Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

October 22, 2018

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

RE: **Notice of Exempt Modification for T-Mobile / Crown Site BU: 876329**
T-Mobile Site ID: CT11278A
Located at: 28 Brewer Dr., Bloomfield, CT 06002
Latitude: 41° 50′ 6.57″/ Longitude: -72° 44′ 28.20″

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 108-foot level of the existing 120-foot monopole tower located at 28 Brewer Drive, Bloomfield, CT. The tower is owned by Crown Castle. The property is owned by the Town of Bloomfield-Cemetery Association. T-Mobile now proposes to swap out six (6) panel antennas, (3) remote radio units (non-antennas), and (1) line of coax for a hybrid fiber line. All work is to be completed within the existing area and the antennas would be installed at the same 108-foot level of the tower.

This facility was approved by the Town of Bloomfield Zoning Board of Appeals on August 5, 1996. This approval included the condition(s) that:

1. The hours of access to the site are from 7:30 AM to 5:00 **PM,** Monday through Friday.
2. That the access road be blocked off at the end of each working day.

This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §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.S.C.A. § 16-50j-73, a copy of this letter is being sent to Mr. Philip K. Schenck, Jr., Town Manager for the Town of Bloomfield, Jose Giner, Director of Planning and Zoning for the Town of Bloomfield, as well as the property owner and the tower owner.

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: William Stone.

Sincerely,

William Stone
Real Estate Specialist
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
518-373-3543
William.stone@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc:

Mr. Philip K. Schenck, Jr., Town Manager
Town Hall
800 Bloomfield Avenue
Bloomfield, CT 06002-0337

Jose Giner, Director of Planning and Zoning
Town Hall
800 Bloomfield Avenue
Bloomfield, CT 06002-0337

Bloomfield Cemetery Association
26 Mountain Ave
PO Box 7242
Bloomfield, CT 06002

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076

ZONING BOARD OF APPEALS

August 5, 1996

The Zoning Board of Appeals held a meeting on August 5, 1996, at 7:30 PM with the following members present.

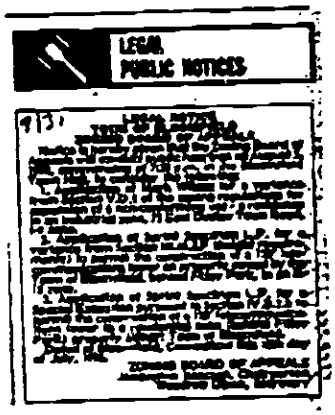
Jacqueline Isaacson/Chairperson
Woodrow Dixon
Joeannah Stinson
Charles Strouse

Michael Kosilla/ZEO
Nancy Awalt/Recording Clerk

Absent: William Goldstein, Robert Horn, Valeria Caldwell-Gaines, Joel Neuwirth

The meeting was called to order at 7:36 PM. Ms. Isaacson explained that with only four (4) members present, the applicants would need 4 affirmative votes for the applications to carry. She also explained that due to the fact that items 2 and 3 needed a sign language interpreter, they would be taken out of order and heard first.

Mr. Dixon read the call for the first application.


LEGAL
PUBLIC NOTICES

APPLICATION OF SPRINT SPECTRUM L.P.

Darryl Hendrickson was present regarding the application of Sprint Spectrum L.P for a variance from Section III.M.4.P (height requirements) to permit the construction of a 120' telecommunication tower on property owned by the Town of Bloomfield, behind Filley Park, in an R-15 Zone. An additional application for a Special Exception pursuant to Section IV.B.2.b was also presented at this time. Steve Crotty was also present for this application.

Mr. Hendrickson thanked Staff for helping them get to this point in the application especially Mr. Hooper, Mr. Chapman and Chief Mulhall. The proposal is for a 120' telecommunication facility for the Filley Park location. Sprint Spectrum is currently implementing PCS which stands for Personal Communication Service. It is the next cellular system that has been approved for an FCC license by the government. It will bring the existing cellular service up to a digital standard. These phones will enable the general consumer to enjoy E-mail, paging, PBX, voice data, etc.

There was a brief discussion regarding the exact location and then Mr. Hendrickson showed enlarged photo's of the site, taken from various views. The first photo was taken from the cul-de-sac in the Mountain View Cemetery looking north. He explained that they would be taking down a large, dead tree and erecting the tower approximately where the tree had been located. The second photo was taken from Brewer Road looking up the hill. He noted that they would be using this overgrown road off of Brewer for access for the construction trucks. There is also a pending easement agreement with Mountain View Cemetery that would allow Sprint to go through the Cemetery for their monthly inspections and maintenance of the tower so the use of the road off of Brewer would be for construction purposes only. Once completed the road would be allowed to go back to it's natural state. The third photo was taken from the entrance of Mountain View Cemetery off of Route 178. The purpose of the photo's was to show how the tower would look from different angles in Town. Sprint has worked with the Town very closely in choosing the location of this tower that would be beneficial to all the involved parties. Because of the elevation of this area, the tower will only be 120' high which is a relative low height for these towers. Sprint will also be installing an antenna for the Bloomfield Police Department to enhance their radio capabilities.

Mr. Hendrickson explained further the access road that would be used for trucks during construction. Because of the height of the weeds there might be a need to construct a temporary road but it would be allowed to grow back to its natural state when construction was complete. There is a requirement by Sprint to have a once a month maintenance visit to each tower and this would be done through the Cemetery as mentioned before.

The construction should take about 30-60 days to complete. The nearest house is no more than 600'-700' away. It was asked how the 120' height was arrived at and if the tower should fall would it hit any buildings. Steve Crotty showed graphic photos of the proposed Bloomfield site as well as other proposed and existing sites in surrounding towns. The maps showed the coverage of the town and the only non-coverage area was at the top of Avon Mountain. Mr. Crotty explained that locations are chosen so the services overlap so all areas are served. There had been a drive test done with a crane and the 120' height was what was needed to serve the Town of Bloomfield. He noted that the towers range from 100'-250' high. Because of the high elevation of this site, only 120' was all that was needed for this tower. He noted that Chief Mulhull had been extremely interested in having this installed stating that it would be a 40%-60% improvement in their radio transmissions. The tower would be delivered in sections and constructed on site. If the tower would fall it would collapse at the joint and fall into itself. At the worst case scenario, if the tower would fall straight, to the east or west it would fall on Town property, to the south it would fall on the Cemetery property and to the north it would fall on Alexandria Manor. There would be no buildings hit if the tower would fall.

Mr. Kosilla stated that there had been a meeting with the applicant, the Town Manager, The Town Planner and Chief Mulhall regarding this application and that he Town is very interested in this tower.

George Szala of 17 Downing Drive asked if the access road would be blocked off at the end of each working day. His concern was that because of the tracks made, it might encourage others to use this as a road. After a brief discussion Mr. Hendrickson stated that if the Town so wished, signs or road blocks of some sort could be used to deterred others from using the road. As mentioned before, they would let the road grow back to it's

original state or if needed additional plantings would be done. Mr. Szala also asked the time schedule of this project and was told that assuming that all approvals are given, they should be going for the building permit by the end of September.

Attorney John Pinney, on behalf of the Mountain View Cemetery, stated that their first involvement with this project had been through the Town contacting them. In exchange for the access through the Cemetery, Sprint will be installing underground electric and phone wires to the existing building on the Cemetery property which had been unattainable before because of the costs. The existing building on the Cemetery property would then be used to house some of the records and the daily operations of the Cemetery. Mr. Pinney stated that the Cemetery Association supported both of the applications being presented by Sprint Spectrum L.P.

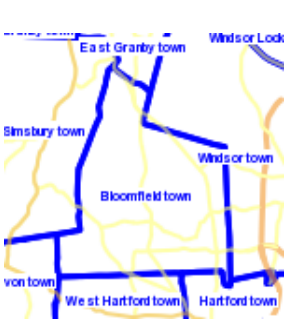
Mr. Hendrickson said that they would be leasing a 100' x 100' fenced area. The concrete slab for the tower would be 15'x 20'. There will also be a slab constructed at this time for the Town of Bloomfield's Police Department's equipment. There would also be room for future projects if needed. There would be three (3) five foot high, weatherproofed, electronic cabinets with the tower, on the slab. There was a brief discussion regarding hours of operation for the construction. Mr. Hendrickson stated that he didn't know the exact hours that Sprint used but it would probably be 7:30 AM - 5:30 PM. Mr. Hendrickson left handouts with the Board of an article from USA Today, July 17, 1996, talking about President Clintons plans to introduce cellular phones as the newest weapon in his community policing initiative.

The public hearing was closed and a brief discussion followed. Mr. Strouse then motioned to approve the application of Sprint Spectrum L. P. for a variance from Section III.M.4.P (height requirements) to permit the construction of a 120' telecommunication tower on property owned by the Town of Bloomfield, behind Filley Park, in an R-15 zone. Conditions of this approval are that the hours will be from 7:30 AM to 5:00 PM, Monday through Friday and that the access road be blocked off at the end of each working day. Ms. Stinson seconded the motion and it carried unanimously.

Ms. Stinson motioned to approve the application of Sprint Spectrum L.P. for a Special Exception pursuant to Section IV.B.2.b to permit the construction of a 120' telecommunications tower in a residential zone (behind Filley Park) property owner: Town of Bloomfield. Mr. Dixon seconded the motion and it carried unanimously.

The call for the second hearing was read.

Town of Bloomfield			
Parcel: 7622 Acres: 3.37			
Name:	BLOOMFIELD TOWN OF	Land Value	327300
Site:	28 BREWER DR	Building Value	0
Sale:	0 on 0000-00-00 Reason=U Qual=34	Misc Value	0
Mail:	800 BLOOMFIELD AVE BLOOMFIELD, CT 06002	Just Value	330700
		Assessed Value	0
		Exempt Value	0
		Taxable Value	0



Date printed: 09/19/16 : 14:48:54

Recent Sales in Neighborhood | Previous Parcel | Next Parcel | Field Definitions | Return to Main Search | Bloomfield Home

Owner and Parcel Information

Owner Name	BLOOMFIELD TOWN OF TOWN HALL	**Today's Date**	September 19, 2016
Mailing Address	800 BLOOMFIELD AVE	**Parcel ID**	7622 (Account #: R12968)
	BLOOMFIELD, CT 06002	**Fire District**	C
Location Address	28 BREWER DR	**Census Tract**	
Map / Lot	176-1 / 1168	**Acreage**	3.37
Use Class / Description	921 Mun Lnd Res	**Parcel Map**	Show Parcel Map Owner List By Radius
Assessing Neighborhood	0001A	**Utilities**	

Current Appraised Value Information

Building Value	XF Value	OB Value	Land Value	Special Land Value	Total Appraised Value	Net Appraised Value	Current Assessment
$ 0	$ 0	$ 3,400	$ 327,300		$ 330,700	$ 330,700	$ 231,490

Assessment History

Year	Building	OB/Misc	Land	Total Assessment
Current	0	$ 2,380	$ 229,110	$ 231,490
2013	0	$ 2,380	$ 195,860	$ 198,240
2009	0	$ 2,380	$ 195,860	$ 198,240

Land Information

Use	Class	Zoning	Area	Value
Mun Lnd Res	E	R-15	0.34 AC	$ 107,200
Res Cell Site	R	R-15	1 BL	$ 200,000
Mun Lnd Res	E		3.03 AC	$ 20,100

Building Information

No Building Information available for this parcel.

Out Buildings / Extra Features

Description	Sub Description	Area	Year Built	Value
Shed	1 Stry Frame	286 S.F.	1998	$ 3,400

Sale Information

Sale Date	Sale Price	Deed Book/Page	Sale Qualification	Reason	Vacant or Improved	Owner
00/00/0000		113/ 751	Unqualified	Old sale- Validity unknown	Vacant	BLOOMFIELD TOWN OF TOWN HALL

Permit Information

Permit ID	Issue Date	Type	Description	Amount	Inspection Date	% Complete	Date Complete	Comments
B19770	05/06/1998					100		12X26 SHED TENANT ON TOWER;

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SHEET INDEX

NO.	DESCRIPTION
T1	TITLE PAGE
N1	NOTES
C1	PLAN & ELEVATION
C2	RF CHART AND ORIENTATION
D1	EQUIPMENT DETAILS
E1	GROUNDING & ELECTRICAL DETAILS
E2	RF PLUMBING DIAGRAM

TOWER OWNER NOTIFICATION

ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, CONTRACTOR WILL CONTACT THE CROWN CASTLE CONSTRUCTION MANAGER OF RECORD (NOTED ON THE FIRST PAGE ON THIS CONSTRUCTION DRAWING) A MINIMUM OF 48 HOURS PRIOR TO WORK START. UPON ARRIVAL TO THE JOB SITE, CONTRACTOR CREW IS REQUIRED CALL 1-800-788-7011 TO NOTIFY THE CROWN CASTLE NOC WORK HAS BEGUN.

T-Mobile

CROWN CASTLE

CBU

CBU # 876329

SITE ID

CT11278A

SITE NAME

BLOOMFIELD/DTWN

SITE ADDRESS

28 BREWER DR.
BLOOMFIELD, CT 06002

CONFIGURATION

67D92DB_2XAIR+1OP

PROJECT SITE INFORMATION

SITE ID:	CT11278A	
SITE NAME:	BLOOMFIELD/DTWN	
SITE ADDRESS:	28 BREWER DR. BLOOMFIELD, CT 06002	
PERMITTING JURISDICTION:	TOWN OF BLOOMFIELD	
COUNTY:	HARTFORD	
ZONING:	R-15	
SITE COORDINATES: LATITUDE:	41.8351600000°	(NAD 83)
LONGITUDE:	-72.7412000000°	(NAD 83)
APPLICANT:	T-MOBILE NORTHEAST LLC 103 MONARCH DRIVE LIVERPOOL, NY 13088	

STRUCTURAL ANALYSIS INFORMATION

TOWER ANALYSIS

INFINIGY ENGINEERING HAS NOT EVALUATED THE EXISTING **TOWER** FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO STRUCTURAL ANALYSIS FROM TOWER OWNER PRIOR TO ANY CONSTRUCTION.

ANTENNA MOUNTS

INFINIGY ENGINEERING HAS NOT EVALUATED THE EXISTING **MOUNTS** FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO PASSING MOUNT ANALYSIS PRIOR TO ANY CONSTRUCTION.

