.1					82.4	478.4	552.9	610.6	0.0	0.0
40.00		643.4	297.2					191.1	1,102.3	834.5	1,399.5	0.0	0.0
45.00		471.7	287.1					192.4	1,102.3	664.2	1,389.4	0.0	0.0
47.50	Reinf. Top Reinf	306.7	139.8					96.6	551.2	403.3	690.9	0.0	0.0
50.00		447.7	137.2					96.8	551.2	544.5	688.4	0.0	0.0
55.00		579.9	266.9					193.9	1,102.3	773.9	1,369.2	0.0	0.0
60.00	Appurtenance(s)	444.6	256.8	641.2	0.0	0.0	143.7	194.3	1,102.3	1,280.1	1,502.9	0.0	0.0
62.92	Bot - Section 3	274.6	145.1					113.4	641.6	388.0	786.7	0.0	0.0
65.00		154.8	179.5					81.0	458.3	235.8	637.8	0.0	0.0
65.75	Top - Section 2	134.3	63.8					29.2	165.0	163.5	228.8	0.0	0.0
67.50	Reinf. Top Reinf	225.0	64.0					68.0	385.0	293.0	449.0	0.0	0.0
70.00	Appurtenance(s)	384.9	89.8	850.5	0.0	0.0	341.3	97.1	550.0	1,332.5	981.1	0.0	0.0
75.00		351.7	173.9					190.2	1,077.8	541.9	1,251.7	0.0	0.0
77.00	Reinf. Top Reinf	100.1	67.5	358.4	0.0	-203.4	154.5	76.0	706.5	534.5	928.5	0.0	0.0
77.04	Reinf. Top	143.5	1.4					1.6	8.3	145.1	9.7	0.0	0.0
80.00	Appurtenance(s)	371.1	97.5	3,233.5	0.0	0.0	2,296.0	112.2	414.2	3,716.8	2,807.8	0.0	0.0
85.00	Reinf. Top Reinf	435.9	158.8					181.7	644.1	617.6	802.9	0.0	0.0
90.00	Appurtenance(s)	330.3	151.2	4,675.0	0.0	-1,191.8	3,683.1	12.6	644.1	5,017.8	4,478.4	0.0	0.0
93.00	Reinf. Top	206.8	87.1					7.5	335.3	214.3	422.4	0.0	0.0
95.00		290.3	56.6					5.0	70.2	295.3	126.7	0.0	0.0
100.00	Top - Section 3	256.1	136.1					12.5	175.4	268.6	311.5	0.0	0.0
102.00	Appurtenance(s)	121.3	89.3	6,112.5	0.0	-5,448.1	3,888.1	4.9	70.2	6,238.7	4,047.6	0.0	0.0
105.00		193.4	133.9					0.0	11.9	193.4	145.8	0.0	0.0
110.00	Appurtenance(s)	120.7	223.2	1,746.5	0.0	0.0	812.5	0.0	19.8	1,867.2	1,055.6	0.0	0.0
								Totals:		33,827.4	36,768.1	0.00	0.00

Site Number: 302481 Code: ANSI/TIA-222-H

Site Name: Hrfr - South, CT Engineering Number: 13251341_C4_07 9/30/2020 11:38:17 AM

Customer: T-MOBILE

Load Case: 0.9D + 1.0W 112 mph with No Ice (Reduced DL) 22 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 0.90
Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-36.66	-33.47	0.00	-2,438.17	0.00	2,438.17	1,564.13	420.30	1,179.53	948.21	0.00	0.00	0.718
5.00	-35.01	-32.53	0.00	-2,270.85	0.00	2,270.85	1,541.15	408.73	1,115.51	908.35	0.19	-0.34	0.681
10.00	-33.44	-31.83	0.00	-2,108.19	0.00	2,108.19	1,517.03	397.17	1,053.29	868.61	0.72	-0.67	0.645
12.00	-32.77	-31.42	0.00	-2,044.53	0.00	2,044.53	1,507.06	392.54	1,028.90	852.76	1.04	-0.81	0.630
12.00	-32.77	-31.42	0.00	-2,044.53	0.00	2,044.53	1,507.06	392.54	1,028.90	852.76	1.04	-0.81	0.630
15.00	-31.81	-30.91	0.00	-1,950.27	0.00	1,950.27	1,491.77	385.60	992.85	829.06	1.61	-1.01	0.608
18.00	-30.87	-30.47	0.00	-1,857.54	0.00	1,857.54	1,476.07	378.66	957.44	805.43	2.31	-1.20	0.587
18.00	-30.87	-30.47	0.00	-1,857.54	0.00	1,857.54	1,476.07	378.66	957.44	805.43	2.31	-1.20	0.587
20.00	-30.20	-29.98	0.00	-1,796.59	0.00	1,796.59	1,465.38	374.03	934.19	789.74	2.84	-1.33	0.572
25.00	-28.65	-29.24	0.00	-1,646.67	0.00	1,646.67	1,437.85	362.47	877.32	750.71	4.41	-1.65	0.536
29.33	-27.36	-28.76	0.00	-1,520.09	0.00	1,520.09	1,413.10	352.45	829.52	717.20	6.04	-1.92	0.504
30.00	-27.09	-28.55	0.00	-1,500.81	0.00	1,500.81	1,409.19	350.90	822.24	712.04	6.31	-1.96	0.487
32.83	-26.06	-28.14	0.00	-1,420.03	0.00	1,420.03	1,130.07	270.32	634.36	571.86	7.53	-2.13	0.592
35.00	-25.38	-27.65	0.00	-1,358.97	0.00	1,358.97	1,119.12	266.46	616.37	558.15	8.53	-2.26	0.573
40.00	-23.89	-26.87	0.00	-1,220.71	0.00	1,220.71	1,081.75	257.56	575.90	521.31	11.04	-2.53	0.533
45.00	-22.44	-26.22	0.00	-1,086.35	0.00	1,086.35	1,044.38	248.66	536.82	485.73	13.84	-2.80	0.493
47.50	-21.71	-25.83	0.00	-1,020.80	0.00	1,020.80	1,025.69	244.21	517.79	468.42	15.34	-2.93	0.472
47.50	-21.71	-25.83	0.00	-1,020.80	0.00	1,020.80	1,025.69	244.21	517.79	468.42	15.34	-2.93	0.472
50.00	-20.97	-25.32	0.00	-956.22	0.00	956.22	1,007.01	239.76	499.10	451.41	16.91	-3.05	0.451
55.00	-19.55	-24.55	0.00	-829.63	0.00	829.63	969.64	230.87	462.76	418.35	20.23	-3.29	0.407
60.00	-18.06	-23.23	0.00	-706.88	0.00	706.88	932.27	221.97	427.79	386.54	23.80	-3.51	0.361
62.92	-17.26	-22.83	0.00	-639.12	0.00	639.12	910.47	216.78	408.02	368.57	25.98	-3.63	0.335
65.00	-16.61	-22.57	0.00	-591.56	0.00	591.56	894.90	213.07	394.19	355.99	27.58	-3.71	0.308
65.75	-16.38	-22.40	0.00	-574.64	0.00	574.64	664.38	162.37	305.14	269.42	28.17	-3.74	0.333
67.50	-15.92	-22.10	0.00	-535.43	0.00	535.43	658.03	160.03	296.43	262.98	29.55	-3.80	0.314
67.50	-15.92	-22.10	0.00	-535.43	0.00	535.43	658.03	160.03	296.43	262.98	29.55	-3.80	0.314
70.00	-14.99	-20.74	0.00	-480.17	0.00	480.17	648.81	156.70	284.20	253.83	31.57	-3.89	0.285
75.00	-13.74	-20.14	0.00	-376.47	0.00	376.47	629.79	150.02	260.52	235.80	35.73	-4.04	0.233
77.00	-12.84	-19.54	0.00	-336.19	0.00	336.19	618.88	147.35	251.33	227.55	37.44	-4.10	0.210
77.00	-12.84	-19.54	0.00	-336.19	0.00	336.19	618.88	147.35	251.33	227.55	37.44	-4.10	0.228
77.04	-12.83	-19.41	0.00	-335.38	0.00	335.38	618.65	147.30	251.14	227.38	37.47	-4.10	0.227
77.04	-12.83	-19.41	0.00	-335.38	0.00	335.38	618.65	147.30	251.14	227.38	37.47	-4.10	0.425
80.00	-10.26	-15.53	0.00	-277.96	0.00	277.96	602.07	143.35	237.86	215.29	40.04	-4.18	0.360
85.00	-9.45	-14.88	0.00	-200.34	0.00	200.34	574.04	136.68	216.24	195.61	44.54	-4.40	0.277
85.00	-9.45	-14.88	0.00	-200.34	0.00	200.34	574.04	136.68	216.24	195.61	44.54	-4.40	0.277
90.00	-5.36	-9.54	0.00	-125.93	0.00	125.93	546.01	130.00	195.65	176.87	49.24	-4.56	0.181
93.00	-4.95	-9.30	0.00	-97.32	0.00	97.32	529.19	126.00	183.79	166.09	52.12	-4.63	0.146
93.00	-4.95	-9.30	0.00	-97.32	0.00	97.32	529.19	126.00	183.79	166.09	52.12	-4.63	0.601
95.00	-4.82	-9.01	0.00	-78.73	0.00	78.73	517.98	123.33	176.08	159.08	54.07	-4.67	0.510
100.00	-4.50	-8.73	0.00	-33.69	0.00	33.69	489.95	116.66	157.55	142.23	59.14	-4.97	0.252
100.00	-4.50	-8.73	0.00	-33.69	0.00	33.69	459.24	137.77	149.89	150.79	59.14	-4.97	0.237
102.00	-1.01	-2.16	0.00	-16.24	0.00	16.24	459.24	137.77	149.89	150.79	61.24	-5.04	0.110
105.00	-0.89	-1.95	0.00	-9.77	0.00	9.77	459.24	137.77	149.89	150.79	64.42	-5.08	0.067

Site Number:	302481	Code: ANSI/TIA-222-H	
Site Name:	Hrfr - South, CT	Engineering Number: 13251341_C4_07	9/30/2020 11:38:18 AM
Customer:	T-MOBILE		

Load Case: 0.9D + 1.0W — 112 mph with No Ice (Reduced DL) — 22 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 0.90
Wind Load Factor : 1.00

110.00	0.00	-1.87	0.00	0.00	0.00	0.00	459.24	137.77	149.89	150.79	69.74	-5.10	0.000

Site Number: 302481 Code: ANSI/TIA-222-H

Site Name: Hrfr - South, CT Engineering Number: 13251341_C4_07 9/30/2020 11:38:18 AM

Customer: T-MOBILE

Load Case: 1.2D + 1.0Di + 1.0Wi 49 mph with 1.27 in Radial Ice 21 Iterations

Gust Response Factor : 1.10 Ice Dead Load Factor : 1.00

Dead Load Factor : 1.20 Ice Importance Factor : 1.00

Wind Load Factor : 1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		104.0	0.0					0.0	0.0	104.0	0.0	0.0	0.0
5.00		203.0	756.8					30.4	1,833.8	233.3	2,590.6	0.0	0.0
10.00		137.2	764.3					70.8	1,875.8	208.0	2,640.1	0.0	0.0
12.00	Reinf. Top Reinf	93.9	304.3					28.3	755.9	122.2	1,060.1	0.0	0.0
15.00		109.8	452.0					42.2	1,137.9	152.0	1,590.0	0.0	0.0
18.00	Reinf. Top Reinf	89.1	446.5					42.0	1,141.7	131.0	1,588.2	0.0	0.0
20.00		119.5	294.6					33.9	762.7	153.4	1,057.3	0.0	0.0
25.00		154.1	721.0					95.0	1,911.1	249.1	2,632.1	0.0	0.0
29.33	Bot - Section 2	80.3	609.0					88.5	1,658.4	168.8	2,267.4	0.0	0.0
30.00		55.6	150.0					14.0	256.9	69.7	406.8	0.0	0.0
32.83	Top - Section 1	79.1	625.5					61.0	1,085.3	140.1	1,710.8	0.0	0.0
35.00		112.2	299.8					46.8	832.7	159.0	1,132.5	0.0	0.0
40.00		154.9	672.9					113.4	1,919.8	268.4	2,592.7	0.0	0.0
45.00		114.8	651.1					120.0	1,920.7	234.9	2,571.8	0.0	0.0
47.50	Reinf. Top Reinf	75.5	318.4					62.1	960.6	137.6	1,278.9	0.0	0.0
50.00		111.5	312.8					63.3	960.6	174.9	1,273.4	0.0	0.0
55.00		146.2	606.6					130.0	1,921.2	276.2	2,527.8	0.0	0.0
60.00	Appurtenance(s)	113.6	584.2	164.8	0.0	0.0	417.6	133.8	1,920.9	412.3	2,922.7	0.0	0.0
62.92	Bot - Section 3	71.0	331.4					79.6	1,099.1	150.6	1,430.5	0.0	0.0
65.00		40.2	337.9					60.9	785.0	101.1	1,122.9	0.0	0.0
65.75	Top - Section 2	35.0	120.4					22.1	282.5	57.1	402.9	0.0	0.0
67.50	Reinf. Top Reinf	58.9	166.5					51.1	659.3	110.1	825.8	0.0	0.0
70.00	Appurtenance(s)	101.8	233.5	236.2	0.0	0.0	800.7	73.8	941.7	411.8	1,975.8	0.0	0.0
75.00		93.4	450.3					119.4	1,766.8	212.8	2,217.1	0.0	0.0
77.00	Reinf. Top Reinf	26.7	175.8	94.5	0.0	-55.7	344.4	48.9	1,090.7	170.1	1,610.8	0.0	0.0
77.04	Reinf. Top	38.4	3.6					1.0	14.1	39.4	17.7	0.0	0.0
80.00	Appurtenance(s)	99.5	253.7	921.6	0.0	0.0	5,245.9	73.5	766.2	1,094.6	6,265.8	0.0	0.0
85.00	Reinf. Top Reinf	110.8	411.7					62.0	1,057.7	172.9	1,469.4	0.0	0.0
90.00	Appurtenance(s)	77.5	392.4	1,217.2	0.0	-297.5	14,185.3	50.0	1,037.7	1,344.7	15,615.4	0.0	0.0
93.00	Reinf. Top	46.8	227.3					30.6	554.2	77.4	781.4	0.0	0.0
95.00		63.0	148.0					20.7	164.9	83.7	312.9	0.0	0.0
100.00	Top - Section 3	59.8	353.9					52.5	386.8	112.3	740.7	0.0	0.0
102.00	Appurtenance(s)	38.0	177.1	1,632.7	0.0	-1,358.2	9,942.2	34.9	147.9	1,705.5	10,267.3	0.0	0.0
105.00		60.5	265.6					8.9	40.7	69.5	306.3	0.0	0.0
110.00	Appurtenance(s)	37.8	442.4	446.0	0.0	0.0	2,125.0	14.8	67.7	498.6	2,635.1	0.0	0.0
									Totals:	9,806.69	79,841.1	0.00	0.00

Site Number: 302481 Code: ANSI/TIA-222-H

Site Name: Hrfr - South, CT Engineering Number: 13251341_C4_07 9/30/2020 11:38:24 AM

Customer: T-MOBILE

Load Case: 1.2D + 1.0Di + 1.0Wi 49 mph with 1.27 in Radial Ice 21 Iterations

Gust Response Factor : 1.10 Ice Dead Load Factor : 1.00

Dead Load Factor : 1.20 Ice Importance Factor : 1.00

Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-79.83	-9.78	0.00	-754.10	0.00	754.10	1,564.13	420.30	1,179.53	948.21	0.00	0.00	0.235
5.00	-77.22	-9.68	0.00	-705.21	0.00	705.21	1,541.15	408.73	1,115.51	908.35	0.06	-0.11	0.224
10.00	-74.57	-9.56	0.00	-656.80	0.00	656.80	1,517.03	397.17	1,053.29	868.61	0.22	-0.21	0.213
12.00	-73.50	-9.50	0.00	-637.67	0.00	637.67	1,507.06	392.54	1,028.90	852.76	0.32	-0.25	0.208
12.00	-73.50	-9.50	0.00	-637.67	0.00	637.67	1,507.06	392.54	1,028.90	852.76	0.32	-0.25	0.208
15.00	-71.90	-9.42	0.00	-609.16	0.00	609.16	1,491.77	385.60	992.85	829.06	0.50	-0.31	0.201
18.00	-70.31	-9.34	0.00	-580.90	0.00	580.90	1,476.07	378.66	957.44	805.43	0.72	-0.37	0.194
18.00	-70.31	-9.34	0.00	-580.90	0.00	580.90	1,476.07	378.66	957.44	805.43	0.72	-0.37	0.194
20.00	-69.24	-9.27	0.00	-562.22	0.00	562.22	1,465.38	374.03	934.19	789.74	0.88	-0.42	0.190
25.00	-66.60	-9.10	0.00	-515.88	0.00	515.88	1,437.85	362.47	877.32	750.71	1.37	-0.51	0.178
29.33	-64.32	-8.97	0.00	-476.47	0.00	476.47	1,413.10	352.45	829.52	717.20	1.88	-0.60	0.168
30.00	-63.91	-8.93	0.00	-470.46	0.00	470.46	1,409.19	350.90	822.24	712.04	1.96	-0.61	0.162
32.83	-62.20	-8.82	0.00	-445.19	0.00	445.19	1,130.07	270.32	634.36	571.86	2.34	-0.66	0.197
35.00	-61.06	-8.72	0.00	-426.06	0.00	426.06	1,119.12	266.46	616.37	558.15	2.66	-0.70	0.191
40.00	-58.45	-8.50	0.00	-382.48	0.00	382.48	1,081.75	257.56	575.90	521.31	3.44	-0.79	0.178
45.00	-55.88	-8.29	0.00	-339.98	0.00	339.98	1,044.38	248.66	536.82	485.73	4.32	-0.87	0.165
47.50	-54.60	-8.17	0.00	-319.26	0.00	319.26	1,025.69	244.21	517.79	468.42	4.78	-0.91	0.158
47.50	-54.60	-8.17	0.00	-319.26	0.00	319.26	1,025.69	244.21	517.79	468.42	4.78	-0.91	0.158
50.00	-53.32	-8.03	0.00	-298.85	0.00	298.85	1,007.01	239.76	499.10	451.41	5.27	-0.95	0.151
55.00	-50.79	-7.77	0.00	-258.72	0.00	258.72	969.64	230.87	462.76	418.35	6.31	-1.03	0.136
60.00	-47.86	-7.35	0.00	-219.88	0.00	219.88	932.27	221.97	427.79	386.54	7.43	-1.10	0.121
62.92	-46.43	-7.19	0.00	-198.46	0.00	198.46	910.47	216.78	408.02	368.57	8.11	-1.13	0.113
65.00	-45.31	-7.08	0.00	-183.48	0.00	183.48	894.90	213.07	394.19	355.99	8.61	-1.16	0.104
65.75	-44.91	-7.03	0.00	-178.17	0.00	178.17	664.38	162.37	305.14	269.42	8.79	-1.17	0.111
67.50	-44.08	-6.92	0.00	-165.87	0.00	165.87	658.03	160.03	296.43	262.98	9.23	-1.19	0.105
67.50	-44.08	-6.92	0.00	-165.87	0.00	165.87	658.03	160.03	296.43	262.98	9.23	-1.19	0.105
70.00	-42.11	-6.49	0.00	-148.57	0.00	148.57	648.81	156.70	284.20	253.83	9.86	-1.21	0.095
75.00	-39.89	-6.26	0.00	-116.10	0.00	116.10	629.79	150.02	260.52	235.80	11.16	-1.26	0.078
77.00	-38.29	-6.06	0.00	-103.58	0.00	103.58	618.88	147.35	251.33	227.55	11.69	-1.28	0.071
77.00	-38.29	-6.06	0.00	-103.58	0.00	103.58	618.88	147.35	251.33	227.55	11.69	-1.28	0.077
77.04	-38.27	-6.02	0.00	-103.33	0.00	103.33	618.65	147.30	251.14	227.38	11.70	-1.28	0.077
77.04	-38.27	-6.02	0.00	-103.33	0.00	103.33	618.65	147.30	251.14	227.38	11.70	-1.28	0.144
80.00	-32.02	-4.81	0.00	-85.51	0.00	85.51	602.07	143.35	237.86	215.29	12.50	-1.30	0.123
85.00	-30.55	-4.64	0.00	-61.44	0.00	61.44	574.04	136.68	216.24	195.61	13.91	-1.37	0.096
85.00	-30.55	-4.64	0.00	-61.44	0.00	61.44	574.04	136.68	216.24	195.61	13.91	-1.37	0.096
90.00	-14.98	-2.92	0.00	-38.25	0.00	38.25	546.01	130.00	195.65	176.87	15.37	-1.42	0.061
93.00	-14.20	-2.83	0.00	-29.48	0.00	29.48	529.19	126.00	183.79	166.09	16.27	-1.44	0.050
93.00	-14.20	-2.83	0.00	-29.48	0.00	29.48	529.19	126.00	183.79	166.09	16.27	-1.44	0.205
95.00	-13.88	-2.75	0.00	-23.82	0.00	23.82	517.98	123.33	176.08	159.08	16.88	-1.45	0.177
100.00	-13.14	-2.63	0.00	-10.06	0.00	10.06	489.95	116.66	157.55	142.23	18.46	-1.55	0.098
100.00	-13.14	-2.63	0.00	-10.06	0.00	10.06	459.24	137.77	149.89	150.79	18.46	-1.55	0.096
102.00	-2.92	-0.65	0.00	-4.80	0.00	4.80	459.24	137.77	149.89	150.79	19.11	-1.56	0.038
105.00	-2.62	-0.57	0.00	-2.86	0.00	2.86	459.24	137.77	149.89	150.79	20.09	-1.58	0.025

Site Number:	302481	Code: ANSI/TIA-222-H	
Site Name:	Hrfr - South, CT	Engineering Number: 13251341_C4_07	9/30/2020 11:38:24 AM
Customer:	T-MOBILE		

Load Case: 1.2D + 1.0Di + 1.0Wi — 49 mph with 1.27 in Radial Ice — 21 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 1.20
Wind Load Factor : 1.00
Ice Dead Load Factor : 1.00
Ice Importance Factor : 1.00

110.00	0.00	-0.50	0.00	0.00	0.00	0.00	459.24	137.77	149.89	150.79	21.75	-1.58	0.000

Site Number: 302481 Code: ANSI/TIA-222-H

Site Name: Hrfr - South, CT Engineering Number: 13251341_C4_07 9/30/2020 11:38:24 AM

Customer: T-MOBILE

Load Case: 1.0D + 1.0W Serviceability 60 mph 21 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		121.7	0.0					0.0	0.0	121.7	0.0	0.0	0.0
5.00		235.6	401.9					63.6	1,224.8	299.2	1,626.7	0.0	0.0
10.00		157.4	390.6					61.2	1,224.8	218.5	1,615.4	0.0	0.0
12.00	Reinf. Top Reinf	106.6	153.1					23.8	489.9	130.4	643.0	0.0	0.0
15.00		123.8	226.3					35.1	734.9	158.9	961.2	0.0	0.0
18.00	Reinf. Top Reinf	99.8	222.3					34.3	734.9	134.1	957.2	0.0	0.0
20.00		132.6	145.9					22.5	489.9	155.1	635.9	0.0	0.0
25.00		169.5	357.0					54.9	1,224.8	224.4	1,581.8	0.0	0.0
29.33	Bot - Section 2	87.7	300.1					46.0	1,060.6	133.8	1,360.7	0.0	0.0
30.00		60.3	92.3					7.0	164.1	67.3	256.5	0.0	0.0
32.83	Top - Section 1	85.6	385.4					29.7	693.2	115.3	1,078.6	0.0	0.0
35.00		120.6	146.8					22.9	531.6	143.4	678.4	0.0	0.0
40.00		164.8	330.2					53.0	1,224.8	217.9	1,555.0	0.0	0.0
45.00		120.9	319.0					53.3	1,224.8	174.2	1,543.8	0.0	0.0
47.50	Reinf. Top Reinf	78.6	155.3					26.7	612.4	105.3	767.7	0.0	0.0
50.00		114.7	152.5					26.7	612.4	141.4	764.9	0.0	0.0
55.00		148.6	296.6					53.5	1,224.8	202.0	1,521.4	0.0	0.0
60.00	Appurtenance(s)	113.9	285.4	164.3	0.0	0.0	159.7	53.4	1,224.8	331.6	1,669.8	0.0	0.0
62.92	Bot - Section 3	70.3	161.3					31.1	712.9	101.4	874.2	0.0	0.0
65.00		39.7	199.4					22.2	509.3	61.8	708.6	0.0	0.0
65.75	Top - Section 2	34.4	70.9					8.0	183.3	42.4	254.2	0.0	0.0
67.50	Reinf. Top Reinf	57.6	71.1					18.6	427.8	76.2	498.9	0.0	0.0
70.00	Appurtenance(s)	98.6	99.8	217.9	0.0	0.0	379.2	26.5	611.1	343.0	1,090.1	0.0	0.0
75.00		90.1	193.3					52.8	1,197.5	142.9	1,390.8	0.0	0.0
77.00	Reinf. Top Reinf	25.6	75.0	91.8	0.0	-52.1	171.7	21.1	785.0	138.5	1,031.7	0.0	0.0
77.04	Reinf. Top	36.8	1.5					0.4	9.3	37.2	10.8	0.0	0.0
80.00	Appurtenance(s)	95.1	108.4	828.4	0.0	0.0	2,551.1	31.1	460.3	954.5	3,119.7	0.0	0.0
85.00	Reinf. Top Reinf	111.7	176.5					52.3	715.7	164.0	892.2	0.0	0.0
90.00	Appurtenance(s)	84.6	168.0	1,197.7	0.0	-305.3	4,092.3	3.2	715.7	1,285.5	4,976.0	0.0	0.0
93.00	Reinf. Top	53.0	96.8					1.9	372.5	54.9	469.3	0.0	0.0
95.00		74.4	62.8					1.3	78.0	75.7	140.8	0.0	0.0
100.00	Top - Section 3	65.6	151.2					3.2	194.9	68.8	346.1	0.0	0.0
102.00	Appurtenance(s)	31.2	99.2	1,565.9	0.0	-1,395.7	4,320.1	1.3	78.0	1,598.3	4,497.3	0.0	0.0
105.00		49.8	148.8					0.0	13.2	49.8	162.0	0.0	0.0
110.00	Appurtenance(s)	31.1	248.0	447.4	0.0	0.0	902.8	0.0	22.0	478.5	1,172.8	0.0	0.0
								Totals:		8,748.11	40,853.4	0.00	0.00

Load Case: 1.0D + 1.0W Serviceability 60 mph 21 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-40.85	-8.66	0.00	-631.39	0.00	631.39	1,564.13	420.30	1,179.53	948.21	0.00	0.00	0.191
5.00	-39.21	-8.42	0.00	-588.10	0.00	588.10	1,541.15	408.73	1,115.51	908.35	0.05	-0.09	0.181
10.00	-37.58	-8.24	0.00	-546.01	0.00	546.01	1,517.03	397.17	1,053.29	868.61	0.19	-0.17	0.172
12.00	-36.94	-8.13	0.00	-529.54	0.00	529.54	1,507.06	392.54	1,028.90	852.76	0.27	-0.21	0.168
12.00	-36.94	-8.13	0.00	-529.54	0.00	529.54	1,507.06	392.54	1,028.90	852.76	0.27	-0.21	0.168
15.00	-35.97	-8.00	0.00	-505.15	0.00	505.15	1,491.77	385.60	992.85	829.06	0.42	-0.26	0.162
18.00	-35.01	-7.89	0.00	-481.15	0.00	481.15	1,476.07	378.66	957.44	805.43	0.60	-0.31	0.156
18.00	-35.01	-7.89	0.00	-481.15	0.00	481.15	1,476.07	378.66	957.44	805.43	0.60	-0.31	0.156
20.00	-34.36	-7.76	0.00	-465.37	0.00	465.37	1,465.38	374.03	934.19	789.74	0.74	-0.35	0.152
25.00	-32.77	-7.57	0.00	-426.56	0.00	426.56	1,437.85	362.47	877.32	750.71	1.14	-0.43	0.143
29.33	-31.41	-7.45	0.00	-393.78	0.00	393.78	1,413.10	352.45	829.52	717.20	1.56	-0.50	0.134
30.00	-31.15	-7.39	0.00	-388.79	0.00	388.79	1,409.19	350.90	822.24	712.04	1.63	-0.51	0.130
32.83	-30.07	-7.29	0.00	-367.87	0.00	367.87	1,130.07	270.32	634.36	571.86	1.95	-0.55	0.157
35.00	-29.38	-7.17	0.00	-352.05	0.00	352.05	1,119.12	266.46	616.37	558.15	2.21	-0.58	0.152
40.00	-27.82	-6.96	0.00	-316.23	0.00	316.23	1,081.75	257.56	575.90	521.31	2.86	-0.66	0.142
45.00	-26.27	-6.79	0.00	-281.40	0.00	281.40	1,044.38	248.66	536.82	485.73	3.59	-0.72	0.131
47.50	-25.50	-6.69	0.00	-264.42	0.00	264.42	1,025.69	244.21	517.79	468.42	3.97	-0.76	0.125
47.50	-25.50	-6.69	0.00	-264.42	0.00	264.42	1,025.69	244.21	517.79	468.42	3.97	-0.76	0.125
50.00	-24.74	-6.56	0.00	-247.68	0.00	247.68	1,007.01	239.76	499.10	451.41	4.38	-0.79	0.120
55.00	-23.21	-6.36	0.00	-214.87	0.00	214.87	969.64	230.87	462.76	418.35	5.24	-0.85	0.108
60.00	-21.54	-6.02	0.00	-183.05	0.00	183.05	932.27	221.97	427.79	386.54	6.17	-0.91	0.096
62.92	-20.67	-5.92	0.00	-165.49	0.00	165.49	910.47	216.78	408.02	368.57	6.73	-0.94	0.089
65.00	-19.96	-5.85	0.00	-153.17	0.00	153.17	894.90	213.07	394.19	355.99	7.15	-0.96	0.082
65.75	-19.70	-5.80	0.00	-148.78	0.00	148.78	664.38	162.37	305.14	269.42	7.30	-0.97	0.087
67.50	-19.20	-5.73	0.00	-138.62	0.00	138.62	658.03	160.03	296.43	262.98	7.66	-0.98	0.082
67.50	-19.20	-5.73	0.00	-138.62	0.00	138.62	658.03	160.03	296.43	262.98	7.66	-0.98	0.082
70.00	-18.12	-5.38	0.00	-124.31	0.00	124.31	648.81	156.70	284.20	253.83	8.18	-1.01	0.075
75.00	-16.73	-5.21	0.00	-97.43	0.00	97.43	629.79	150.02	260.52	235.80	9.26	-1.05	0.061
77.00	-15.70	-5.06	0.00	-87.00	0.00	87.00	618.88	147.35	251.33	227.55	9.70	-1.06	0.055
77.00	-15.70	-5.06	0.00	-87.00	0.00	87.00	618.88	147.35	251.33	227.55	9.70	-1.06	0.060
77.04	-15.68	-5.02	0.00	-86.79	0.00	86.79	618.65	147.30	251.14	227.38	9.71	-1.06	0.059
77.04	-15.68	-5.02	0.00	-86.79	0.00	86.79	618.65	147.30	251.14	227.38	9.71	-1.06	0.113
80.00	-12.58	-4.02	0.00	-71.92	0.00	71.92	602.07	143.35	237.86	215.29	10.38	-1.08	0.096
85.00	-11.69	-3.85	0.00	-51.82	0.00	51.82	574.04	136.68	216.24	195.61	11.54	-1.14	0.074
85.00	-11.69	-3.85	0.00	-51.82	0.00	51.82	574.04	136.68	216.24	195.61	11.54	-1.14	0.074
90.00	-6.74	-2.47	0.00	-32.58	0.00	32.58	546.01	130.00	195.65	176.87	12.76	-1.18	0.049
93.00	-6.27	-2.40	0.00	-25.18	0.00	25.18	529.19	126.00	183.79	166.09	13.51	-1.20	0.039
93.00	-6.27	-2.40	0.00	-25.18	0.00	25.18	529.19	126.00	183.79	166.09	13.51	-1.20	0.164
95.00	-6.13	-2.33	0.00	-20.37	0.00	20.37	517.98	123.33	176.08	159.08	14.01	-1.21	0.140
100.00	-5.78	-2.26	0.00	-8.72	0.00	8.72	489.95	116.66	157.55	142.23	15.33	-1.29	0.073
100.00	-5.78	-2.26	0.00	-8.72	0.00	8.72	459.24	137.77	149.89	150.79	15.33	-1.29	0.071
102.00	-1.32	-0.56	0.00	-4.20	0.00	4.20	459.24	137.77	149.89	150.79	15.87	-1.30	0.031
105.00	-1.16	-0.51	0.00	-2.53	0.00	2.53	459.24	137.77	149.89	150.79	16.69	-1.31	0.019

Site Number:	302481	Code: ANSI/TIA-222-H	
Site Name:	Hrfr - South, CT	Engineering Number: 13251341_C4_07	9/30/2020 11:38:31 AM
Customer:	T-MOBILE		

Load Case: 1.0D + 1.0W — Serviceability 60 mph — 21 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 1.00
Wind Load Factor : 1.00

110.00	0.00	-0.48	0.00	0.00	0.00	0.00	459.24	137.77	149.89	150.79	18.08	-1.32	0.000

Equivalent Lateral Forces Method Analysis

Spectral Response Acceleration for Short Period (S_s):	0.19
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.05
Long-Period Transition Period (T_L):	6
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coeffiecient F_v:	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.20
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.09
Seismic Response Coefficient (C_s):	0.03
Upper Limit C_s	0.03
Lower Limit C_s	0.03
Period based on Rayleigh Method (sec):	2.07
Redundancy Factor (p):	1.00
Seismic Force Distribution Exponent (k):	1.79
Total Unfactored Dead Load:	40.85 k
Seismic Base Shear (E):	1.23 k

Load Case 1.2D + 1.0Ev + 1.0Eh Seismic

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
34	107.50	270	1,148	0.016	19	335
33	103.50	162	644	0.009	11	201
32	101.00	177	674	0.009	11	220
31	97.50	346	1,236	0.017	21	430
30	94.00	141	471	0.006	8	175
29	91.50	469	1,496	0.020	25	582
28	87.50	884	2,601	0.035	43	1,097
27	82.50	892	2,364	0.032	39	1,107
26	78.52	569	1,380	0.019	23	706
25	77.02	11	25	0.000	0	13
24	76.00	860	1,968	0.027	33	1,067
23	72.50	1,391	2,926	0.040	49	1,726
22	68.75	711	1,360	0.019	23	882
21	66.62	499	903	0.012	15	619
20	65.37	254	445	0.006	7	315
19	63.96	709	1,192	0.016	20	879
18	61.46	874	1,369	0.019	23	1,085
17	57.50	1,510	2,100	0.029	35	1,874
16	52.50	1,521	1,798	0.024	30	1,888
15	48.75	765	792	0.011	13	949
14	46.25	768	724	0.010	12	953
13	42.50	1,544	1,251	0.017	21	1,916
12	37.50	1,555	1,008	0.014	17	1,930
11	33.91	678	367	0.005	6	842
10	31.41	1,079	509	0.007	9	1,338

9	29.66	256	109	0.001	2	318
8	27.16	1,361	496	0.007	8	1,689
7	22.50	1,582	412	0.006	7	1,963
6	19.00	636	122	0.002	2	789
5	16.50	957	143	0.002	2	1,188
4	13.50	961	100	0.001	2	1,193
3	11.00	643	47	0.001	1	798
2	7.50	1,615	59	0.001	1	2,005
1	2.50	1,627	8	0.000	0	2,019
DragonWave Horizon C	110.00	32	141	0.002	2	39
Generic 12" x 12" Ju	110.00	10	44	0.001	1	12
DragonWave A-ANT-23G	110.00	15	66	0.001	1	19
NextNet BTS-2500	110.00	105	465	0.006	8	130
Argus LLPX310R	110.00	86	380	0.005	6	106
Clearwirre Side Arm	110.00	560	2,481	0.034	41	695
DragonWave A-ANT-11G	110.00	95	422	0.006	7	118
Powerwave Allgon 702	102.00	13	51	0.001	1	16
CCI TPX-070821	102.00	45	174	0.002	3	56
Kaelus DBCT108F1V92-	102.00	83	323	0.004	5	103
Powerwave Allgon LGP	102.00	85	327	0.004	5	105
Raycap DC6-48-60-0-8	102.00	33	127	0.002	2	41
Raycap DC6-48-60-18-	102.00	66	254	0.003	4	81
Ericsson RRUS 4426 B	102.00	145	562	0.008	9	180
Ericsson RRUS 4478 B	102.00	180	696	0.009	12	223
Ericsson RRUS 4478 B	102.00	178	690	0.009	12	221
Ericsson RRUS-11 (50	102.00	150	581	0.008	10	186
Ericsson RRUS 32 B2	102.00	159	616	0.008	10	197
Ericsson RRUS-32 (77	102.00	231	894	0.012	15	287
Powerwave Allgon 777	102.00	105	406	0.006	7	130
Quintel QS66512-2	102.00	222	859	0.012	14	275
CCI OPA-65R-LCUU-H6	102.00	146	565	0.008	9	181
CCI OPA-65R-LCUU-H8	102.00	88	341	0.005	6	109
CCI TPA-65R-LCUUUU-H	102.00	82	316	0.004	5	101
Kathrein Scala 80010	102.00	195	756	0.010	13	242
Kathrein Scala 80010	102.00	115	444	0.006	7	142
Small Platform with	102.00	2,000	7,742	0.105	129	2,482
Ericsson Radio 4449	90.00	222	687	0.009	11	275
Ericsson Radio 4449	90.00	225	697	0.009	12	279
Ericsson RRUS 4415 B	90.00	138	427	0.006	7	171
Ericsson Air6449 B41	90.00	312	966	0.013	16	387
Ericsson AIR32 B66Aa	90.00	397	1,228	0.017	20	492
Ericsson Air 3246 B6	90.00	540	1,672	0.023	28	670
RFS APXVAARR24_43-U-	90.00	384	1,188	0.016	20	476
Generic Flat Low Pro	90.00	1,875	5,804	0.079	97	2,327
Nokia AirScale RRH 4	80.00	106	266	0.004	4	131
Alcatel-Lucent B25 R	80.00	159	399	0.005	7	197
Alcatel-Lucent B13 R	80.00	173	435	0.006	7	215
Alcatel-Lucent B66A	80.00	201	504	0.007	8	249
Raycap RVZDC-6627-PF	80.00	32	80	0.001	1	40
Commscope JAHH-65B-R	80.00	380	953	0.013	16	471
Round Low Profile Pl	80.00	1,500	3,762	0.051	63	1,861
Scala 840 10212	77.00	7	16	0.000	0	8
TX RX Systems 421-86	77.00	15	35	0.000	1	19
Stand Offs	77.00	150	351	0.005	6	186
Round Side Arms	70.00	300	593	0.008	10	372
RFS APXV18-206517S-C	70.00	79	156	0.002	3	98
Generic Radio/ODU	60.00	30	45	0.001	1	37
Scala 840 10212	60.00	7	10	0.000	0	8
Stand Off	60.00	75	113	0.002	2	93
Radio Waves SP2-4.7	60.00	26	39	0.001	1	32
Radio Waves SP2-4.7	60.00	22	33	0.000	1	27
		40,853	73,429	1.000	1,226	50,698

Load Case 0.9D - 1.0Ev + 1.0Eh Seismic (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
34	107.50	270	1,148	0.016	19	232
33	103.50	162	644	0.009	11	139
32	101.00	177	674	0.009	11	152
31	97.50	346	1,236	0.017	21	297
30	94.00	141	471	0.006	8	121
29	91.50	469	1,496	0.020	25	403
28	87.50	884	2,601	0.035	43	759
27	82.50	892	2,364	0.032	39	766
26	78.52	569	1,380	0.019	23	488
25	77.02	11	25	0.000	0	9
24	76.00	860	1,968	0.027	33	739
23	72.50	1,391	2,926	0.040	49	1,195
22	68.75	711	1,360	0.019	23	611
21	66.62	499	903	0.012	15	429
20	65.37	254	445	0.006	7	218
19	63.96	709	1,192	0.016	20	609
18	61.46	874	1,369	0.019	23	751
17	57.50	1,510	2,100	0.029	35	1,297
16	52.50	1,521	1,798	0.024	30	1,307
15	48.75	765	792	0.011	13	657
14	46.25	768	724	0.010	12	659
13	42.50	1,544	1,251	0.017	21	1,326
12	37.50	1,555	1,008	0.014	17	1,336
11	33.91	678	367	0.005	6	583
10	31.41	1,079	509	0.007	9	927
9	29.66	256	109	0.001	2	220
8	27.16	1,361	496	0.007	8	1,169
7	22.50	1,582	412	0.006	7	1,359
6	19.00	636	122	0.002	2	546
5	16.50	957	143	0.002	2	822
4	13.50	961	100	0.001	2	826
3	11.00	643	47	0.001	1	552
2	7.50	1,615	59	0.001	1	1,388
1	2.50	1,627	8	0.000	0	1,397
DragonWave Horizon C	110.00	32	141	0.002	2	27
Generic 12" x 12" Ju	110.00	10	44	0.001	1	9
DragonWave A-ANT-23G	110.00	15	66	0.001	1	13
NextNet BTS-2500	110.00	105	465	0.006	8	90
Argus LLPX310R	110.00	86	380	0.005	6	74
Clearwirre Side Arm	110.00	560	2,481	0.034	41	481
DragonWave A-ANT-11G	110.00	95	422	0.006	7	82
Powerwave Allgon 702	102.00	13	51	0.001	1	11
CCI TPX-070821	102.00	45	174	0.002	3	39
Kaelus DBCT108F1V92-	102.00	83	323	0.004	5	72
Powerwave Allgon LGP	102.00	85	327	0.004	5	73
Raycap DC6-48-60-0-8	102.00	33	127	0.002	2	28
Raycap DC6-48-60-18-	102.00	66	254	0.003	4	56
Ericsson RRUS 4426 B	102.00	145	562	0.008	9	125
Ericsson RRUS 4478 B	102.00	180	696	0.009	12	154
Ericsson RRUS 4478 B	102.00	178	690	0.009	12	153
Ericsson RRUS-11 (50	102.00	150	581	0.008	10	129
Ericsson RRUS 32 B2	102.00	159	616	0.008	10	137
Ericsson RRUS-32 (77	102.00	231	894	0.012	15	198
Powerwave Allgon 777	102.00	105	406	0.006	7	90
Quintel QS66512-2	102.00	222	859	0.012	14	191
CCI OPA-65R-LCUU-H6	102.00	146	565	0.008	9	125
CCI OPA-65R-LCUU-H8	102.00	88	341	0.005	6	76

CCI TPA-65R-LCUUUU-H	102.00	82	316	0.004	5	70
Kathrein Scala 80010	102.00	195	756	0.010	13	168
Kathrein Scala 80010	102.00	115	444	0.006	7	98
Small Platform with	102.00	2,000	7,742	0.105	129	1,718
Ericsson Radio 4449	90.00	222	687	0.009	11	191
Ericsson Radio 4449	90.00	225	697	0.009	12	193
Ericsson RRUS 4415 B	90.00	138	427	0.006	7	119
Ericsson Air6449 B41	90.00	312	966	0.013	16	268
Ericsson AIR32 B66Aa	90.00	397	1,228	0.017	20	341
Ericsson Air 3246 B6	90.00	540	1,672	0.023	28	464
RFS APXVAARR24_43-U-	90.00	384	1,188	0.016	20	330
Generic Flat Low Pro	90.00	1,875	5,804	0.079	97	1,611
Nokia AirScale RRH 4	80.00	106	266	0.004	4	91
Alcatel-Lucent B25 R	80.00	159	399	0.005	7	137
Alcatel-Lucent B13 R	80.00	173	435	0.006	7	149
Alcatel-Lucent B66A	80.00	201	504	0.007	8	173
Raycap RVZDC-6627-PF	80.00	32	80	0.001	1	27
Commscope JAHH-65B-R	80.00	380	953	0.013	16	326
Round Low Profile Pl	80.00	1,500	3,762	0.051	63	1,289
Scala 840 10212	77.00	7	16	0.000	0	6
TX RX Systems 421-86	77.00	15	35	0.000	1	13
Stand Offs	77.00	150	351	0.005	6	129
Round Side Arms	70.00	300	593	0.008	10	258
RFS APXV18-206517S-C	70.00	79	156	0.002	3	68
Generic Radio/ODU	60.00	30	45	0.001	1	26
Scala 840 10212	60.00	7	10	0.000	0	6
Stand Off	60.00	75	113	0.002	2	64
Radio Waves SP2-4.7	60.00	26	39	0.001	1	22
Radio Waves SP2-4.7	60.00	22	33	0.000	1	19
		40,853	73,429	1.000	1,226	35,095

Load Case 1.2D + 1.0Ev + 1.0Eh Seismic

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-48.68	-1.23	0.00	-106.57	0.00	106.57	1,564.13	420.30	1,179.53	948.21	0.00	0.00	0.041
5.00	-46.67	-1.24	0.00	-100.41	0.00	100.41	1,541.15	408.73	1,115.51	908.35	0.01	-0.01	0.039
10.00	-45.88	-1.25	0.00	-94.20	0.00	94.20	1,517.03	397.17	1,053.29	868.61	0.03	-0.03	0.038
12.00	-44.68	-1.25	0.00	-91.70	0.00	91.70	1,507.06	392.54	1,028.90	852.76	0.05	-0.04	0.037
12.00	-44.68	-1.25	0.00	-91.70	0.00	91.70	1,507.06	392.54	1,028.90	852.76	0.05	-0.04	0.037
15.00	-43.49	-1.26	0.00	-87.95	0.00	87.95	1,491.77	385.60	992.85	829.06	0.07	-0.04	0.036
18.00	-42.71	-1.26	0.00	-84.18	0.00	84.18	1,476.07	378.66	957.44	805.43	0.10	-0.05	0.035
18.00	-42.71	-1.26	0.00	-84.18	0.00	84.18	1,476.07	378.66	957.44	805.43	0.10	-0.05	0.035
20.00	-40.74	-1.26	0.00	-81.66	0.00	81.66	1,465.38	374.03	934.19	789.74	0.13	-0.06	0.034
25.00	-39.05	-1.26	0.00	-75.37	0.00	75.37	1,437.85	362.47	877.32	750.71	0.20	-0.07	0.032
29.33	-38.73	-1.26	0.00	-69.93	0.00	69.93	1,413.10	352.45	829.52	717.20	0.27	-0.09	0.031
30.00	-37.40	-1.25	0.00	-69.09	0.00	69.09	1,409.19	350.90	822.24	712.04	0.28	-0.09	0.029
32.83	-36.55	-1.25	0.00	-65.55	0.00	65.55	1,130.07	270.32	634.36	571.86	0.34	-0.10	0.036
35.00	-34.62	-1.23	0.00	-62.84	0.00	62.84	1,119.12	266.46	616.37	558.15	0.38	-0.10	0.035
40.00	-32.71	-1.22	0.00	-56.67	0.00	56.67	1,081.75	257.56	575.90	521.31	0.49	-0.11	0.032
45.00	-31.76	-1.21	0.00	-50.59	0.00	50.59	1,044.38	248.66	536.82	485.73	0.62	-0.13	0.030
47.50	-30.81	-1.20	0.00	-47.57	0.00	47.57	1,025.69	244.21	517.79	468.42	0.69	-0.13	0.029
47.50	-30.81	-1.20	0.00	-47.57	0.00	47.57	1,025.69	244.21	517.79	468.42	0.69	-0.13	0.029
50.00	-28.92	-1.17	0.00	-44.58	0.00	44.58	1,007.01	239.76	499.10	451.41	0.76	-0.14	0.028
55.00	-27.04	-1.13	0.00	-38.76	0.00	38.76	969.64	230.87	462.76	418.35	0.91	-0.15	0.025
60.00	-25.76	-1.10	0.00	-33.10	0.00	33.10	932.27	221.97	427.79	386.54	1.08	-0.16	0.023
62.92	-24.88	-1.08	0.00	-29.89	0.00	29.89	910.47	216.78	408.02	368.57	1.18	-0.17	0.022
65.00	-24.57	-1.08	0.00	-27.63	0.00	27.63	894.90	213.07	394.19	355.99	1.25	-0.17	0.020
65.75	-23.95	-1.06	0.00	-26.82	0.00	26.82	664.38	162.37	305.14	269.42	1.28	-0.17	0.022
67.50	-23.06	-1.04	0.00	-24.97	0.00	24.97	658.03	160.03	296.43	262.98	1.34	-0.17	0.020
67.50	-23.06	-1.04	0.00	-24.97	0.00	24.97	658.03	160.03	296.43	262.98	1.34	-0.17	0.020
70.00	-20.87	-0.97	0.00	-22.38	0.00	22.38	648.81	156.70	284.20	253.83	1.43	-0.18	0.018
75.00	-19.80	-0.94	0.00	-17.52	0.00	17.52	629.79	150.02	260.52	235.80	1.62	-0.19	0.016
77.00	-19.57	-0.93	0.00	-15.65	0.00	15.65	618.88	147.35	251.33	227.55	1.70	-0.19	0.015
77.00	-19.57	-0.93	0.00	-15.65	0.00	15.65	618.88	147.35	251.33	227.55	1.70	-0.19	0.016
77.04	-18.87	-0.90	0.00	-15.61	0.00	15.61	618.65	147.30	251.14	227.38	1.70	-0.19	0.016
77.04	-18.87	-0.90	0.00	-15.61	0.00	15.61	618.65	147.30	251.14	227.38	1.70	-0.19	0.028
80.00	-14.60	-0.75	0.00	-12.94	0.00	12.94	602.07	143.35	237.86	215.29	1.82	-0.19	0.023
85.00	-13.50	-0.70	0.00	-9.22	0.00	9.22	574.04	136.68	216.24	195.61	2.03	-0.20	0.019
85.00	-13.50	-0.70	0.00	-9.22	0.00	9.22	574.04	136.68	216.24	195.61	2.03	-0.20	0.019
90.00	-7.84	-0.44	0.00	-5.72	0.00	5.72	546.01	130.00	195.65	176.87	2.24	-0.21	0.012
93.00	-7.67	-0.44	0.00	-4.38	0.00	4.38	529.19	126.00	183.79	166.09	2.37	-0.21	0.010
93.00	-7.67	-0.44	0.00	-4.38	0.00	4.38	529.19	126.00	183.79	166.09	2.37	-0.21	0.041
95.00	-7.24	-0.41	0.00	-3.51	0.00	3.51	517.98	123.33	176.08	159.08	2.46	-0.21	0.036
100.00	-7.02	-0.40	0.00	-1.44	0.00	1.44	489.95	116.66	157.55	142.23	2.70	-0.23	0.024
100.00	-7.02	-0.40	0.00	-1.44	0.00	1.44	459.24	137.77	149.89	150.79	2.70	-0.23	0.025
102.00	-1.46	-0.09	0.00	-0.63	0.00	0.63	459.24	137.77	149.89	150.79	2.79	-0.23	0.007
105.00	-1.12	-0.07	0.00	-0.36	0.00	0.36	459.24	137.77	149.89	150.79	2.94	-0.23	0.005
110.00	0.00	-0.07	0.00	0.00	0.00	0.00	459.24	137.77	149.89	150.79	3.18	-0.23	0.000

Load Case 0.9D - 1.0Ev + 1.0Eh Seismic (Reduced DL)

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-33.70	-1.23	0.00	-104.87	0.00	104.87	1,564.13	420.30	1,179.53	948.21	0.00	0.00	0.037
5.00	-32.31	-1.24	0.00	-98.72	0.00	98.72	1,541.15	408.73	1,115.51	908.35	0.01	-0.01	0.036
10.00	-31.76	-1.24	0.00	-92.54	0.00	92.54	1,517.03	397.17	1,053.29	868.61	0.03	-0.03	0.034
12.00	-30.93	-1.24	0.00	-90.06	0.00	90.06	1,507.06	392.54	1,028.90	852.76	0.04	-0.04	0.034
12.00	-30.93	-1.24	0.00	-90.06	0.00	90.06	1,507.06	392.54	1,028.90	852.76	0.04	-0.04	0.034
15.00	-30.11	-1.24	0.00	-86.34	0.00	86.34	1,491.77	385.60	992.85	829.06	0.07	-0.04	0.033
18.00	-29.56	-1.25	0.00	-82.60	0.00	82.60	1,476.07	378.66	957.44	805.43	0.10	-0.05	0.032
18.00	-29.56	-1.25	0.00	-82.60	0.00	82.60	1,476.07	378.66	957.44	805.43	0.10	-0.05	0.032
20.00	-28.20	-1.24	0.00	-80.11	0.00	80.11	1,465.38	374.03	934.19	789.74	0.12	-0.06	0.031
25.00	-27.03	-1.24	0.00	-73.90	0.00	73.90	1,437.85	362.47	877.32	750.71	0.19	-0.07	0.029
29.33	-26.81	-1.24	0.00	-68.54	0.00	68.54	1,413.10	352.45	829.52	717.20	0.26	-0.08	0.028
30.00	-25.89	-1.23	0.00	-67.71	0.00	67.71	1,409.19	350.90	822.24	712.04	0.28	-0.09	0.027
32.83	-25.30	-1.23	0.00	-64.22	0.00	64.22	1,130.07	270.32	634.36	571.86	0.33	-0.09	0.032
35.00	-23.97	-1.21	0.00	-61.55	0.00	61.55	1,119.12	266.46	616.37	558.15	0.37	-0.10	0.031
40.00	-22.64	-1.19	0.00	-55.49	0.00	55.49	1,081.75	257.56	575.90	521.31	0.49	-0.11	0.029
45.00	-21.98	-1.18	0.00	-49.52	0.00	49.52	1,044.38	248.66	536.82	485.73	0.61	-0.12	0.027
47.50	-21.32	-1.17	0.00	-46.56	0.00	46.56	1,025.69	244.21	517.79	468.42	0.68	-0.13	0.026
47.50	-21.32	-1.17	0.00	-46.56	0.00	46.56	1,025.69	244.21	517.79	468.42	0.68	-0.13	0.026
50.00	-20.02	-1.14	0.00	-43.63	0.00	43.63	1,007.01	239.76	499.10	451.41	0.75	-0.14	0.025
55.00	-18.72	-1.11	0.00	-37.92	0.00	37.92	969.64	230.87	462.76	418.35	0.90	-0.15	0.023
60.00	-17.83	-1.08	0.00	-32.38	0.00	32.38	932.27	221.97	427.79	386.54	1.06	-0.16	0.021
62.92	-17.22	-1.06	0.00	-29.23	0.00	29.23	910.47	216.78	408.02	368.57	1.15	-0.16	0.019
65.00	-17.00	-1.05	0.00	-27.03	0.00	27.03	894.90	213.07	394.19	355.99	1.23	-0.17	0.018
65.75	-16.58	-1.04	0.00	-26.24	0.00	26.24	664.38	162.37	305.14	269.42	1.25	-0.17	0.019
67.50	-15.97	-1.01	0.00	-24.42	0.00	24.42	658.03	160.03	296.43	262.98	1.31	-0.17	0.018
67.50	-15.97	-1.01	0.00	-24.42	0.00	24.42	658.03	160.03	296.43	262.98	1.31	-0.17	0.018
70.00	-14.45	-0.95	0.00	-21.89	0.00	21.89	648.81	156.70	284.20	253.83	1.40	-0.17	0.016
75.00	-13.71	-0.92	0.00	-17.14	0.00	17.14	629.79	150.02	260.52	235.80	1.59	-0.18	0.014
77.00	-13.55	-0.91	0.00	-15.31	0.00	15.31	618.88	147.35	251.33	227.55	1.67	-0.18	0.013
77.00	-13.55	-0.91	0.00	-15.31	0.00	15.31	618.88	147.35	251.33	227.55	1.67	-0.18	0.014
77.04	-13.06	-0.88	0.00	-15.27	0.00	15.27	618.65	147.30	251.14	227.38	1.67	-0.18	0.014
77.04	-13.06	-0.88	0.00	-15.27	0.00	15.27	618.65	147.30	251.14	227.38	1.67	-0.18	0.025
80.00	-10.10	-0.73	0.00	-12.66	0.00	12.66	602.07	143.35	237.86	215.29	1.78	-0.19	0.021
85.00	-9.34	-0.68	0.00	-9.02	0.00	9.02	574.04	136.68	216.24	195.61	1.99	-0.20	0.016
85.00	-9.34	-0.68	0.00	-9.02	0.00	9.02	574.04	136.68	216.24	195.61	1.99	-0.20	0.016
90.00	-5.43	-0.43	0.00	-5.59	0.00	5.59	546.01	130.00	195.65	176.87	2.20	-0.20	0.010
93.00	-5.31	-0.43	0.00	-4.29	0.00	4.29	529.19	126.00	183.79	166.09	2.33	-0.21	0.009
93.00	-5.31	-0.43	0.00	-4.29	0.00	4.29	529.19	126.00	183.79	166.09	2.33	-0.21	0.036
95.00	-5.01	-0.41	0.00	-3.44	0.00	3.44	517.98	123.33	176.08	159.08	2.42	-0.21	0.031
100.00	-4.86	-0.39	0.00	-1.41	0.00	1.41	489.95	116.66	157.55	142.23	2.64	-0.22	0.020
100.00	-4.86	-0.39	0.00	-1.41	0.00	1.41	459.24	137.77	149.89	150.79	2.64	-0.22	0.020
102.00	-1.01	-0.09	0.00	-0.62	0.00	0.62	459.24	137.77	149.89	150.79	2.74	-0.23	0.006
105.00	-0.78	-0.07	0.00	-0.35	0.00	0.35	459.24	137.77	149.89	150.79	2.88	-0.23	0.004
110.00	0.00	-0.07	0.00	0.00	0.00	0.00	459.24	137.77	149.89	150.79	3.12	-0.23	0.000

Analysis Summary

	Reactions						Max Usage	
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.0W	33.51	0.00	48.92	0.00	0.00	2469.70	0.00	0.73
0.9D + 1.0W	33.47	0.00	36.66	0.00	0.00	2438.17	0.00	0.72
1.2D + 1.0Di + 1.0Wi	9.78	0.00	79.83	0.00	0.00	754.10	0.00	0.23
1.2D + 1.0Ev + 1.0Eh	1.23	0.00	48.68	0.00	0.00	106.57	0.00	0.04
0.9D - 1.0Ev + 1.0Eh	1.23	0.00	33.70	0.00	0.00	104.87	0.00	0.04
1.0D + 1.0W	8.66	0.00	40.85	0.00	0.00	631.39	0.00	0.19

Additional Steel Summary

Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors VQ/I (lb/in)	Shear Applied (kips)	Shear phiVn (kips)	Ratio	Max Member Pu (kip)	phiPn (kip)	Ratio
0.00	12.00	(4) SOL-#20 All Thread Bar	321.4	12.5	16.8	0.746	279.6	315.5	0.886
0.00	18.00	(4) PL-PL 6 x 1.25	410.0	9.8	38.3	0.257	356.6	395.0	0.903
12.00	47.50	(4) SOL-#20 All Thread Bar	346.2	10.4	16.8	0.618	256.2	330.5	0.775
18.00	77.00	(4) PL-PL 6 x 1.25	435.1	10.4	38.3	0.273	306.5	395.0	0.776
47.50	67.50	(4) SOL-#20 All Thread Bar	364.6	10.9	16.8	0.651	166.6	330.5	0.504
67.50	77.04	(4) SOL-#20 All Thread Bar	380.2	11.4	16.8	0.678	107.8	330.5	0.326
77.00	85.00	(4) PL-PL 5" x 1.25"	721.0	17.3	38.3	0.452	152.6	329.2	0.464
85.00	93.00	(4) PL-PL 5" x 1.25"	605.1	14.5	38.3	0.379	100.0	329.2	0.304

Elev From (ft)	Elev To (ft)	Member	Upper Termination Connectors MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Ratio	Lower Termination Connectors MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Ratio
0.00	12.00	(4) SOL-#20 All Thread Bar	0.0	12.0	0	0	0.000	0.0	12.0	0	0	0.000
0.00	18.00	(4) PL-PL 6 x 1.25	302.2	38.3	8	8	0.987	0.0	38.3	0	0	0.000
12.00	47.50	(4) SOL-#20 All Thread Bar	0.0	12.0	0	0	0.000	0.0	12.0	0	0	0.000
18.00	77.00	(4) PL-PL 6 x 1.25	0.0	38.3	0	8	0.000	0.0	38.3	0	0	0.000
47.50	67.50	(4) SOL-#20 All Thread Bar	0.0	12.0	0	0	0.000	0.0	12.0	0	0	0.000
67.50	77.04	(4) SOL-#20 All Thread Bar	78.3	12.0	7	7	0.933	0.0	12.0	0	0	0.000
77.00	85.00	(4) PL-PL 5" x 1.25"	0.0	38.3	0	8	0.000	0.0	38.3	0	8	0.000
85.00	93.00	(4) PL-PL 5" x 1.25"	0.0	38.3	0	8	0.000	0.0	38.3	0	8	0.000

Base Plate & Anchor Rod Analysis

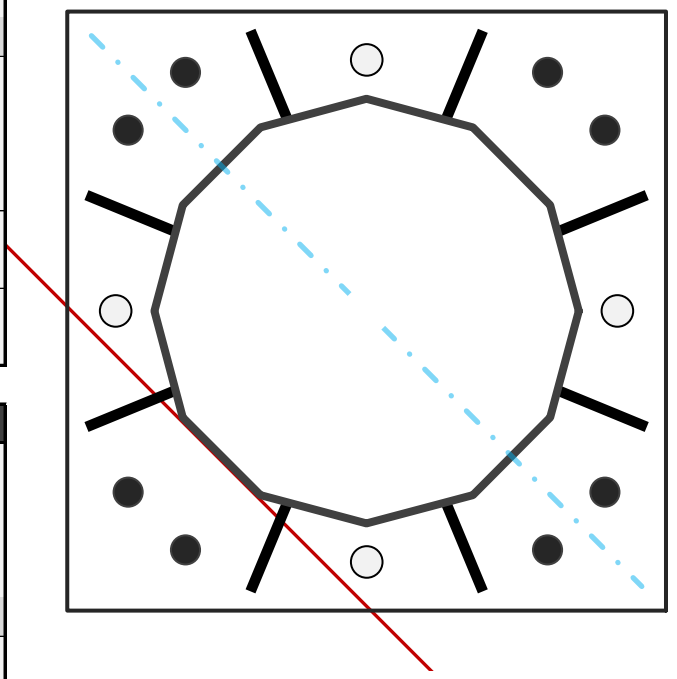
Pole Dimensions		
Number of Sides	12	-
Diameter	30	in
Thickness	1/4	in
Orientation Offset	0	°

Base Reactions		
Moment, Mu	2469.7	k-ft
Axial, Pu	48.9	k
Shear, Vu	33.5	k
Neutral Axis	135	°

Report Capacities		
Component	Capacity	Result
Base Plate	95%	Pass
Anchor Rods	61%	Pass
Dwyidag	89%	Pass