PROJECT TEAM INFORMATION

CLIENT REPRESENTATIVE:	CROWN CASTLE 3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
CLIENT REP. CONTACT:	WILL STONE (518) 373-3543
ENGINEER:	INFINIGY 6865 DEERPATH ROAD SUITE 152 ELKRIDGE, MD 21075
ENGINEER CONTACT:	MATTHEW LIVERETTE (518) 690-0790

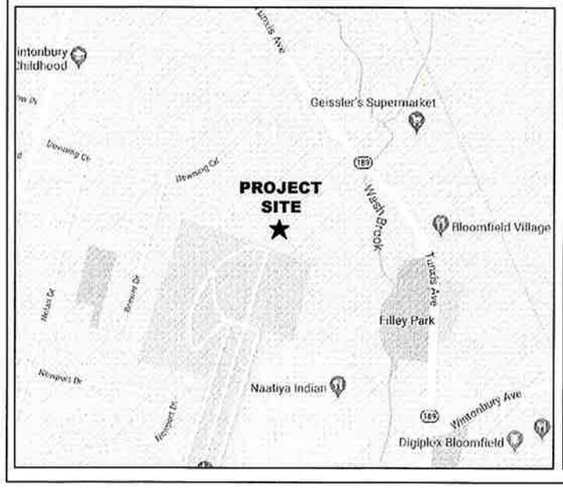
SCOPE OF WORK

SCOPE OF WORK:
L700 4X2 6792DB OUTDOOR: REPLACE (6) ANTENNAS. REPLACE (1) COAX WITH (1) NEW HYBRID. REPLACE (3) RRU'S. FINAL CONFIG: (9) ANTENNAS, (11) COAX, (2) HYBRIDS, (3) TMA'S, (3) RRU'S, AND (1) GPS W/ ASSOCIATED LINE.

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

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN CONNECTICUT, CONTACT CALL BEFORE YOU DIG
TOLL FREE: 1-800-922-4455 OR
www.cbyd.com
CONNECTICUT STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

LOCATION MAP



GENERAL NOTES

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- FACILITY HAS NO PLUMBING OR REFRIGERANTS.
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRH AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
- THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON STORMWATER DRAINAGE.
- NO SANITARY SEWER, POTABLE WATER, OR TRASH DISPOSAL SERVICE IS REQUIRED
- NO COMMERCIAL SIGNAGE IS PROPOSED

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED WITH ANY LOCAL AMENDMENTS BY THE LOCAL GOVERNING AUTHORITIES:

- INTERNATIONAL BUILDING CODE
- NATIONAL ELECTRICAL CODE
- NATIONAL FIRE PROTECTION ASSOCIATION 101
- NATIONAL FIRE PROTECTION ASSOCIATION 1
- LOCAL BUILDING CODES
- CITY/COUNTY ORDINANCES
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATIONS (AISC)
- UNDERWRITERS LABORATORIES APPROVED ELECTRICAL PRODUCTS.
- ANSI EIA/TIA 222 REV. G
- TIA 607
- INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
- IEEE C2 (LATEST EDITION)
- TELCORDIA GR-1275
- ANSI T1.311

T-Mobile
T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY
6865 DEERPATH ROAD SUITE 152
ELKRIDGE, MD 21075
TEL (443) 592-3143

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24765
LICENSED PROFESSIONAL ENGINEER
SEP 11 2018

No.	Submittal / Revision	Appd	Date
0	ISSUED FOR CONSTRUCTION	SL	09/11/18
A	ISSUED FOR REVIEW	SL	08/21/18

Drawn: RCD
Designed: MRL
Checked: A-D

Project Number: 600-007

Project Title: CT11278A
BLOOMFIELD/DTWN
28 BREWER DR.
BLOOMFIELD, CT 06002

Prepared For: CROWN CASTLE

Drawing Title: **TITLE PAGE**

Drawing Number: **T1**

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
- B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
- C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
- D. AND NFPA 101 (LIFE SAFETY CODE).
- E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
- F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:
A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B: COMPANY: T-MOBILE CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.

1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.7 NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE T-MOBILE WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY T-MOBILE TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR T-MOBILE PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
- A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
- B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
- C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
- D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO T-MOBILE OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
- E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
- F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:
- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
- B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
- C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
- D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
- E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
- F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
- G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.

B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.

C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.

E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.

F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.

G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
T	TRANSFORMER
M	KILOWATT HOUR METER
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
	UNDERGROUND UTILITIES
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION
OR ⊗	GROUND ROD
OR ⊠	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	120AC DUPLEX RECEPTACLE
G	GROUND CONDUCTOR
	DC POWER AND FIBER OPTIC TRUNK CABLES
E	DC POWER CABLES
# / #	REPRESENTS DETAIL NUMBER / REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

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STATE OF CONNECTICUT
JOHN S. STEVENS
SEP 11 2018
LICENSED PROFESSIONAL ENGINEER

No.	Submittal / Revision	Appd.	Date
0	ISSUED FOR CONSTRUCTION	SL	09/11/18
A	ISSUED FOR REVIEW	SL	08/21/18

Drawn: RCD
Designed: MRL
Checked: AJD

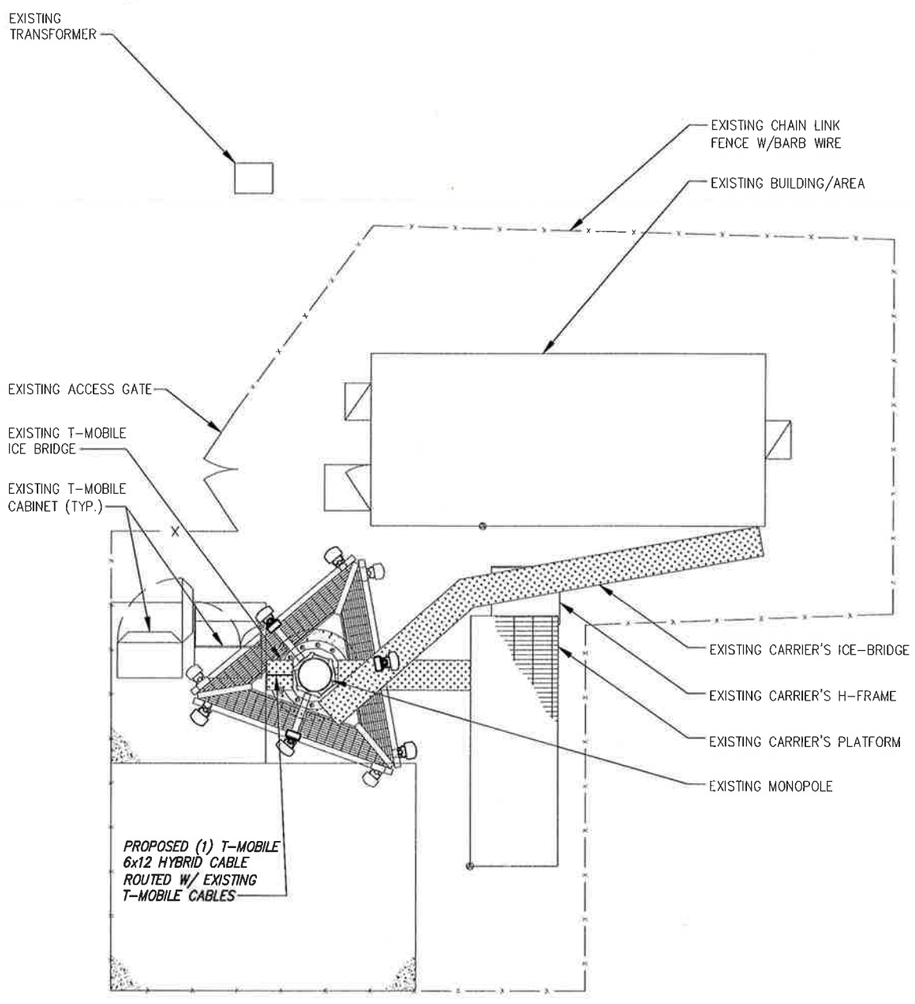
Project Number: 600-007

Project Title: CT11278A
BLOOMFIELD/DTWN
28 BREWER DR.
BLOOMFIELD, CT 06002

Prepared For: CROWN CASTLE

Drawing Title: NOTES

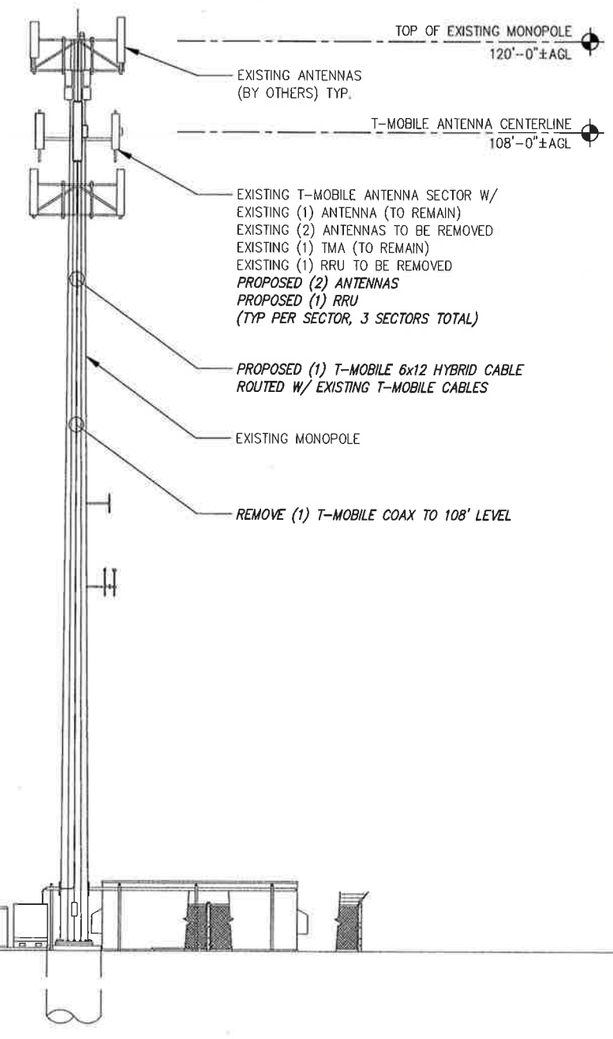
Drawing Number: N1



NORTH

1 C1 PLAN VIEW
SCALE: AS NOTED

GRAPHIC SCALE:
10' 5' 0 5' 10'
SCALE (11x17): 1" = 10'-0"
SCALE (22x34): 1" = 5'-0"



2 C1 ELEVATION
SCALE: NOT TO SCALE

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JOHN S. STEVENS
No. 24018
LICENSED PROFESSIONAL ENGINEER
SEP 12 2018

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Drawing Title
PLAN AND ELEVATION

Drawing Number
C1

SECTOR	ANTENNA POSITION	ANTENNA MODEL #	VENDOR	AZIMUTH	M-TILT	E-TILT	ANTENNA CENTERLINE	TMA/RRU MODEL #	CABLE LENGTH	CABLE TYPE AND QUANTITY
ALPHA	A-1	AIR21 B2A/B4P	ERICSSON	100°	3	-	108'-0"	TWIN STYLE 1B-AWS	158'±	(2) 1-5/8" COAX (1) 6x12 HCS (SHARED)
	A-2	**APXVAARR24_43_U_NA20**	**RFS**	**100°**	**3**	-	108'-0"	**4449 B71+B12**	**158'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	A-3	**AIR32_B66A_B2A**	**ERICSSON**	**100°**	**3**	-	108'-0"	-	EXISTING	(1) 6x12 HCS (SHARED)
BETA	B-1	AIR21 B2A/B4P	ERICSSON	240°	3	-	108'-0"	TWIN STYLE 1B-AWS	158'±	(1) 6x12 HCS (SHARED)
	B-2	**APXVAARR24_43_U_NA20**	**RFS**	**240°**	**3**	-	108'-0"	**4449 B71+B12**	**158'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	B-3	**AIR32_B66A_B2A**	**ERICSSON**	**240°**	**3**	-	108'-0"	-	EXISTING	(1) 6x12 HCS (SHARED)
GAMMA	C-1	AIR21 B2A/B4P	ERICSSON	340°	3	-	108'-0"	TWIN STYLE 1B-AWS	158'±	(2) 1-5/8" COAX (1) 6x12 HCS (SHARED)
	C-2	**APXVAARR24_43_U_NA20**	**RFS**	**340°**	**3**	-	108'-0"	**4449 B71+B12**	**158'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	C-3	**AIR32_B66A_B2A**	**ERICSSON**	**340°**	**3**	-	108'-0"	-	EXISTING	(1) 6x12 HCS (SHARED)

1 C2 RF SYSTEM CHART
SCALE: NOT TO SCALE

KEY

EXISTING
PROPOSED

ANTENNA LOCATION KEY

VIEWED FROM BEHIND

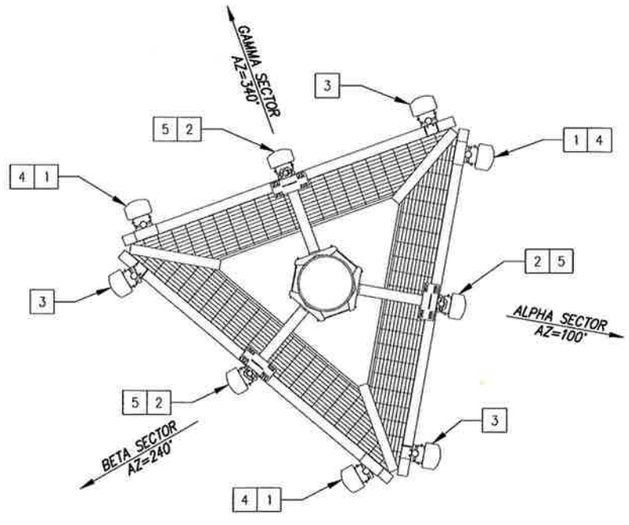
#1 #2 #3

GENERAL NOTES:

1. CONTRACTOR TO VERIFY PROPOSED ANTENNA INFORMATION IS THE MOST CURRENT AT TIME OF CONSTRUCTION.
2. CONTRACTOR TO CONFIRM CABLE LENGTHS FOR ANY PROPOSED CABLES/JUMPERS PRIOR TO CONSTRUCTION.

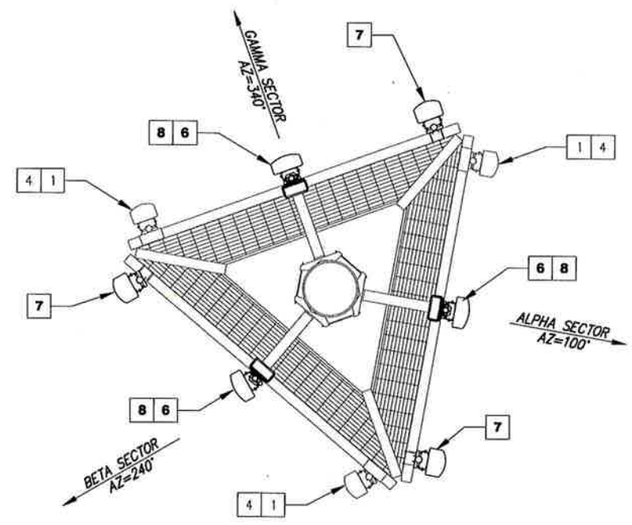
ORIENTATION PLAN KEY

KEY	DESCRIPTION	TYPE	QTY	STATUS
1	AIR21_B2A_B4P	ANTENNA	3	REMAIN
2	LNX-6514DS-A1M	ANTENNA	3	REMOVED
3	AIR21_B2P_B4A	ANTENNA	3	REMOVED
4	TWIN STYLE 1B TMA	TMA	3	REMAIN
5	RRUS11 B12	RRU	3	REMOVED
6	**APXVAARR24_43_U_NA20**	**ANTENNA**	**3**	**PROPOSED**
7	**AIR32_B66A_B2A**	**ANTENNA**	**3**	**PROPOSED**
8	**4449 B71+B12**	**RRU**	**3**	**PROPOSED**



NORTH

2 C2 EXISTING ANTENNA ORIENTATION
SCALE: NOT TO SCALE



NORTH

3 C2 PROPOSED ANTENNA ORIENTATION
SCALE: NOT TO SCALE

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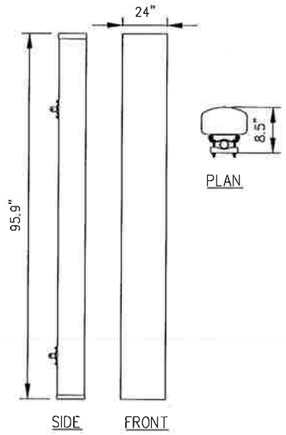
Prepared For:
CROWN CASTLE

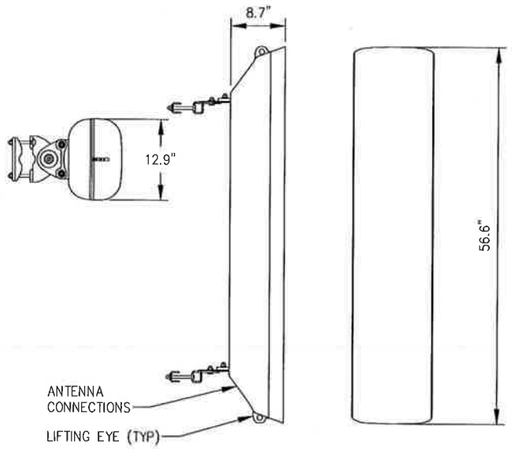
Drawing Title
RF CHART

Drawing Number
C2



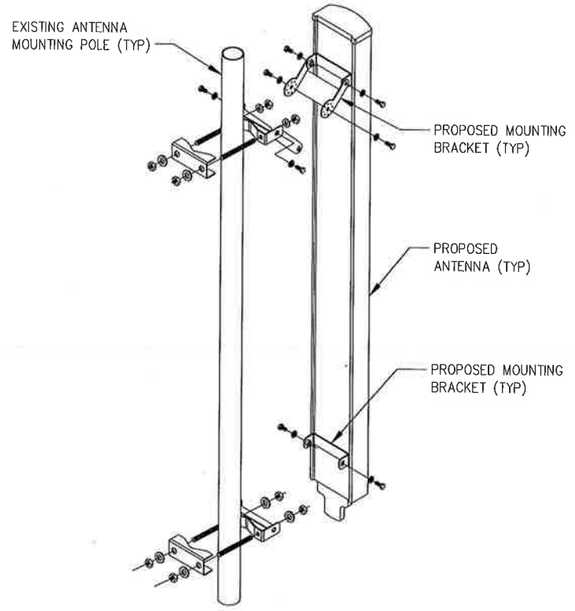
RFS MODEL NO.:	APXVAARR24_43-U-NA20
RADOME MATERIAL:	FIBERGLASS
RADOME COLOR:	LIGHT GREY
DIMENSIONS, HxWxD:	95.9"x24"x8.5"
WEIGHT, W/O MOUNTING KIT:	128 LBS

1/D1 APX ANTENNA DETAIL
SCALE: NOT TO SCALE

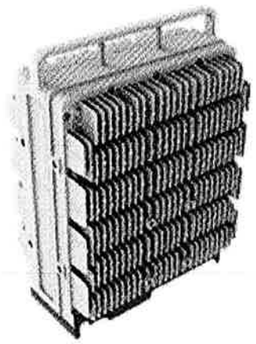


ERICSSON MODEL NO.:	AIR32 B66A-B2A
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	56.6"x12.9"x8.7"
WEIGHT, W/ PRE-MOUNTED BRACKETS:	132.2 LBS

2/D1 AIR32 B66A-B2A ANTENNA DETAIL
SCALE: NOT TO SCALE



3/D1 ANTENNA/RRU MOUNTING DETAIL
SCALE: NOT TO SCALE



ERICSSON 4449 B71+B12 SPECIFICATIONS

- HxWxD, (INCHES) : 17.91"x13.19"x10.63"
- WEIGHT (LBS) : 74.96
- COLOR : GRAY

4/D1 4449 B71+B12 RRU DETAIL
SCALE: NOT TO SCALE

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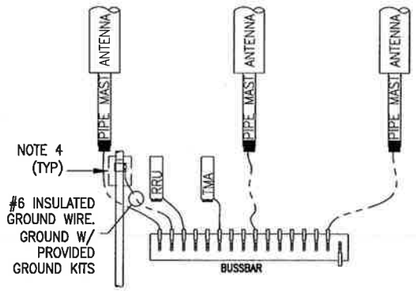
Prepared For:
CROWN CASTLE

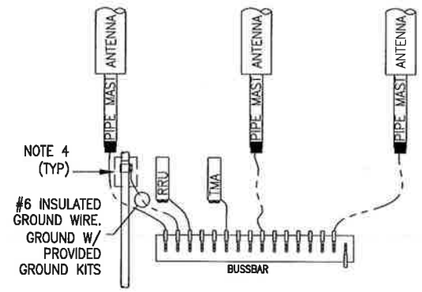
Drawing Title
EQUIPMENT DETAILS

Drawing Number
D1

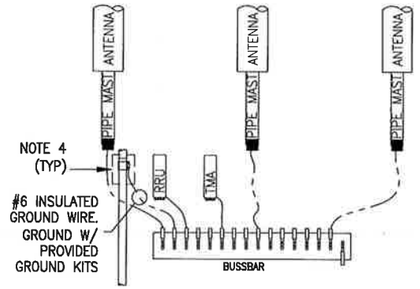
ALPHA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



BETA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)

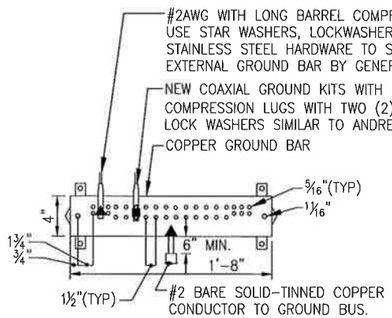


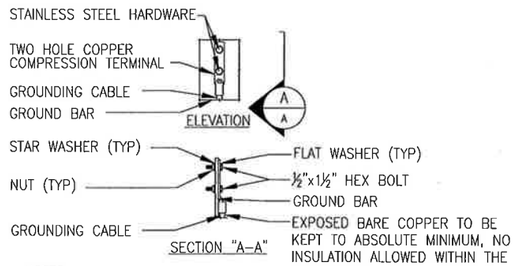
GAMMA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



NOTES:
1. PROVIDE #2AWG GROUNDING CONDUCTOR, U.O.N.
2. PROVIDE BONDING AND GROUNDING CONDUCTORS WITH GREEN TYPE THWN INSULATION, U.O.N.
3. PROVIDE SOLID TINNED BARE COPPER WIRE (BCW) GROUNDING CONDUCTOR.
4. PROVIDE STANDARD COAX OR HYBRID CABLE GROUNDING KIT OR FIELD FABRICATE TO SUIT CONDITIONS. TOTAL LENGTH OF GROUNDING CONDUCTOR SHALL NOT EXCEED 10'-0".
5. PROVIDE GROUNDING ELECTRODES QUANTITY, TYPE AND SIZE AS INDICATED ON SITE GROUNDING PLAN.
6. LEAVE GROUND WIRE COILED UP ABOVE GRADE. CAP END OF CONDUIT.
7. ADD COAX OR HYBRID CABLE GROUND KIT CONNECTION TO BUSSBAR WHEN LENGTH OF CABLE TRAY (FROM TOWER OR MONOPOLE TO EQUIPMENT) IS GREATER THAN 20'-0".
8. ADD #2/0 GREEN INSULATED CONDUCTOR BETWEEN CABLE TRAY AND GRIPSTRUT/COVER.
9. BUSSBARS ARE TO BE TINNED COPPER BARS (¼"X2"X12") MOUNTED ON INSULATORS, U.O.N.
10. GROUND ALL PROPOSED ANTENNAS, DIPLEXERS, TMAS, AND RRUS PER MANU. SPECS.

1 / E1 GROUNDING DIAGRAM
SCALE: NOT TO SCALE

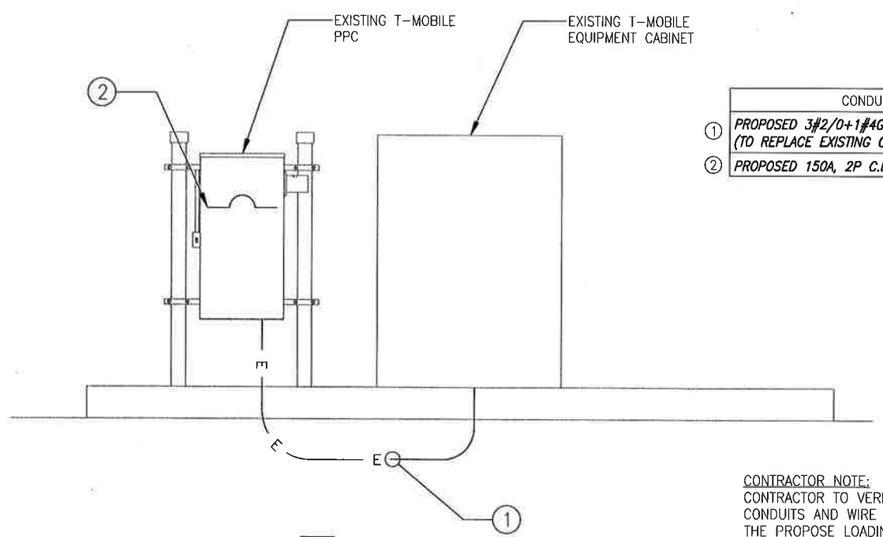




NOTES:
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

2 / E1 GROUND BAR CONNECTION DETAIL
SCALE: NOT TO SCALE



CONDUIT SCHEDULE
① PROPOSED 3#2/0+1#4G IN 2" CONDUIT (TO REPLACE EXISTING CONDUCTOR AND CONDUIT)
② PROPOSED 150A, 2P C.B.

3 / E1 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

CONTRACTOR NOTE:
CONTRACTOR TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSE LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY
6865 DEERPATH ROAD SUITE 152
ELKRIDGE, MD 21075
TEL (443) 592-3143

STATE OF CONNECTICUT
JOHN S. STEVENS
LICENSED PROFESSIONAL ENGINEER
SEP 17 2018

No	Submittal / Revision	Appd	Date
0	ISSUED FOR CONSTRUCTION	SL	09/11/18
A	ISSUED FOR REVIEW	SL	08/21/18

Drawn: RCD
Designed: MRL
Checked: AJD

Project Number: 600-007

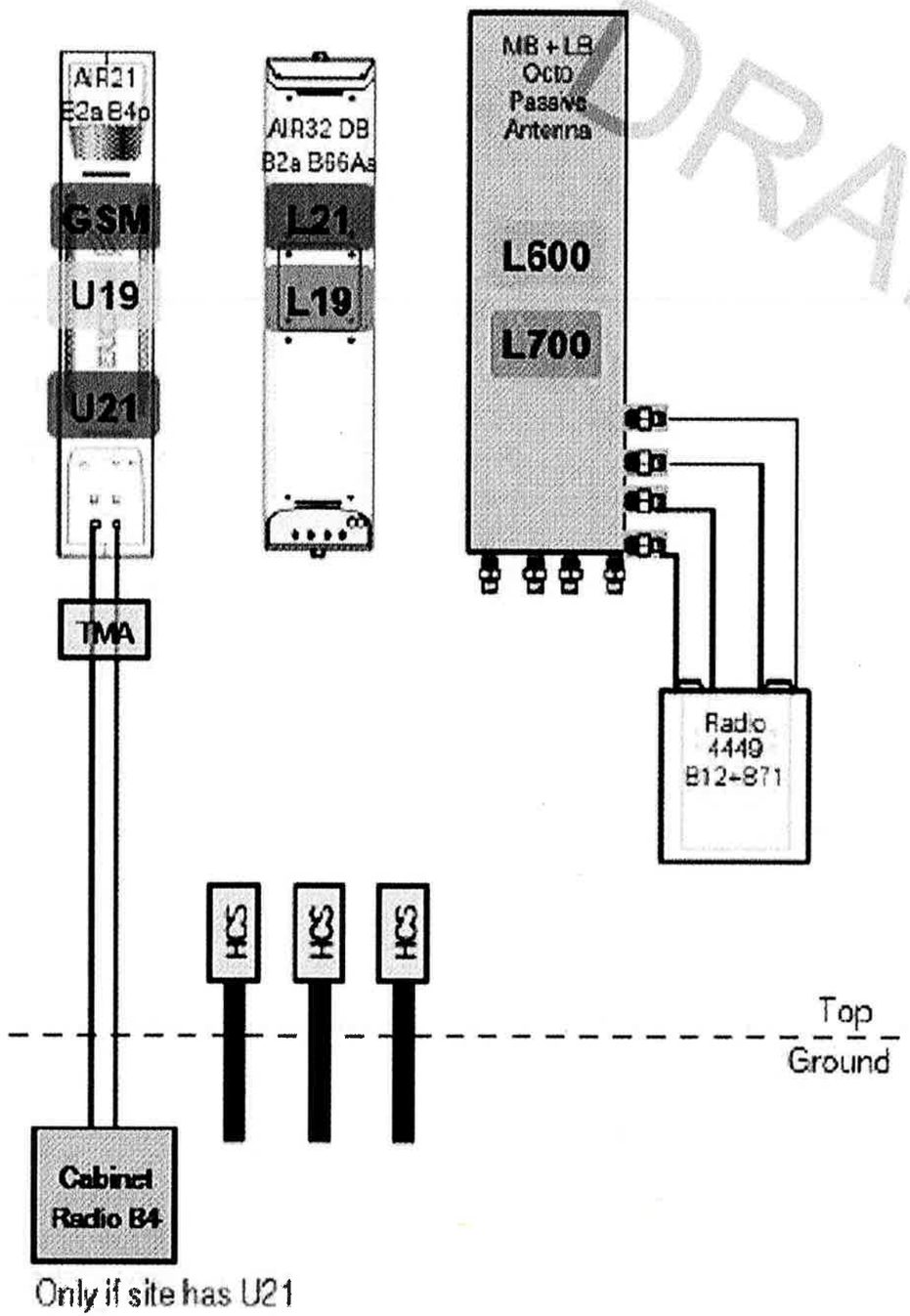
Project Title:
CT11278A
BLOOMFIELD/DTWN
28 BREWER DR.
BLOOMFIELD, CT 06002

Prepared For:
CROWN CASTLE

Drawing Title
GROUNDING & ELECTRICAL DETAILS

Drawing Number
E1

57D92DB_2xAIR+1OPJPG



1 / E2 RF PLUMBING DIAGRAM
SCALE: AS NOTED

T-Mobile

T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY

6865 DEERPATH ROAD SUITE 152
ELKRIDGE, MD 21075
TEL (443) 592-3143

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
REGISTERED PROFESSIONAL ENGINEER
SEP 11 2018

No	Submittal / Revision	Appd	Date
0	ISSUED FOR CONSTRUCTION	SL	09/11/18
A	ISSUED FOR REVIEW	SL	08/21/18

Drawn: RCD
Designed: MRL
Checked: AJD

Project Number:
600-007

Project Title:
CT11278A
BLOOMFIELD/DTWN

28 BREWER DR.
BLOOMFIELD, CT 06002

Prepared For:
CROWN CASTLE

Drawing Title
RF PLUMBING DIAGRAM

Drawing Number
E2

PAUL J. FORD & COMPANY

Date: **October 10, 2018**

Timothy Howell
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Paul J. Ford and Company
250 East Broad st., Suite 600
Columbus, OH 43215
(614) 221-6679

Subject:	**Structural Modification Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11278A
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876329
	Crown Castle Site Name:	MTN. VIEW CEM. (FILLEY PARK)
	Crown Castle JDE Job Number:	512592
	Crown Castle Work Order Number:	1636402
	Crown Castle Order Number:	446055 Rev 0
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37518-2442.004.7700
Site Data:	**28 Brewer Dr., BLOOMFIELD, Hartford County, CT**	
	Latitude *41° 50' 6.57"*, Longitude *-72° 44' 28.2"*	
	120 Foot - Monopole Tower	

Dear Timothy Howell,

Paul J. Ford and Company is pleased to submit this **"Structural Modification Report"** to determine the structural integrity of the above mentioned tower.