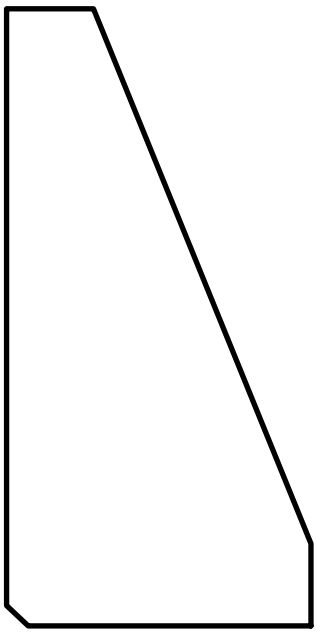
Base Plate		
Shape	Square	-
Width	44	in
Thickness	2	in
Grade	A572-60	
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Clip	0	in
Orientation Offset	0	°
Anchor Rod Detail	c	η=0.55
Clear Distance	N/A	in
Applied Moment, Mu	1979.5	k
Bending Stress, ϕMn	2085.6	k

Dywidag Reinforcement		
Quantity	4	-
Bar Size	#20	in
Diameter, ø	2.5	in
Bracket Type	Angle	-
Circle	36.88	in
Orientation Offset	0	°
Applied Force, Pu	328.3	k
Dywidag Bar, ϕPn	368.2	k



Original Anchor Rods		
Arrangement	Cluster	-
Quantity	8	-
Diameter, ø	2 1/4	in
Bolt Circle	44	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	6.0	in
Orientation Offset	0	°
Applied Force, Pu	147.0	k
Anchor Rods, ϕPn	243.6	k

Stiffeners		
Arrangement	Radial	-
Quantity	8	-
Height	15	in
Width	7	in
Effective Width	7.000	in
Thickness	3/4	in
Effective Thickness	0.750	in
Notch	0.5	in
Flat Edge	2	in
Grade	A572-50	-
Yield Strength, Fy	50	ksi
Tensile Strength, Fu	65	ksi
Horizontal Weld	Fillet	
Horizontal Fillet Size	3/8	in
Bevel Depth		in
Vertical Weld	Fillet	
Vertical Fillet Size	1/4	in
Weld Strength	70	ksi
Electrode Coefficient	1	-
Orientation Offset		°
Vertical Weld, ϕRn	165.2	k
Horz. Weld, ϕRn	124.1	k
Ten. Capacity, ϕTn	213.9	k
Comp. Capacity, ϕPn	637.3	k



Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	33.5	1069.6	0.43
Anchor Rod Forces	33.5	1069.6	0.43
Additional Bolt (Grp1) Forces	0.0	0.0	0.00
Additional Bolt (Grp2) Forces	0.0	0.0	0.00
Dywidag Forces	0.0	1400.1	0.57
Stiffener Forces	23.6	753.5	0.31

Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in^2	in^2	in^4	#	in^4
Pole	23.0996	1.9250	0.0403		2556.06
Bolt	3.9761	3.2477	0.8393	4.5	6294.24
Bolt1	0.0000	0.0000	0.0000	0	0.00
Bolt2	0.0000	0.0000	0.0000	0	0.00
Dywidag	4.9087	4.9087	1.9175		3345.94
Stiffener	4.8750	4.3875	85.7500		6093.22

Base Plate		
Shape	Square	-
Width, W	44	in
Thickness, t	2	in
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Base Plate Chord	32.187	in
Detail Type	c	-
Detail Factor	0.55	-
Clear Distance	N/A	-

External Base Plate		
Chord Length AA	32.100	in
Additional AA	6.521	in
Section Modulus, Z	38.622	in^3
Applied Moment, Mu	1979.5	k-ft
Bending Capacity, ϕMn	2085.6	k-ft
Capacity, Mu/ϕMn	0.949	OK
Chord Length AB	31.038	in
Additional AB	5.206	in
Section Modulus, Z	36.244	in^3
Applied Moment, Mu	1823.3	k-ft
Bending Capacity, ϕMn	1957.2	k-ft
Capacity, Mu/ϕMn	0.932	OK
Bend Line Length	0.000	in
Additional Bend Line	#N/A	in
Section Modulus, Z	#N/A	in^3
Applied Moment, Mu	0.0	k-ft
Bending Capacity, ϕMn	#N/A	k-ft
Capacity, Mu/ϕMn		

Internal Base Plate		
Arc Length	0.000	in
Section Modulus, Z	0.000	in^3
Moment Arm	0.000	in
Applied Moment, Mu	0.0	k-ft
Bending Capacity, ϕMn	0.0	k-ft
Capacity, Mu/ϕMn		

Anchor Rods		
Anchor Rod Quantity, N	8	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	44	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	147.0	k
Applied Shear, Vu	1.0	k
Compressive Capacity, ϕPn	243.6	k
Tensile Capacity, ϕRnt	0.603	OK
Interaction Capacity	0.611	OK

Dywidag Reinforcement		
Dywidag Quantity, N	4	-
Dywidag Diameter, d	2.5	in
Bolt Circle, BC	36.88	in
Yield Strength, Fy	80	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	328.3	k
Compressive Capacity, ϕPn	368.2	k
Capacity, Pu/ϕPn	0.892	OK

Base Plate Stiffeners		
Applied Axial Force, Pu	113.1	k
Applied Horizontal Force, Vu	1.48	k

Vertical Weld		
Vert.-to-Stiffener a=e_x/l	0.156	-
Spacing Ratio, k	0.050	-
Weld Coefficient, C	3.670	-
Compressive Capacity, ϕPn	165.2	k
Vert.-to-Plate a=e_x/l	0.333	-
Spacing Ratio, k	0.050	-
Weld Coefficient, C	2.940	-
Shear Capacity, ϕVn	132.3	k
$P_u/\phi_P P_n + V_u/\phi_V V_n$	0.696	OK

Horizontal Weld		
Horz.-to-Stiffener a=e_x/l	0.167	-
Spacing Ratio, k	0.107	-
Weld Coefficient, C	3.940	-
Effective Fillet	0.375	in
Compressive Capacity, ϕPn	124.1	k
Horz.-to-Pole a=e_x/l	0.357	-
Spacing Ratio, k	0.107	-
Weld Coefficient, C	3.090	-
Shear Capacity, ϕVn	97.3	k
$P_u/\phi_P P_n + V_u/\phi_V V_n$	0.927	OK

Plate Tension		
Gross Cross Section	4.875	in^2
Net Cross Section	4.388	in^2
Tensile Capacity, ϕTn	213.9	k
Capacity, Tu/ϕTn	0.264	OK

Plate Compression		
Radius of Gyration	0.217	in^3
kl/r	41.57	-
4.71 $\sqrt{(E/Fy)}$	113.43	-
Buckling Stress(Fe)	165.6	-
Crit. Buckling Stress(Fcr)	145.3	ksi
Compressive Capacity, ϕPn	637.3	k
Capacity, Pu/ϕPn	0.089	OK

Flange Plate Analysis

Flange Plate

Plate Type	***Flange***	***100 ft***
Pole Diameter	12.75	in
Pole Thickness	0.375	in
Plate Diameter	28.5	in
Plate Thickness	1.5	in
Plate Fy	36	ksi
Weld Length	0.25	in
f_s Resistance	60.83	k-in
Applied	27.64	k-in

Code Rev.	***H***
Moment	34.3 k-ft
Axial	6.2 k

Required Flange Thickness:
1.01 in OK

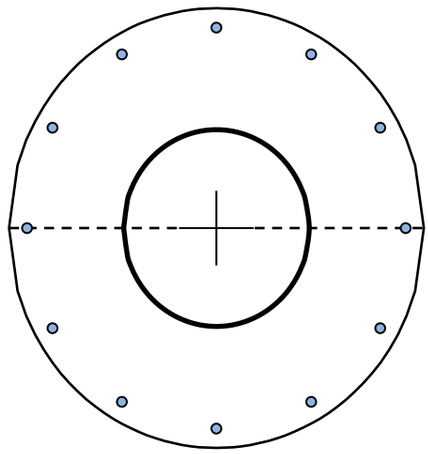
Date	9/30/2020
Engineer	I. Dodson
Site #	302481
Carrier	T-MOBILE

Stiffeners

#	

Bolts

#	***12***	
Bolt Circle	26	in
(R)adial / (S)quare	R	
Bolt Gap	6	in
Diameter	1	in
Hole Diameter	1.125	in
Type	A325	
Fy	92	ksi
Fu	120	ksi
f_s Resistance	54.52	k
Applied	4.75	k



Reinforcement

#	

Plate Stress Ratio:
45% Pass

Bolt Stress Ratio:
9% Pass

Extra Bolts O

#	

Site Name:	**HRFR - South**
Site Number:	**302481**
Engineering Number:	**13251341_C4_07**
Engineer:	**I. Dodson**
Date:	**7/30/2020**

Design Base Loads (Factored) - Design per TIA-222-H Standard

Moment (Overturning) (M_u):	2469.7	k-ft
Shear/Leg (V_u):	33.5	k
Compression/Leg (P_u):	48.9	k
Uplift/Leg (T_u):	0.0	k
Tower Type (GT / SST / MP):	MP	

Length of Block:	9.0	ft
Width of Block:	13.0	ft
Thickness of Block:	6.0	ft
Block Height Above Ground:	1.0	ft
Depth Below Ground Surface to Water Table (w):	30.0	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil:	162.2	pcf
Unit Weight of Water:	62.4	pcf
Ultimate Compressive Bearing Pressure:	15000	psf
Capacity Increase (Due to Transient Loads):	1.00	
Pullout Angle:	45.0	degrees
Rod Diameter:	1.00	in
Rod Ultimate Strength:	71	ksi
Rod Net Area:	0.85	in^2
Number of Rods:	18	
Diameter of Cored Hole:	2.50	in
Ultimate Grout / Rock Interface Bond Strength:	100	psi
Ultimate Grout / Rock Anchor Interface Bond Strength:	400	psi
Overall Rod Embedment Length:	192	in
Rod Exposure Above Lock Off Nut in Foundation:	72	in
Rod Embedment Square:	78	in
Free Stress Length:	0	in
Soil / Concrete Friction Coefficient:	0.45	
Lock Off Load:	60	k
Rock Anchor Design Plastic or Elastic:	Elastic	
Ignore Pullout Weight Resistance (Y/N):	N	
Weight of Concrete (Buoyancy Effect Considered):	105.3	k
Compressive Bearing Resistance:	954.3	k
Total Rock / Grout Bond Strength:	2714.3	k
Total Grout / Rod Bond Strength:	4342.9	k
Total Rod Mechanical Strength:	1080.0	k
Pullout Weight / Rod:	84.3	k
Rock / Grout Bond Strength / Rod:	150.8	k
Grout / Rod Bond Strength / Rod:	241.3	k
Rod Mechanical Strength / Rod:	60.0	k
Soil Strength Reduction Factor (ϕ_s):	0.75	
Factored Nominal Moment Capacity per Leg ($\phi_s M_n$):	3146.4	k
Factored Nominal Uplift Capacity per Leg ($\phi_s T_n$):	925.7	k
Factored Nominal Compressive Capacity per Leg ($\phi_s P_n$):	715.7	k
Factored Nominal Shear Capacity per Leg ($\phi_s V_n$):	486.0	k
M_u:	2670.7	k-ft
T_u:	0.0	k
P_u:	39.8	k
V_u:	33.5	k
$T_u/\phi_s T_n + M_u/\phi_s M_n$:	0.85	Result: OK
$P_u/\phi_s P_n$:	0.06	Result: OK
$V_u/\phi_s V_n$:	0.07	Result: OK

Caisson Strength Capacity

Concrete Compressive Strength (f'_c):	3000	psi
Vertical Steel Rebar Size #:	11	
Vertical Steel Rebar Area:	1.56	in^2
# of Vertical Steel Rebars:	52	Minimum # of vertical rebar met
Vertical Steel Rebar Yield Strength (F_y):	60	ksi
Horizontal Tie / Stirrup Size #:	4	
Horizontal Tie / Stirrup Area:	0.20	in^2
Horizontal Tie / Stirrup Spacing:	12.0	in
Horizontal Tie / Stirrup Steel Yield Strength (F_y):	60	ksi
Anchor Rod Nut Diameter:	2.02	in
Rebar Cage Diameter:	108.0	in
Strength Bending/Tension Reduction Factor (ϕ_B):	0.90	ACI318-05 - 9.3.2.1
Strength Shear Reduction Factor (ϕ_V):	0.75	ACI318-05 - 9.3.2.3
Strength Compression/Bearing Reduction Factor ($\phi_{P/B}$):	0.65	ACI318-05 - 9.3.2.2
Steel Elastic Modulus:	29000	ksi
Design Moment (M_u):	2670.7	k-ft
Factored Nominal Moment Capacity ($\phi_B M_n$):	19276.7	k-ft - ACI318-05 - 10.2
$M_u/\phi_B M_n$:	0.14	Result: OK
Design Shear (V_u):	309.8	k
Factored Nominal Shear Capacity ($\phi_V V_n$):	603.4	k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u/\phi_V V_n$:	0.51	Result: OK
Design Tension (T_u):	0.0	k
Factored Nominal Tension Capacity ($\phi_T T_n$):	4380.5	k - ACI318-05 - 10.2
$T_u/\phi_T T_n$:	0.00	Result: OK
Design Compression (P_u):	48.9	k
Factored Nominal Compression Capacity ($\phi_P P_n$):	14164.4	k - ACI318-05 - 10.3.6.2
$P_u/\phi_P P_n$:	0.00	Result: OK

Exhibit E

Mount Analysis

August 10, 2020

Geoff Middlebrooks
American Tower Corporation
3500 Regency Pkwy, Suite 100
Cary, NC 27518
(919) 466-5149

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
Structures@tepgroup.net

Subject: Appurtenance Mount Modification Analysis Report

Carrier Designation:	***T-Mobile* Reconfiguration**	
	Site Number:	CT11769B
	Site Name:	CT769/SSite Hartford #2
ATC Designation:	**ATC Site Number:**	302481
	ATC Site Name:	Hrfr – South
Engineering Firm Designation:	**TEP Project Number:**	68513.435981
Site Data:	**289 Mountain St., Hartford, Hartford County, CT 06106** **Latitude *41° 43' 35.76"*, Longitude *-72° 42' 29.52"*** **110 ± Foot - Monopole Tower**	

Table 1 - Mount Analysis Specification

Ultimate Wind Speed (MPH)	Radial Ice (in.)	Ice Wind Speed (MPH)	Exposure Category	Risk Category	Topo Procedure	K_{zt}
118	***1.5***	***50***	***B***	***II***	***Method 2***	***1.434***

Based on our analysis we have determined the stress level for the mount structure to be:

LC2: Existing + Proposed + Reserved Loading with Proposed Modifications **Sufficient Capacity**
Note: See Table 2 for the existing, proposed, and reserved loading

The analysis has been performed in accordance with the ANSI/TIA-222-H-2017 Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures.

Structural analysis prepared by: Roger W. Martel

Respectfully submitted by:

Aaron T. Rucker, P.E.

08/10/2020

Table 2 - Existing, Proposed, and Reserved Antenna Loading Configuration

Existing/ Proposed/ Reserved	Mount Level (ft)	Ant CL (ft)	Qty	Antenna Model	Mount Type	Owner/ Tenant
Final Loading Config.	90.0	90.0	3	Ericsson AIR32 B66Aa/B2a	Platform w/Support Rail	T-Mobile
			3	RFS APXVAARR24_43-U-NA20		
			3	Ericsson AIR6449 B41		
			3	Ericsson AIR3246 B66		
			3	Ericsson Radio 4449 B71 B85A		
			3	Ericsson RRUS 4415 B25		

Table 3 - Mount Component Stresses vs. Capacity

Notes	Component	% Capacity	Pass / Fail
-	Face Horizontal	78.6	Pass
-	Support Arm	40.5	Pass
-	Internals	31.8	Pass
-	Mount Pipe	61.8	Pass
-	Support Rail	64.5	Pass
-	Kicker	36.5	Pass

Structure Rating (max from all components) =	**78.6%**

Table 4 - Documents Provided

Document	Remarks	Source
RFDS	T-Mobile, dated May 11, 2020 CT11769B_Anchor_4_draft_2020-05-12	ATC
Reference Photos	Site Photos from 2019	ATC
Previous Mount Analysis	Tower Engineering Professionals, Inc., dated June 19, 2020 TEP No. 68513.424448	TEP

RECOMMENDATIONS

1) If the load differs from that described in Table 2 of this report or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The modifications depicted in Appendix C shall be installed and, upon completion, inspected. The mount has sufficient capacity to support the final antenna configuration once the proposed modifications are completed.
3) Modification of the existing mount would require the following parts:
   a) (1) SitePro HRK14-HD Heavy Duty Handrail Kit
   b) (1) SitePro PRK-SFS-L Kicker Kit
   c) (12) SitePro SCX2-K Crossover Kit
   d) (3) SitePro P30174 Support Pipe

   Total estimated costs of the modification to including the modification drawings, materials, and required labor is $19,000.
4) Should the customer elect to forgo installation of the aforementioned modifications, a mount replacement will be required, SitePro model RMQP-496, or approved equivalent.
   a) Total estimated costs of the replacement including the replacement mount analysis, materials, and required labor is $25,000.
5) TEP was not provided a mount mapping and had to base geometry assumptions off photos. If any of these assumptions are not accurate this analysis is not valid. TEP recommends completing a mount mapping to confirm the mount geometry.

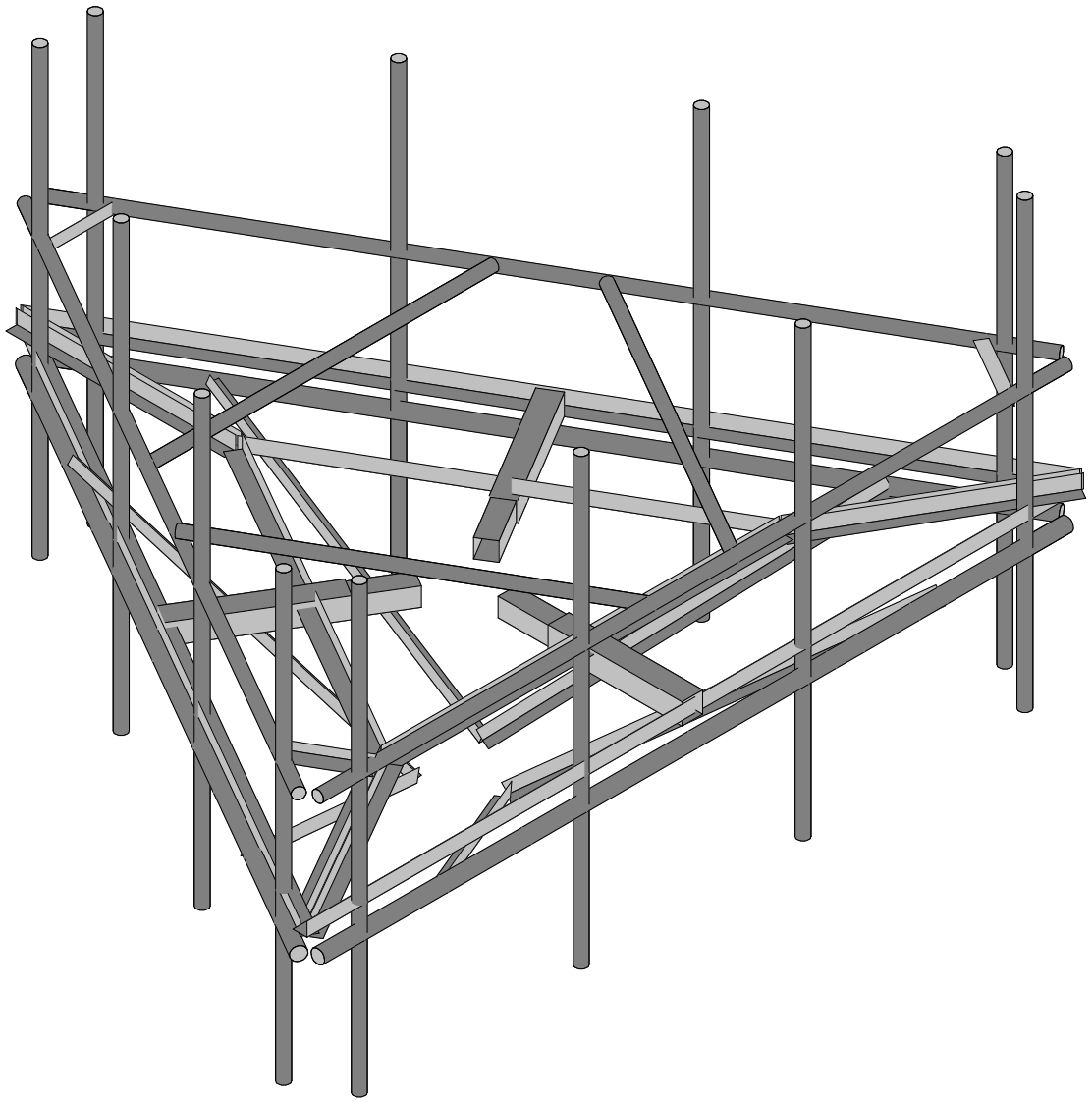
ANALYSIS ASSUMPTIONS

1) The mount was built in accordance with the manufacturer's specifications.
2) The mount has been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Table 2. All mount components have been assumed to be in sufficient condition to carry their full design capacity for this analysis. Refer to the issued mapping for any structural and/or maintenance issues found during our site visit.
4) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
5) TEP did not analyze the collar mount connection to the pole and assumes it to have sufficient structural capacity to transfer the applied forces from the mount to the tower.
6) All material grades used for this analysis, unless verified by mount manufacturer design, were assumed per AISC Table 2-4, 15th Edition. See RISA 3-D output for confirmation on grades used in this analysis.

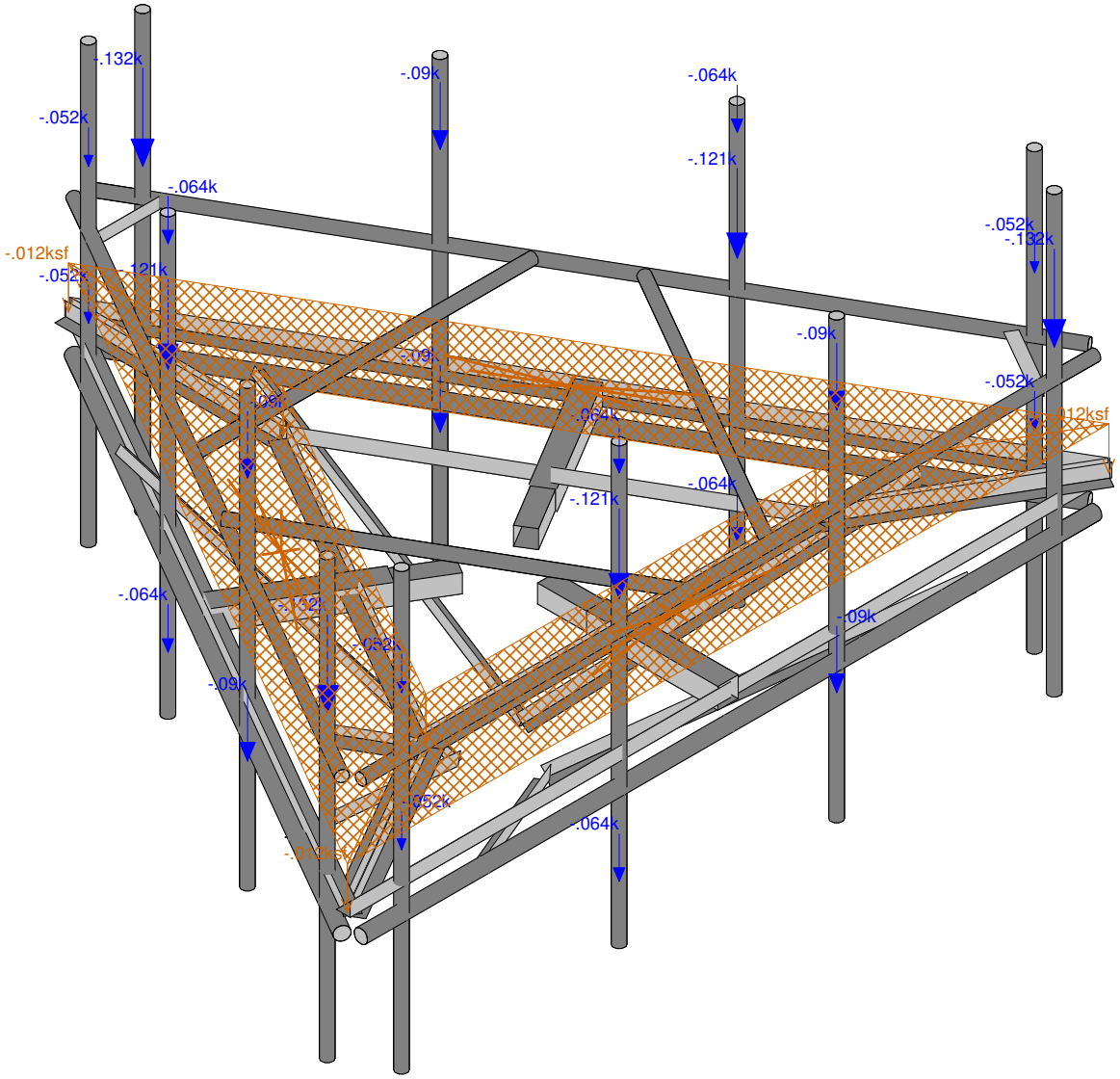
This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals should be notified to determine the effect on the structural integrity of the mount.

APPENDIX A

RISA-3D OUTPUT

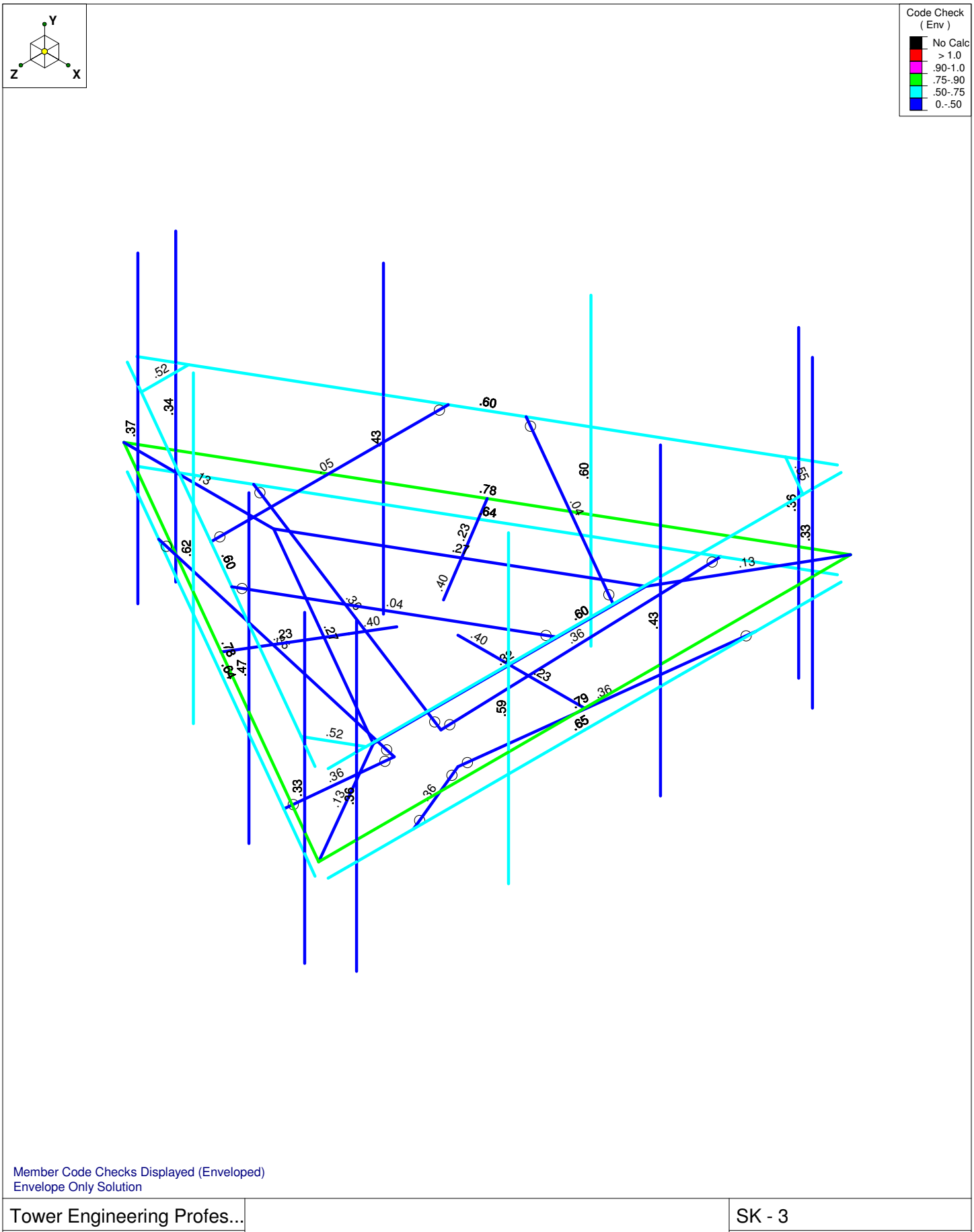


Tower Engineering Profes...	302481 - Hrfr - South	SK - 1
RWM		Aug 6, 2020 at 2:22 PM
TEP No. 68513.435981		Mount Rev H.r3d



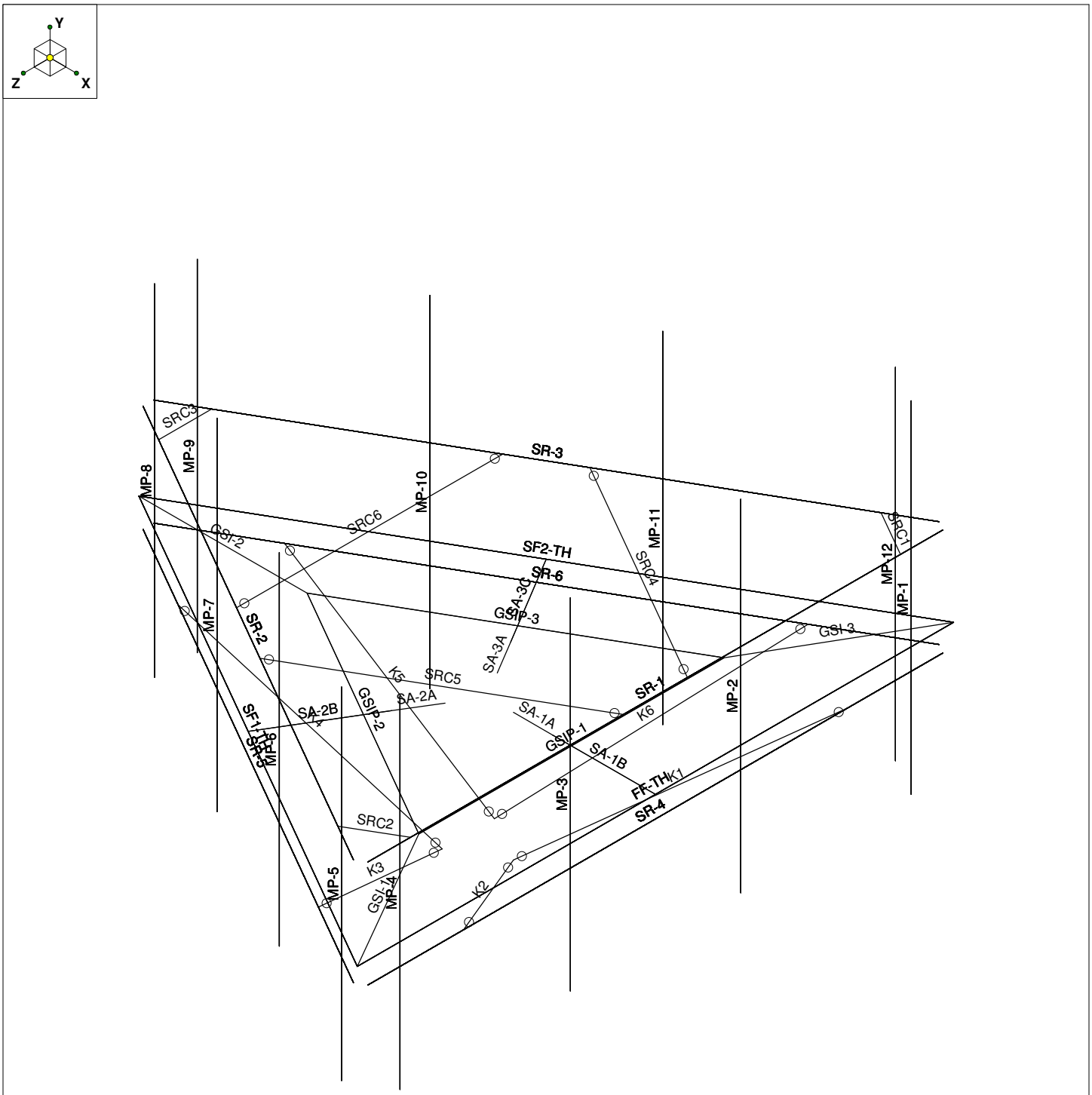
Loads: BLC 1, Dead

Tower Engineering Profes...	302481 - Hrfr - South	SK - 2
RWM		Aug 6, 2020 at 2:23 PM
TEP No. 68513.435981		Mount Rev H.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Tower Engineering Profes...	302481 - Hrfr - South	SK - 3
RWM		Aug 6, 2020 at 2:24 PM
TEP No. 68513.435981		Mount Rev H.r3d