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

LC4.7: Modified Structure w/ Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph from the 2016 Connecticut State Building Code per section 1609.3 and Appendix N. Standard references and design criteria are listed in Section 2 – Analysis Criteria.

Respectfully submitted by:

Gowtham

Gowtham Penumatsa
Structural Designer II KAT/BKK

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED
PROFESSIONAL ENGINEER

OCT 17 2018

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by ROHN in October of 1996. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	II
Ultimate Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
107.0	108.0	3	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe	12 1	1-5/8 1-3/8
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
	107.0	1	cci tower mounts	Platform Mount [LP 712-1]		
48.0	50.0	1	gps	GPS_A	1	1/2
	48.0	1	tower mounts	Side Arm Mount [SO 701-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
118.0	120.0	3	alcatel lucent	TD-RRH8X20-25	1 3 2	5/8 1-1/4 1/2
		1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe		
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
		3	rfs celwave	IBC1900BB-1		
		3	rfs celwave	IBC1900HG-2A		
	118.0	1	cci tower mounts	Platform Mount [LP 502-1]		
	116.0	1	andrew	VHLP1-18		
		1	andrew	VHLP1-23-DW1		
		2	dragonwave	HORIZON COMPACT		
114.0	115.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	-	-
	114.0	1	cci tower mounts	Pipe Mount [PM 602-3]		
	113.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER		
99.0	100.0	6	cci antennas	TPX-070821	12 4 2	7/8 3/4 3/8
		3	communication components inc.	DTMABP7819VG12A		
		3	ericsson	RRUS 11		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 8843 B2/B66A		
		6	quintel technology	QS66512-2 w/ Mount Pipe		
		1	raycap	DC6-48-60-18-8C		
		1	raycap	DC6-48-60-18-8F		
	99.0	1	cci tower mounts	Platform Mount [LP 502-1]		
59.0	59.0	1	tower mounts	Side Arm Mount [SO 701-1]	-	-

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti P.E.; P.C.	1529722	CCISITES
4-POST-MODIFICATION INSPECTION	B+T Group, 79582, 11/03/2008	2343686	CCISITES
4-POST-MODIFICATION INSPECTION	GPD Group, 2011111.27, 05/31/2011	4092494	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals, Inc.	6693484	CCISITES
4-POST-MODIFICATION INSPECTION	TUV Rheinland Industrial Solutions, Inc.	6898999	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn, 4963307, 10/11/1996	1616549	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn, 34738/SW, 10/23/1996	2158527	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions, 080063.01, 01/22/2008	2205450	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group, 79582, 11/03/2008	2343687	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Group, 20111111.27, 05/31/2011	2917489	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37516-0115.006.7700, 08/18/2016	6413631	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Monopole was modified in conformance with the referenced modification drawings.
5) Reinforcement from documents CCI# 6898999, 2205450, 4092494 are partially found ineffective and are not considered in the analysis. Please see attached designed drawings for the existing reinforcement considered in this analysis.
6) In accordance with discussions with CCI Corporate Engineering: Based on the assumption that the monopole manufacturer (ROHN/PiRod) has designed the flange plates at splices to adequately develop the full capacity of the unreinforced shaft section using unpublished and/or proprietary methodologies, we are assuming that if our analysis shows that both the existing shaft and the existing flange bolts are at a usage capacity of 100% or less, then the existing flange plates are at a usage capacity of 100% or less and no additional analysis of the flange plate is required.
7) It is assumed that the welded bridge stiffeners at 30' elevation takes all the loads and no load is shared between the original flange connection.

8) Monopole will be modified in conformance with the attached proposed modification drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
120 - 115	Pole	TP24x24x0.25	Pole	7.2%	Pass
115 - 110	Pole	TP24x24x0.25	Pole	16.5%	Pass
110 - 105	Pole	TP24x24x0.25	Pole	30.4%	Pass
105 - 100	Pole	TP24x24x0.25	Pole	47.1%	Pass
100 - 95	Pole	TP24x24x0.25	Pole	70.5%	Pass
95 - 90	Pole	TP24x24x0.25	Pole	94.4%	Pass
90 - 85	Pole	TP24x24x0.375	Pole	75.5%	Pass
85 - 80	Pole	TP24x24x0.375	Pole	91.3%	Pass
80 - 79.75	Pole + Reinf.	TP24x24x0.625	Reinf. 1 Tension Rupture	78.7%	Pass
79.75 - 78.5	Pole + Reinf.	TP24x24x0.625	Reinf. 1 Tension Rupture	82.1%	Pass
78.5 - 78.25	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	51.5%	Pass
78.25 - 73.25	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	60.3%	Pass
73.25 - 68.25	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	69.4%	Pass
68.25 - 68	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	69.9%	Pass
68 - 67.75	Pole + Reinf.	TP24x24x0.775	Reinf. 6 Tension Rupture	67.5%	Pass
67.75 - 62.75	Pole + Reinf.	TP24x24x0.775	Reinf. 6 Tension Rupture	76.6%	Pass
62.75 - 60	Pole + Reinf.	TP24x24x0.775	Reinf. 6 Tension Rupture	81.7%	Pass
60 - 59.75	Pole + Reinf.	TP30x30x0.675	Pole	60.3%	Pass
59.75 - 54.75	Pole + Reinf.	TP30x30x0.675	Pole	67.6%	Pass
54.75 - 49.75	Pole + Reinf.	TP30x30x0.675	Pole	75.1%	Pass
49.75 - 45.42	Pole + Reinf.	TP30x30x0.675	Pole	81.9%	Pass
45.42 - 45.17	Pole + Reinf.	TP30x30x0.8375	Pole	68.1%	Pass
45.17 - 40.17	Pole + Reinf.	TP30x30x0.8375	Pole	74.7%	Pass
40.17 - 36.42	Pole + Reinf.	TP30x30x0.8375	Pole	79.8%	Pass
36.42 - 36.17	Pole + Reinf.	TP30x30x1	Pole	68.4%	Pass
36.17 - 32.75	Pole + Reinf.	TP30x30x1	Pole	72.4%	Pass
32.75 - 32.5	Pole + Reinf.	TP30x30x3.025	Reinf. 10 Compression	45.7%	Pass
32.5 - 32.25	Pole + Reinf.	TP30x30x3.525	Reinf. 10 Compression	41.7%	Pass
32.25 - 30	Pole + Reinf.	TP30x30x3.525	Reinf. 10 Compression	43.3%	Pass
30 - 28.66	Pole + Reinf.	TP36x36x2.225	Reinf. 10 Compression	37.8%	Pass
28.66 - 28.41	Pole + Reinf.	TP36x36x1.45	Reinf. 10 Compression	54.1%	Pass
28.41 - 26.75	Pole + Reinf.	TP36x36x1.45	Reinf. 10 Compression	55.6%	Pass
26.75 - 26.5	Pole + Reinf.	TP36x36x0.7125	Pole	76.6%	Pass
26.5 - 21.5	Pole + Reinf.	TP36x36x0.7125	Pole	82.7%	Pass
21.5 - 21	Pole + Reinf.	TP36x36x0.7125	Pole	83.3%	Pass
21 - 20.75	Pole + Reinf.	TP36x36x0.975	Pole	62.6%	Pass
20.75 - 15.75	Pole + Reinf.	TP36x36x0.975	Pole	67.3%	Pass
15.75 - 10.75	Pole + Reinf.	TP36x36x0.975	Pole	72.0%	Pass
10.75 - 5.75	Pole + Reinf.	TP36x36x0.975	Pole	76.8%	Pass
5.75 - 2	Pole + Reinf.	TP36x36x0.975	Pole	80.5%	Pass

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
2 - 1.75	Pole + Reinf.	TP36x36x1.15	Reinf. 9 Connection	72.2%	Pass
1.75 - 0	Pole + Reinf.	TP36x36x1.15	Reinf. 9 Connection	73.8%	Pass
				Summary	
			Pole	94.4%	Pass
			Reinforcement	82.1%	Pass
			Overall	94.4%	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	92.1	Pass
1	Base Plate	0	67.1	Pass
1	Base Foundation Structural Steel	0	87.1	Pass
1	Base Foundation Soil Interaction	0	34.6	Pass
1	Flange Connection	30	64.4	Pass
1	Flange Connection	60	63.7	Pass
1,6	Flange Connection	90	64.8	Pass

Structure Rating (max from all components) =	94.4%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

4.1) Recommendations

The monopole and its foundation have sufficient capacity to carry the proposed loading configuration. Install the proposed modifications per the attached drawings for the for the determined available structural capacity to be effective.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in Hartford County, Connecticut.
2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
3) Basic wind speed of 97 mph.
4) Structure Class II.
5) Exposure Category C.
6) Topographic Category 1.
7) Crest Height 0.00 ft.
8) Nominal ice thickness of 1.0000 in.
9) Ice thickness is considered to increase with height.
10) Ice density of 56.00 pcf.
11) A wind speed of 50 mph is used in combination with ice.
12) Temperature drop of 50 °F.
13) Deflections calculated using a wind speed of 60 mph.
14) A non-linear (P-delta) analysis was used.
15) Pressures are calculated at each section.
16) Stress ratio used in pole design is 1.
17) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	*Elevation*	*Section Length*	*Pole Size*	*Pole Grade*	*Socket Length*
	ft	*ft*			*ft*
L1	120.00-115.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L2	115.00-110.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L3	110.00-105.00	5.00	P24x0.25	A53-B-42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L4	105.00-100.00	5.00	P24x0.25	(42 ksi) A53-B-42 (42 ksi)	
L5	100.00-95.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L6	95.00-90.00	5.00	P24x0.25	A53-B-42 (42 ksi)	
L7	90.00-85.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L8	85.00-80.00	5.00	P24x0.375	A53-B-42 (42 ksi)	
L9	80.00-79.75	0.25	P24x0.625	A53-B-42 (42 ksi)	
L10	79.75-78.50	1.25	P24x0.625	A53-B-42 (42 ksi)	
L11	78.50-78.25	0.25	P24x1.075	A53-B-42 (42 ksi)	
L12	78.25-73.25	5.00	P24x1.075	A53-B-42 (42 ksi)	
L13	73.25-68.25	5.00	P24x1.075	A53-B-42 (42 ksi)	
L14	68.25-68.00	0.25	P24x1.075	A53-B-42 (42 ksi)	
L15	68.00-67.75	0.25	P24x0.775	A53-B-42 (42 ksi)	
L16	67.75-62.75	5.00	P24x0.775	A53-B-42 (42 ksi)	
L17	62.75-60.00	2.75	P24x0.775	A53-B-42 (42 ksi)	
L18	60.00-59.75	0.25	P30x0.675	A53-B-42 (42 ksi)	
L19	59.75-54.75	5.00	P30x0.675	A53-B-42 (42 ksi)	
L20	54.75-49.75	5.00	P30x0.675	A53-B-42 (42 ksi)	
L21	49.75-45.42	4.33	P30x0.675	A53-B-42 (42 ksi)	
L22	45.42-45.17	0.25	P30x0.8375	A53-B-42 (42 ksi)	
L23	45.17-40.17	5.00	P30x0.8375	A53-B-42 (42 ksi)	
L24	40.17-36.42	3.75	P30x0.8375	A53-B-42 (42 ksi)	
L25	36.42-36.17	0.25	P30x1	A53-B-42 (42 ksi)	
L26	36.17-32.75	3.42	P30x1	A53-B-42 (42 ksi)	
L27	32.75-32.50	0.25	P30x3.025	A53-B-42 (42 ksi)	
L28	32.50-32.25	0.25	P30x3.525	A53-B-42 (42 ksi)	
L29	32.25-30.00	2.25	P30x3.525	A53-B-42 (42 ksi)	
L30	30.00-28.66	1.34	P36x2.225	A53-B-42 (42 ksi)	
L31	28.66-28.41	0.25	P36x1.45	A53-B-42 (42 ksi)	
L32	28.41-26.75	1.66	P36x1.45	A53-B-42 (42 ksi)	
L33	26.75-26.50	0.25	P36x0.7125	A53-B-42 (42 ksi)	
L34	26.50-21.50	5.00	P36x0.7125	A53-B-42 (42 ksi)	
L35	21.50-21.00	0.50	P36x0.7125	A53-B-42 (42 ksi)	
L36	21.00-20.75	0.25	P36x0.975	A53-B-42 (42 ksi)	
L37	20.75-15.75	5.00	P36x0.975	A53-B-42 (42 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L38	15.75-10.75	5.00	P36x0.975	A53-B-42 (42 ksi)	
L39	10.75-5.75	5.00	P36x0.975	A53-B-42 (42 ksi)	
L40	5.75-2.00	3.75	P36x0.975	A53-B-42 (42 ksi)	
L41	2.00-1.75	0.25	P36x1.15	A53-B-42 (42 ksi)	
L42	1.75-0.00	1.75	P36x1.15	A53-B-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 120.00-115.00				1	1	1			
L2 115.00-110.00				1	1	1			
L3 110.00-105.00				1	1	1			
L4 105.00-100.00				1	1	1			
L5 100.00-95.00				1	1	1			
L6 95.00-90.00				1	1	1			
L7 90.00-85.00				1	1	1			
L8 85.00-80.00				1	1	1			
L9 80.00-79.75				1	1	0.933238			
L10 79.75-78.50				1	1	0.933238			
L11 78.50-78.25				1	1	0.863218			
L12 78.25-73.25				1	1	0.863218			
L13 73.25-68.25				1	1	0.863218			
L14 68.25-68.00				1	1	0.863218			
L15 68.00-67.75				1	1	0.916633			
L16 67.75-62.75				1	1	0.916633			
L17 62.75-60.00				1	1	0.916633			
L18 60.00-59.75				1	1	0.947179			
L19 59.75-54.75				1	1	0.947179			
L20 54.75-49.75				1	1	0.947179			
L21 49.75-45.42				1	1	0.947179			
L22 45.42-45.17				1	1	0.91779			
L23 45.17-40.17				1	1	0.91779			
L24 40.17-36.42				1	1	0.91779			
L25 36.42-36.17				1	1	0.892768			
L26 36.17-				1	1	0.892768			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
32.75									
L27 32.75-32.50				1	1	0.434312			
L28 32.50-32.25				1	1	0.293843			
L29 32.25-30.00				1	1	0.293843			
L30 30.00-28.66				1	1	0.39485			
L31 28.66-28.41				1	1	0.457282			
L32 28.41-26.75				1	1	0.457282			
L33 26.75-26.50				1	1	0.94281			
L34 26.50-21.50				1	1	0.94281			
L35 21.50-21.00				1	1	0.94281			
L36 21.00-20.75				1	1	0.917846			
L37 20.75-15.75				1	1	0.917846			
L38 15.75-10.75				1	1	0.917846			
L39 10.75-5.75				1	1	0.917846			
L40 5.75-2.00				1	1	0.917846			
L41 2.00-1.75				1	1	0.790024			
L42 1.75-0.00				1	1	0.790024			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
****									
HB058-M12-XXXF(5/8)	C	No	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.24
							1/2" Ice	0.00	0.24
							1" Ice	0.00	0.24
HB114-1-08U4-M5J(1-1/4)	C	No	No	Inside Pole	118.00 - 0.00	3	No Ice	0.00	1.08
							1/2" Ice	0.00	1.08
							1" Ice	0.00	1.08
FSJ4-50B(1/2)	C	No	No	CaAa (Out Of Face)	118.00 - 0.00	1	No Ice	0.00	0.14
							1/2" Ice	0.00	0.77
							1" Ice	0.00	2.01
FSJ4-50B(1/2)	C	No	No	CaAa (Out Of Face)	99.00 - 0.00	1	No Ice	0.00	0.14
							1/2" Ice	0.00	0.77
							1" Ice	0.00	2.01
FSJ4-50B(1/2)	C	No	No	CaAa (Out Of Face)	118.00 - 99.00	1	No Ice	0.05	0.14
							1/2" Ice	0.15	0.77
							1" Ice	0.25	2.01

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
****									
****									
FB-L98B-034-XXX(3/8)	C	No	No	CaAa (Out Of Face)	99.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.60
							1" Ice	0.00	1.76
WR-VG86ST-BRD(3/4)	C	No	No	CaAa (Out Of Face)	99.00 - 0.00	1	No Ice	0.00	0.58
							1/2" Ice	0.00	1.38
							1" Ice	0.00	2.78
WR-VG86ST-BRD(3/4)	C	No	No	CaAa (Out Of Face)	99.00 - 0.00	1	No Ice	0.08	0.58
							1/2" Ice	0.18	1.38
							1" Ice	0.28	2.78
LDF5-50A(7/8)	C	No	No	Inside Pole	99.00 - 0.00	12	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	99.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	99.00 - 0.00	2	No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
***									
LDF4-50A(1/2)	C	No	No	CaAa (Out Of Face)	48.00 - 0.00	3	No Ice	0.00	0.15
							1/2" Ice	0.00	0.84
							1" Ice	0.00	2.14
****									
1 1/4" Flat Reinforcement	C	No	No	CaAa (Out Of Face)	25.00 - 0.00	2	No Ice	0.21	0.00
							1/2" Ice	0.32	0.00
							1" Ice	0.43	0.00
1" Flat Reinforcement	C	No	No	CaAa (Out Of Face)	55.00 - 48.00	2	No Ice	0.17	0.00
							1/2" Ice	0.28	0.00
							1" Ice	0.39	0.00
1 1/4" Flat Reinforcement	C	No	No	CaAa (Out Of Face)	80.50 - 65.00	2	No Ice	0.21	0.00
							1/2" Ice	0.32	0.00
							1" Ice	0.43	0.00
Aero MP3-03	C	No	No	CaAa (Out Of Face)	48.00 - 35.00	2	No Ice	0.26	0.00
							1/2" Ice	0.37	0.00
							1" Ice	0.48	0.00
***									
HCS 6X12 6AWG(1-3/8)	C	No	No	CaAa (Out Of Face)	107.00 - 0.00	1	No Ice	0.00	1.70
							1/2" Ice	0.00	2.85
							1" Ice	0.00	4.61
FLC 158-50J(1-5/8)	C	No	No	Inside Pole	107.00 - 0.00	6	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
FLC 158-50J(1-5/8)	C	No	No	CaAa (Out Of Face)	107.00 - 0.00	5	No Ice	0.00	0.92
							1/2" Ice	0.00	2.46
							1" Ice	0.00	4.60
FLC 158-50J(1-5/8)	C	No	No	CaAa (Out Of Face)	107.00 - 0.00	1	No Ice	0.20	0.92
							1/2" Ice	0.30	2.46
							1" Ice	0.40	4.60

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.00-115.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.159	0.01
L2	115.00-110.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.265	0.02

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L3	110.00-105.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.668	0.04
L4	105.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.273	0.08
L5	100.00-95.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.379	0.11
L6	95.00-90.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.405	0.11
L7	90.00-85.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.405	0.11
L8	85.00-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.613	0.11
L9	80.00-79.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.174	0.01
L10	79.75-78.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.872	0.03
L11	78.50-78.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.174	0.01
L12	78.25-73.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.488	0.11
L13	73.25-68.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.488	0.11
L14	68.25-68.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.174	0.01
L15	68.00-67.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.174	0.01
L16	67.75-62.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.551	0.11
L17	62.75-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.773	0.06
L18	60.00-59.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.070	0.01
L19	59.75-54.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.488	0.11
L20	54.75-49.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.072	0.11
L21	49.75-45.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.154	0.10
L22	45.42-45.17	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.201	0.01
L23	45.17-40.17	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.030	0.12
L24	40.17-36.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.022	0.09
L25	36.42-36.17	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.201	0.01

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L26	36.17-32.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.575	0.08
L27	32.75-32.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.070	0.01
L28	32.50-32.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.070	0.01
L29	32.25-30.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.632	0.05
L30	30.00-28.66	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.377	0.03
L31	28.66-28.41	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.070	0.01
L32	28.41-26.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.466	0.04
L33	26.75-26.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.070	0.01
L34	26.50-21.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.863	0.12
L35	21.50-21.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.349	0.01
L36	21.00-20.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.174	0.01
L37	20.75-15.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.488	0.12
L38	15.75-10.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.488	0.12
L39	10.75-5.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.488	0.12
L40	5.75-2.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.616	0.09
L41	2.00-1.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.174	0.01
L42	1.75-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.221	0.04

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.00-115.00	A	2.271	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.521	0.06
L2	115.00-110.00	A	2.261	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.526	0.10
L3	110.00-105.00	A	2.251	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.819	0.29

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L4	105.00-100.00	A	2.240	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.753	0.58
L5	100.00-95.00	A	2.229	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.836	0.70
L6	95.00-90.00	A	2.217	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.839	0.73
L7	90.00-85.00	A	2.205	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.815	0.72
L8	85.00-80.00	A	2.192	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.484	0.71
L9	80.00-79.75	A	2.185	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.636	0.04
L10	79.75-78.50	A	2.183	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.176	0.18
L11	78.50-78.25	A	2.181	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.635	0.04
L12	78.25-73.25	A	2.173	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	12.664	0.70
L13	73.25-68.25	A	2.158	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	12.602	0.70
L14	68.25-68.00	A	2.150	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.628	0.03
L15	68.00-67.75	A	2.150	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.628	0.03
L16	67.75-62.75	A	2.141	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	9.450	0.69
L17	62.75-60.00	A	2.128	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.114	0.37
L18	60.00-59.75	A	2.123	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.283	0.03
L19	59.75-54.75	A	2.113	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.950	0.67
L20	54.75-49.75	A	2.094	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.913	0.66
L21	49.75-45.42	A	2.075	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.740	0.62
L22	45.42-45.17	A	2.064	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.637	0.04
L23	45.17-40.17	A	2.052	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	12.694	0.74
L24	40.17-36.42	A	2.030	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	9.450	0.55
L25	36.42-36.17	A	2.019	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.628	0.04
L26	36.17-32.75	A	2.009	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.368	0.49

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L27	32.75-32.50	A	1.998	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.270	0.04
L28	32.50-32.25	A	1.996	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.270	0.04
L29	32.25-30.00	A	1.988	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.422	0.32
L30	30.00-28.66	A	1.977	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.436	0.19
L31	28.66-28.41	A	1.971	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.267	0.03
L32	28.41-26.75	A	1.964	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.771	0.23
L33	26.75-26.50	A	1.958	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.266	0.03
L34	26.50-21.50	A	1.937	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	9.752	0.68
L35	21.50-21.00	A	1.914	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.157	0.07
L36	21.00-20.75	A	1.910	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.578	0.03
L37	20.75-15.75	A	1.885	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.447	0.66
L38	15.75-10.75	A	1.826	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.196	0.64
L39	10.75-5.75	A	1.741	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.840	0.61
L40	5.75-2.00	A	1.614	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	7.728	0.42
L41	2.00-1.75	A	1.501	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.491	0.03
L42	1.75-0.00	A	1.391	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.277	0.17

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	120.00-115.00	-0.2683	0.1549	-1.0012	0.5781
L2	115.00-110.00	-0.4396	0.2538	-1.5638	0.9028
L3	110.00-105.00	-1.0411	0.6011	-2.1964	1.2681
L4	105.00-100.00	-1.7916	1.0344	-2.9902	1.7264
L5	100.00-95.00	-1.8736	1.0817	-3.0227	1.7452
L6	95.00-90.00	-1.8932	1.0930	-3.0256	1.7469
L7	90.00-85.00	-1.8932	1.0930	-3.0185	1.7427
L8	85.00-80.00	-2.0364	1.1757	-3.2591	1.8817
L9	80.00-79.75	-2.3406	1.3513	-4.9119	2.8359
L10	79.75-78.50	-2.3406	1.3513	-4.9105	2.8351
L11	78.50-78.25	-2.3406	1.3513	-4.9091	2.8342

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L12	78.25-73.25	-2.3406	1.3513	-4.9040	2.8313
L13	73.25-68.25	-2.3406	1.3513	-4.8939	2.8255
L14	68.25-68.00	-2.3406	1.3513	-4.8883	2.8223
L15	68.00-67.75	-2.3406	1.3513	-4.8878	2.8220
L16	67.75-62.75	-1.8218	1.0518	-4.1629	2.4034
L17	62.75-60.00	-1.8932	1.0930	-2.9729	1.7164
L18	60.00-59.75	-2.0496	1.1833	-3.2232	1.8609
L19	59.75-54.75	-2.1510	1.2419	-3.3512	1.9348
L20	54.75-49.75	-2.2080	1.2748	-5.3351	3.0802
L21	49.75-45.42	-2.5381	1.4654	-5.4655	3.1555
L22	45.42-45.17	-2.7508	1.5882	-5.5542	3.2067
L23	45.17-40.17	-2.7508	1.5882	-5.5436	3.2006
L24	40.17-36.42	-2.7508	1.5882	-5.5243	3.1894
L25	36.42-36.17	-2.7508	1.5882	-5.5147	3.1839
L26	36.17-32.75	-2.7178	1.5691	-4.1012	2.3678
L27	32.75-32.50	-2.0496	1.1833	-3.1321	1.8083
L28	32.50-32.25	-2.0496	1.1833	-3.1310	1.8077
L29	32.25-30.00	-2.0496	1.1833	-3.1252	1.8043
L30	30.00-28.66	-2.1050	1.2153	-3.2968	1.9034
L31	28.66-28.41	-2.1050	1.2153	-3.2923	1.9008
L32	28.41-26.75	-2.1050	1.2153	-3.2866	1.8975
L33	26.75-26.50	-2.1050	1.2153	-3.2808	1.8942
L34	26.50-21.50	-3.3165	1.9148	-5.1201	2.9561
L35	21.50-21.00	-3.6202	2.0901	-5.7283	3.3072
L36	21.00-20.75	-3.6202	2.0901	-5.7244	3.3050
L37	20.75-15.75	-3.6202	2.0901	-5.6952	3.2881
L38	15.75-10.75	-3.6202	2.0901	-5.6261	3.2482
L39	10.75-5.75	-3.6202	2.0901	-5.5255	3.1901
L40	5.75-2.00	-3.6202	2.0901	-5.3689	3.0998
L41	2.00-1.75	-3.6202	2.0901	-5.2233	3.0157
L42	1.75-0.00	-3.6202	2.0901	-5.0756	2.9304

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

Shielding Factor Ka

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	K
Lightning Rod 5/8"x4'	B	From Leg	2.00 0.00 7.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.25 0.66 0.97	0.25 0.66 0.97	0.00 0.01 0.01
10'x4" Mount Pipe	B	From Leg	2.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	3.46 5.24 5.85	3.46 5.24 5.85	0.13 0.16 0.19
***									
Platform Mount [LP 502-1]	C	None		0.0000	118.00	No Ice 1/2"	32.35 45.67	32.35 45.67	0.93 1.19

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						Ice	58.99	58.99	1.46
						1" Ice			
10'x2" Mount Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	2.38	2.38	0.04
			0.00			1/2"	3.40	3.40	0.05
			0.00			Ice	4.45	4.45	0.08
						1" Ice			
(2) 7'x2" Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	1.66	1.66	0.03
			0.00			1/2"	2.39	2.39	0.04
			0.00			Ice	2.83	2.83	0.06
						1" Ice			
(2) 7'x2" Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	1.66	1.66	0.03
			0.00			1/2"	2.39	2.39	0.04
			0.00			Ice	2.83	2.83	0.06
						1" Ice			
10'x2" Mount Pipe	C	From Leg	4.00	0.0000	118.00	No Ice	2.38	2.38	0.04
			0.00			1/2"	3.40	3.40	0.05
			0.00			Ice	4.45	4.45	0.08
						1" Ice			
APXV9ERR18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	8.26	7.47	0.09
			0.00			1/2"	8.82	8.66	0.16
			2.00			Ice	9.35	9.56	0.24
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	8.26	6.95	0.08
			0.00			1/2"	8.82	8.13	0.15
			2.00			Ice	9.35	9.02	0.23
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	118.00	No Ice	8.26	6.95	0.08
			0.00			1/2"	8.82	8.13	0.15
			2.00			Ice	9.35	9.02	0.23
						1" Ice			
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	6.58	4.96	0.08
			6.00			1/2"	7.03	5.75	0.13
			2.00			Ice	7.47	6.47	0.19
						1" Ice			
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	6.58	4.96	0.08
			-6.00			1/2"	7.03	5.75	0.13
			2.00			Ice	7.47	6.47	0.19
						1" Ice			
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	6.58	4.96	0.08
			6.00			1/2"	7.03	5.75	0.13
			2.00			Ice	7.47	6.47	0.19
						1" Ice			
(2) HORIZON COMPACT	B	From Leg	4.00	0.0000	118.00	No Ice	0.72	0.37	0.01
			0.00			1/2"	0.83	0.45	0.02
			-2.00			Ice	0.94	0.54	0.03
						1" Ice			
IBC1900BB-1	A	From Leg	4.00	0.0000	118.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			2.00			Ice	1.22	0.66	0.04
						1" Ice			
IBC1900BB-1	B	From Leg	4.00	0.0000	118.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			2.00			Ice	1.22	0.66	0.04
						1" Ice			
IBC1900BB-1	C	From Leg	4.00	0.0000	118.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			2.00			Ice	1.22	0.66	0.04
						1" Ice			
IBC1900HG-2A	A	From Leg	4.00	0.0000	118.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			2.00			Ice	1.22	0.66	0.04
						1" Ice			
IBC1900HG-2A	B	From Leg	4.00	0.0000	118.00	No Ice	0.97	0.46	0.02
			0.00			1/2"	1.09	0.56	0.03
			2.00			Ice	1.22	0.66	0.04