Envelope Only Solution

Tower Engineering Profes...	302481 - Hrfr - South	SK - 4
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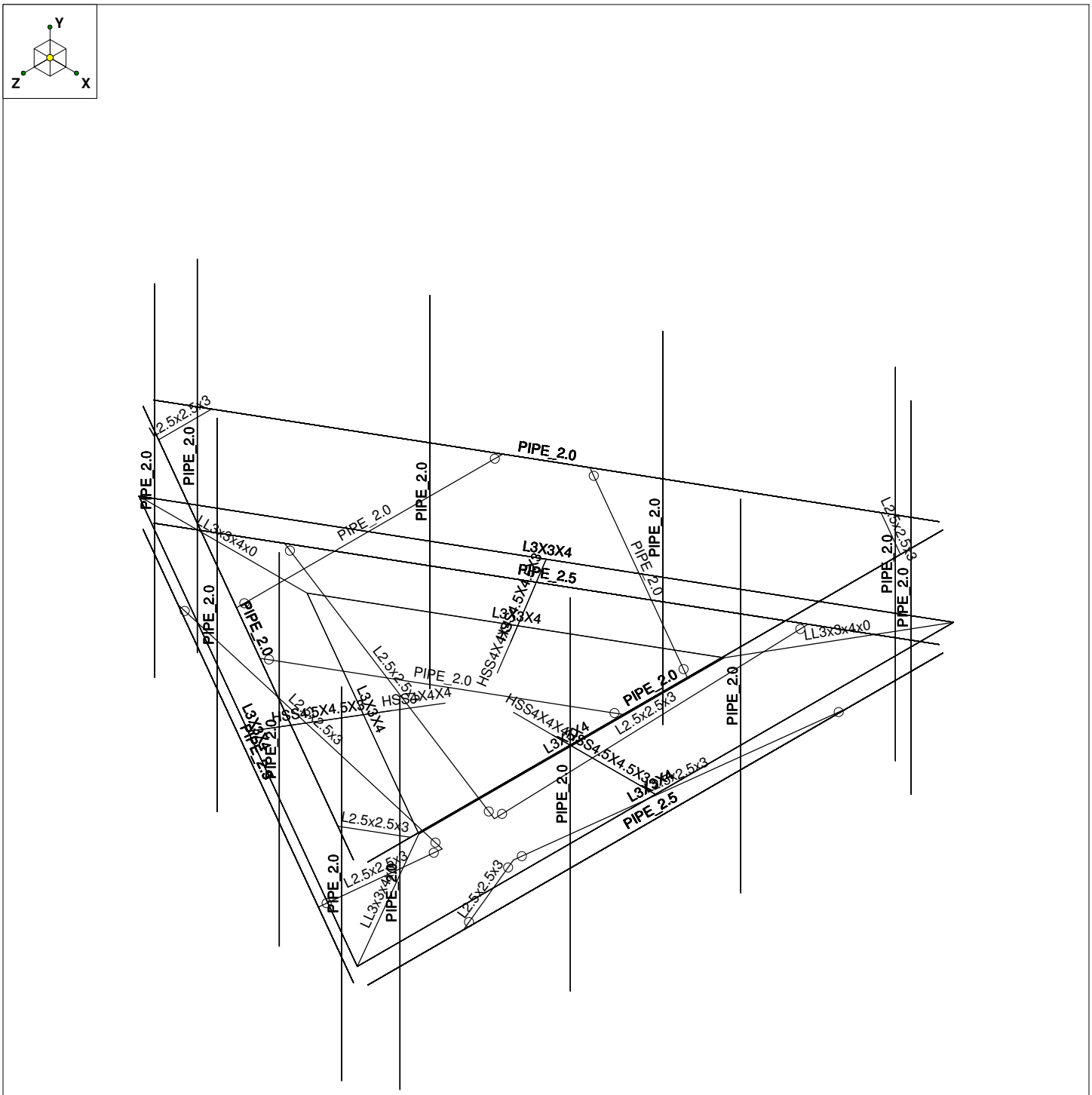
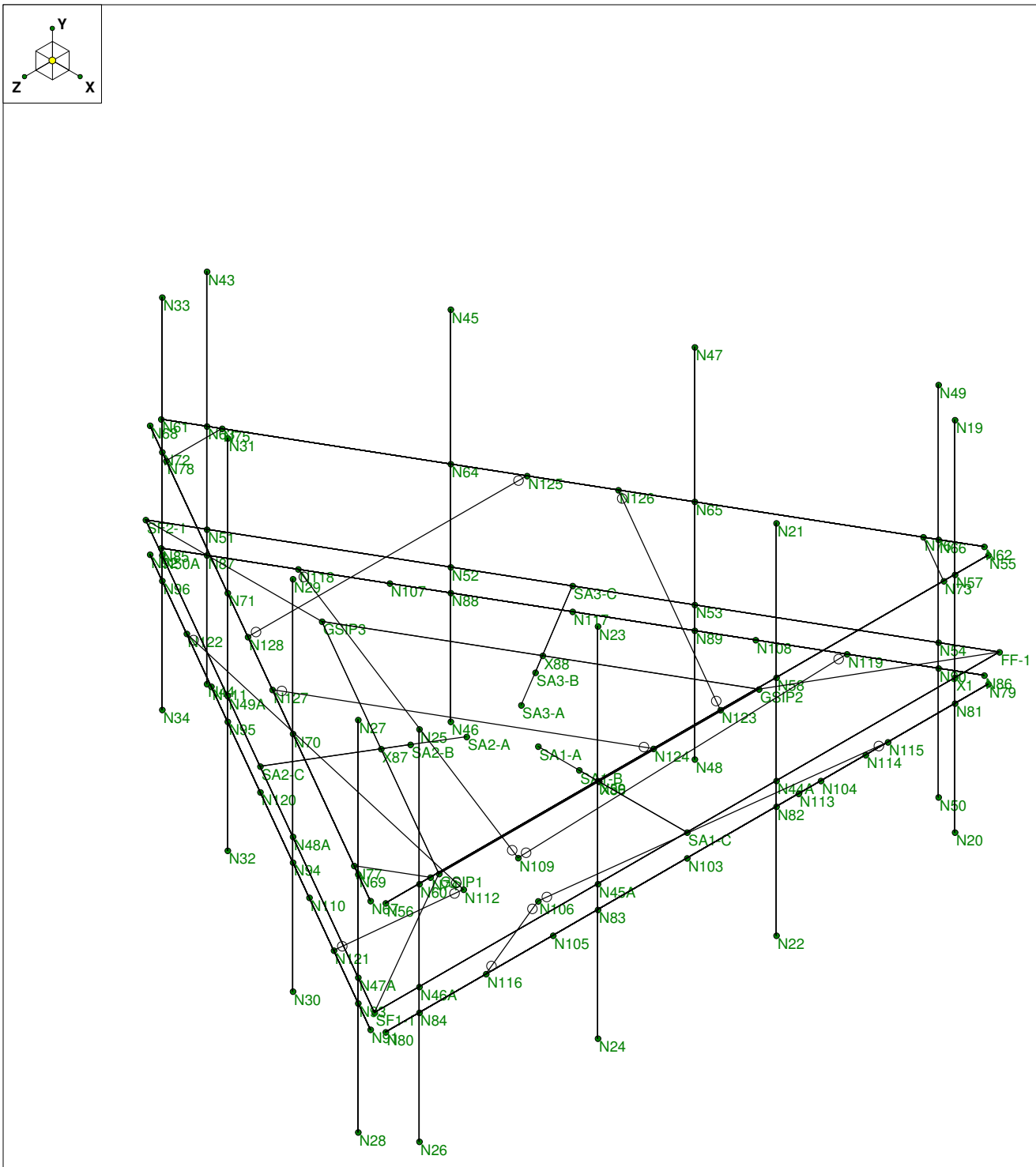
TEP No. 68513.435981		Mount Rev H.r3d



Envelope Only Solution

Tower Engineering Profes...	302481 - Hrfr - South	SK - 5
RWM		Aug 6, 2020 at 2:25 PM
TEP No. 68513.435981		Mount Rev H.r3d



Envelope Only Solution

Tower Engineering Profes...	302481 - Hrfr - South	SK - 6
RWM		Aug 6, 2020 at 2:25 PM
TEP No. 68513.435981		Mount Rev H.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	No
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

Company : Tower Engineering Professionals, Inc.
Designer : RWM
Job Number : TEP No. 68513.435981
Model Name : 302481 - Hrfr - South

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(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1...	Density[k/ft^3]	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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Face Horizontal	L3X3X4	None	None	A36 Gr.36	Typical	1.44	1.23	1.23	.031
2	Internal	L3X3X4	None	None	A36 Gr.36	Typical	1.44	1.23	1.23	.031
3	Support Arm A	HSS4X4X4	None	None	A500 Gr.B R...	Typical	3.37	7.8	7.8	12.8
4	Support Arm B	HSS4.5X4.5X3	None	None	A500 Gr.B R...	Typical	2.93	9.02	9.02	14.4
5	Corner Internal	LL3x3x4x0	None	None	A36 Gr.36	Typical	2.88	4.5	2.46	.063
6	Mount Pipe	PIPE_2.0	None	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
7	Support Rail	PIPE_2.0	None	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
8	Mod Pipe	PIPE_2.5	None	None	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
9	Support Rail Connection	L2.5x2.5x3	None	None	A36 Gr.36	Typical	.901	.535	.535	.011
10	Kicker	L2.5x2.5x3	None	None	A36 Gr.36	Typical	.901	.535	.535	.011

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	RRH Mount	P1000_CFA...	Beam	None	A653 SS Gr33	Typical	.554	.178	.358	.002

Material Takeoff

	Material	Size	Pieces	Length[ft]	Weight[K]
1	Hot Rolled Steel				
2	A36 Gr.36	L2.5x2.5x3	9	40.5	.1
3	A36 Gr.36	L3X3X4	6	63.5	.3
4	A36 Gr.36	LL3x3x4x0	3	11.8	.1
5	A500 Gr.B Rect	HSS4.5X4.5X3	3	7.3	0
6	A500 Gr.B Rect	HSS4X4X4	3	2.8	0
7	A53 Gr.B	PIPE 2.0	18	155.3	.5
8	A53 Gr.B	PIPE 2.5	3	40.5	.2
9	Total HR Steel		45	321.7	1.4

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	SA1-A	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	SA3-A	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	SA2-A	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N106	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N109	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
6	N112	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	FF-TH	FF-1	SF1-1			Face Horizontal	None	None	A36 Gr.36	Typical
2	GSI-1	GSIP1	SF1-1		180	Corner Internal	None	None	A36 Gr.36	Typical
3	GSI-2	GSIP3	SF2-1		180	Corner Internal	None	None	A36 Gr.36	Typical
4	GSI-3	GSIP2	FF-1		180	Corner Internal	None	None	A36 Gr.36	Typical
5	GSIP-1	GSIP1	GSIP2			Internal	None	None	A36 Gr.36	Typical
6	GSIP-2	GSIP3	GSIP1			Internal	None	None	A36 Gr.36	Typical
7	GSIP-3	GSIP2	GSIP3			Internal	None	None	A36 Gr.36	Typical
8	MP-1	N19	N20			Mount Pipe	None	None	A53 Gr.B	Typical
9	MP-2	N21	N22			Mount Pipe	None	None	A53 Gr.B	Typical
10	MP-3	N23	N24			Mount Pipe	None	None	A53 Gr.B	Typical
11	MP-4	N25	N26			Mount Pipe	None	None	A53 Gr.B	Typical
12	MP-5	N27	N28			Mount Pipe	None	None	A53 Gr.B	Typical
13	MP-6	N29	N30			Mount Pipe	None	None	A53 Gr.B	Typical
14	MP-7	N31	N32			Mount Pipe	None	None	A53 Gr.B	Typical
15	MP-8	N33	N34			Mount Pipe	None	None	A53 Gr.B	Typical
16	MP-9	N43	N44			Mount Pipe	None	None	A53 Gr.B	Typical
17	MP-10	N45	N46			Mount Pipe	None	None	A53 Gr.B	Typical
18	MP-11	N47	N48			Mount Pipe	None	None	A53 Gr.B	Typical
19	MP-12	N49	N50			Mount Pipe	None	None	A53 Gr.B	Typical
20	SA-1A	SA1-A	SA1-B			Support Arm A	None	None	A500 Gr.B Rect	Typical
21	SA-1B	SA1-B	SA1-C			Support Arm B	None	None	A500 Gr.B Rect	Typical

Company : Tower Engineering Professionals, Inc.
Designer : RWM
Job Number : TEP No. 68513.435981
Model Name : 302481 - Hrfr - South

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Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
22	SA-2A	SA2-A	SA2-B			Support Arm A	None	None	A500 Gr.B Rect	Typical
23	SA-2B	SA2-B	SA2-C			Support Arm B	None	None	A500 Gr.B Rect	Typical
24	SA-3A	SA3-A	SA3-B			Support Arm A	None	None	A500 Gr.B Rect	Typical
25	SA-3C	SA3-B	SA3-C			Support Arm B	None	None	A500 Gr.B Rect	Typical
26	SF1-TH	SF1-1	SF2-1			Face Horizontal	None	None	A36 Gr.36	Typical
27	SF2-TH	SF2-1	FF-1			Face Horizontal	None	None	A36 Gr.36	Typical
28	SR-1	N55	N56			Support Rail	None	None	A53 Gr.B	Typical
29	SR-3	N61	N62			Support Rail	None	None	A53 Gr.B	Typical
30	SR-2	N67	N68			Support Rail	None	None	A53 Gr.B	Typical
31	SRC2	N74	N77		90	Support Rail Connection	None	None	A36 Gr.36	Typical
32	SRC3	N78	N75		90	Support Rail Connection	None	None	A36 Gr.36	Typical
33	SRC1	N76	N73		90	Support Rail Connection	None	None	A36 Gr.36	Typical
34	SR-4	N79	N80			Mod Pipe	None	None	A53 Gr.B	Typical
35	SR-6	N85	N86			Mod Pipe	None	None	A53 Gr.B	Typical
36	SR-5	N91	N92			Mod Pipe	None	None	A53 Gr.B	Typical
37	K1	N106	N115			Kicker	None	None	A36 Gr.36	Typical
38	K2	N106	N116			Kicker	None	None	A36 Gr.36	Typical
39	K5	N109	N118			Kicker	None	None	A36 Gr.36	Typical
40	K6	N109	N119			Kicker	None	None	A36 Gr.36	Typical
41	K3	N112	N121			Kicker	None	None	A36 Gr.36	Typical
42	K4	N112	N122			Kicker	None	None	A36 Gr.36	Typical
43	SRC4	N126	N123			Support Rail	None	None	A53 Gr.B	Typical
44	SRC5	N124	N127			Support Rail	None	None	A53 Gr.B	Typical
45	SRC6	N128	N125			Support Rail	None	None	A53 Gr.B	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	FF-TH						Yes	** NA **			None
2	GSI-1						Yes	** NA **			None
3	GSI-2						Yes	** NA **			None
4	GSI-3						Yes	** NA **			None
5	GSIP-1						Yes	** NA **			None
6	GSIP-2						Yes	** NA **			None
7	GSIP-3						Yes	** NA **			None
8	MP-1						Yes	** NA **			None
9	MP-2						Yes	** NA **			None
10	MP-3						Yes	** NA **			None
11	MP-4						Yes	** NA **			None
12	MP-5						Yes	** NA **			None
13	MP-6						Yes	** NA **			None
14	MP-7						Yes	** NA **			None
15	MP-8						Yes	** NA **			None
16	MP-9						Yes	** NA **			None
17	MP-10						Yes	** NA **			None
18	MP-11						Yes	** NA **			None
19	MP-12						Yes	** NA **			None
20	SA-1A						Yes	** NA **			None
21	SA-1B						Yes	** NA **			None
22	SA-2A						Yes	** NA **			None
23	SA-2B						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
24	SA-3A						Yes	** NA **			None
25	SA-3C						Yes	** NA **			None
26	SF1-TH						Yes	** NA **			None
27	SF2-TH						Yes	** NA **			None
28	SR-1						Yes	** NA **			None
29	SR-3						Yes	** NA **			None
30	SR-2						Yes	** NA **			None
31	SRC2						Yes	** NA **			None
32	SRC3						Yes	** NA **			None
33	SRC1						Yes	** NA **			None
34	SR-4						Yes	** NA **			None
35	SR-6						Yes	** NA **			None
36	SR-5						Yes	** NA **			None
37	K1	BenPIN	BenPIN				Yes	** NA **			None
38	K2	BenPIN	BenPIN				Yes	** NA **			None
39	K5	BenPIN	BenPIN				Yes	** NA **			None
40	K6	BenPIN	BenPIN				Yes	** NA **			None
41	K3	BenPIN	BenPIN				Yes	** NA **			None
42	K4	BenPIN	BenPIN				Yes	** NA **			None
43	SRC4	BenPIN	BenPIN				Yes	** NA **			None
44	SRC5	BenPIN	BenPIN				Yes	** NA **			None
45	SRC6	BenPIN	BenPIN				Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top...	Lcomp bot...	L-torq...	Kyy	Kzz	Cb	Funct...
1	FF-TH	Face Horizontal	14	7	7				1	1		Lateral
2	GSI-1	Corner Internal	3.944						1	1		Lateral
3	GSI-2	Corner Internal	3.944						1	1		Lateral
4	GSI-3	Corner Internal	3.944						1	1		Lateral
5	GSIP-1	Internal	7.168	3.583	3.583				1	1		Lateral
6	GSIP-2	Internal	7.168	3.583	3.583				1	1		Lateral
7	GSIP-3	Internal	7.168	3.583	3.583				1	1		Lateral
8	MP-1	Mount Pipe	8	Segment	Segment				2.1	2.1		Lateral
9	MP-2	Mount Pipe	8	Segment	Segment				2.1	2.1		Lateral
10	MP-3	Mount Pipe	8	Segment	Segment				2.1	2.1		Lateral
11	MP-4	Mount Pipe	8	Segment	Segment				2.1	2.1		Lateral
12	MP-5	Mount Pipe	8	Segment	Segment				2.1	2.1		Lateral
13	MP-6	Mount Pipe	8	Segment	Segment				2.1	2.1		Lateral
14	MP-7	Mount Pipe	8	Segment	Segment				2.1	2.1		Lateral
15	MP-8	Mount Pipe	8	Segment	Segment				2.1	2.1		Lateral
16	MP-9	Mount Pipe	8	Segment	Segment				2.1	2.1		Lateral
17	MP-10	Mount Pipe	8	Segment	Segment				2.1	2.1		Lateral
18	MP-11	Mount Pipe	8	Segment	Segment				2.1	2.1		Lateral
19	MP-12	Mount Pipe	8	Segment	Segment				2.1	2.1		Lateral
20	SA-1A	Support Arm A	.917						1	1		Lateral
21	SA-1B	Support Arm B	2.417						1	1		Lateral
22	SA-2A	Support Arm A	.917						1	1		Lateral
23	SA-2B	Support Arm B	2.452						1	1		Lateral
24	SA-3A	Support Arm A	.917						1	1		Lateral
25	SA-3C	Support Arm B	2.452						1	1		Lateral

Company : Tower Engineering Professionals, Inc.
Designer : RWM
Job Number : TEP No. 68513.435981
Model Name : 302481 - Hrfr - South

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Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top...	Lcomp bot...	L-torq...	Kyy	Kzz	Cb	Funct...
26	SF1-TH	Face Horizontal	14	7	7				1	1		Lateral
27	SF2-TH	Face Horizontal	14	7	7				1	1		Lateral
28	SR-1	Support Rail	13.5						2.1	2.1		Lateral
29	SR-3	Support Rail	13.5						2.1	2.1		Lateral
30	SR-2	Support Rail	13.5						2.1	2.1		Lateral
31	SRC2	Support Rail Conn...	1.25						.65	.65		Lateral
32	SRC3	Support Rail Conn...	1.25						.65	.65		Lateral
33	SRC1	Support Rail Conn...	1.25						.65	.65		Lateral
34	SR-4	Mod Pipe	13.5						2.1	2.1		Lateral
35	SR-6	Mod Pipe	13.5						2.1	2.1		Lateral
36	SR-5	Mod Pipe	13.5						2.1	2.1		Lateral
37	K1	Kicker	6.133						1	1		Lateral
38	K2	Kicker	6.133						1	1		Lateral
39	K5	Kicker	6.133						1	1		Lateral
40	K6	Kicker	6.133						1	1		Lateral
41	K3	Kicker	6.133						1	1		Lateral
42	K4	Kicker	6.133						1	1		Lateral
43	SRC4	Support Rail	6.25						1	1		Lateral
44	SRC5	Support Rail	6.25						1	1		Lateral
45	SRC6	Support Rail	6.25						1	1		Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead	None		-1			27		3	
2	0 Wind - No Ice	None					27	45		
3	30 Wind - No Ice	None					54	90		
4	45 Wind - No Ice	None					54	90		
5	60 Wind - No Ice	None					54	90		
6	90 Wind - No Ice	None					27	45		
7	120 Wind - No Ice	None					54	90		
8	135 Wind - No Ice	None					54	90		
9	150 Wind - No Ice	None					54	90		
10	180 Wind - No Ice	None					27	45		
11	210 Wind - No Ice	None					54	90		
12	225 Wind - No Ice	None					54	90		
13	240 Wind - No Ice	None					54	90		
14	270 Wind - No Ice	None					27	45		
15	300 Wind - No Ice	None					54	90		
16	315 Wind - No Ice	None					54	90		
17	330 Wind - No Ice	None					54	90		
18	Ice Weight	None					27	45	3	
19	0 Wind - Ice	None					27	45		
20	30 Wind - Ice	None					54	90		
21	45 Wind - Ice	None					54	90		
22	60 Wind - Ice	None					54	90		
23	90 Wind - Ice	None					27	45		
24	120 Wind - Ice	None					54	90		
25	135 Wind - Ice	None					54	90		
26	150 Wind - Ice	None					54	90		
27	180 Wind - Ice	None					27	45		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
28	210 Wind - Ice	None					54	90		
29	225 Wind - Ice	None					54	90		
30	240 Wind - Ice	None					54	90		
31	270 Wind - Ice	None					27	45		
32	300 Wind - Ice	None					54	90		
33	315 Wind - Ice	None					54	90		
34	330 Wind - Ice	None					54	90		
35	Lm	None				1				
36	Lv	None				1				
37	Seismic Load X	ELX	-1				27			
38	Seismic Load Z	ELZ			-1		27			
39	BLC 1 Transient Area...	None						32		
40	BLC 18 Transient Are...	None						32		

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.4D	Yes	Y		1	1.4																				
2	0.9D+1.0 0-Wind	Yes	Y		1	.9	2	1																		
3	0.9D+1.0 30-Wind	Yes	Y		1	.9	3	1																		
4	0.9D+1.0 45-Wind	Yes	Y		1	.9	4	1																		
5	0.9D+1.0 60-Wind	Yes	Y		1	.9	5	1																		
6	0.9D+1.0 90-Wind	Yes	Y		1	.9	6	1																		
7	0.9D+1.0 120-Wind	Yes	Y		1	.9	7	1																		
8	0.9D+1.0 135-Wind	Yes	Y		1	.9	8	1																		
9	0.9D+1.0 150-Wind	Yes	Y		1	.9	9	1																		
10	0.9D+1.0 180-Wind	Yes	Y		1	.9	10	1																		
11	0.9D+1.0 210-Wind	Yes	Y		1	.9	11	1																		
12	0.9D+1.0 225-Wind	Yes	Y		1	.9	12	1																		
13	0.9D+1.0 240-Wind	Yes	Y		1	.9	13	1																		
14	0.9D+1.0 270-Wind	Yes	Y		1	.9	14	1																		
15	0.9D+1.0 300-Wind	Yes	Y		1	.9	15	1																		
16	0.9D+1.0 315-Wind	Yes	Y		1	.9	16	1																		
17	0.9D+1.0 330-Wind	Yes	Y		1	.9	17	1																		
18	1.2D+1.0 0-Wind	Yes	Y		1	1.2	2	1																		
19	1.2D+1.0 30-Wind	Yes	Y		1	1.2	3	1																		
20	1.2D+1.0 45-Wind	Yes	Y		1	1.2	4	1																		
21	1.2D+1.0 60-Wind	Yes	Y		1	1.2	5	1																		
22	1.2D+1.0 90-Wind	Yes	Y		1	1.2	6	1																		
23	1.2D+1.0 120-Wind	Yes	Y		1	1.2	7	1																		
24	1.2D+1.0 135-Wind	Yes	Y		1	1.2	8	1																		
25	1.2D+1.0 150-Wind	Yes	Y		1	1.2	9	1																		
26	1.2D+1.0 180-Wind	Yes	Y		1	1.2	10	1																		
27	1.2D+1.0 210-Wind	Yes	Y		1	1.2	11	1																		
28	1.2D+1.0 225-Wind	Yes	Y		1	1.2	12	1																		
29	1.2D+1.0 240-Wind	Yes	Y		1	1.2	13	1																		
30	1.2D+1.0 270-Wind	Yes	Y		1	1.2	14	1																		
31	1.2D+1.0 300-Wind	Yes	Y		1	1.2	15	1																		
32	1.2D+1.0 315-Wind	Yes	Y		1	1.2	16	1																		
33	1.2D+1.0 330-Wind	Yes	Y		1	1.2	17	1																		
34	1.2D+1.0Di+1.0 0-Win...	Yes	Y		1	1.2	18	1	19	1																

Company : Tower Engineering Professionals, Inc.
Designer : RWM
Job Number : TEP No. 68513.435981
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Load Combinations (Continued)

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
35	1.2D+1.0Di+1.0 30-Wi...	Yes	Y		1	1.2	18	1	20	1																
36	1.2D+1.0Di+1.0 45-Wi...	Yes	Y		1	1.2	18	1	21	1																
37	1.2D+1.0Di+1.0 60-Wi...	Yes	Y		1	1.2	18	1	22	1																
38	1.2D+1.0Di+1.0 90-Wi...	Yes	Y		1	1.2	18	1	23	1																
39	1.2D+1.0Di+1.0 120-...	Yes	Y		1	1.2	18	1	24	1																
40	1.2D+1.0Di+1.0 135-...	Yes	Y		1	1.2	18	1	25	1																
41	1.2D+1.0Di+1.0 150-...	Yes	Y		1	1.2	18	1	26	1																
42	1.2D+1.0Di+1.0 180-...	Yes	Y		1	1.2	18	1	27	1																
43	1.2D+1.0Di+1.0 210-...	Yes	Y		1	1.2	18	1	28	1																
44	1.2D+1.0Di+1.0 225-...	Yes	Y		1	1.2	18	1	29	1																
45	1.2D+1.0Di+1.0 240-...	Yes	Y		1	1.2	18	1	30	1																
46	1.2D+1.0Di+1.0 270-...	Yes	Y		1	1.2	18	1	31	1																
47	1.2D+1.0Di+1.0 300-...	Yes	Y		1	1.2	18	1	32	1																
48	1.2D+1.0Di+1.0 315-...	Yes	Y		1	1.2	18	1	33	1																
49	1.2D+1.0Di+1.0 330-...	Yes	Y		1	1.2	18	1	34	1																
50	1.2D+1.5Lv	Yes	Y		36	1.5	1	1.2																		
51	1.2D+1.5Lm+1.0 0-Wi...	Yes	Y		1	1.2	2	.065	35	1.5																
52	1.2D+1.5Lm+1.0 30-...	Yes	Y		1	1.2	3	.065	35	1.5																
53	1.2D+1.5Lm+1.0 45-...	Yes	Y		1	1.2	4	.065	35	1.5																
54	1.2D+1.5Lm+1.0 60-...	Yes	Y		1	1.2	5	.065	35	1.5																
55	1.2D+1.5Lm+1.0 90-...	Yes	Y		1	1.2	6	.065	35	1.5																
56	1.2D+1.5Lm+1.0 120-...	Yes	Y		1	1.2	7	.065	35	1.5																
57	1.2D+1.5Lm+1.0 135-...	Yes	Y		1	1.2	8	.065	35	1.5																
58	1.2D+1.5Lm+1.0 150-...	Yes	Y		1	1.2	9	.065	35	1.5																
59	1.2D+1.5Lm+1.0 180-...	Yes	Y		1	1.2	10	.065	35	1.5																
60	1.2D+1.5Lm+1.0 210-...	Yes	Y		1	1.2	11	.065	35	1.5																
61	1.2D+1.5Lm+1.0 225-...	Yes	Y		1	1.2	12	.065	35	1.5																
62	1.2D+1.5Lm+1.0 240-...	Yes	Y		1	1.2	13	.065	35	1.5																
63	1.2D+1.5Lm+1.0 270-...	Yes	Y		1	1.2	14	.065	35	1.5																
64	1.2D+1.5Lm+1.0 300-...	Yes	Y		1	1.2	15	.065	35	1.5																
65	1.2D+1.5Lm+1.0 315-...	Yes	Y		1	1.2	16	.065	35	1.5																
66	1.2D+1.5Lm+1.0 330-...	Yes	Y		1	1.2	17	.065	35	1.5																

Joint Loads and Enforced Displacements (BLC 35 : Lm)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	X1	L	Y	-.5

Joint Loads and Enforced Displacements (BLC 36 : Lv)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	FF-1	L	Y	-.25

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Y	-.132	2.5
2	MP-2	Y	-.09	1.5
3	MP-3	Y	-.064	.5
4	MP-3	Y	-.046	2.5
5	MP-3	Y	-.075	2.5