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
						1" Ice			
IBC1900HG-2A	C	From Leg	4.00	0.0000	118.00	No Ice	0.97	0.46	0.02
			0.00			1/2" Ice	1.09	0.56	0.03
			2.00			1" Ice	1.22	0.66	0.04
TD-RRH8X20-25	A	From Leg	4.00	0.0000	118.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			2.00			1" Ice	4.56	1.90	0.13
(2) TD-RRH8X20-25	B	From Leg	4.00	0.0000	118.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			2.00			1" Ice	4.56	1.90	0.13
***									
Pipe Mount [PM 602-3]	C	None		0.0000	114.00	No Ice	7.68	7.68	0.28
						1/2" Ice	9.50	9.50	0.35
						1" Ice	11.32	11.32	0.43
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.00	0.0000	114.00	No Ice	2.32	2.24	0.06
			0.00			1/2" Ice	2.53	2.44	0.08
			1.00			1" Ice	2.74	2.65	0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.00	0.0000	114.00	No Ice	2.32	2.24	0.06
			0.00			1/2" Ice	2.53	2.44	0.08
			1.00			1" Ice	2.74	2.65	0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.00	0.0000	114.00	No Ice	2.32	2.24	0.06
			0.00			1/2" Ice	2.53	2.44	0.08
			1.00			1" Ice	2.74	2.65	0.11
800MHz 2X50W RRH W/FILTER	A	From Leg	1.00	0.0000	114.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			-1.00			1" Ice	2.43	2.29	0.11
800MHz 2X50W RRH W/FILTER	B	From Leg	1.00	0.0000	114.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			-1.00			1" Ice	2.43	2.29	0.11
800MHz 2X50W RRH W/FILTER	C	From Leg	1.00	0.0000	114.00	No Ice	2.06	1.93	0.06
			0.00			1/2" Ice	2.24	2.11	0.09
			-1.00			1" Ice	2.43	2.29	0.11
***									
*****									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.0000	107.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			1.00			1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	107.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			1.00			1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	107.00	No Ice	6.33	5.64	0.11
			0.00			1/2" Ice	6.78	6.43	0.17
			1.00			1" Ice	7.21	7.13	0.23
AIR 32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00	0.0000	107.00	No Ice	6.75	6.07	0.15
			0.00			1/2" Ice	7.20	6.87	0.21
			1.00			1" Ice	7.65	7.58	0.28
AIR 32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00	0.0000	107.00	No Ice	6.75	6.07	0.15
			0.00			1/2" Ice	7.20	6.87	0.21
			1.00			1" Ice	7.65	7.58	0.28
AIR 32 B2A/B66AA w/	C	From Leg	4.00	0.0000	107.00	No Ice	6.75	6.07	0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Mount Pipe			0.00			1/2" Ice	7.20	6.87	0.21
			1.00			1" Ice	7.65	7.58	0.28
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00	0.0000	107.00	No Ice	20.48	11.02	0.16
			0.00			1/2" Ice	21.23	12.55	0.30
			1.00			1" Ice	21.99	14.10	0.44
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00	0.0000	107.00	No Ice	20.48	11.02	0.16
			0.00			1/2" Ice	21.23	12.55	0.30
			1.00			1" Ice	21.99	14.10	0.44
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00	0.0000	107.00	No Ice	20.48	11.02	0.16
			0.00			1/2" Ice	21.23	12.55	0.30
			1.00			1" Ice	21.99	14.10	0.44
RADIO 4449 B12/B71	A	From Leg	4.00	0.0000	107.00	No Ice	1.65	1.16	0.07
			0.00			1/2" Ice	1.81	1.30	0.09
			1.00			1" Ice	1.98	1.45	0.11
RADIO 4449 B12/B71	B	From Leg	4.00	0.0000	107.00	No Ice	1.65	1.16	0.07
			0.00			1/2" Ice	1.81	1.30	0.09
			1.00			1" Ice	1.98	1.45	0.11
RADIO 4449 B12/B71	C	From Leg	4.00	0.0000	107.00	No Ice	1.65	1.16	0.07
			0.00			1/2" Ice	1.81	1.30	0.09
			1.00			1" Ice	1.98	1.45	0.11
KRY 112 144/1	A	From Leg	4.00	0.0000	107.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
			1.00			1" Ice	0.51	0.30	0.02
KRY 112 144/1	B	From Leg	4.00	0.0000	107.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
			1.00			1" Ice	0.51	0.30	0.02
KRY 112 144/1	C	From Leg	4.00	0.0000	107.00	No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
			1.00			1" Ice	0.51	0.30	0.02
Platform Mount [LP 712-1]	C	None		0.0000	107.00	No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96
****									
(2) QS66512-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	99.00	No Ice	8.37	8.46	0.14
			0.00			1/2" Ice	8.93	9.66	0.21
			1.00			1" Ice	9.46	10.55	0.30
(2) QS66512-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	99.00	No Ice	8.37	8.46	0.14
			0.00			1/2" Ice	8.93	9.66	0.21
			1.00			1" Ice	9.46	10.55	0.30
(2) QS66512-2 w/ Mount Pipe	C	From Leg	4.00	0.0000	99.00	No Ice	8.37	8.46	0.14
			0.00			1/2" Ice	8.93	9.66	0.21
			1.00			1" Ice	9.46	10.55	0.30
RRUS 8843 B2/B66A	A	From Leg	4.00	0.0000	99.00	No Ice	1.64	1.35	0.07
			0.00			1/2" Ice	1.80	1.50	0.09
			1.00			1" Ice	1.97	1.65	0.11
RRUS 8843 B2/B66A	B	From Leg	4.00	0.0000	99.00	No Ice	1.64	1.35	0.07
			0.00			1/2" Ice	1.80	1.50	0.09
			1.00			1" Ice	1.97	1.65	0.11
RRUS 8843 B2/B66A	C	From Leg	4.00	0.0000	99.00	No Ice	1.64	1.35	0.07

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
			0.00			1/2" Ice	1.80	1.50	0.09
			1.00			1" Ice	1.97	1.65	0.11
(2) TPX-070821	A	From Leg	4.00	0.0000	99.00	No Ice	0.47	0.10	0.01
			0.00			1/2" Ice	0.56	0.15	0.01
			1.00			1" Ice	0.66	0.20	0.02
(2) TPX-070821	B	From Leg	4.00	0.0000	99.00	No Ice	0.47	0.10	0.01
			0.00			1/2" Ice	0.56	0.15	0.01
			1.00			1" Ice	0.66	0.20	0.02
(2) TPX-070821	C	From Leg	4.00	0.0000	99.00	No Ice	0.47	0.10	0.01
			0.00			1/2" Ice	0.56	0.15	0.01
			1.00			1" Ice	0.66	0.20	0.02
(2) DTMABP7819VG12A	A	From Leg	4.00	0.0000	99.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			1.00			1" Ice	1.23	0.51	0.04
DTMABP7819VG12A	C	From Leg	4.00	0.0000	99.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			1.00			1" Ice	1.23	0.51	0.04
RRUS 32	A	From Leg	4.00	0.0000	99.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			1.00			1" Ice	3.32	2.17	0.10
RRUS 32	B	From Leg	4.00	0.0000	99.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			1.00			1" Ice	3.32	2.17	0.10
RRUS 32	C	From Leg	4.00	0.0000	99.00	No Ice	2.86	1.78	0.06
			0.00			1/2" Ice	3.08	1.97	0.08
			1.00			1" Ice	3.32	2.17	0.10
RRUS 11	A	From Leg	4.00	0.0000	99.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			1.00			1" Ice	3.21	1.50	0.10
RRUS 11	B	From Leg	4.00	0.0000	99.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			1.00			1" Ice	3.21	1.50	0.10
RRUS 11	C	From Leg	4.00	0.0000	99.00	No Ice	2.79	1.19	0.05
			0.00			1/2" Ice	3.00	1.34	0.07
			1.00			1" Ice	3.21	1.50	0.10
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	99.00	No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			1.00			1" Ice	1.64	1.64	0.06
DC6-48-60-18-8C	A	From Leg	4.00	0.0000	99.00	No Ice	2.74	2.74	0.03
			0.00			1/2" Ice	2.96	2.96	0.05
			1.00			1" Ice	3.20	3.20	0.08
Platform Mount [LP 502-1]	C	None		0.0000	99.00	No Ice	32.35	32.35	0.93
						1/2" Ice	45.67	45.67	1.19
						1" Ice	58.99	58.99	1.46
****									
Side Arm Mount [SO 701-1]	A	None		0.0000	59.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
****									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
GPS_A	B	From Leg	4.00 0.00 2.00	0.0000	48.00	No Ice 1/2" Ice 1" Ice	0.26 0.32 0.39	0.26 0.32 0.39	0.00 0.00 0.01
Side Arm Mount [SO 701-1] **	B	None		0.0000	48.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
(2) Bridge Stiffener (137" x 15.5" x 1.25")	C	None		0.0000	30.00	No Ice 1/2" Ice 1" Ice	21.55 22.42 23.30	2.38 3.66 4.96	0.75 0.83 0.92
(2) Bridge Stiffener (109" x 15.75" x 1.25")	C	None		0.0000	60.00	No Ice 1/2" Ice 1" Ice	16.65 17.33 18.01	1.89 2.92 3.96	0.61 0.67 0.75

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP1-18	B	Paraboloid w/o Radome	From Leg	1.00 0.00 -2.00	-6.0000		118.00	1.27	No Ice 1/2" Ice 1" Ice	1.28 1.45 1.62	0.01 0.02 0.03
VHLP1-23-DW1	B	Paraboloid w/o Radome	From Leg	1.00 0.00 -2.00	-6.0000		118.00	1.27	No Ice 1/2" Ice 1" Ice	1.28 1.45 1.62	0.01 0.02 0.03

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 115	Pole	Max Tension	42	0.00	-0.00	0.00
			Max. Compression	26	-8.58	-11.33	-1.79
			Max. Mx	8	-2.41	-26.52	-1.40
			Max. My	14	-2.42	-3.54	-23.72
			Max. Vy	20	-6.13	20.35	0.63
			Max. Vx	2	-6.03	-1.40	22.73
			Max. Torque	14			7.08
L2	115 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-11.34	-11.33	-1.85
			Max. Mx	8	-3.46	-61.80	-2.46
			Max. My	14	-3.48	-4.79	-58.56
			Max. Vy	20	-7.50	55.97	2.12
			Max. Vx	2	-7.39	0.40	57.83
			Max. Torque	14			7.08
L3	110 - 105	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.76	-11.19	-2.01
			Max. Mx	8	-6.86	-113.57	-3.54
			Max. My	14	-6.87	-6.05	-109.93
			Max. Vy	20	-12.87	108.10	3.61
			Max. Vx	2	-12.77	2.23	109.42
			Max. Torque	14			7.07
L4	105 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.10	-10.83	-2.32
			Max. Mx	8	-7.34	-178.55	-4.64
			Max. My	14	-7.35	-7.31	-174.52
			Max. Vy	20	-13.27	173.49	5.11
			Max. Vx	2	-13.17	4.08	174.22
			Max. Torque	14			7.03
L5	100 - 95	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.82	-10.07	-0.60
			Max. Mx	8	-10.43	-268.14	-5.30

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-10.44	6.00	264.40
			Max. Vy	20	-18.58	263.70	6.97
			Max. Vx	2	-18.52	6.00	264.40
			Max. Torque	14			6.97
L6	95 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.30	-9.59	-0.97
			Max. Mx	8	-11.03	-361.57	-6.36
			Max. My	2	-11.03	7.84	357.86
			Max. Vy	20	-18.95	357.55	8.42
			Max. Vx	2	-18.88	7.84	357.86
			Max. Torque	14			6.84
L7	90 - 85	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.97	-9.10	-1.34
			Max. Mx	8	-11.80	-456.84	-7.42
			Max. My	2	-11.81	9.68	453.14
			Max. Vy	20	-19.32	453.24	9.87
			Max. Vx	2	-19.25	9.68	453.14
			Max. Torque	14			6.77
L8	85 - 80	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.62	-8.60	-1.70
			Max. Mx	8	-12.61	-553.96	-8.48
			Max. My	2	-12.61	11.54	550.29
			Max. Vy	20	-19.69	550.79	11.32
			Max. Vx	2	-19.63	11.54	550.29
			Max. Torque	14			6.71
L9	80 - 79.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.72	-8.57	-1.72
			Max. Mx	8	-12.67	-558.87	-8.53
			Max. My	2	-12.67	11.63	555.19
			Max. Vy	20	-19.72	555.72	11.39
			Max. Vx	2	-19.66	11.63	555.19
			Max. Torque	14			6.64
L10	79.75 - 78.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.21	-8.44	-1.81
			Max. Mx	8	-12.92	-583.54	-8.79
			Max. My	2	-12.93	12.09	579.87
			Max. Vy	20	-19.92	580.50	11.76
			Max. Vx	2	-19.85	12.09	579.87
			Max. Torque	14			6.63
L11	78.5 - 78.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.33	-8.42	-1.83
			Max. Mx	8	-13.01	-588.51	-8.84
			Max. My	2	-13.01	12.19	584.84
			Max. Vy	20	-19.95	585.49	11.83
			Max. Vx	2	-19.88	12.19	584.84
			Max. Torque	14			6.59
L12	78.25 - 73.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.77	-7.91	-2.19
			Max. Mx	8	-14.52	-689.85	-9.90
			Max. My	2	-14.52	14.04	686.21
			Max. Vy	20	-20.74	687.26	13.28
			Max. Vx	2	-20.68	14.04	686.21
			Max. Torque	14			6.58
L13	73.25 - 68.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.20	-7.40	-2.54
			Max. Mx	8	-16.06	-795.08	-10.95
			Max. My	2	-16.06	15.89	791.46
			Max. Vy	20	-21.51	792.92	14.73
			Max. Vx	2	-21.44	15.89	791.46
			Max. Torque	14			6.44
L14	68.25 - 68	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.32	-7.37	-2.56
			Max. Mx	8	-16.14	-800.44	-11.01
			Max. My	2	-16.14	15.99	796.82
			Max. Vy	20	-21.54	798.30	14.80
			Max. Vx	2	-21.47	15.99	796.82
			Max. Torque	14			6.29

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L15	68 - 67.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.42	-7.35	-2.58
			Max. Mx	8	-16.20	-805.81	-11.06
			Max. My	2	-16.20	16.08	802.19
			Max. Vy	20	-21.58	803.69	14.87
			Max. Vx	2	-21.51	16.08	802.19
			Max. Torque	14			6.28
L16	67.75 - 62.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.53	-6.84	-2.93
			Max. Mx	8	-17.47	-914.91	-12.11
			Max. My	2	-17.47	17.94	911.32
			Max. Vy	20	-22.23	913.23	16.32
			Max. Vx	2	-22.16	17.94	911.32
			Max. Torque	14			6.28
L17	62.75 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.69	-6.56	-3.12
			Max. Mx	8	-18.19	-976.03	-12.69
			Max. My	2	-18.19	18.97	972.45
			Max. Vy	20	-22.40	974.58	17.11
			Max. Vx	2	-22.33	18.97	972.45
			Max. Torque	14			6.17
L18	60 - 59.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.94	-6.53	-3.14
			Max. Mx	8	-19.67	-982.00	-12.75
			Max. My	2	-19.67	19.07	978.42
			Max. Vy	20	-23.99	980.58	17.19
			Max. Vx	2	-23.93	19.07	978.42
			Max. Torque	14			6.14
L19	59.75 - 54.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.39	-5.89	-3.55
			Max. Mx	8	-21.15	-1102.87	-13.81
			Max. My	2	-21.16	20.95	1099.31
			Max. Vy	20	-24.46	1101.90	18.62
			Max. Vx	2	-24.40	20.95	1099.31
			Max. Torque	14			6.14
L20	54.75 - 49.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.68	-5.25	-3.96
			Max. Mx	8	-22.57	-1226.65	-14.86
			Max. My	2	-22.57	22.83	1223.13
			Max. Vy	20	-25.23	1226.14	20.06
			Max. Vx	2	-25.16	22.83	1223.13
			Max. Torque	14			6.06
L21	49.75 - 45.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.88	-4.78	-4.41
			Max. Mx	8	-23.88	-1337.15	-15.78
			Max. My	2	-23.88	24.45	1333.64
			Max. Vy	20	-25.96	1337.02	21.30
			Max. Vx	2	-25.89	24.45	1333.64
			Max. Torque	14			5.91
L22	45.42 - 45.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.01	-4.74	-4.43
			Max. Mx	8	-23.98	-1343.62	-15.83
			Max. My	2	-23.98	24.54	1340.12
			Max. Vy	20	-25.99	1343.52	21.37
			Max. Vx	2	-25.92	24.54	1340.12
			Max. Torque	14			5.81
L23	45.17 - 40.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.62	-4.01	-4.87
			Max. Mx	20	-25.63	1475.41	22.80
			Max. My	2	-25.63	26.42	1471.58
			Max. Vy	20	-26.75	1475.41	22.80
			Max. Vx	2	-26.68	26.42	1471.58
			Max. Torque	14			5.80

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L24	40.17 - 36.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.56	-3.46	-5.18
			Max. Mx	20	-26.89	1576.73	23.86
			Max. My	2	-26.89	27.82	1572.57
			Max. Vy	20	-27.29	1576.73	23.86
			Max. Vx	2	-27.22	27.82	1572.57
			Max. Torque	14			5.62
L25	36.42 - 36.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.70	-3.43	-5.20
			Max. Mx	20	-27.00	1583.55	23.94
			Max. My	2	-27.00	27.92	1579.38
			Max. Vy	20	-27.31	1583.55	23.94
			Max. Vx	2	-27.24	27.92	1579.38
			Max. Torque	14			5.48
L26	36.17 - 32.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.60	-2.95	-5.48
			Max. Mx	20	-28.29	1677.43	24.90
			Max. My	2	-28.29	29.20	1672.96
			Max. Vy	20	-27.58	1677.43	24.90
			Max. Vx	2	-27.51	29.20	1672.96
			Max. Torque	14			5.47
L27	32.75 - 32.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-62.79	-2.91	-5.50
			Max. Mx	20	-28.44	1684.32	24.97
			Max. My	2	-28.44	29.29	1679.84
			Max. Vy	20	-27.58	1684.32	24.97
			Max. Vx	2	-27.52	29.29	1679.84
			Max. Torque	14			5.40
L28	32.5 - 32.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.00	-2.88	-5.52
			Max. Mx	20	-28.60	1691.22	25.04
			Max. My	2	-28.60	29.38	1686.71
			Max. Vy	20	-27.60	1691.22	25.04
			Max. Vx	2	-27.53	29.38	1686.71
			Max. Torque	14			5.40
L29	32.25 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.85	-2.56	-5.70
			Max. Mx	20	-30.02	1753.54	25.68
			Max. My	2	-30.03	30.22	1748.84
			Max. Vy	20	-27.77	1753.54	25.68
			Max. Vx	2	-27.71	30.22	1748.84
			Max. Torque	14			5.39
L30	30 - 28.66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.36	-2.34	-5.83
			Max. Mx	20	-32.48	1793.18	26.06
			Max. My	2	-32.48	30.73	1788.35
			Max. Vy	20	-29.63	1793.18	26.06
			Max. Vx	2	-29.56	30.73	1788.35
			Max. Torque	14			5.37
L31	28.66 - 28.41	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-68.50	-2.30	-5.85
			Max. Mx	20	-32.57	1800.59	26.13
			Max. My	2	-32.58	30.82	1795.74
			Max. Vy	20	-29.64	1800.59	26.13
			Max. Vx	2	-29.57	30.82	1795.74
			Max. Torque	14			5.35
L32	28.41 - 26.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-69.43	-2.03	-6.01
			Max. Mx	20	-33.16	1849.92	26.60
			Max. My	2	-33.16	31.44	1844.92
			Max. Vy	20	-29.77	1849.92	26.60
			Max. Vx	2	-29.71	31.44	1844.92
			Max. Torque	14			5.34
L33	26.75 - 26.5	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-69.56	-1.99	-6.03
			Max. Mx	20	-33.26	1857.36	26.67
			Max. My	2	-33.26	31.54	1852.35
			Max. Vy	20	-29.78	1857.36	26.67
			Max. Vx	2	-29.72	31.54	1852.35
			Max. Torque	14			5.32
L34	26.5 - 21.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.24	-1.18	-6.50
			Max. Mx	20	-35.02	2007.35	28.07
			Max. My	2	-35.02	33.42	2001.89
			Max. Vy	20	-30.20	2007.35	28.07
			Max. Vx	2	-30.13	33.42	2001.89
			Max. Torque	14			5.32
L35	21.5 - 21	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.50	-1.10	-6.55
			Max. Mx	20	-35.20	2022.46	28.21
			Max. My	2	-35.20	33.61	2016.95
			Max. Vy	20	-30.23	2022.46	28.21
			Max. Vx	2	-30.17	33.61	2016.95
			Max. Torque	14			5.17
L36	21 - 20.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.66	-1.06	-6.57
			Max. Mx	20	-35.31	2030.02	28.28
			Max. My	2	-35.32	33.70	2024.49
			Max. Vy	20	-30.25	2030.02	28.28
			Max. Vx	2	-30.19	33.70	2024.49
			Max. Torque	14			5.16
L37	20.75 - 15.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-75.79	-0.28	-7.02
			Max. Mx	20	-37.55	2182.47	29.68
			Max. My	2	-37.55	35.57	2176.49
			Max. Vy	20	-30.71	2182.47	29.68
			Max. Vx	2	-30.64	35.57	2176.49
			Max. Torque	14			5.15
L38	15.75 - 10.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-78.89	0.47	-7.45
			Max. Mx	20	-39.80	2337.04	31.07
			Max. My	2	-39.80	37.43	2330.62
			Max. Vy	20	-31.11	2337.04	31.07
			Max. Vx	2	-31.05	37.43	2330.62
			Max. Torque	14			4.99
L39	10.75 - 5.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-81.93	1.18	-7.86
			Max. Mx	20	-42.06	2493.57	32.45
			Max. My	2	-42.06	39.29	2486.71
			Max. Vy	20	-31.49	2493.57	32.45
			Max. Vx	2	-31.43	39.29	2486.71
			Max. Torque	14			4.83
L40	5.75 - 2	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.16	1.67	-8.14
			Max. Mx	20	-43.76	2612.17	33.48
			Max. My	2	-43.76	40.68	2604.98
			Max. Vy	20	-31.77	2612.17	33.48
			Max. Vx	2	-31.70	40.68	2604.98
			Max. Torque	16			4.74
L41	2 - 1.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.30	1.70	-8.16
			Max. Mx	20	-43.88	2620.11	33.55
			Max. My	2	-43.88	40.77	2612.90
			Max. Vy	20	-31.77	2620.11	33.55
			Max. Vx	2	-31.70	40.77	2612.90
			Max. Torque	16			4.67
L42	1.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-85.30	1.88	-8.27
			Max. Mx	20	-44.67	2675.83	34.03
			Max. My	2	-44.67	41.41	2668.46
			Max. Vy	20	-31.92	2675.83	34.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-31.85	41.41	2668.46
			Max. Torque	16			4.66

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	31	85.30	-8.94	-5.18
	Max. H_x	21	33.51	31.89	0.28
	Max. H_z	2	44.68	0.35	31.82
	Max. M_x	2	2668.46	0.35	31.82
	Max. M_z	8	2671.61	-31.82	-0.20
	Max. Torsion	16	4.63	15.76	-27.38
	Min. Vert	25	33.51	16.21	27.63
	Min. H_x	8	44.68	-31.82	-0.20
	Min. H_z	15	33.51	-0.22	-31.78
	Min. M_x	14	-2664.14	-0.22	-31.78
	Min. M_z	20	-2675.83	31.89	0.28
	Min. Torsion	4	-4.61	-15.74	27.39

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	37.24	0.00	0.00	0.61	-1.58	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	44.68	-0.35	-31.82	-2668.46	41.42	4.40
0.9 Dead+1.6 Wind 0 deg - No Ice	33.51	-0.35	-31.82	-2648.27	41.53	4.34
1.2 Dead+1.6 Wind 30 deg - No Ice	44.68	15.74	-27.39	-2289.60	-1314.90	4.61
0.9 Dead+1.6 Wind 30 deg - No Ice	33.51	15.74	-27.39	-2272.33	-1304.39	4.55
1.2 Dead+1.6 Wind 60 deg - No Ice	44.68	27.44	-15.72	-1309.37	-2299.43	3.59
0.9 Dead+1.6 Wind 60 deg - No Ice	33.51	27.44	-15.72	-1299.59	-2281.38	3.55
1.2 Dead+1.6 Wind 90 deg - No Ice	44.68	31.82	0.20	25.24	-2671.61	1.57
0.9 Dead+1.6 Wind 90 deg - No Ice	33.51	31.82	0.20	24.82	-2650.70	1.57
1.2 Dead+1.6 Wind 120 deg - No Ice	44.68	27.67	16.08	1356.24	-2327.40	-0.93
0.9 Dead+1.6 Wind 120 deg - No Ice	33.51	27.67	16.08	1345.66	-2309.09	-0.90
1.2 Dead+1.6 Wind 150 deg - No Ice	44.68	16.07	27.63	2321.66	-1357.14	-3.18
0.9 Dead+1.6 Wind 150 deg - No Ice	33.51	16.07	27.63	2303.73	-1346.23	-3.12
1.2 Dead+1.6 Wind 180 deg - No Ice	44.68	0.22	31.78	2664.14	-29.83	-4.50
0.9 Dead+1.6 Wind 180 deg - No Ice	33.51	0.22	31.78	2643.62	-29.06	-4.43
1.2 Dead+1.6 Wind 210 deg - No Ice	44.68	-15.76	27.38	2289.67	1314.04	-4.63
0.9 Dead+1.6 Wind 210 deg - No Ice	33.51	-15.76	27.38	2272.04	1304.54	-4.58
1.2 Dead+1.6 Wind 240 deg - No Ice	44.68	-27.57	15.61	1298.34	2311.07	-3.49

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 240 deg - No Ice	33.51	-27.57	15.61	1288.30	2293.92	-3.46
1.2 Dead+1.6 Wind 270 deg - No Ice	44.68	-31.89	-0.28	-34.03	2675.83	-1.44
0.9 Dead+1.6 Wind 270 deg - No Ice	33.51	-31.89	-0.28	-33.90	2655.89	-1.44
1.2 Dead+1.6 Wind 300 deg - No Ice	44.68	-27.74	-16.10	-1356.67	2332.40	0.90
0.9 Dead+1.6 Wind 300 deg - No Ice	33.51	-27.74	-16.10	-1346.46	2315.06	0.86
1.2 Dead+1.6 Wind 330 deg - No Ice	44.68	-16.21	-27.63	-2319.85	1369.71	3.00
0.9 Dead+1.6 Wind 330 deg - No Ice	33.51	-16.21	-27.63	-2302.30	1359.70	2.95
1.2 Dead+1.0 Ice+1.0 Temp	85.30	0.00	0.00	8.27	1.88	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	85.30	-0.07	-10.31	-927.75	10.66	0.77
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	85.30	5.13	-8.90	-798.04	-462.93	1.14
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	85.30	8.91	-5.13	-455.77	-806.31	1.20
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	85.30	10.31	0.03	11.83	-934.07	0.94
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	85.30	8.94	5.18	479.37	-810.74	0.40
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	85.30	5.18	8.94	820.03	-468.82	-0.24
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	85.30	0.03	10.30	942.91	-2.50	-0.79
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	85.30	-5.14	8.90	814.45	467.56	-1.15
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	85.30	-8.95	5.10	469.03	814.49	-1.18
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	85.30	-10.33	-0.05	2.07	940.15	-0.91
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	85.30	-8.96	-5.18	-463.10	817.05	-0.42
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	85.30	-5.21	-8.94	-803.13	477.27	0.18
Dead+Wind 0 deg - Service	37.24	-0.08	-6.81	-568.13	7.61	0.95
Dead+Wind 30 deg - Service	37.24	3.37	-5.86	-487.39	-281.38	0.99
Dead+Wind 60 deg - Service	37.24	5.87	-3.36	-278.53	-491.16	0.77
Dead+Wind 90 deg - Service	37.24	6.81	0.04	5.83	-570.47	0.34
Dead+Wind 120 deg - Service	37.24	5.92	3.44	289.44	-497.13	-0.20
Dead+Wind 150 deg - Service	37.24	3.44	5.91	495.16	-290.39	-0.68
Dead+Wind 180 deg - Service	37.24	0.05	6.80	568.12	-7.56	-0.96
Dead+Wind 210 deg - Service	37.24	-3.37	5.86	488.33	278.78	-0.99
Dead+Wind 240 deg - Service	37.24	-5.90	3.34	277.11	491.22	-0.75
Dead+Wind 270 deg - Service	37.24	-6.82	-0.06	-6.79	568.95	-0.31
Dead+Wind 300 deg - Service	37.24	-5.94	-3.44	-288.62	495.79	0.19
Dead+Wind 330 deg - Service	37.24	-3.47	-5.91	-493.86	290.65	0.64