Member Point Loads (BLC 1 : Dead) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
6	MP-4	Y	-.052	2
7	MP-5	Y	-.132	2.5
8	MP-6	Y	-.09	1.5
9	MP-7	Y	-.064	.5
10	MP-7	Y	-.046	2.5
11	MP-7	Y	-.075	2.5
12	MP-8	Y	-.052	2
13	MP-9	Y	-.132	2.5
14	MP-10	Y	-.09	1.5
15	MP-11	Y	-.064	.5
16	MP-11	Y	-.046	2.5
17	MP-11	Y	-.075	2.5
18	MP-12	Y	-.052	2
19	MP-2	Y	-.09	6
20	MP-3	Y	-.064	7
21	MP-4	Y	-.052	4.5
22	MP-6	Y	-.09	6
23	MP-7	Y	-.064	7
24	MP-8	Y	-.052	4.5
25	MP-10	Y	-.09	6
26	MP-11	Y	-.064	7
27	MP-12	Y	-.052	4.5

Member Point Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.256	2.5
2	MP-2	X	-.156	1.5
3	MP-3	X	-.399	.5
4	MP-3	X	-.027	2.5
5	MP-3	X	-.052	2.5
6	MP-4	X	-.112	2
7	MP-5	X	-.203	2.5
8	MP-6	X	-.116	1.5
9	MP-7	X	-.231	.5
10	MP-7	X	-.055	2.5
11	MP-7	X	-.062	2.5
12	MP-8	X	-.065	2
13	MP-9	X	-.203	2.5
14	MP-10	X	-.116	1.5
15	MP-11	X	-.231	.5
16	MP-11	X	-.055	2.5
17	MP-11	X	-.062	2.5
18	MP-12	X	-.065	2
19	MP-2	X	-.156	6
20	MP-3	X	-.399	7
21	MP-4	X	-.112	4.5
22	MP-6	X	-.116	6
23	MP-7	X	-.231	7
24	MP-8	X	-.065	4.5
25	MP-10	X	-.116	6
26	MP-11	X	-.231	7

Member Point Loads (BLC 2 : 0 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
27	MP-12	X	-.065	4.5

Member Point Loads (BLC 3 : 30 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.207	2.5
2	MP-2	X	-.124	1.5
3	MP-3	X	-.297	.5
4	MP-3	X	-.032	2.5
5	MP-3	X	-.048	2.5
6	MP-4	X	-.083	2
7	MP-5	X	-.161	2.5
8	MP-6	X	-.088	1.5
9	MP-7	X	-.152	.5
10	MP-7	X	-.056	2.5
11	MP-7	X	-.056	2.5
12	MP-8	X	-.042	2
13	MP-9	X	-.207	2.5
14	MP-10	X	-.124	1.5
15	MP-11	X	-.297	.5
16	MP-11	X	-.032	2.5
17	MP-11	X	-.048	2.5
18	MP-12	X	-.083	2
19	MP-2	X	-.124	6
20	MP-3	X	-.297	7
21	MP-4	X	-.083	4.5
22	MP-6	X	-.088	6
23	MP-7	X	-.152	7
24	MP-8	X	-.042	4.5
25	MP-10	X	-.124	6
26	MP-11	X	-.297	7
27	MP-12	X	-.083	4.5
28	MP-1	Z	-.119	2.5
29	MP-2	Z	-.071	1.5
30	MP-3	Z	-.171	.5
31	MP-3	Z	-.018	2.5
32	MP-3	Z	-.028	2.5
33	MP-4	Z	-.048	2
34	MP-5	Z	-.093	2.5
35	MP-6	Z	-.051	1.5
36	MP-7	Z	-.088	.5
37	MP-7	Z	-.033	2.5
38	MP-7	Z	-.033	2.5
39	MP-8	Z	-.025	2
40	MP-9	Z	-.119	2.5
41	MP-10	Z	-.071	1.5
42	MP-11	Z	-.171	.5
43	MP-11	Z	-.018	2.5
44	MP-11	Z	-.028	2.5
45	MP-12	Z	-.048	2
46	MP-2	Z	-.071	6
47	MP-3	Z	-.171	7

Member Point Loads (BLC 3 : 30 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
48	MP-4	Z	-.048	4.5
49	MP-6	Z	-.051	6
50	MP-7	Z	-.088	7
51	MP-8	Z	-.025	4.5
52	MP-10	Z	-.071	6
53	MP-11	Z	-.171	7
54	MP-12	Z	-.048	4.5

Member Point Loads (BLC 4 : 45 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.156	2.5
2	MP-2	X	-.091	1.5
3	MP-3	X	-.203	.5
4	MP-3	X	-.032	2.5
5	MP-3	X	-.041	2.5
6	MP-4	X	-.057	2
7	MP-5	X	-.135	2.5
8	MP-6	X	-.075	1.5
9	MP-7	X	-.134	.5
10	MP-7	X	-.044	2.5
11	MP-7	X	-.045	2.5
12	MP-8	X	-.038	2
13	MP-9	X	-.178	2.5
14	MP-10	X	-.108	1.5
15	MP-11	X	-.271	.5
16	MP-11	X	-.021	2.5
17	MP-11	X	-.037	2.5
18	MP-12	X	-.076	2
19	MP-2	X	-.091	6
20	MP-3	X	-.203	7
21	MP-4	X	-.057	4.5
22	MP-6	X	-.075	6
23	MP-7	X	-.134	7
24	MP-8	X	-.038	4.5
25	MP-10	X	-.108	6
26	MP-11	X	-.271	7
27	MP-12	X	-.076	4.5
28	MP-1	Z	-.156	2.5
29	MP-2	Z	-.091	1.5
30	MP-3	Z	-.203	.5
31	MP-3	Z	-.032	2.5
32	MP-3	Z	-.041	2.5
33	MP-4	Z	-.057	2
34	MP-5	Z	-.135	2.5
35	MP-6	Z	-.075	1.5
36	MP-7	Z	-.134	.5
37	MP-7	Z	-.044	2.5
38	MP-7	Z	-.045	2.5
39	MP-8	Z	-.038	2
40	MP-9	Z	-.178	2.5
41	MP-10	Z	-.108	1.5

Company : Tower Engineering Professionals, Inc.
Designer : RWM
Job Number : TEP No. 68513.435981
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Member Point Loads (BLC 4 : 45 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
42	MP-11	Z	-.271	.5
43	MP-11	Z	-.021	2.5
44	MP-11	Z	-.037	2.5
45	MP-12	Z	-.076	2
46	MP-2	Z	-.091	6
47	MP-3	Z	-.203	7
48	MP-4	Z	-.057	4.5
49	MP-6	Z	-.075	6
50	MP-7	Z	-.134	7
51	MP-8	Z	-.038	4.5
52	MP-10	Z	-.108	6
53	MP-11	Z	-.271	7
54	MP-12	Z	-.076	4.5

Member Point Loads (BLC 5 : 60 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.102	2.5
2	MP-2	X	-.058	1.5
3	MP-3	X	-.116	.5
4	MP-3	X	-.028	2.5
5	MP-3	X	-.031	2.5
6	MP-4	X	-.032	2
7	MP-5	X	-.102	2.5
8	MP-6	X	-.058	1.5
9	MP-7	X	-.116	.5
10	MP-7	X	-.028	2.5
11	MP-7	X	-.031	2.5
12	MP-8	X	-.032	2
13	MP-9	X	-.128	2.5
14	MP-10	X	-.078	1.5
15	MP-11	X	-.199	.5
16	MP-11	X	-.013	2.5
17	MP-11	X	-.026	2.5
18	MP-12	X	-.056	2
19	MP-2	X	-.058	6
20	MP-3	X	-.116	7
21	MP-4	X	-.032	4.5
22	MP-6	X	-.058	6
23	MP-7	X	-.116	7
24	MP-8	X	-.032	4.5
25	MP-10	X	-.078	6
26	MP-11	X	-.199	7
27	MP-12	X	-.056	4.5
28	MP-1	Z	-.176	2.5
29	MP-2	Z	-.1	1.5
30	MP-3	Z	-.2	.5
31	MP-3	Z	-.048	2.5
32	MP-3	Z	-.053	2.5
33	MP-4	Z	-.056	2
34	MP-5	Z	-.176	2.5
35	MP-6	Z	-.1	1.5

Member Point Loads (BLC 5 : 60 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
36	MP-7	Z	-.2	.5
37	MP-7	Z	-.048	2.5
38	MP-7	Z	-.053	2.5
39	MP-8	Z	-.056	2
40	MP-9	Z	-.222	2.5
41	MP-10	Z	-.135	1.5
42	MP-11	Z	-.345	.5
43	MP-11	Z	-.023	2.5
44	MP-11	Z	-.045	2.5
45	MP-12	Z	-.097	2
46	MP-2	Z	-.1	6
47	MP-3	Z	-.2	7
48	MP-4	Z	-.056	4.5
49	MP-6	Z	-.1	6
50	MP-7	Z	-.2	7
51	MP-8	Z	-.056	4.5
52	MP-10	Z	-.135	6
53	MP-11	Z	-.345	7
54	MP-12	Z	-.097	4.5

Member Point Loads (BLC 6 : 90 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Z	-.186	2.5
2	MP-2	Z	-.102	1.5
3	MP-3	Z	-.175	.5
4	MP-3	Z	-.065	2.5
5	MP-3	Z	-.065	2.5
6	MP-4	Z	-.049	2
7	MP-5	Z	-.239	2.5
8	MP-6	Z	-.143	1.5
9	MP-7	Z	-.343	.5
10	MP-7	Z	-.036	2.5
11	MP-7	Z	-.055	2.5
12	MP-8	Z	-.096	2
13	MP-9	Z	-.239	2.5
14	MP-10	Z	-.143	1.5
15	MP-11	Z	-.343	.5
16	MP-11	Z	-.036	2.5
17	MP-11	Z	-.055	2.5
18	MP-12	Z	-.096	2
19	MP-2	Z	-.102	6
20	MP-3	Z	-.175	7
21	MP-4	Z	-.049	4.5
22	MP-6	Z	-.143	6
23	MP-7	Z	-.343	7
24	MP-8	Z	-.096	4.5
25	MP-10	Z	-.143	6
26	MP-11	Z	-.343	7
27	MP-12	Z	-.096	4.5

Company : Tower Engineering Professionals, Inc.
Designer : RWM
Job Number : TEP No. 68513.435981
Model Name : 302481 - Hrfr - South

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Member Point Loads (BLC 7 : 120 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.102	2.5
2	MP-2	X	.058	1.5
3	MP-3	X	.116	.5
4	MP-3	X	.028	2.5
5	MP-3	X	.031	2.5
6	MP-4	X	.032	2
7	MP-5	X	.128	2.5
8	MP-6	X	.078	1.5
9	MP-7	X	.199	.5
10	MP-7	X	.013	2.5
11	MP-7	X	.026	2.5
12	MP-8	X	.056	2
13	MP-9	X	.102	2.5
14	MP-10	X	.058	1.5
15	MP-11	X	.116	.5
16	MP-11	X	.028	2.5
17	MP-11	X	.031	2.5
18	MP-12	X	.032	2
19	MP-2	X	.058	6
20	MP-3	X	.116	7
21	MP-4	X	.032	4.5
22	MP-6	X	.078	6
23	MP-7	X	.199	7
24	MP-8	X	.056	4.5
25	MP-10	X	.058	6
26	MP-11	X	.116	7
27	MP-12	X	.032	4.5
28	MP-1	Z	-.176	2.5
29	MP-2	Z	-.1	1.5
30	MP-3	Z	-.2	.5
31	MP-3	Z	-.048	2.5
32	MP-3	Z	-.053	2.5
33	MP-4	Z	-.056	2
34	MP-5	Z	-.222	2.5
35	MP-6	Z	-.135	1.5
36	MP-7	Z	-.345	.5
37	MP-7	Z	-.023	2.5
38	MP-7	Z	-.045	2.5
39	MP-8	Z	-.097	2
40	MP-9	Z	-.176	2.5
41	MP-10	Z	-.1	1.5
42	MP-11	Z	-.2	.5
43	MP-11	Z	-.048	2.5
44	MP-11	Z	-.053	2.5
45	MP-12	Z	-.056	2
46	MP-2	Z	-.1	6
47	MP-3	Z	-.2	7
48	MP-4	Z	-.056	4.5
49	MP-6	Z	-.135	6
50	MP-7	Z	-.345	7
51	MP-8	Z	-.097	4.5
52	MP-10	Z	-.1	6

Member Point Loads (BLC 7 : 120 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
53	MP-11	Z	-.2	7
54	MP-12	Z	-.056	4.5

Member Point Loads (BLC 8 : 135 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.156	2.5
2	MP-2	X	.091	1.5
3	MP-3	X	.203	.5
4	MP-3	X	.032	2.5
5	MP-3	X	.041	2.5
6	MP-4	X	.057	2
7	MP-5	X	.178	2.5
8	MP-6	X	.108	1.5
9	MP-7	X	.271	.5
10	MP-7	X	.021	2.5
11	MP-7	X	.037	2.5
12	MP-8	X	.076	2
13	MP-9	X	.135	2.5
14	MP-10	X	.075	1.5
15	MP-11	X	.134	.5
16	MP-11	X	.044	2.5
17	MP-11	X	.045	2.5
18	MP-12	X	.038	2
19	MP-2	X	.091	6
20	MP-3	X	.203	7
21	MP-4	X	.057	4.5
22	MP-6	X	.108	6
23	MP-7	X	.271	7
24	MP-8	X	.076	4.5
25	MP-10	X	.075	6
26	MP-11	X	.134	7
27	MP-12	X	.038	4.5
28	MP-1	Z	-.156	2.5
29	MP-2	Z	-.091	1.5
30	MP-3	Z	-.203	.5
31	MP-3	Z	-.032	2.5
32	MP-3	Z	-.041	2.5
33	MP-4	Z	-.057	2
34	MP-5	Z	-.178	2.5
35	MP-6	Z	-.108	1.5
36	MP-7	Z	-.271	.5
37	MP-7	Z	-.021	2.5
38	MP-7	Z	-.037	2.5
39	MP-8	Z	-.076	2
40	MP-9	Z	-.135	2.5
41	MP-10	Z	-.075	1.5
42	MP-11	Z	-.134	.5
43	MP-11	Z	-.044	2.5
44	MP-11	Z	-.045	2.5
45	MP-12	Z	-.038	2
46	MP-2	Z	-.091	6

Company : Tower Engineering Professionals, Inc.
Designer : RWM
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Member Point Loads (BLC 8 : 135 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
47	MP-3	Z	-.203	7
48	MP-4	Z	-.057	4.5
49	MP-6	Z	-.108	6
50	MP-7	Z	-.271	7
51	MP-8	Z	-.076	4.5
52	MP-10	Z	-.075	6
53	MP-11	Z	-.134	7
54	MP-12	Z	-.038	4.5

Member Point Loads (BLC 9 : 150 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.207	2.5
2	MP-2	X	.124	1.5
3	MP-3	X	.297	.5
4	MP-3	X	.032	2.5
5	MP-3	X	.048	2.5
6	MP-4	X	.083	2
7	MP-5	X	.207	2.5
8	MP-6	X	.124	1.5
9	MP-7	X	.297	.5
10	MP-7	X	.032	2.5
11	MP-7	X	.048	2.5
12	MP-8	X	.083	2
13	MP-9	X	.161	2.5
14	MP-10	X	.088	1.5
15	MP-11	X	.152	.5
16	MP-11	X	.056	2.5
17	MP-11	X	.056	2.5
18	MP-12	X	.042	2
19	MP-2	X	.124	6
20	MP-3	X	.297	7
21	MP-4	X	.083	4.5
22	MP-6	X	.124	6
23	MP-7	X	.297	7
24	MP-8	X	.083	4.5
25	MP-10	X	.088	6
26	MP-11	X	.152	7
27	MP-12	X	.042	4.5
28	MP-1	Z	-.119	2.5
29	MP-2	Z	-.071	1.5
30	MP-3	Z	-.171	.5
31	MP-3	Z	-.018	2.5
32	MP-3	Z	-.028	2.5
33	MP-4	Z	-.048	2
34	MP-5	Z	-.119	2.5
35	MP-6	Z	-.071	1.5
36	MP-7	Z	-.171	.5
37	MP-7	Z	-.018	2.5
38	MP-7	Z	-.028	2.5
39	MP-8	Z	-.048	2
40	MP-9	Z	-.093	2.5

Member Point Loads (BLC 9 : 150 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
41	MP-10	Z	-.051	1.5
42	MP-11	Z	-.088	.5
43	MP-11	Z	-.033	2.5
44	MP-11	Z	-.033	2.5
45	MP-12	Z	-.025	2
46	MP-2	Z	-.071	6
47	MP-3	Z	-.171	7
48	MP-4	Z	-.048	4.5
49	MP-6	Z	-.071	6
50	MP-7	Z	-.171	7
51	MP-8	Z	-.048	4.5
52	MP-10	Z	-.051	6
53	MP-11	Z	-.088	7
54	MP-12	Z	-.025	4.5

Member Point Loads (BLC 10 : 180 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.256	2.5
2	MP-2	X	.156	1.5
3	MP-3	X	.399	.5
4	MP-3	X	.027	2.5
5	MP-3	X	.052	2.5
6	MP-4	X	.112	2
7	MP-5	X	.203	2.5
8	MP-6	X	.116	1.5
9	MP-7	X	.231	.5
10	MP-7	X	.055	2.5
11	MP-7	X	.062	2.5
12	MP-8	X	.065	2
13	MP-9	X	.203	2.5
14	MP-10	X	.116	1.5
15	MP-11	X	.231	.5
16	MP-11	X	.055	2.5
17	MP-11	X	.062	2.5
18	MP-12	X	.065	2
19	MP-2	X	.156	6
20	MP-3	X	.399	7
21	MP-4	X	.112	4.5
22	MP-6	X	.116	6
23	MP-7	X	.231	7
24	MP-8	X	.065	4.5
25	MP-10	X	.116	6
26	MP-11	X	.231	7
27	MP-12	X	.065	4.5

Member Point Loads (BLC 11 : 210 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.207	2.5
2	MP-2	X	.124	1.5
3	MP-3	X	.297	.5
4	MP-3	X	.032	2.5

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Designer : RWM
Job Number : TEP No. 68513.435981
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Member Point Loads (BLC 11 : 210 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
5	MP-3	X	.048	2.5
6	MP-4	X	.083	2
7	MP-5	X	.161	2.5
8	MP-6	X	.088	1.5
9	MP-7	X	.152	.5
10	MP-7	X	.056	2.5
11	MP-7	X	.056	2.5
12	MP-8	X	.042	2
13	MP-9	X	.207	2.5
14	MP-10	X	.124	1.5
15	MP-11	X	.297	.5
16	MP-11	X	.032	2.5
17	MP-11	X	.048	2.5
18	MP-12	X	.083	2
19	MP-2	X	.124	6
20	MP-3	X	.297	7
21	MP-4	X	.083	4.5
22	MP-6	X	.088	6
23	MP-7	X	.152	7
24	MP-8	X	.042	4.5
25	MP-10	X	.124	6
26	MP-11	X	.297	7
27	MP-12	X	.083	4.5
28	MP-1	Z	.119	2.5
29	MP-2	Z	.071	1.5
30	MP-3	Z	.171	.5
31	MP-3	Z	.018	2.5
32	MP-3	Z	.028	2.5
33	MP-4	Z	.048	2
34	MP-5	Z	.093	2.5
35	MP-6	Z	.051	1.5
36	MP-7	Z	.088	.5
37	MP-7	Z	.033	2.5
38	MP-7	Z	.033	2.5
39	MP-8	Z	.025	2
40	MP-9	Z	.119	2.5
41	MP-10	Z	.071	1.5
42	MP-11	Z	.171	.5
43	MP-11	Z	.018	2.5
44	MP-11	Z	.028	2.5
45	MP-12	Z	.048	2
46	MP-2	Z	.071	6
47	MP-3	Z	.171	7
48	MP-4	Z	.048	4.5
49	MP-6	Z	.051	6
50	MP-7	Z	.088	7
51	MP-8	Z	.025	4.5
52	MP-10	Z	.071	6
53	MP-11	Z	.171	7
54	MP-12	Z	.048	4.5

Member Point Loads (BLC 12 : 225 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.156	2.5
2	MP-2	X	.091	1.5
3	MP-3	X	.203	.5
4	MP-3	X	.032	2.5
5	MP-3	X	.041	2.5
6	MP-4	X	.057	2
7	MP-5	X	.135	2.5
8	MP-6	X	.075	1.5
9	MP-7	X	.134	.5
10	MP-7	X	.044	2.5
11	MP-7	X	.045	2.5
12	MP-8	X	.038	2
13	MP-9	X	.178	2.5
14	MP-10	X	.108	1.5
15	MP-11	X	.271	.5
16	MP-11	X	.021	2.5
17	MP-11	X	.037	2.5
18	MP-12	X	.076	2
19	MP-2	X	.091	6
20	MP-3	X	.203	7
21	MP-4	X	.057	4.5
22	MP-6	X	.075	6
23	MP-7	X	.134	7
24	MP-8	X	.038	4.5
25	MP-10	X	.108	6
26	MP-11	X	.271	7
27	MP-12	X	.076	4.5
28	MP-1	Z	.156	2.5
29	MP-2	Z	.091	1.5
30	MP-3	Z	.203	.5
31	MP-3	Z	.032	2.5
32	MP-3	Z	.041	2.5
33	MP-4	Z	.057	2
34	MP-5	Z	.135	2.5
35	MP-6	Z	.075	1.5
36	MP-7	Z	.134	.5
37	MP-7	Z	.044	2.5
38	MP-7	Z	.045	2.5
39	MP-8	Z	.038	2
40	MP-9	Z	.178	2.5
41	MP-10	Z	.108	1.5
42	MP-11	Z	.271	.5
43	MP-11	Z	.021	2.5
44	MP-11	Z	.037	2.5
45	MP-12	Z	.076	2
46	MP-2	Z	.091	6
47	MP-3	Z	.203	7
48	MP-4	Z	.057	4.5
49	MP-6	Z	.075	6
50	MP-7	Z	.134	7
51	MP-8	Z	.038	4.5
52	MP-10	Z	.108	6

Company : Tower Engineering Professionals, Inc.
Designer : RWM
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Model Name : 302481 - Hrfr - South

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Member Point Loads (BLC 12 : 225 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
53	MP-11	Z	.271	7
54	MP-12	Z	.076	4.5

Member Point Loads (BLC 13 : 240 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.102	2.5
2	MP-2	X	.058	1.5
3	MP-3	X	.116	.5
4	MP-3	X	.028	2.5
5	MP-3	X	.031	2.5
6	MP-4	X	.032	2
7	MP-5	X	.102	2.5
8	MP-6	X	.058	1.5
9	MP-7	X	.116	.5
10	MP-7	X	.028	2.5
11	MP-7	X	.031	2.5
12	MP-8	X	.032	2
13	MP-9	X	.128	2.5
14	MP-10	X	.078	1.5
15	MP-11	X	.199	.5
16	MP-11	X	.013	2.5
17	MP-11	X	.026	2.5
18	MP-12	X	.056	2
19	MP-2	X	.058	6
20	MP-3	X	.116	7
21	MP-4	X	.032	4.5
22	MP-6	X	.058	6
23	MP-7	X	.116	7
24	MP-8	X	.032	4.5
25	MP-10	X	.078	6
26	MP-11	X	.199	7
27	MP-12	X	.056	4.5
28	MP-1	Z	.176	2.5
29	MP-2	Z	.1	1.5
30	MP-3	Z	.2	.5
31	MP-3	Z	.048	2.5
32	MP-3	Z	.053	2.5
33	MP-4	Z	.056	2
34	MP-5	Z	.176	2.5
35	MP-6	Z	.1	1.5
36	MP-7	Z	.2	.5
37	MP-7	Z	.048	2.5
38	MP-7	Z	.053	2.5
39	MP-8	Z	.056	2
40	MP-9	Z	.222	2.5
41	MP-10	Z	.135	1.5
42	MP-11	Z	.345	.5
43	MP-11	Z	.023	2.5
44	MP-11	Z	.045	2.5
45	MP-12	Z	.097	2
46	MP-2	Z	.1	6

Member Point Loads (BLC 13 : 240 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
47	MP-3	Z	.2	7
48	MP-4	Z	.056	4.5
49	MP-6	Z	.1	6
50	MP-7	Z	.2	7
51	MP-8	Z	.056	4.5
52	MP-10	Z	.135	6
53	MP-11	Z	.345	7
54	MP-12	Z	.097	4.5

Member Point Loads (BLC 14 : 270 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Z	.186	2.5
2	MP-2	Z	.102	1.5
3	MP-3	Z	.175	.5
4	MP-3	Z	.065	2.5
5	MP-3	Z	.065	2.5
6	MP-4	Z	.049	2
7	MP-5	Z	.239	2.5
8	MP-6	Z	.143	1.5
9	MP-7	Z	.343	.5
10	MP-7	Z	.036	2.5
11	MP-7	Z	.055	2.5
12	MP-8	Z	.096	2
13	MP-9	Z	.239	2.5
14	MP-10	Z	.143	1.5
15	MP-11	Z	.343	.5
16	MP-11	Z	.036	2.5
17	MP-11	Z	.055	2.5
18	MP-12	Z	.096	2
19	MP-2	Z	.102	6
20	MP-3	Z	.175	7
21	MP-4	Z	.049	4.5
22	MP-6	Z	.143	6
23	MP-7	Z	.343	7
24	MP-8	Z	.096	4.5
25	MP-10	Z	.143	6
26	MP-11	Z	.343	7
27	MP-12	Z	.096	4.5

Member Point Loads (BLC 15 : 300 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.102	2.5
2	MP-2	X	-.058	1.5
3	MP-3	X	-.116	.5
4	MP-3	X	-.028	2.5
5	MP-3	X	-.031	2.5
6	MP-4	X	-.032	2
7	MP-5	X	-.128	2.5
8	MP-6	X	-.078	1.5
9	MP-7	X	-.199	.5
10	MP-7	X	-.013	2.5

Company : Tower Engineering Professionals, Inc.
Designer : RWM
Job Number : TEP No. 68513.435981
Model Name : 302481 - Hrfr - South

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Member Point Loads (BLC 15 : 300 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
11	MP-7	X	-.026	2.5
12	MP-8	X	-.056	2
13	MP-9	X	-.102	2.5
14	MP-10	X	-.058	1.5
15	MP-11	X	-.116	.5
16	MP-11	X	-.028	2.5
17	MP-11	X	-.031	2.5
18	MP-12	X	-.032	2
19	MP-2	X	-.058	6
20	MP-3	X	-.116	7
21	MP-4	X	-.032	4.5
22	MP-6	X	-.078	6
23	MP-7	X	-.199	7
24	MP-8	X	-.056	4.5
25	MP-10	X	-.058	6
26	MP-11	X	-.116	7
27	MP-12	X	-.032	4.5
28	MP-1	Z	.176	2.5
29	MP-2	Z	.1	1.5
30	MP-3	Z	.2	.5
31	MP-3	Z	.048	2.5
32	MP-3	Z	.053	2.5
33	MP-4	Z	.056	2
34	MP-5	Z	.222	2.5
35	MP-6	Z	.135	1.5
36	MP-7	Z	.345	.5
37	MP-7	Z	.023	2.5
38	MP-7	Z	.045	2.5
39	MP-8	Z	.097	2
40	MP-9	Z	.176	2.5
41	MP-10	Z	.1	1.5
42	MP-11	Z	.2	.5
43	MP-11	Z	.048	2.5
44	MP-11	Z	.053	2.5
45	MP-12	Z	.056	2
46	MP-2	Z	.1	6
47	MP-3	Z	.2	7
48	MP-4	Z	.056	4.5
49	MP-6	Z	.135	6
50	MP-7	Z	.345	7
51	MP-8	Z	.097	4.5
52	MP-10	Z	.1	6
53	MP-11	Z	.2	7
54	MP-12	Z	.056	4.5

Member Point Loads (BLC 16 : 315 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.156	2.5
2	MP-2	X	-.091	1.5
3	MP-3	X	-.203	.5
4	MP-3	X	-.032	2.5

Member Point Loads (BLC 16 : 315 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
5	MP-3	X	-.041	2.5
6	MP-4	X	-.057	2
7	MP-5	X	-.178	2.5
8	MP-6	X	-.108	1.5
9	MP-7	X	-.271	.5
10	MP-7	X	-.021	2.5
11	MP-7	X	-.037	2.5
12	MP-8	X	-.076	2
13	MP-9	X	-.135	2.5
14	MP-10	X	-.075	1.5
15	MP-11	X	-.134	.5
16	MP-11	X	-.044	2.5
17	MP-11	X	-.045	2.5
18	MP-12	X	-.038	2
19	MP-2	X	-.091	6
20	MP-3	X	-.203	7
21	MP-4	X	-.057	4.5
22	MP-6	X	-.108	6
23	MP-7	X	-.271	7
24	MP-8	X	-.076	4.5
25	MP-10	X	-.075	6
26	MP-11	X	-.134	7
27	MP-12	X	-.038	4.5
28	MP-1	Z	.156	2.5
29	MP-2	Z	.091	1.5
30	MP-3	Z	.203	.5
31	MP-3	Z	.032	2.5
32	MP-3	Z	.041	2.5
33	MP-4	Z	.057	2
34	MP-5	Z	.178	2.5
35	MP-6	Z	.108	1.5
36	MP-7	Z	.271	.5
37	MP-7	Z	.021	2.5
38	MP-7	Z	.037	2.5
39	MP-8	Z	.076	2
40	MP-9	Z	.135	2.5
41	MP-10	Z	.075	1.5
42	MP-11	Z	.134	.5
43	MP-11	Z	.044	2.5
44	MP-11	Z	.045	2.5
45	MP-12	Z	.038	2
46	MP-2	Z	.091	6
47	MP-3	Z	.203	7
48	MP-4	Z	.057	4.5
49	MP-6	Z	.108	6
50	MP-7	Z	.271	7
51	MP-8	Z	.076	4.5
52	MP-10	Z	.075	6
53	MP-11	Z	.134	7
54	MP-12	Z	.038	4.5

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Member Point Loads (BLC 17 : 330 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.207	2.5
2	MP-2	X	-.124	1.5
3	MP-3	X	-.297	.5
4	MP-3	X	-.032	2.5
5	MP-3	X	-.048	2.5
6	MP-4	X	-.083	2
7	MP-5	X	-.207	2.5
8	MP-6	X	-.124	1.5
9	MP-7	X	-.297	.5
10	MP-7	X	-.032	2.5
11	MP-7	X	-.048	2.5
12	MP-8	X	-.083	2
13	MP-9	X	-.161	2.5
14	MP-10	X	-.088	1.5
15	MP-11	X	-.152	.5
16	MP-11	X	-.056	2.5
17	MP-11	X	-.056	2.5
18	MP-12	X	-.042	2
19	MP-2	X	-.124	6
20	MP-3	X	-.297	7
21	MP-4	X	-.083	4.5
22	MP-6	X	-.124	6
23	MP-7	X	-.297	7
24	MP-8	X	-.083	4.5
25	MP-10	X	-.088	6
26	MP-11	X	-.152	7
27	MP-12	X	-.042	4.5
28	MP-1	Z	.119	2.5
29	MP-2	Z	.071	1.5
30	MP-3	Z	.171	.5
31	MP-3	Z	.018	2.5
32	MP-3	Z	.028	2.5
33	MP-4	Z	.048	2
34	MP-5	Z	.119	2.5
35	MP-6	Z	.071	1.5
36	MP-7	Z	.171	.5
37	MP-7	Z	.018	2.5
38	MP-7	Z	.028	2.5
39	MP-8	Z	.048	2
40	MP-9	Z	.093	2.5
41	MP-10	Z	.051	1.5
42	MP-11	Z	.088	.5
43	MP-11	Z	.033	2.5
44	MP-11	Z	.033	2.5
45	MP-12	Z	.025	2
46	MP-2	Z	.071	6
47	MP-3	Z	.171	7
48	MP-4	Z	.048	4.5
49	MP-6	Z	.071	6
50	MP-7	Z	.171	7
51	MP-8	Z	.048	4.5
52	MP-10	Z	.051	6

Member Point Loads (BLC 17 : 330 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
53	MP-11	Z	.088	7
54	MP-12	Z	.025	4.5

Member Point Loads (BLC 18 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Y	-.165	2.5
2	MP-2	Y	-.098	1.5
3	MP-3	Y	-.195	.5
4	MP-3	Y	-.049	2.5
5	MP-3	Y	-.065	2.5
6	MP-4	Y	-.07	2
7	MP-5	Y	-.165	2.5
8	MP-6	Y	-.098	1.5
9	MP-7	Y	-.195	.5
10	MP-7	Y	-.049	2.5
11	MP-7	Y	-.065	2.5
12	MP-8	Y	-.07	2
13	MP-9	Y	-.165	2.5
14	MP-10	Y	-.098	1.5
15	MP-11	Y	-.195	.5
16	MP-11	Y	-.049	2.5
17	MP-11	Y	-.065	2.5
18	MP-12	Y	-.07	2
19	MP-2	Y	-.098	6
20	MP-3	Y	-.195	7
21	MP-4	Y	-.07	4.5
22	MP-6	Y	-.098	6
23	MP-7	Y	-.195	7
24	MP-8	Y	-.07	4.5
25	MP-10	Y	-.098	6
26	MP-11	Y	-.195	7
27	MP-12	Y	-.07	4.5

Member Point Loads (BLC 19 : 0 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.062	2.5
2	MP-2	X	-.037	1.5
3	MP-3	X	-.087	.5
4	MP-3	X	-.019	2.5
5	MP-3	X	-.019	2.5
6	MP-4	X	-.027	2
7	MP-5	X	-.062	2.5
8	MP-6	X	-.037	1.5
9	MP-7	X	-.087	.5
10	MP-7	X	-.019	2.5
11	MP-7	X	-.019	2.5
12	MP-8	X	-.027	2
13	MP-9	X	-.062	2.5
14	MP-10	X	-.037	1.5
15	MP-11	X	-.087	.5
16	MP-11	X	-.019	2.5

Member Point Loads (BLC 19 : 0 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
17	MP-11	X	-.019	2.5
18	MP-12	X	-.027	2
19	MP-2	X	-.037	6
20	MP-3	X	-.087	7
21	MP-4	X	-.027	4.5
22	MP-6	X	-.037	6
23	MP-7	X	-.087	7
24	MP-8	X	-.027	4.5
25	MP-10	X	-.037	6
26	MP-11	X	-.087	7
27	MP-12	X	-.027	4.5

Member Point Loads (BLC 20 : 30 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.051	2.5
2	MP-2	X	-.03	1.5
3	MP-3	X	-.066	.5
4	MP-3	X	-.01	2.5
5	MP-3	X	-.014	2.5
6	MP-4	X	-.02	2
7	MP-5	X	-.042	2.5
8	MP-6	X	-.023	1.5
9	MP-7	X	-.038	.5
10	MP-7	X	-.016	2.5
11	MP-7	X	-.016	2.5
12	MP-8	X	-.012	2
13	MP-9	X	-.051	2.5
14	MP-10	X	-.03	1.5
15	MP-11	X	-.066	.5
16	MP-11	X	-.01	2.5
17	MP-11	X	-.014	2.5
18	MP-12	X	-.02	2
19	MP-2	X	-.03	6
20	MP-3	X	-.066	7
21	MP-4	X	-.02	4.5
22	MP-6	X	-.023	6
23	MP-7	X	-.038	7
24	MP-8	X	-.012	4.5
25	MP-10	X	-.03	6
26	MP-11	X	-.066	7
27	MP-12	X	-.02	4.5
28	MP-1	Z	-.029	2.5
29	MP-2	Z	-.017	1.5
30	MP-3	Z	-.038	.5
31	MP-3	Z	-.006	2.5
32	MP-3	Z	-.008	2.5
33	MP-4	Z	-.012	2
34	MP-5	Z	-.024	2.5
35	MP-6	Z	-.013	1.5
36	MP-7	Z	-.022	.5
37	MP-7	Z	-.009	2.5

Member Point Loads (BLC 20 : 30 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
38	MP-7	Z	-.009	2.5
39	MP-8	Z	-.007	2
40	MP-9	Z	-.029	2.5
41	MP-10	Z	-.017	1.5
42	MP-11	Z	-.038	.5
43	MP-11	Z	-.006	2.5
44	MP-11	Z	-.008	2.5
45	MP-12	Z	-.012	2
46	MP-2	Z	-.017	6
47	MP-3	Z	-.038	7
48	MP-4	Z	-.012	4.5
49	MP-6	Z	-.013	6
50	MP-7	Z	-.022	7
51	MP-8	Z	-.007	4.5
52	MP-10	Z	-.017	6
53	MP-11	Z	-.038	7
54	MP-12	Z	-.012	4.5

Member Point Loads (BLC 21 : 45 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.039	2.5
2	MP-2	X	-.022	1.5
3	MP-3	X	-.046	.5
4	MP-3	X	-.01	2.5
5	MP-3	X	-.012	2.5
6	MP-4	X	-.014	2
7	MP-5	X	-.035	2.5
8	MP-6	X	-.019	1.5
9	MP-7	X	-.033	.5
10	MP-7	X	-.013	2.5
11	MP-7	X	-.013	2.5
12	MP-8	X	-.01	2
13	MP-9	X	-.043	2.5
14	MP-10	X	-.026	1.5
15	MP-11	X	-.06	.5
16	MP-11	X	-.007	2.5
17	MP-11	X	-.011	2.5
18	MP-12	X	-.018	2
19	MP-2	X	-.022	6
20	MP-3	X	-.046	7
21	MP-4	X	-.014	4.5
22	MP-6	X	-.019	6
23	MP-7	X	-.033	7
24	MP-8	X	-.01	4.5
25	MP-10	X	-.026	6
26	MP-11	X	-.06	7
27	MP-12	X	-.018	4.5
28	MP-1	Z	-.039	2.5
29	MP-2	Z	-.022	1.5
30	MP-3	Z	-.046	.5
31	MP-3	Z	-.01	2.5

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Member Point Loads (BLC 21 : 45 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
32	MP-3	Z	-.012	2.5
33	MP-4	Z	-.014	2
34	MP-5	Z	-.035	2.5
35	MP-6	Z	-.019	1.5
36	MP-7	Z	-.033	.5
37	MP-7	Z	-.013	2.5
38	MP-7	Z	-.013	2.5
39	MP-8	Z	-.01	2
40	MP-9	Z	-.043	2.5
41	MP-10	Z	-.026	1.5
42	MP-11	Z	-.06	.5
43	MP-11	Z	-.007	2.5
44	MP-11	Z	-.011	2.5
45	MP-12	Z	-.018	2
46	MP-2	Z	-.022	6
47	MP-3	Z	-.046	7
48	MP-4	Z	-.014	4.5
49	MP-6	Z	-.019	6
50	MP-7	Z	-.033	7
51	MP-8	Z	-.01	4.5
52	MP-10	Z	-.026	6
53	MP-11	Z	-.06	7
54	MP-12	Z	-.018	4.5

Member Point Loads (BLC 22 : 60 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.026	2.5
2	MP-2	X	-.014	1.5
3	MP-3	X	-.027	.5
4	MP-3	X	-.008	2.5
5	MP-3	X	-.009	2.5
6	MP-4	X	-.008	2
7	MP-5	X	-.026	2.5
8	MP-6	X	-.014	1.5
9	MP-7	X	-.027	.5
10	MP-7	X	-.008	2.5
11	MP-7	X	-.009	2.5
12	MP-8	X	-.008	2
13	MP-9	X	-.031	2.5
14	MP-10	X	-.018	1.5
15	MP-11	X	-.044	.5
16	MP-11	X	-.005	2.5
17	MP-11	X	-.008	2.5
18	MP-12	X	-.013	2
19	MP-2	X	-.014	6
20	MP-3	X	-.027	7
21	MP-4	X	-.008	4.5
22	MP-6	X	-.014	6
23	MP-7	X	-.027	7
24	MP-8	X	-.008	4.5
25	MP-10	X	-.018	6

Member Point Loads (BLC 22 : 60 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
26	MP-11	X	-.044	7
27	MP-12	X	-.013	4.5
28	MP-1	Z	-.045	2.5
29	MP-2	Z	-.025	1.5
30	MP-3	Z	-.047	.5
31	MP-3	Z	-.014	2.5
32	MP-3	Z	-.015	2.5
33	MP-4	Z	-.015	2
34	MP-5	Z	-.045	2.5
35	MP-6	Z	-.025	1.5
36	MP-7	Z	-.047	.5
37	MP-7	Z	-.014	2.5
38	MP-7	Z	-.015	2.5
39	MP-8	Z	-.015	2
40	MP-9	Z	-.054	2.5
41	MP-10	Z	-.032	1.5
42	MP-11	Z	-.075	.5
43	MP-11	Z	-.008	2.5
44	MP-11	Z	-.013	2.5
45	MP-12	Z	-.023	2
46	MP-2	Z	-.025	6
47	MP-3	Z	-.047	7
48	MP-4	Z	-.015	4.5
49	MP-6	Z	-.025	6
50	MP-7	Z	-.047	7
51	MP-8	Z	-.015	4.5
52	MP-10	Z	-.032	6
53	MP-11	Z	-.075	7
54	MP-12	Z	-.023	4.5

Member Point Loads (BLC 23 : 90 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Z	-.048	2.5
2	MP-2	Z	-.026	1.5
3	MP-3	Z	-.044	.5
4	MP-3	Z	-.01	2.5
5	MP-3	Z	-.015	2.5
6	MP-4	Z	-.014	2
7	MP-5	Z	-.048	2.5
8	MP-6	Z	-.026	1.5
9	MP-7	Z	-.044	.5
10	MP-7	Z	-.01	2.5
11	MP-7	Z	-.015	2.5
12	MP-8	Z	-.014	2
13	MP-9	Z	-.048	2.5
14	MP-10	Z	-.026	1.5
15	MP-11	Z	-.044	.5
16	MP-11	Z	-.01	2.5
17	MP-11	Z	-.015	2.5
18	MP-12	Z	-.014	2
19	MP-2	Z	-.026	6

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Member Point Loads (BLC 23 : 90 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
20	MP-3	Z	-.044	7
21	MP-4	Z	-.014	4.5
22	MP-6	Z	-.026	6
23	MP-7	Z	-.044	7
24	MP-8	Z	-.014	4.5
25	MP-10	Z	-.026	6
26	MP-11	Z	-.044	7
27	MP-12	Z	-.014	4.5

Member Point Loads (BLC 24 : 120 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.026	2.5
2	MP-2	X	.014	1.5
3	MP-3	X	.027	.5
4	MP-3	X	.008	2.5
5	MP-3	X	.009	2.5
6	MP-4	X	.008	2
7	MP-5	X	.031	2.5
8	MP-6	X	.018	1.5
9	MP-7	X	.044	.5
10	MP-7	X	.005	2.5
11	MP-7	X	.008	2.5
12	MP-8	X	.013	2
13	MP-9	X	.026	2.5
14	MP-10	X	.014	1.5
15	MP-11	X	.027	.5
16	MP-11	X	.008	2.5
17	MP-11	X	.009	2.5
18	MP-12	X	.008	2
19	MP-2	X	.014	6
20	MP-3	X	.027	7
21	MP-4	X	.008	4.5
22	MP-6	X	.018	6
23	MP-7	X	.044	7
24	MP-8	X	.013	4.5
25	MP-10	X	.014	6
26	MP-11	X	.027	7
27	MP-12	X	.008	4.5
28	MP-1	Z	-.045	2.5
29	MP-2	Z	-.025	1.5
30	MP-3	Z	-.047	.5
31	MP-3	Z	-.014	2.5
32	MP-3	Z	-.015	2.5
33	MP-4	Z	-.015	2
34	MP-5	Z	-.054	2.5
35	MP-6	Z	-.032	1.5
36	MP-7	Z	-.075	.5
37	MP-7	Z	-.008	2.5
38	MP-7	Z	-.013	2.5
39	MP-8	Z	-.023	2
40	MP-9	Z	-.045	2.5

Member Point Loads (BLC 24 : 120 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
41	MP-10	Z	-.025	1.5
42	MP-11	Z	-.047	.5
43	MP-11	Z	-.014	2.5
44	MP-11	Z	-.015	2.5
45	MP-12	Z	-.015	2
46	MP-2	Z	-.025	6
47	MP-3	Z	-.047	7
48	MP-4	Z	-.015	4.5
49	MP-6	Z	-.032	6
50	MP-7	Z	-.075	7
51	MP-8	Z	-.023	4.5
52	MP-10	Z	-.025	6
53	MP-11	Z	-.047	7
54	MP-12	Z	-.015	4.5

Member Point Loads (BLC 25 : 135 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.039	2.5
2	MP-2	X	.022	1.5
3	MP-3	X	.046	.5
4	MP-3	X	.01	2.5
5	MP-3	X	.012	2.5
6	MP-4	X	.014	2
7	MP-5	X	.043	2.5
8	MP-6	X	.026	1.5
9	MP-7	X	.06	.5
10	MP-7	X	.007	2.5
11	MP-7	X	.011	2.5
12	MP-8	X	.018	2
13	MP-9	X	.035	2.5
14	MP-10	X	.019	1.5
15	MP-11	X	.033	.5
16	MP-11	X	.013	2.5
17	MP-11	X	.013	2.5
18	MP-12	X	.01	2
19	MP-2	X	.022	6
20	MP-3	X	.046	7
21	MP-4	X	.014	4.5
22	MP-6	X	.026	6
23	MP-7	X	.06	7
24	MP-8	X	.018	4.5
25	MP-10	X	.019	6
26	MP-11	X	.033	7
27	MP-12	X	.01	4.5
28	MP-1	Z	-.039	2.5
29	MP-2	Z	-.022	1.5
30	MP-3	Z	-.046	.5
31	MP-3	Z	-.01	2.5
32	MP-3	Z	-.012	2.5
33	MP-4	Z	-.014	2
34	MP-5	Z	-.043	2.5

Company : Tower Engineering Professionals, Inc.
Designer : RWM
Job Number : TEP No. 68513.435981
Model Name : 302481 - Hrfr - South

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Member Point Loads (BLC 25 : 135 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
35	MP-6	Z	-.026	1.5
36	MP-7	Z	-.06	.5
37	MP-7	Z	-.007	2.5
38	MP-7	Z	-.011	2.5
39	MP-8	Z	-.018	2
40	MP-9	Z	-.035	2.5
41	MP-10	Z	-.019	1.5
42	MP-11	Z	-.033	.5
43	MP-11	Z	-.013	2.5
44	MP-11	Z	-.013	2.5
45	MP-12	Z	-.01	2
46	MP-2	Z	-.022	6
47	MP-3	Z	-.046	7
48	MP-4	Z	-.014	4.5
49	MP-6	Z	-.026	6
50	MP-7	Z	-.06	7
51	MP-8	Z	-.018	4.5
52	MP-10	Z	-.019	6
53	MP-11	Z	-.033	7
54	MP-12	Z	-.01	4.5

Member Point Loads (BLC 26 : 150 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.051	2.5
2	MP-2	X	.03	1.5
3	MP-3	X	.066	.5
4	MP-3	X	.01	2.5
5	MP-3	X	.014	2.5
6	MP-4	X	.02	2
7	MP-5	X	.051	2.5
8	MP-6	X	.03	1.5
9	MP-7	X	.066	.5
10	MP-7	X	.01	2.5
11	MP-7	X	.014	2.5
12	MP-8	X	.02	2
13	MP-9	X	.042	2.5
14	MP-10	X	.023	1.5
15	MP-11	X	.038	.5
16	MP-11	X	.016	2.5
17	MP-11	X	.016	2.5
18	MP-12	X	.012	2
19	MP-2	X	.03	6
20	MP-3	X	.066	7
21	MP-4	X	.02	4.5
22	MP-6	X	.03	6
23	MP-7	X	.066	7
24	MP-8	X	.02	4.5
25	MP-10	X	.023	6
26	MP-11	X	.038	7
27	MP-12	X	.012	4.5
28	MP-1	Z	-.029	2.5

Member Point Loads (BLC 26 : 150 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
29	MP-2	Z	-.017	1.5
30	MP-3	Z	-.038	.5
31	MP-3	Z	-.006	2.5
32	MP-3	Z	-.008	2.5
33	MP-4	Z	-.012	2
34	MP-5	Z	-.029	2.5
35	MP-6	Z	-.017	1.5
36	MP-7	Z	-.038	.5
37	MP-7	Z	-.006	2.5
38	MP-7	Z	-.008	2.5
39	MP-8	Z	-.012	2
40	MP-9	Z	-.024	2.5
41	MP-10	Z	-.013	1.5
42	MP-11	Z	-.022	.5
43	MP-11	Z	-.009	2.5
44	MP-11	Z	-.009	2.5
45	MP-12	Z	-.007	2
46	MP-2	Z	-.017	6
47	MP-3	Z	-.038	7
48	MP-4	Z	-.012	4.5
49	MP-6	Z	-.017	6
50	MP-7	Z	-.038	7
51	MP-8	Z	-.012	4.5
52	MP-10	Z	-.013	6
53	MP-11	Z	-.022	7
54	MP-12	Z	-.007	4.5

Member Point Loads (BLC 27 : 180 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.062	2.5
2	MP-2	X	.037	1.5
3	MP-3	X	.087	.5
4	MP-3	X	.019	2.5
5	MP-3	X	.019	2.5
6	MP-4	X	.027	2
7	MP-5	X	.062	2.5
8	MP-6	X	.037	1.5
9	MP-7	X	.087	.5
10	MP-7	X	.019	2.5
11	MP-7	X	.019	2.5
12	MP-8	X	.027	2
13	MP-9	X	.062	2.5
14	MP-10	X	.037	1.5
15	MP-11	X	.087	.5
16	MP-11	X	.019	2.5
17	MP-11	X	.019	2.5
18	MP-12	X	.027	2
19	MP-2	X	.037	6
20	MP-3	X	.087	7
21	MP-4	X	.027	4.5
22	MP-6	X	.037	6

Member Point Loads (BLC 27 : 180 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
23	MP-7	X	.087	7
24	MP-8	X	.027	4.5
25	MP-10	X	.037	6
26	MP-11	X	.087	7
27	MP-12	X	.027	4.5

Member Point Loads (BLC 28 : 210 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.051	2.5
2	MP-2	X	.03	1.5
3	MP-3	X	.066	.5
4	MP-3	X	.01	2.5
5	MP-3	X	.014	2.5
6	MP-4	X	.02	2
7	MP-5	X	.042	2.5
8	MP-6	X	.023	1.5
9	MP-7	X	.038	.5
10	MP-7	X	.016	2.5
11	MP-7	X	.016	2.5
12	MP-8	X	.012	2
13	MP-9	X	.051	2.5
14	MP-10	X	.03	1.5
15	MP-11	X	.066	.5
16	MP-11	X	.01	2.5
17	MP-11	X	.014	2.5
18	MP-12	X	.02	2
19	MP-2	X	.03	6
20	MP-3	X	.066	7
21	MP-4	X	.02	4.5
22	MP-6	X	.023	6
23	MP-7	X	.038	7
24	MP-8	X	.012	4.5
25	MP-10	X	.03	6
26	MP-11	X	.066	7
27	MP-12	X	.02	4.5
28	MP-1	Z	.029	2.5
29	MP-2	Z	.017	1.5
30	MP-3	Z	.038	.5
31	MP-3	Z	.006	2.5
32	MP-3	Z	.008	2.5
33	MP-4	Z	.012	2
34	MP-5	Z	.024	2.5
35	MP-6	Z	.013	1.5
36	MP-7	Z	.022	.5
37	MP-7	Z	.009	2.5
38	MP-7	Z	.009	2.5
39	MP-8	Z	.007	2
40	MP-9	Z	.029	2.5
41	MP-10	Z	.017	1.5
42	MP-11	Z	.038	.5
43	MP-11	Z	.006	2.5

Member Point Loads (BLC 28 : 210 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
44	MP-11	Z	.008	2.5
45	MP-12	Z	.012	2
46	MP-2	Z	.017	6
47	MP-3	Z	.038	7
48	MP-4	Z	.012	4.5
49	MP-6	Z	.013	6
50	MP-7	Z	.022	7
51	MP-8	Z	.007	4.5
52	MP-10	Z	.017	6
53	MP-11	Z	.038	7
54	MP-12	Z	.012	4.5

Member Point Loads (BLC 29 : 225 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.039	2.5
2	MP-2	X	.022	1.5
3	MP-3	X	.046	.5
4	MP-3	X	.01	2.5
5	MP-3	X	.012	2.5
6	MP-4	X	.014	2
7	MP-5	X	.035	2.5
8	MP-6	X	.019	1.5
9	MP-7	X	.033	.5
10	MP-7	X	.013	2.5
11	MP-7	X	.013	2.5
12	MP-8	X	.01	2
13	MP-9	X	.043	2.5
14	MP-10	X	.026	1.5
15	MP-11	X	.06	.5
16	MP-11	X	.007	2.5
17	MP-11	X	.011	2.5
18	MP-12	X	.018	2
19	MP-2	X	.022	6
20	MP-3	X	.046	7
21	MP-4	X	.014	4.5
22	MP-6	X	.019	6
23	MP-7	X	.033	7
24	MP-8	X	.01	4.5
25	MP-10	X	.026	6
26	MP-11	X	.06	7
27	MP-12	X	.018	4.5
28	MP-1	Z	.039	2.5
29	MP-2	Z	.022	1.5
30	MP-3	Z	.046	.5
31	MP-3	Z	.01	2.5
32	MP-3	Z	.012	2.5
33	MP-4	Z	.014	2
34	MP-5	Z	.035	2.5
35	MP-6	Z	.019	1.5
36	MP-7	Z	.033	.5
37	MP-7	Z	.013	2.5

Company : Tower Engineering Professionals, Inc.
Designer : RWM
Job Number : TEP No. 68513.435981
Model Name : 302481 - Hrfr - South

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Member Point Loads (BLC 29 : 225 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
38	MP-7	Z	.013	2.5
39	MP-8	Z	.01	2
40	MP-9	Z	.043	2.5
41	MP-10	Z	.026	1.5
42	MP-11	Z	.06	.5
43	MP-11	Z	.007	2.5
44	MP-11	Z	.011	2.5
45	MP-12	Z	.018	2
46	MP-2	Z	.022	6
47	MP-3	Z	.046	7
48	MP-4	Z	.014	4.5
49	MP-6	Z	.019	6
50	MP-7	Z	.033	7
51	MP-8	Z	.01	4.5
52	MP-10	Z	.026	6
53	MP-11	Z	.06	7
54	MP-12	Z	.018	4.5

Member Point Loads (BLC 30 : 240 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	.026	2.5
2	MP-2	X	.014	1.5
3	MP-3	X	.027	.5
4	MP-3	X	.008	2.5
5	MP-3	X	.009	2.5
6	MP-4	X	.008	2
7	MP-5	X	.026	2.5
8	MP-6	X	.014	1.5
9	MP-7	X	.027	.5
10	MP-7	X	.008	2.5
11	MP-7	X	.009	2.5
12	MP-8	X	.008	2
13	MP-9	X	.031	2.5
14	MP-10	X	.018	1.5
15	MP-11	X	.044	.5
16	MP-11	X	.005	2.5
17	MP-11	X	.008	2.5
18	MP-12	X	.013	2
19	MP-2	X	.014	6
20	MP-3	X	.027	7
21	MP-4	X	.008	4.5
22	MP-6	X	.014	6
23	MP-7	X	.027	7
24	MP-8	X	.008	4.5
25	MP-10	X	.018	6
26	MP-11	X	.044	7
27	MP-12	X	.013	4.5
28	MP-1	Z	.045	2.5
29	MP-2	Z	.025	1.5
30	MP-3	Z	.047	.5
31	MP-3	Z	.014	2.5

Member Point Loads (BLC 30 : 240 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
32	MP-3	Z	.015	2.5
33	MP-4	Z	.015	2
34	MP-5	Z	.045	2.5
35	MP-6	Z	.025	1.5
36	MP-7	Z	.047	.5
37	MP-7	Z	.014	2.5
38	MP-7	Z	.015	2.5
39	MP-8	Z	.015	2
40	MP-9	Z	.054	2.5
41	MP-10	Z	.032	1.5
42	MP-11	Z	.075	.5
43	MP-11	Z	.008	2.5
44	MP-11	Z	.013	2.5
45	MP-12	Z	.023	2
46	MP-2	Z	.025	6
47	MP-3	Z	.047	7
48	MP-4	Z	.015	4.5
49	MP-6	Z	.025	6
50	MP-7	Z	.047	7
51	MP-8	Z	.015	4.5
52	MP-10	Z	.032	6
53	MP-11	Z	.075	7
54	MP-12	Z	.023	4.5

Member Point Loads (BLC 31 : 270 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Z	.048	2.5
2	MP-2	Z	.026	1.5
3	MP-3	Z	.044	.5
4	MP-3	Z	.01	2.5
5	MP-3	Z	.015	2.5
6	MP-4	Z	.014	2
7	MP-5	Z	.048	2.5
8	MP-6	Z	.026	1.5
9	MP-7	Z	.044	.5
10	MP-7	Z	.01	2.5
11	MP-7	Z	.015	2.5
12	MP-8	Z	.014	2
13	MP-9	Z	.048	2.5
14	MP-10	Z	.026	1.5
15	MP-11	Z	.044	.5
16	MP-11	Z	.01	2.5
17	MP-11	Z	.015	2.5
18	MP-12	Z	.014	2
19	MP-2	Z	.026	6
20	MP-3	Z	.044	7
21	MP-4	Z	.014	4.5
22	MP-6	Z	.026	6
23	MP-7	Z	.044	7
24	MP-8	Z	.014	4.5
25	MP-10	Z	.026	6

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Designer : RWM
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Model Name : 302481 - Hrfr - South

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Member Point Loads (BLC 31 : 270 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
26	MP-11	Z	.044	7
27	MP-12	Z	.014	4.5

Member Point Loads (BLC 32 : 300 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.026	2.5
2	MP-2	X	-.014	1.5
3	MP-3	X	-.027	.5
4	MP-3	X	-.008	2.5
5	MP-3	X	-.009	2.5
6	MP-4	X	-.008	2
7	MP-5	X	-.031	2.5
8	MP-6	X	-.018	1.5
9	MP-7	X	-.044	.5
10	MP-7	X	-.005	2.5
11	MP-7	X	-.008	2.5
12	MP-8	X	-.013	2
13	MP-9	X	-.026	2.5
14	MP-10	X	-.014	1.5
15	MP-11	X	-.027	.5
16	MP-11	X	-.008	2.5
17	MP-11	X	-.009	2.5
18	MP-12	X	-.008	2
19	MP-2	X	-.014	6
20	MP-3	X	-.027	7
21	MP-4	X	-.008	4.5
22	MP-6	X	-.018	6
23	MP-7	X	-.044	7
24	MP-8	X	-.013	4.5
25	MP-10	X	-.014	6
26	MP-11	X	-.027	7
27	MP-12	X	-.008	4.5
28	MP-1	Z	.045	2.5
29	MP-2	Z	.025	1.5
30	MP-3	Z	.047	.5
31	MP-3	Z	.014	2.5
32	MP-3	Z	.015	2.5
33	MP-4	Z	.015	2
34	MP-5	Z	.054	2.5
35	MP-6	Z	.032	1.5
36	MP-7	Z	.075	.5
37	MP-7	Z	.008	2.5
38	MP-7	Z	.013	2.5
39	MP-8	Z	.023	2
40	MP-9	Z	.045	2.5
41	MP-10	Z	.025	1.5
42	MP-11	Z	.047	.5
43	MP-11	Z	.014	2.5
44	MP-11	Z	.015	2.5
45	MP-12	Z	.015	2
46	MP-2	Z	.025	6

Member Point Loads (BLC 32 : 300 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
47	MP-3	Z	.047	7
48	MP-4	Z	.015	4.5
49	MP-6	Z	.032	6
50	MP-7	Z	.075	7
51	MP-8	Z	.023	4.5
52	MP-10	Z	.025	6
53	MP-11	Z	.047	7
54	MP-12	Z	.015	4.5

Member Point Loads (BLC 33 : 315 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.039	2.5
2	MP-2	X	-.022	1.5
3	MP-3	X	-.046	.5
4	MP-3	X	-.01	2.5
5	MP-3	X	-.012	2.5
6	MP-4	X	-.014	2
7	MP-5	X	-.043	2.5
8	MP-6	X	-.026	1.5
9	MP-7	X	-.06	.5
10	MP-7	X	-.007	2.5
11	MP-7	X	-.011	2.5
12	MP-8	X	-.018	2
13	MP-9	X	-.035	2.5
14	MP-10	X	-.019	1.5
15	MP-11	X	-.033	.5
16	MP-11	X	-.013	2.5
17	MP-11	X	-.013	2.5
18	MP-12	X	-.01	2
19	MP-2	X	-.022	6
20	MP-3	X	-.046	7
21	MP-4	X	-.014	4.5
22	MP-6	X	-.026	6
23	MP-7	X	-.06	7
24	MP-8	X	-.018	4.5
25	MP-10	X	-.019	6
26	MP-11	X	-.033	7
27	MP-12	X	-.01	4.5
28	MP-1	Z	.039	2.5
29	MP-2	Z	.022	1.5
30	MP-3	Z	.046	.5
31	MP-3	Z	.01	2.5
32	MP-3	Z	.012	2.5
33	MP-4	Z	.014	2
34	MP-5	Z	.043	2.5
35	MP-6	Z	.026	1.5
36	MP-7	Z	.06	.5
37	MP-7	Z	.007	2.5
38	MP-7	Z	.011	2.5
39	MP-8	Z	.018	2
40	MP-9	Z	.035	2.5

Company : Tower Engineering Professionals, Inc.
Designer : RWM
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Model Name : 302481 - Hrfr - South

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Member Point Loads (BLC 33 : 315 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
41	MP-10	Z	.019	1.5
42	MP-11	Z	.033	.5
43	MP-11	Z	.013	2.5
44	MP-11	Z	.013	2.5
45	MP-12	Z	.01	2
46	MP-2	Z	.022	6
47	MP-3	Z	.046	7
48	MP-4	Z	.014	4.5
49	MP-6	Z	.026	6
50	MP-7	Z	.06	7
51	MP-8	Z	.018	4.5
52	MP-10	Z	.019	6
53	MP-11	Z	.033	7
54	MP-12	Z	.01	4.5

Member Point Loads (BLC 34 : 330 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.051	2.5
2	MP-2	X	-.03	1.5
3	MP-3	X	-.066	.5
4	MP-3	X	-.01	2.5
5	MP-3	X	-.014	2.5
6	MP-4	X	-.02	2
7	MP-5	X	-.051	2.5
8	MP-6	X	-.03	1.5
9	MP-7	X	-.066	.5
10	MP-7	X	-.01	2.5
11	MP-7	X	-.014	2.5
12	MP-8	X	-.02	2
13	MP-9	X	-.042	2.5
14	MP-10	X	-.023	1.5
15	MP-11	X	-.038	.5
16	MP-11	X	-.016	2.5
17	MP-11	X	-.016	2.5
18	MP-12	X	-.012	2
19	MP-2	X	-.03	6
20	MP-3	X	-.066	7
21	MP-4	X	-.02	4.5
22	MP-6	X	-.03	6
23	MP-7	X	-.066	7
24	MP-8	X	-.02	4.5
25	MP-10	X	-.023	6
26	MP-11	X	-.038	7
27	MP-12	X	-.012	4.5
28	MP-1	Z	.029	2.5
29	MP-2	Z	.017	1.5
30	MP-3	Z	.038	.5
31	MP-3	Z	.006	2.5
32	MP-3	Z	.008	2.5
33	MP-4	Z	.012	2
34	MP-5	Z	.029	2.5

Member Point Loads (BLC 34 : 330 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
35	MP-6	Z	.017	1.5
36	MP-7	Z	.038	.5
37	MP-7	Z	.006	2.5
38	MP-7	Z	.008	2.5
39	MP-8	Z	.012	2
40	MP-9	Z	.024	2.5
41	MP-10	Z	.013	1.5
42	MP-11	Z	.022	.5
43	MP-11	Z	.009	2.5
44	MP-11	Z	.009	2.5
45	MP-12	Z	.007	2
46	MP-2	Z	.017	6
47	MP-3	Z	.038	7
48	MP-4	Z	.012	4.5
49	MP-6	Z	.017	6
50	MP-7	Z	.038	7
51	MP-8	Z	.012	4.5
52	MP-10	Z	.013	6
53	MP-11	Z	.022	7
54	MP-12	Z	.007	4.5

Member Point Loads (BLC 37 : Seismic Load X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	X	-.132	2.5
2	MP-2	X	-.09	1.5
3	MP-3	X	-.064	.5
4	MP-3	X	-.046	2.5
5	MP-3	X	-.075	2.5
6	MP-4	X	-.052	2
7	MP-5	X	-.132	2.5
8	MP-6	X	-.09	1.5
9	MP-7	X	-.064	.5
10	MP-7	X	-.046	2.5
11	MP-7	X	-.075	2.5
12	MP-8	X	-.052	2
13	MP-9	X	-.132	2.5
14	MP-10	X	-.09	1.5
15	MP-11	X	-.064	.5
16	MP-11	X	-.046	2.5
17	MP-11	X	-.075	2.5
18	MP-12	X	-.052	2
19	MP-2	X	-.09	6
20	MP-3	X	-.064	7
21	MP-4	X	-.052	4.5
22	MP-6	X	-.09	6
23	MP-7	X	-.064	7
24	MP-8	X	-.052	4.5
25	MP-10	X	-.09	6
26	MP-11	X	-.064	7
27	MP-12	X	-.052	4.5

Company : Tower Engineering Professionals, Inc.
Designer : RWM
Job Number : TEP No. 68513.435981
Model Name : 302481 - Hrfr - South

Aug 10, 2020
11:50 AM
Checked By: SDJ

Member Point Loads (BLC 38 : Seismic Load Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	MP-1	Z	-.132	2.5
2	MP-2	Z	-.09	1.5
3	MP-3	Z	-.064	.5
4	MP-3	Z	-.046	2.5
5	MP-3	Z	-.075	2.5
6	MP-4	Z	-.052	2
7	MP-5	Z	-.132	2.5
8	MP-6	Z	-.09	1.5
9	MP-7	Z	-.064	.5
10	MP-7	Z	-.046	2.5
11	MP-7	Z	-.075	2.5
12	MP-8	Z	-.052	2
13	MP-9	Z	-.132	2.5
14	MP-10	Z	-.09	1.5
15	MP-11	Z	-.064	.5
16	MP-11	Z	-.046	2.5
17	MP-11	Z	-.075	2.5
18	MP-12	Z	-.052	2
19	MP-2	Z	-.09	6
20	MP-3	Z	-.064	7
21	MP-4	Z	-.052	4.5
22	MP-6	Z	-.09	6
23	MP-7	Z	-.064	7
24	MP-8	Z	-.052	4.5
25	MP-10	Z	-.09	6
26	MP-11	Z	-.064	7
27	MP-12	Z	-.052	4.5

Member Area Loads (BLC 1 : Dead)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	FF-1	SF1-1	GSIP1	GSIP2	Y	Two Way	-.012
2	SF1-1	SF2-1	GSIP3	GSIP1	Y	Two Way	-.012
3	SF2-1	FF-1	GSIP2	GSIP3	Y	Two Way	-.012

Member Area Loads (BLC 18 : Ice Weight)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
1	FF-1	SF1-1	GSIP1	GSIP2	Y	Two Way	-.007
2	SF1-1	SF2-1	GSIP3	GSIP1	Y	Two Way	-.007
3	SF2-1	FF-1	GSIP2	GSIP3	Y	Two Way	-.007

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	SA1-A	max	.802	2	1.832	42	4.131	21	.265	5	3.83	29	5.212	42
2		min	-1.744	26	.324	2	-4.128	29	-.288	29	-3.83	5	.781	2
3	SA3-A	max	3.911	18	1.806	37	3.003	23	4.478	37	3.979	23	-.341	11
4		min	-3.428	10	.325	13	-2.188	15	.676	13	-3.975	15	-2.629	34
5	SA2-A	max	4.113	18	1.805	47	2.039	5	-.674	7	3.91	18	-.35	9
6		min	-3.629	10	.325	7	-2.854	29	-4.42	47	-3.912	10	-2.719	34

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
7	N106	max	2.693	42	2.087	42	.732	30	0	22	0	22	0	11
8		min	.445	2	.275	2	-.722	6	0	14	0	14	0	34
9	N109	max	.195	9	2.065	37	-.302	15	0	6	0	33	0	26
10		min	-1.438	34	.277	13	-2.344	39	0	30	0	9	0	2
11	N112	max	.172	11	2.065	47	2.31	45	0	39	0	27	0	26
12		min	-1.498	34	.278	7	.26	5	0	14	0	3	0	2
13	Totals:	max	7.165	18	11.082	49	7.024	22						
14		min	-7.165	10	3.754	2	-7.024	14						

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

	Member	Shape	Code C...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	FF-TH	L3X3X4	.786	14	42	.124	14	z	43	15.778	46.656	1.688	3.017	2...	H2-1
2	SF1-TH	L3X3X4	.783	14	32	.126	14	z	34	15.778	46.656	1.688	2.697	1...	H2-1
3	SF2-TH	L3X3X4	.778	14	21	.124	14	z	37	15.778	46.656	1.688	2.713	1...	H2-1
4	SR-4	PIPE 2.5	.645	2.25	23	.092	12.656		26	2.83	50.715	3.596	3.596	3...	H1-1a
5	SR-6	PIPE 2.5	.641	2.25	18	.092	12.656		21	2.83	50.715	3.596	3.596	3...	H1-1a
6	SR-5	PIPE 2.5	.638	2.25	29	.092	12.656		31	2.83	50.715	3.596	3.596	3...	H1-1a
7	MP-7	PIPE 2.0	.618	5	31	.229	5		31	26.005	32.13	1.872	1.872	2...	H1-1b
8	MP-11	PIPE 2.0	.604	5	20	.229	5		21	26.005	32.13	1.872	1.872	1...	H1-1b
9	SR-2	PIPE 2.0	.601	4.781	29	.180	.844		32	1.224	32.13	1.872	1.872	2...	H1-1a
10	SR-1	PIPE 2.0	.599	4.781	23	.179	.844		27	1.224	32.13	1.872	1.872	2...	H1-1a
11	SR-3	PIPE 2.0	.598	4.781	18	.180	.844		22	1.224	32.13	1.872	1.872	2...	H1-1a
12	MP-3	PIPE 2.0	.588	3	26	.230	5		26	19.964	32.13	1.872	1.872	1...	H1-1b
13	SRC1	L2.5x2.5x3	.546	0	28	.083	1.25	z	28	27.881	29.192	.873	1.972	2...	H2-1
14	SRC3	L2.5x2.5x3	.525	0	23	.083	1.25	z	22	27.881	29.192	.873	1.972	1...	H2-1
15	SRC2	L2.5x2.5x3	.524	0	18	.083	0	z	25	27.881	29.192	.873	1.972	1.8	H2-1
16	MP-6	PIPE 2.0	.472	5	18	.201	5		31	26.005	32.13	1.872	1.872	3...	H1-1b
17	MP-2	PIPE 2.0	.431	5	29	.202	5		26	26.005	32.13	1.872	1.872	2...	H1-1b
18	MP-10	PIPE 2.0	.429	5	23	.201	5		20	26.005	32.13	1.872	1.872	4...	H1-1b
19	SA-3A	HSS4X4X4	.405	0	23	.132	0	z	24	139.028	139.518	16.181	16.181	1...	H1-1b
20	SA-2A	HSS4X4X4	.403	0	34	.128	0	z	18	139.028	139.518	16.181	16.181	1...	H1-1b
21	SA-1A	HSS4X4X4	.401	0	28	.129	0	z	29	139.028	139.518	16.181	16.181	1...	H1-1b
22	MP-8	PIPE 2.0	.373	5	18	.272	5		34	26.005	32.13	1.872	1.872	3...	H1-1b
23	K4	L2.5x2.5x3	.365	3.066	34	.009	0	z	22	8.731	29.192	.873	1.52	1...	H2-1
24	MP-4	PIPE 2.0	.363	5	29	.264	5		45	26.005	32.13	1.872	1.872	2...	H1-1b
25	MP-12	PIPE 2.0	.362	5	24	.267	5		41	26.005	32.13	1.872	1.872	4...	H1-1b
26	K5	L2.5x2.5x3	.362	3.066	34	.010	0	z	31	8.731	29.192	.873	1.52	1...	H2-1
27	K6	L2.5x2.5x3	.361	3.066	39	.009	6.133	z	27	8.731	29.192	.873	1.52	1...	H2-1
28	K2	L2.5x2.5x3	.360	3.066	44	.010	0	z	32	8.731	29.192	.873	1.52	1...	H2-1
29	K3	L2.5x2.5x3	.357	3.066	44	.010	6.133	z	26	8.731	29.192	.873	1.52	1...	H2-1
30	K1	L2.5x2.5x3	.357	3.066	39	.011	0	z	20	8.731	29.192	.873	1.52	1...	H2-1
31	MP-9	PIPE 2.0	.341	5	18	.278	5		34	26.005	32.13	1.872	1.872	3...	H1-1b
32	MP-5	PIPE 2.0	.332	5	28	.271	5		44	26.005	32.13	1.872	1.872	3...	H1-1b
33	MP-1	PIPE 2.0	.331	5	23	.268	5		39	26.005	32.13	1.872	1.872	2...	H1-1b
34	GSIP-1	L3X3X4	.318	3.584	28	.017	3.584	y	38	35.106	46.656	1.688	3.315	1...	H2-1
35	GSIP-3	L3X3X4	.269	3.584	19	.017	3.584	y	41	35.106	46.656	1.688	3.294	1...	H2-1
36	GSIP-2	L3X3X4	.267	3.584	18	.017	3.659	y	35	35.106	46.656	1.688	3.307	1...	H2-1
37	SA-2B	HSS4.5X4.5...	.230	0	49	.140	0	z	18	119.028	121.302	16.25	16.25	1...	H1-1b
38	SA-1B	HSS4.5X4.5...	.229	0	43	.141	0	z	29	119.093	121.302	16.25	16.25	1...	H1-1b
39	SA-3C	HSS4.5X4.5...	.228	0	38	.144	0	z	24	119.028	121.302	16.25	16.25	1...	H1-1b

Company : Tower Engineering Professionals, Inc.
Designer : RWM
Job Number : TEP No. 68513.435981
Model Name : 302481 - Hrfr - South

Aug 10, 2020
11:50 AM
Checked By: SDJ

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

	Member	Shape	Code C...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn z...	Cb	Eqn
40	GSI-3	LL3x3x4x0	.133	3.944	20	.014	0	z	27	76.346	93.312	6.48	4.36	1...	H1-1b
41	GSI-2	LL3x3x4x0	.132	3.944	30	.015	0	z	22	76.346	93.312	6.48	4.36	2...	H1-1b
42	GSI-1	LL3x3x4x0	.128	3.944	25	.014	0	z	33	76.346	93.312	6.48	4.36	1...	H1-1b
43	SRC6	PIPE 2.0	.045	3.125	26	.075	0		30	20.114	32.13	1.872	1.872	1...	H1-1b
44	SRC4	PIPE 2.0	.045	3.125	31	.078	0		20	20.114	32.13	1.872	1.872	1...	H1-1b
45	SRC5	PIPE 2.0	.044	3.125	21	.075	0		25	20.114	32.13	1.872	1.872	1...	H1-1b

APPENDIX B

ADDITIONAL CALCULATIONS

TOWER ENGINEERING PROFESSIONALS

302481 - Hrfr-South

TEP No.	68513.435981	
Analysis By:	RWM	8/6/2020
Checked By:	SDJ	8/6/2020

Code Revisions:	TIA-222-H	IBC 2018
Tower Type:	Monopole	

Wind Inputs:

Ult. Wind Velocity:	118.0	mph
Live Load Velocity:	30.0	mph
Ice Wind Velocity:	50.0	mph
Base Ice Thickness:	1.50	inches
Mount Centerline:	90.0	ft
Antenna Centerline:	90.0	ft
Exposure Category:	B	
Topo Category:	5	
Risk Category:	II	
Ground Elevation:	291	ft

Wind Calculations:

K_{zt}:	1.434	Section 2.6.6
K_d:	0.950	
$K_{z\text{-}Mount}$:	0.959	Section 2.6.5.2
$K_{z\text{-}Antenna}$:	0.959	Section 2.6.5.2
K_{iz}:	1.106	Section 2.6.10
Ice Thickness:	1.599	inches - Section 2.6.10
$K_{es\text{-}wind}$:	0.95	Annex S (Table S-1)
$K_{es\text{-}ice}$:	0.85	Annex S (Table S-1)

Without Ice - (psf)		With Ice - (psf)	
$(q_zG_h)_{Mount}$:	43.77	**$(q_zG_h)_{Mount}$:**	8.27
$(q_zG_h)_{Antenna}$:	43.77	**$(q_zG_h)_{Antenna}$:**	8.27

TOWER ENGINEERING PROFESSIONALS

302481 - Hrfr-South

TEP No.	68513.435981	
Analysis By:	RWM	8/6/2020
Checked By:	SDJ	8/6/2020

Antenna Loads are Calculated in Accordance with TIA-222-H

Azimuth is the absolute angle measured clockwise from RISA-3D global X-axis.

										Distance from start node of the member		
MFR	Model	Height (in)	Width (in)	Depth (in)	Wt. (lbs)	Azimuth°	Qty	Shape	Member Label	Location #1 (ft,%)	Location #2 (ft,%)	Location #3 (ft,%)
ERICSSON	AIR 32 B66Aa/B2a	56.60	12.90	8.70	132.20	0.00	1	Flat	MP-1	2.50		
ERICSSON	AIR3246 B66	58.10	15.70	9.40	180.00	0.00	1	Flat	MP-2	1.50	6.00	
RFS/CELWAVE	APXVAARR24_43-U-NA20	95.90	24.00	8.70	127.90	0.00	1	Flat	MP-3	0.50	7.00	
ERICSSON	RRUS 4415 B25	15.00	13.20	5.40	46.00	90.00	1	Flat	MP-3	2.50		
ERICSSON	RADIO 4449 B71/B85A	15.00	13.20	10.50	75.00	90.00	1	Flat	MP-3	2.50		
ERICSSON	AIR6449 B41	33.10	20.60	8.60	104.00	0.00	1	Flat	MP-4	2.00	4.50	
ERICSSON	AIR 32 B66Aa/B2a	56.60	12.90	8.70	132.20	120.00	1	Flat	MP-5	2.50		
ERICSSON	AIR3246 B66	58.10	15.70	9.40	180.00	120.00	1	Flat	MP-6	1.50	6.00	
RFS/CELWAVE	APXVAARR24_43-U-NA20	95.90	24.00	8.70	127.90	120.00	1	Flat	MP-7	0.50	7.00	
ERICSSON	RRUS 4415 B25	15.00	13.20	5.40	46.00	210.00	1	Flat	MP-7	2.50		
ERICSSON	RADIO 4449 B71/B85A	15.00	13.20	10.50	75.00	210.00	1	Flat	MP-7	2.50		
ERICSSON	AIR6449 B41	33.10	20.60	8.60	104.00	120.00	1	Flat	MP-8	2.00	4.50	
ERICSSON	AIR 32 B66Aa/B2a	56.60	12.90	8.70	132.20	240.00	1	Flat	MP-9	2.50		
ERICSSON	AIR3246 B66	58.10	15.70	9.40	180.00	240.00	1	Flat	MP-10	1.50	6.00	
RFS/CELWAVE	APXVAARR24_43-U-NA20	95.90	24.00	8.70	127.90	240.00	1	Flat	MP-11	0.50	7.00	
ERICSSON	RRUS 4415 B25	15.00	13.20	5.40	46.00	330.00	1	Flat	MP-11	2.50		
ERICSSON	RADIO 4449 B71/B85A	15.00	13.20	10.50	75.00	330.00	1	Flat	MP-11	2.50		
ERICSSON	AIR6449 B41	33.10	20.60	8.60	104.00	240.00	1	Flat	MP-12	2.00	4.50	

TOWER ENGINEERING PROFESSIONALS

302481 - Hrfr-South

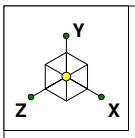
TEP No.	68513.435981	
Analysis By:	RWM	8/6/2020
Checked By:	SDJ	8/6/2020

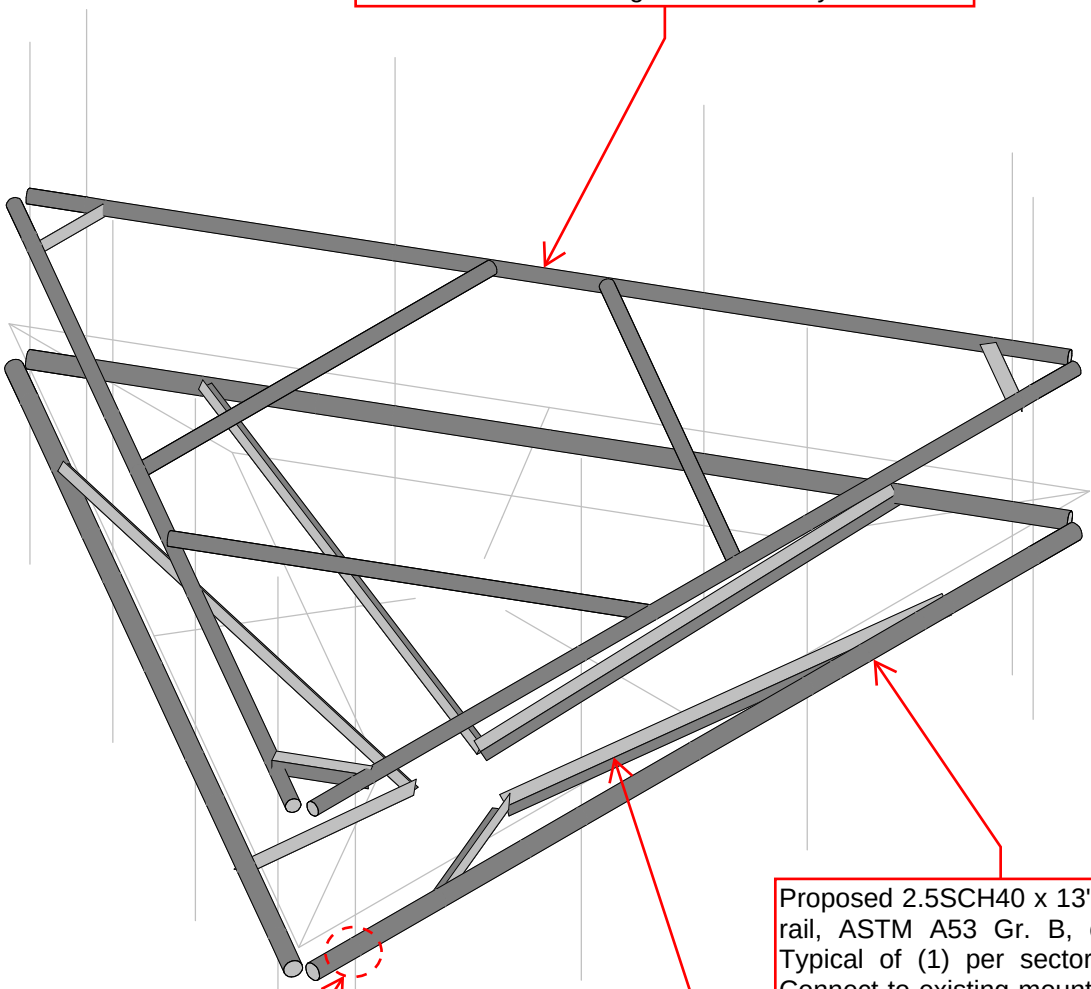
Member Forces are Calculated in Accordance with TIA-222-H

Member Name	Wind Proj. (in)	Length (in)	Shape	θ (°)	Perimeter (in)
FF-TH	3.000	168.00	Flat	90.00	12.00
GSI-1	3.000	47.33	Flat	-60.00	18.00
GSI-2	3.000	47.33	Flat	0.00	18.00
GSI-3	3.000	47.33	Flat	60.00	18.00
GSIP-1	3.000	86.02	Flat	90.00	12.00
GSIP-2	3.000	86.02	Flat	-30.00	12.00
GSIP-3	3.000	86.02	Flat	30.00	12.00
MP-1	2.375	96.00	Round		7.46
MP-2	2.375	96.00	Round		7.46
MP-3	2.375	96.00	Round		7.46
MP-4	2.375	96.00	Round		7.46
MP-5	2.375	96.00	Round		7.46
MP-6	2.375	96.00	Round		7.46
MP-7	2.375	96.00	Round		7.46
MP-8	2.375	96.00	Round		7.46
MP-9	2.375	96.00	Round		7.46
MP-10	2.375	96.00	Round		7.46
MP-11	2.375	96.00	Round		7.46
MP-12	2.375	96.00	Round		7.46
SA-1A	4.000	11.00	Flat	0.00	16.00
SA-1B	4.500	29.00	Flat	0.00	18.00
SA-2A	4.000	11.00	Flat	58.97	16.00
SA-2B	4.500	29.43	Flat	58.97	18.00
SA-3A	4.000	11.00	Flat	-58.97	16.00
SA-3C	4.500	29.43	Flat	-58.97	18.00
SF1-TH	3.000	168.00	Flat	-30.00	12.00
SF2-TH	3.000	168.00	Flat	30.00	12.00
SR-1	2.375	162.00	Round	90.00	7.46
SR-3	2.375	162.00	Round	30.00	7.46
SR-2	2.375	162.00	Round	-30.00	7.46
SRC2	2.500	15.00	Flat	30.00	10.00
SRC3	2.500	15.00	Flat	90.00	10.00
SRC1	2.500	15.00	Flat	-30.00	10.00
SR-4	2.875	162.00	Round	90.00	9.03
SR-6	2.875	162.00	Round	30.00	9.03
SR-5	2.875	162.00	Round	-30.00	9.03
K1	2.500	73.59	Flat		10.00
K2	2.500	73.59	Flat		10.00
K5	2.500	73.59	Flat		10.00
K6	2.500	73.59	Flat		10.00
K3	2.500	73.59	Flat		10.00
K4	2.500	73.59	Flat		10.00
SRC4	2.375	75.00	Round	-30.00	7.46
SRC5	2.375	75.00	Round	30.00	7.46
SRC6	2.375	75.00	Round	90.00	7.46

APPENDIX C

PROPOSED MODIFICATION GRAPHIC





Proposed SitePro HRK14-HD Kit, or approved equivalent. Typical of (1) total. Connect to existing mount pipes. Connection hardware included in kit. Contractor to cut to length as necessary.

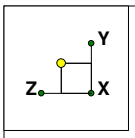
Proposed 2.5SCH40 x 13'-6" support rail, ASTM A53 Gr. B, or greater. Typical of (1) per sector, (3) total. Connect to existing mount pipes with proposed crossover plate kits.

Proposed SitePro PRK-SFS-L Platform reinforcement kit, or approved equivalent. Typical of (1) total. Connect to proposed bottom support rail. Connection hardware provided with kit.

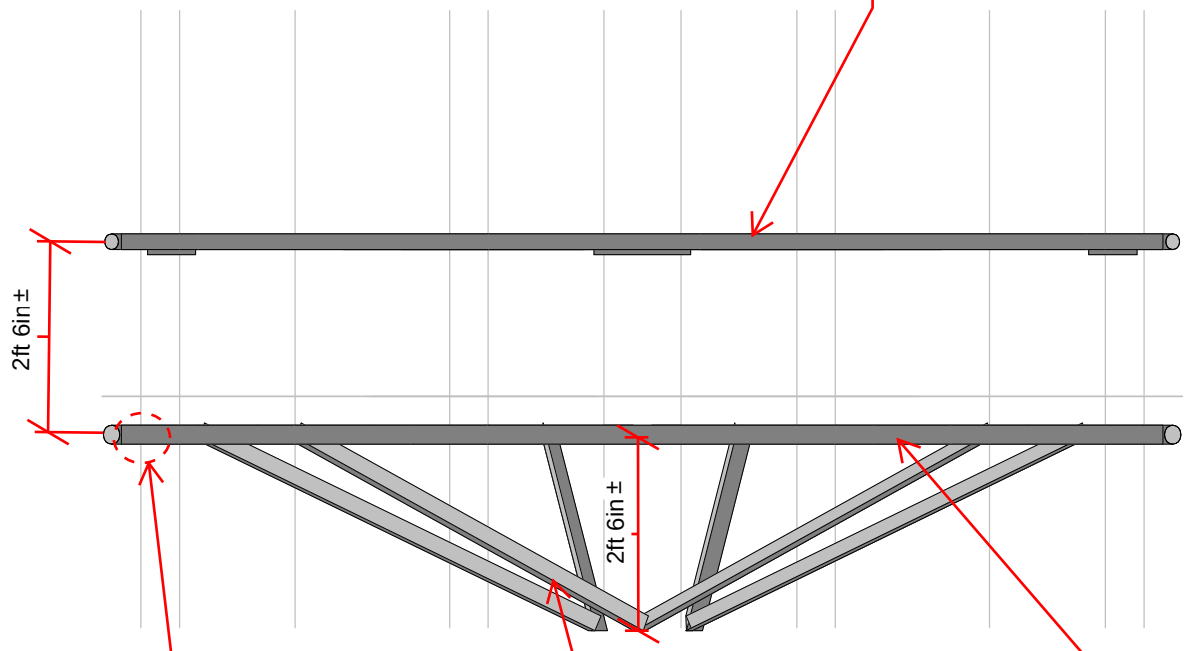
Proposed SitePro SCX2-K Crossover Plate Kit, or approved equivalent. Typical of (4) per sector, (12) total.

Envelope Only Solution

Tower Engineering Profes...	302481 - Hrfr - South	ISO View C - 1
RWM		Aug 6, 2020 at 2:33 PM
TEP No. 68513.435981		Mount Rev H.r3d



Proposed SitePro HRK14-HD Kit, or approved equivalent. Typical of (1) total. Connect to existing mount pipes. Connection hardware included in kit. Contractor to cut to length as necessary.



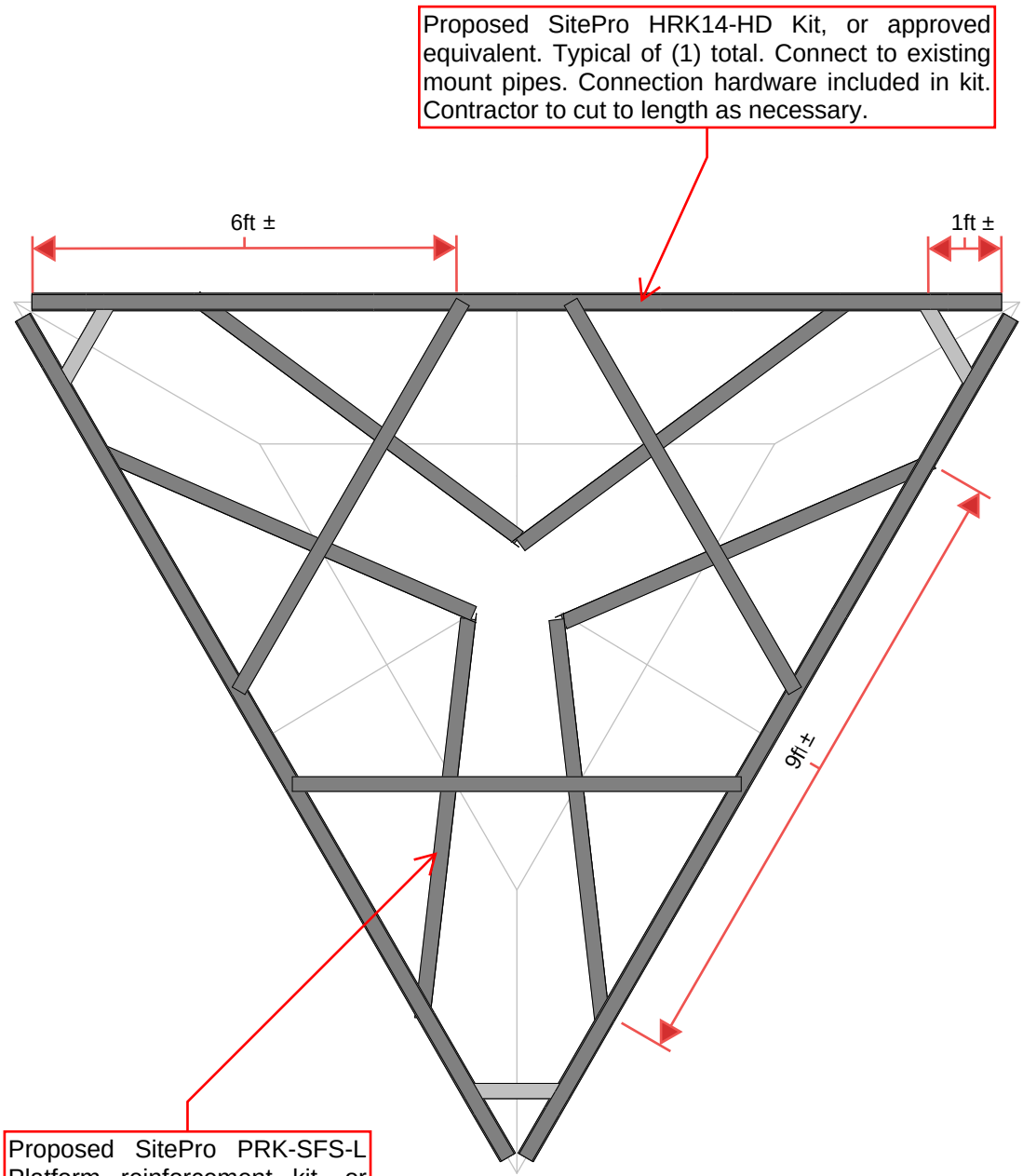
Proposed SitePro SCX2-K Crossover Plate Kit, or approved equivalent. Typical of (4) per sector, (12) total.

Proposed SitePro PRK-SFS-L Platform reinforcement kit, or approved equivalent. Typical of (1) total. Connect to proposed bottom support rail. Connection hardware provided with kit.

Proposed 2.5SCH40 x 13'-6" support rail, ASTM A53 Gr. B or greater. Typical of (1) per sector, (3) total. Connect to existing mount pipes with proposed crossover plate kits.

Envelope Only Solution

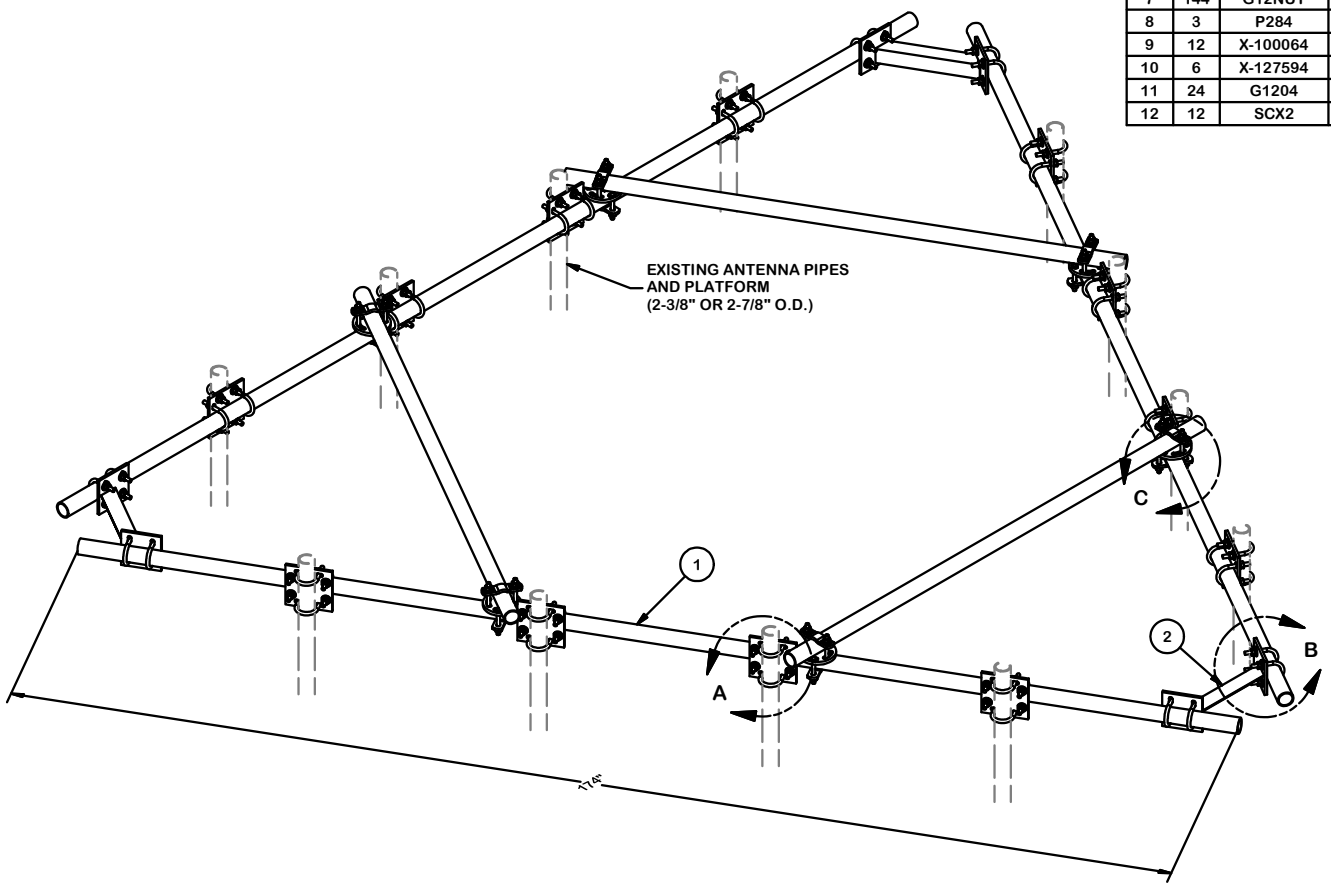
Tower Engineering Profes...	302481 - Hrfr - South	Elevation View C - 2
RWM		Aug 6, 2020 at 2:34 PM
TEP No. 68513.435981		Mount Rev H.r3d

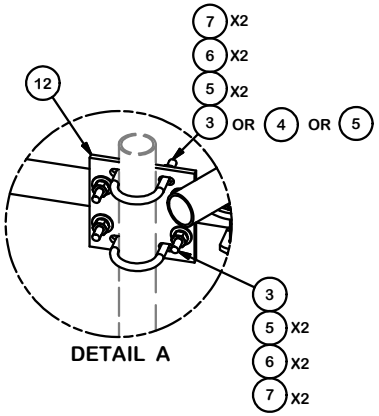


Envelope Only Solution

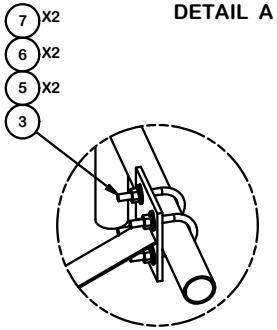
Tower Engineering Profes...	302481 - Hrfr - South	Plan View C - 3
RWM		Aug 6, 2020 at 2:34 PM
TEP No. 68513.435981		Mount Rev H.r3d

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2174	2-3/8" OD X 174" SCH 40 GALVANIZED PIPE	174 in	55.75	167.24
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.26	15.42
4	24	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.26	6.17
5	144	G12FW	1/2" HDG USS FLATWASHER		0.03	4.91
6	144	G12LW	1/2" HDG LOCKWASHER		0.01	2.00
7	144	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	10.31
8	3	P284	2-3/8" X 84" SCH 40 GALVANIZED PIPE	84 in	26.91	80.74
9	12	X-100064	CLAMP (S) (4" V-CLAMP) GALVANIZED		0.91	10.95
10	6	X-127594	FLAT DISK CLAMP PLATE 4" CENTERS (GALV.)		2.48	14.90
11	24	G1204	1/2" x 4" HDG HEX BOLT GR5 FULL THREAD	4 in	0.27	6.48
12	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
					TOTAL WT. #	448.08

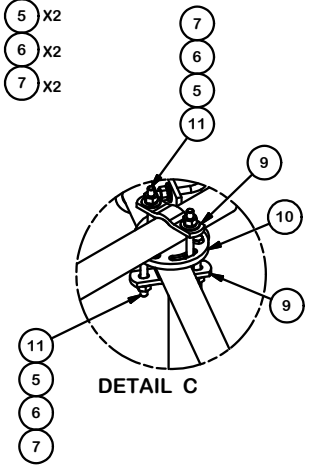




DETAIL A



DETAIL B



DETAIL C

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
HEAY DUTY HANDRAIL KIT
FOR 14' PLATFORMS WITH
2-3/8" OR 2-7/8" ANTENNA PIPES

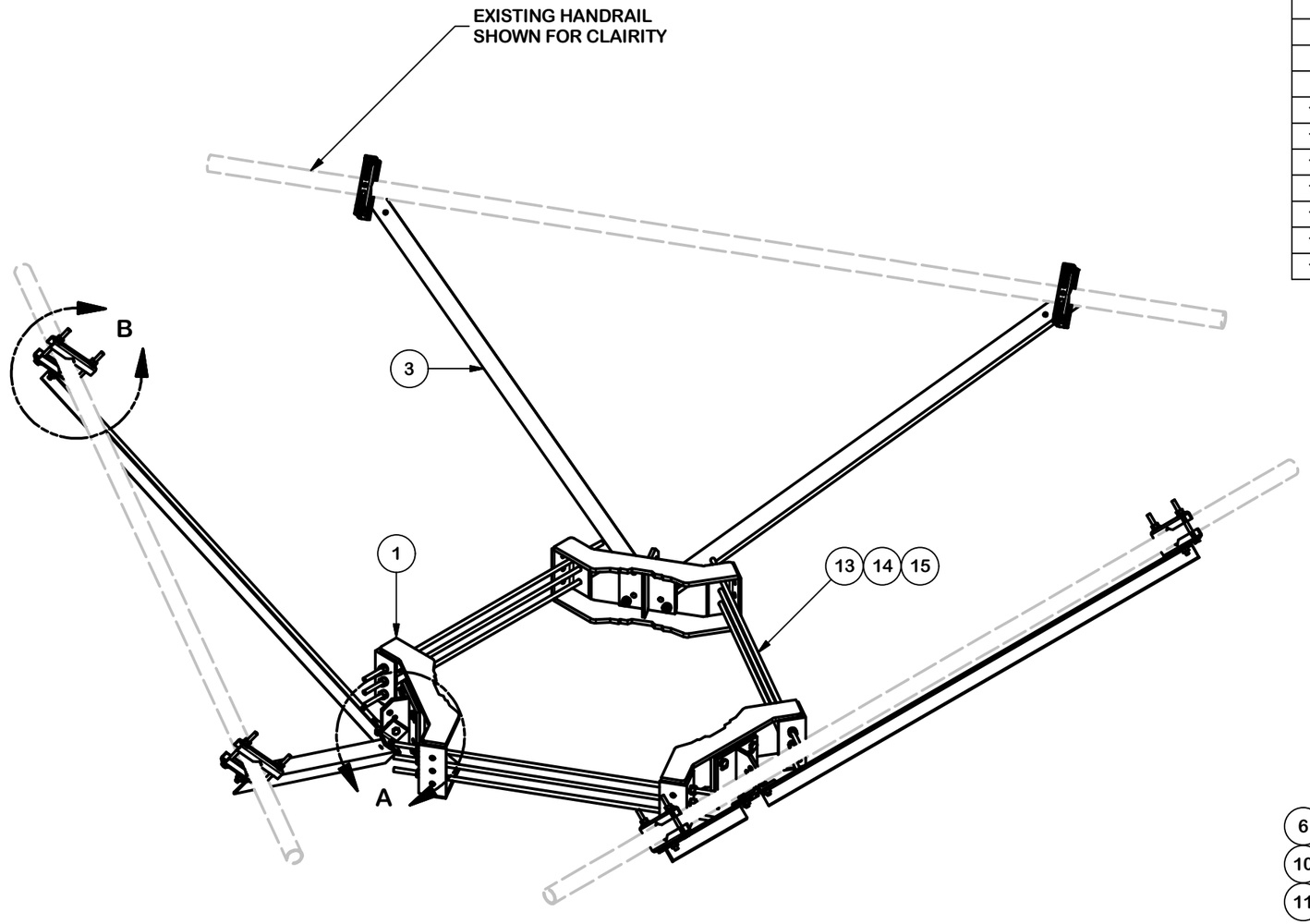
SITE PRO 1
A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	CEK 3/31/2015		HRK14-HD	1 OF 1

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 3/31/2015	HRK14-HD



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	3	X-TBW	T-BRACKET WELDMENT		13.60	40.80
3	6	X-254924	DIAGONAL ANGLE - SITE PRO 1	72 in	19.71	118.24
4	12	X-STU	STIFF ARM CHANNEL BRACKET	8 1/2 in	1.37	16.46
5	6	SHCM-T	CHAIN MOUNT TIGHTENER BRACKET	3 in	1.86	11.15
6	12	G12112	1/2" x 1-1/2" HDG HEX BOLT GR5	1/2 in	0.15	1.77
7	3	G12212	1/2" x 2-1/2" HDG HEX BOLT GR5	2 1/2 in	0.20	0.61
8	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
9	24	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	0.82
10	27	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.38
11	27	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.93
12	12	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	3.75
13	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)	24 in	0.40	3.59
13	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)	48 in	0.40	3.59
14	30	G58LW	5/8" HDG LOCKWASHER		0.03	0.78
15	30	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	3.90
					TOTAL WT. #	642.04

DETAIL A

DETAIL B

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	CHANGED MAX. DIA. FOR HANDRAIL CONNECTION	SP1	BC	10/25/2017

REVISION HISTORY

TOLERANCE NOTES

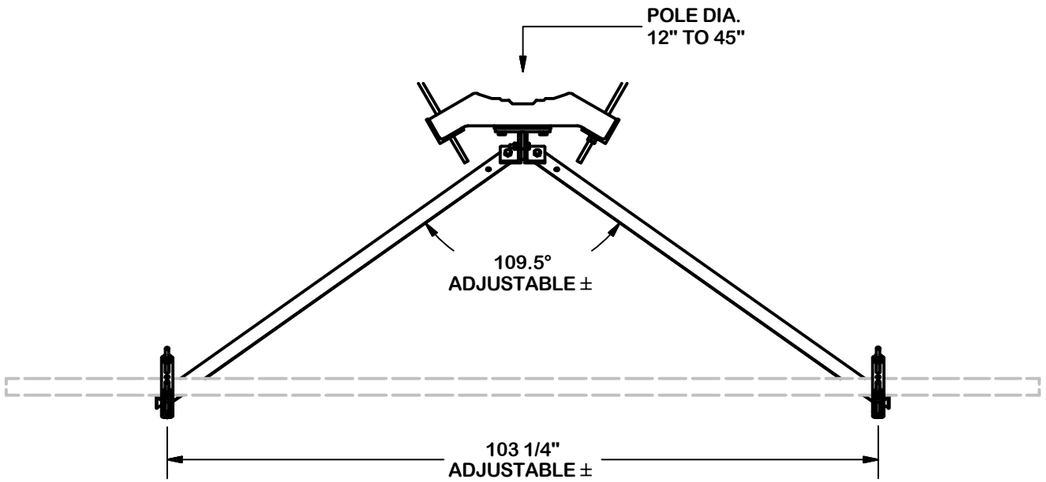
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES (± 0.030")
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

DESCRIPTION: HANDRAIL REINFORCEMENT KIT (LONG)

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
SP1	CSL3 2/23/2017	3RD PARTY	PRK-SFS-L

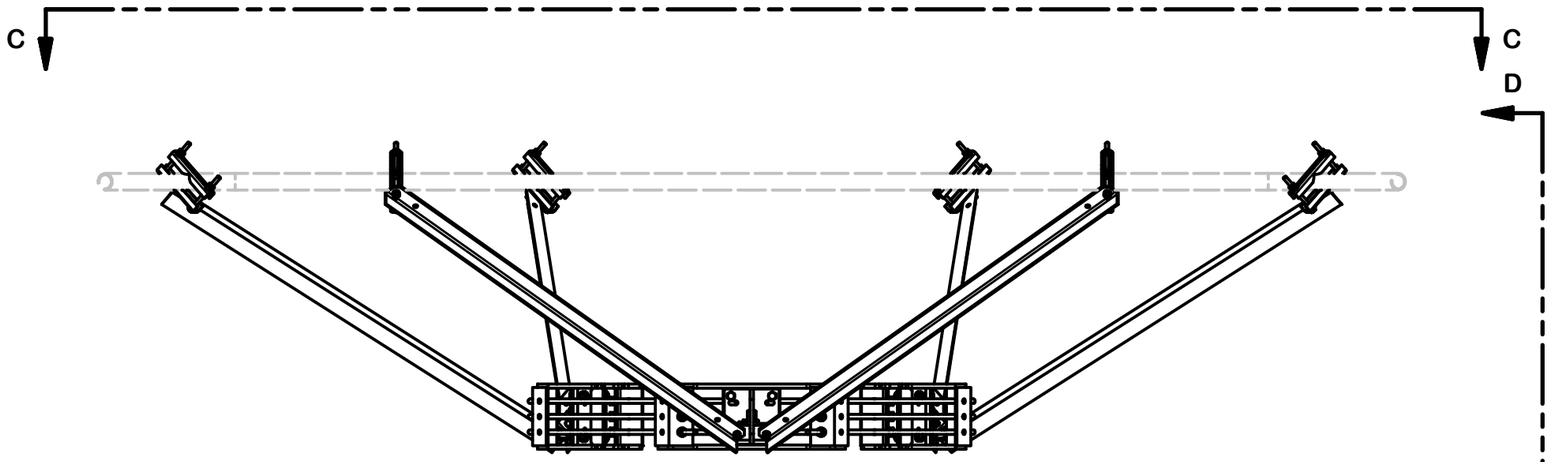
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	SHOP	BMC 9/8/2017	PRK-SFS-L

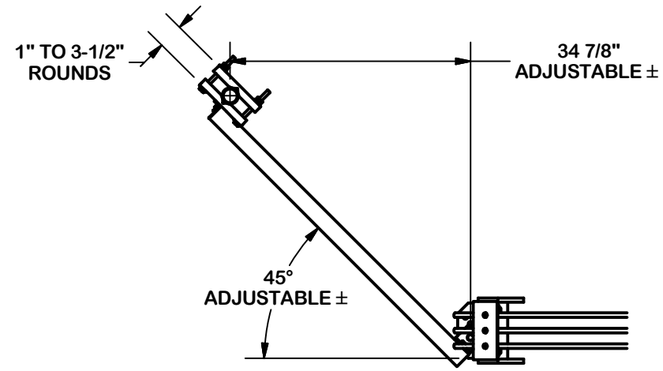
SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX



PARTIAL VIEW C-C

VERTICAL POSITION





PARTIAL VIEW D-D

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	CHANGED MAX. DIA. FOR HANDRAIL CONNECTION	SP1	BC	10/25/2017

REVISION HISTORY

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES (± 0.030")
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

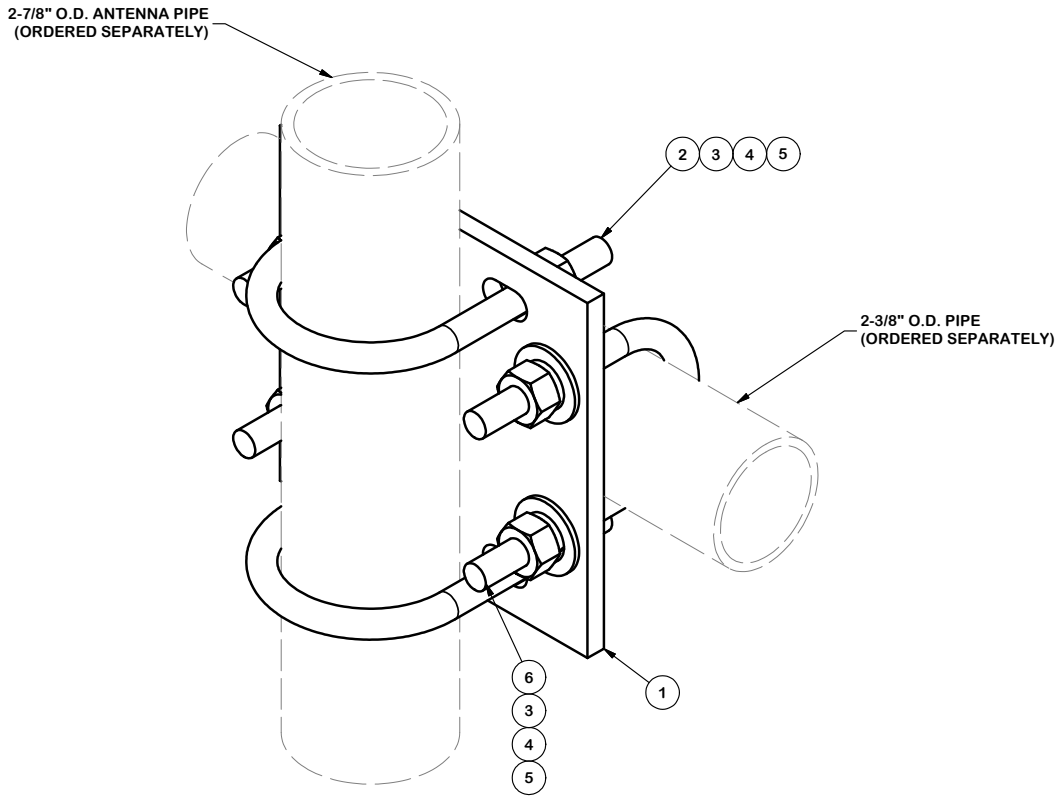
DESCRIPTION: HANDRAIL REINFORCEMENT KIT (LONG)

SITE PRO 1 — A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
SP1	CSL3 2/23/2017	3RD PARTY	PRK-SFS-L

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	SHOP	BMC 9/8/2017	PRK-SFS-L

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	SCX2	CROSSOVER PLATE	7 in	4.80	4.80
2	2	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.66	1.31
3	8	G12FW	1/2" HDG USS FLATWASHER		0.03	0.27
4	8	G12LW	1/2" HDG LOCKWASHER		0.01	0.11
5	8	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	0.57
6	2	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	1.25
					TOTAL WT. #	8.39



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: CROSSOVER PLATE KIT

SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	CEK 6/30/2011		SCX2-K	1 OF 1

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
		SHOP	BMC 7/1/2011	SCX2-K

SITE PRO 1

Bulk Pipe

A valmont COMPANY

Features: Factory cut end, hot-dip galvanized pipe.

Construction: ASTMA53 Grade B. Schedule 40.

Design Criteria: Conforms to the minimum requirements as stated in the ASTM A53 Grade B standard. ASTM Grade B standard. ASTM A53 Grade B (Yield Fy = 35 ksi [240 MPa] / Tensile Fu = 60 ksi [415 MPa]). All Finished goods are Hot Dip Galvanized in accordance with ASTM A123 requirements.

Part #	Length	Size (O.D.)	Weight
P1126	10’-6”	1.66” x 126”	24 lb.
P263	5’-3”	2-3/8” x 63”	18.25 lb.
P272	6’-0”	2-3/8” x 72”	23 lb.
P284	7’-0”	2-3/8” x 84”	27 lb.
P296	8’-0”	2-3/8” x 96”	27.80 lb.
P2126	10’-6”	2-3/8” x 126”	36 lb.
P2150	12’-6”	2-3/8” x 150”	42.40 lb.
P2174	14’-6”	2-3/8” x 174”	56 lb.
P3084	7’-0”	2-7/8” x 84”	43 lb.
P3096	8’-0”	2-7/8” x 96”	49 lb.
P30174	14’-6”	2-7/8” x 174”	78 lb.
P360	5’-0”	3-1/2” x 60”	35.20 lb.
P372	6’-0”	3-1/2” x 72”	47 lb.
P3150	12’-6”	3-1/2” x 150”	88 lb.
P3160	13’-4”	3-1/2” x 160”	96 lb.
P3174	14’-6”	3-1/2” x 174”	115 lb.
P3216	18’-0”	3-1/2” x 216”	132 lb.
P472	6’-0”	4-1/2” x 72”	64 lb.
P4126	10’-6”	4-1/2” x 126”	106 lb.
P4204	17’-0”	4-1/2” x 204”	188 lb.

Exhibit F

Power Density/RF Emissions Report

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: CT11769B

CT769/SSite Hartford #2
289H Mountain Road
Hartford, Connecticut 06106

September 9, 2020

EBI Project Number: 6220004696

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**62.90%**

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

September 9, 2020

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

Emissions Analysis for Site: CT11769B - CT769/SSite Hartford #2

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **289H Mountain Road** in **Hartford, 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 289H Mountain Road in Hartford, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

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

5) 4 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 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.

7) 4 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

8) 2 LTE channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

9) 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.

10) 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.

11) The antennas used in this modeling are the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 3246 for the 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 3246 for the 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 3246 for the 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 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.

12) The antenna mounting height centerline of the proposed antennas is 90 feet above ground level (AGL).

13) 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.

14) 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 AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd
Height (AGL):	90 feet	Height (AGL):	90 feet	Height (AGL):	90 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	300 Watts	Total TX Power (W):	300 Watts	Total TX Power (W):	300 Watts
ERP (W):	10,533.98	ERP (W):	10,533.98	ERP (W):	10,533.98
Antenna A1 MPE %:	**4.68%**	Antenna B1 MPE %:	**4.68%**	Antenna C1 MPE %:	**4.68%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR 3246	Make / Model:	Ericsson AIR 3246	Make / Model:	Ericsson AIR 3246
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.85 dBd	Gain:	15.85 dBd	Gain:	15.85 dBd
Height (AGL):	90 feet	Height (AGL):	90 feet	Height (AGL):	90 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts
ERP (W):	6,153.47	ERP (W):	6,153.47	ERP (W):	6,153.47
Antenna A2 MPE %:	**2.73%**	Antenna B2 MPE %:	**2.73%**	Antenna C2 MPE %:	**2.73%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd
Height (AGL):	90 feet	Height (AGL):	90 feet	Height (AGL):	90 feet
Channel Count:	7	Channel Count:	7	Channel Count:	7
Total TX Power (W):	320 Watts	Total TX Power (W):	320 Watts	Total TX Power (W):	320 Watts
ERP (W):	8,466.41	ERP (W):	8,466.41	ERP (W):	8,466.41
Antenna A3 MPE %:	**6.25%**	Antenna B3 MPE %:	**6.25%**	Antenna C3 MPE %:	**6.25%**
Antenna #:	**4**	Antenna #:	**4**	Antenna #:	**4**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd
Height (AGL):	90 feet	Height (AGL):	90 feet	Height (AGL):	90 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts
ERP (W):	25,651.93	ERP (W):	25,651.93	ERP (W):	25,651.93
Antenna A4 MPE %:	**11.39%**	Antenna B4 MPE %:	**11.39%**	Antenna C4 MPE %:	**11.39%**

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	25.05%
AT&T	14.53%
Sprint	4.86%
Metro PCS	2.97%
Town of W.Hfd	0.98%
Verizon	14.51%
Site Total MPE % :	62.90%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	25.05%
T-Mobile Sector B Total:	25.05%
T-Mobile Sector C Total:	25.05%
Site Total MPE % :	62.90%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz GSM	4	1028.30	90.0	18.26	1900 MHz GSM	1000	1.83%
T-Mobile 1900 MHz LTE	2	2056.61	90.0	18.26	1900 MHz LTE	1000	1.83%
T-Mobile 2100 MHz UMTS	2	1153.78	90.0	10.24	2100 MHz UMTS	1000	1.02%
T-Mobile 2100 MHz LTE	4	1538.37	90.0	27.31	2100 MHz LTE	1000	2.73%
T-Mobile 600 MHz LTE	2	591.73	90.0	5.25	600 MHz LTE	400	1.31%
T-Mobile 600 MHz NR	1	1577.94	90.0	7.00	600 MHz NR	400	1.75%
T-Mobile 700 MHz LTE	2	648.82	90.0	5.76	700 MHz LTE	467	1.23%
T-Mobile 1900 MHz LTE	2	2203.69	90.0	19.56	1900 MHz LTE	1000	1.96%
T-Mobile 2500 MHz LTE	2	6412.98	90.0	56.93	2500 MHz LTE	1000	5.69%
T-Mobile 2500 MHz LTE	2	6412.98	90.0	56.93	2500 MHz LTE	1000	5.69%
						Total:	**25.05%**

• 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:	25.05%
Sector B:	25.05%
Sector C:	25.05%
T-Mobile Maximum MPE % (Sector A):	25.05%
Site Total:	62.90%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **62.90%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Exhibit G

Mailing Receipts/Proof of Notice

UPS CampusShip: View/Print Label

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

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

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

   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the Resources area of CampusShip and select UPS Locations.
   Schedule a same day or future day Pickup to have a UPS driver pickup all your CampusShip packages.
   Hand the package to any UPS driver in your area.

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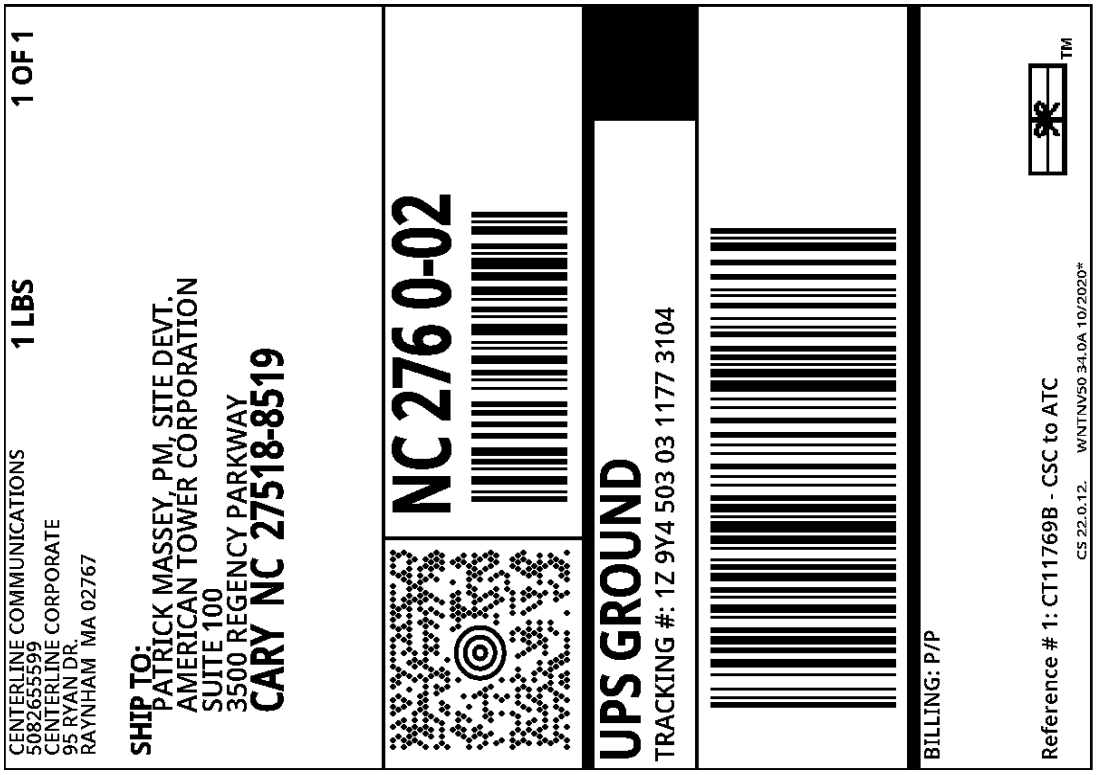
UPS Access Point™
CVS STORE # 7232
689 DEPOT ST
NORTH EASTON ,MA 02356

UPS Access Point™
TOWN LINE GENERAL STORE
450 E CENTER ST
WEST BRIDGEWATER ,MA 02379

FOLD HERE



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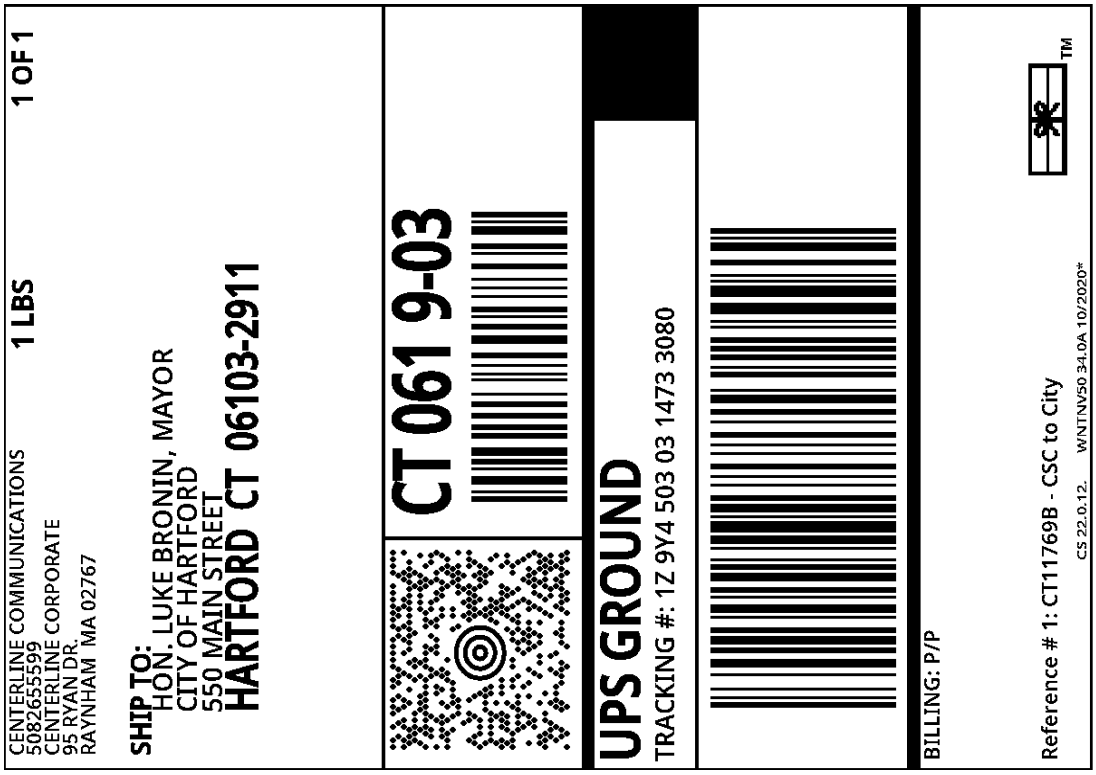

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