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-37.24	0.00	0.00	37.24	0.00	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
2	-0.35	-44.68	-31.82	0.35	44.68	31.82	0.000%
3	-0.35	-33.51	-31.82	0.35	33.51	31.82	0.000%
4	15.74	-44.68	-27.39	-15.74	44.68	27.39	0.000%
5	15.74	-33.51	-27.39	-15.74	33.51	27.39	0.000%
6	27.44	-44.68	-15.72	-27.44	44.68	15.72	0.000%
7	27.44	-33.51	-15.72	-27.44	33.51	15.72	0.000%
8	31.82	-44.68	0.20	-31.82	44.68	-0.20	0.000%
9	31.82	-33.51	0.20	-31.82	33.51	-0.20	0.000%
10	27.67	-44.68	16.08	-27.67	44.68	-16.08	0.000%
11	27.67	-33.51	16.08	-27.67	33.51	-16.08	0.000%
12	16.07	-44.68	27.63	-16.07	44.68	-27.63	0.000%
13	16.07	-33.51	27.63	-16.07	33.51	-27.63	0.000%
14	0.22	-44.68	31.78	-0.22	44.68	-31.78	0.000%
15	0.22	-33.51	31.78	-0.22	33.51	-31.78	0.000%
16	-15.76	-44.68	27.38	15.76	44.68	-27.38	0.000%
17	-15.76	-33.51	27.38	15.76	33.51	-27.38	0.000%
18	-27.57	-44.68	15.61	27.57	44.68	-15.61	0.000%
19	-27.57	-33.51	15.61	27.57	33.51	-15.61	0.000%
20	-31.89	-44.68	-0.28	31.89	44.68	0.28	0.000%
21	-31.89	-33.51	-0.28	31.89	33.51	0.28	0.000%
22	-27.74	-44.68	-16.10	27.74	44.68	16.10	0.000%
23	-27.74	-33.51	-16.10	27.74	33.51	16.10	0.000%
24	-16.21	-44.68	-27.63	16.21	44.68	27.63	0.000%
25	-16.21	-33.51	-27.63	16.21	33.51	27.63	0.000%
26	0.00	-85.30	0.00	-0.00	85.30	-0.00	0.000%
27	-0.07	-85.30	-10.31	0.07	85.30	10.31	0.000%
28	5.13	-85.30	-8.90	-5.13	85.30	8.90	0.000%
29	8.91	-85.30	-5.13	-8.91	85.30	5.13	0.000%
30	10.31	-85.30	0.03	-10.31	85.30	-0.03	0.000%
31	8.94	-85.30	5.18	-8.94	85.30	-5.18	0.000%
32	5.18	-85.30	8.94	-5.18	85.30	-8.94	0.000%
33	0.03	-85.30	10.30	-0.03	85.30	-10.30	0.000%
34	-5.14	-85.30	8.90	5.14	85.30	-8.90	0.000%
35	-8.95	-85.30	5.10	8.95	85.30	-5.10	0.000%
36	-10.33	-85.30	-0.05	10.33	85.30	0.05	0.000%
37	-8.96	-85.30	-5.18	8.96	85.30	5.18	0.000%
38	-5.21	-85.30	-8.94	5.21	85.30	8.94	0.000%
39	-0.08	-37.24	-6.81	0.08	37.24	6.81	0.000%
40	3.37	-37.24	-5.86	-3.37	37.24	5.86	0.000%
41	5.87	-37.24	-3.36	-5.87	37.24	3.36	0.000%
42	6.81	-37.24	0.04	-6.81	37.24	-0.04	0.000%
43	5.92	-37.24	3.44	-5.92	37.24	-3.44	0.000%
44	3.44	-37.24	5.91	-3.44	37.24	-5.91	0.000%
45	0.05	-37.24	6.80	-0.05	37.24	-6.80	0.000%
46	-3.37	-37.24	5.86	3.37	37.24	-5.86	0.000%
47	-5.90	-37.24	3.34	5.90	37.24	-3.34	0.000%
48	-6.82	-37.24	-0.06	6.82	37.24	0.06	0.000%
49	-5.94	-37.24	-3.44	5.94	37.24	3.44	0.000%
50	-3.47	-37.24	-5.91	3.47	37.24	5.91	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00083331
3	Yes	5	0.00000001	0.00037425
4	Yes	6	0.00000001	0.00016018
5	Yes	6	0.00000001	0.00005085
6	Yes	6	0.00000001	0.00012577
7	Yes	6	0.00000001	0.00003888
8	Yes	5	0.00000001	0.00025773
9	Yes	5	0.00000001	0.00011532
10	Yes	6	0.00000001	0.00013631
11	Yes	6	0.00000001	0.00004177

12	Yes	6	0.00000001	0.00016275
13	Yes	6	0.00000001	0.00005097
14	Yes	6	0.00000001	0.00004227
15	Yes	5	0.00000001	0.00051299
16	Yes	6	0.00000001	0.00012140
17	Yes	6	0.00000001	0.00003757
18	Yes	6	0.00000001	0.00015098
19	Yes	6	0.00000001	0.00004771
20	Yes	5	0.00000001	0.00006714
21	Yes	5	0.00000001	0.00002735
22	Yes	6	0.00000001	0.00015171
23	Yes	6	0.00000001	0.00004714
24	Yes	6	0.00000001	0.00013118
25	Yes	6	0.00000001	0.00004009
26	Yes	5	0.00000001	0.00013618
27	Yes	6	0.00000001	0.00079131
28	Yes	6	0.00000001	0.00098484
29	Yes	6	0.00000001	0.00095838
30	Yes	6	0.00000001	0.00080636
31	Yes	6	0.00000001	0.00099595
32	Yes	7	0.00000001	0.00010712
33	Yes	6	0.00000001	0.00080592
34	Yes	6	0.00000001	0.00094480
35	Yes	6	0.00000001	0.00096897
36	Yes	6	0.00000001	0.00077923
37	Yes	6	0.00000001	0.00095567
38	Yes	6	0.00000001	0.00094831
39	Yes	5	0.00000001	0.00005062
40	Yes	5	0.00000001	0.00008326
41	Yes	5	0.00000001	0.00004567
42	Yes	4	0.00000001	0.00036468
43	Yes	5	0.00000001	0.00004897
44	Yes	5	0.00000001	0.00008201
45	Yes	5	0.00000001	0.00005451
46	Yes	5	0.00000001	0.00005030
47	Yes	5	0.00000001	0.00006897
48	Yes	4	0.00000001	0.00029282
49	Yes	5	0.00000001	0.00006391
50	Yes	5	0.00000001	0.00005100

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		*°*	*°*
L1	120 - 115	14.60	43	1.1216	0.0187
L2	115 - 110	13.42	43	1.1179	0.0175
L3	110 - 105	12.26	43	1.1056	0.0154
L4	105 - 100	11.11	43	1.0838	0.0134
L5	100 - 95	9.99	43	1.0475	0.0113
L6	95 - 90	8.92	43	0.9937	0.0093
L7	90 - 85	7.92	43	0.9185	0.0074
L8	85 - 80	6.99	43	0.8527	0.0060
L9	80 - 79.75	6.14	43	0.7718	0.0047
L10	79.75 - 78.5	6.10	43	0.7690	0.0046
L11	78.5 - 78.25	5.90	43	0.7549	0.0044
L12	78.25 - 73.25	5.86	43	0.7531	0.0044
L13	73.25 - 68.25	5.09	43	0.7143	0.0039
L14	68.25 - 68	4.37	43	0.6692	0.0034
L15	68 - 67.75	4.33	43	0.6668	0.0034
L16	67.75 - 62.75	4.30	43	0.6636	0.0034
L17	62.75 - 60	3.64	43	0.5940	0.0028
L18	60 - 59.75	3.31	43	0.5520	0.0024
L19	59.75 - 54.75	3.28	43	0.5498	0.0024
L20	54.75 - 49.75	2.73	43	0.5018	0.0020
L21	49.75 - 45.42	2.23	43	0.4482	0.0017
L22	45.42 - 45.17	1.85	43	0.3972	0.0014
L23	45.17 - 40.17	1.83	43	0.3946	0.0014

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L24	40.17 - 36.42	1.44	43	0.3416	0.0011
L25	36.42 - 36.17	1.19	43	0.2986	0.0009
L26	36.17 - 32.75	1.17	43	0.2961	0.0009
L27	32.75 - 32.5	0.97	43	0.2604	0.0008
L28	32.5 - 32.25	0.96	43	0.2593	0.0008
L29	32.25 - 30	0.95	43	0.2583	0.0007
L30	30 - 28.66	0.83	43	0.2492	0.0007
L31	28.66 - 28.41	0.76	43	0.2449	0.0007
L32	28.41 - 26.75	0.74	43	0.2437	0.0007
L33	26.75 - 26.5	0.66	43	0.2358	0.0007
L34	26.5 - 21.5	0.65	43	0.2335	0.0007
L35	21.5 - 21	0.43	43	0.1854	0.0005
L36	21 - 20.75	0.41	43	0.1804	0.0005
L37	20.75 - 15.75	0.40	43	0.1785	0.0005
L38	15.75 - 10.75	0.23	43	0.1393	0.0004
L39	10.75 - 5.75	0.11	43	0.0973	0.0002
L40	5.75 - 2	0.03	43	0.0525	0.0001
L41	2 - 1.75	0.00	43	0.0169	0.0000
L42	1.75 - 0	0.00	43	0.0148	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	Lightning Rod 5/8"x4'	43	14.13	1.1208	0.0183	35224
116.00	VHLP1-18	43	13.66	1.1192	0.0179	35224
114.00	Pipe Mount [PM 602-3]	43	13.19	1.1163	0.0172	29465
107.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	43	11.57	1.0940	0.0142	12137
99.00	(2) QS66512-2 w/ Mount Pipe	43	9.78	1.0386	0.0110	5892
60.00	(2) Bridge Stiffener (109" x 15.75" x 1.25")	43	3.31	0.5520	0.0024	4674
59.00	Side Arm Mount [SO 701-1]	43	3.19	0.5431	0.0024	5070
48.00	GPS_A	43	2.07	0.4269	0.0016	5021
30.00	(2) Bridge Stiffener (137" x 15.5" x 1.25")	43	0.83	0.2492	0.0007	11488

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 115	67.95	10	5.1878	0.0883
L2	115 - 110	62.53	10	5.1761	0.0826
L3	110 - 105	57.15	10	5.1277	0.0731
L4	105 - 100	51.83	10	5.0345	0.0634
L5	100 - 95	46.65	22	4.8736	0.0538
L6	95 - 90	41.69	22	4.6294	0.0442
L7	90 - 85	37.03	22	4.2840	0.0348
L8	85 - 80	32.70	22	3.9804	0.0284
L9	80 - 79.75	28.73	22	3.6057	0.0221
L10	79.75 - 78.5	28.54	22	3.5929	0.0219
L11	78.5 - 78.25	27.61	22	3.5276	0.0210
L12	78.25 - 73.25	27.43	22	3.5194	0.0208
L13	73.25 - 68.25	23.84	22	3.3395	0.0185
L14	68.25 - 68	20.45	22	3.1304	0.0162
L15	68 - 67.75	20.29	22	3.1192	0.0161
L16	67.75 - 62.75	20.13	22	3.1041	0.0159
L17	62.75 - 60	17.04	22	2.7803	0.0130
L18	60 - 59.75	15.50	22	2.5845	0.0113

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L19	59.75 - 54.75	15.36	22	2.5740	0.0113
L20	54.75 - 49.75	12.78	22	2.3500	0.0096
L21	49.75 - 45.42	10.45	22	2.0998	0.0079
L22	45.42 - 45.17	8.66	22	1.8612	0.0066
L23	45.17 - 40.17	8.56	22	1.8494	0.0065
L24	40.17 - 36.42	6.75	22	1.6013	0.0052
L25	36.42 - 36.17	5.57	22	1.3999	0.0043
L26	36.17 - 32.75	5.50	22	1.3880	0.0042
L27	32.75 - 32.5	4.56	22	1.2209	0.0035
L28	32.5 - 32.25	4.50	22	1.2158	0.0035
L29	32.25 - 30	4.44	22	1.2112	0.0035
L30	30 - 28.66	3.88	22	1.1686	0.0033
L31	28.66 - 28.41	3.55	22	1.1484	0.0032
L32	28.41 - 26.75	3.49	22	1.1429	0.0032
L33	26.75 - 26.5	3.10	22	1.1059	0.0031
L34	26.5 - 21.5	3.04	22	1.0951	0.0031
L35	21.5 - 21	2.01	22	0.8695	0.0023
L36	21 - 20.75	1.92	22	0.8460	0.0022
L37	20.75 - 15.75	1.88	22	0.8372	0.0022
L38	15.75 - 10.75	1.10	22	0.6536	0.0016
L39	10.75 - 5.75	0.51	22	0.4566	0.0011
L40	5.75 - 2	0.14	22	0.2461	0.0006
L41	2 - 1.75	0.02	22	0.0793	0.0002
L42	1.75 - 0	0.01	22	0.0695	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	Lightning Rod 5/8"x4'	10	65.78	5.1857	0.0864	9850
116.00	VHLP1-18	10	63.61	5.1806	0.0841	9850
114.00	Pipe Mount [PM 602-3]	10	61.45	5.1698	0.0810	8014
107.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	10	53.95	5.0788	0.0672	2872
99.00	(2) QS66512-2 w/ Mount Pipe	22	45.64	4.8334	0.0519	1326
60.00	(2) Bridge Stiffener (109" x 15.75" x 1.25")	22	15.50	2.5845	0.0113	1007
59.00	Side Arm Mount [SO 701-1]	22	14.96	2.5428	0.0110	1091
48.00	GPS_A	22	9.70	2.0001	0.0074	1077
30.00	(2) Bridge Stiffener (137" x 15.5" x 1.25")	22	3.88	1.1686	0.0034	2454

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K
L1	120 - 115 (1)	P24x0.25	5.00	0.00	0.0	18.6532	-2.38
L2	115 - 110 (2)	P24x0.25	5.00	0.00	0.0	18.6532	-3.44
L3	110 - 105 (3)	P24x0.25	5.00	0.00	0.0	18.6532	-6.83
L4	105 - 100 (4)	P24x0.25	5.00	0.00	0.0	18.6532	-7.31
L5	100 - 95 (5)	P24x0.25	5.00	0.00	0.0	18.653	-10.40

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u
	ft		ft	ft		in^2	K
L6	95 - 90 (6)	P24x0.25	5.00	0.00	0.0	18.6532	-11.00
L7	90 - 85 (7)	P24x0.375	5.00	0.00	0.0	27.8325	-11.78
L8	85 - 80 (8)	P24x0.375	5.00	0.00	0.0	27.8325	-12.58
L9	80 - 79.75 (9)	P24x0.625	0.25	0.00	0.0	45.8967	-12.65
L10	79.75 - 78.5 (10)	P24x0.625	1.25	0.00	0.0	45.8967	-12.90
L11	78.5 - 78.25 (11)	P24x1.075	0.25	0.00	0.0	77.4226	-12.99
L12	78.25 - 73.25 (12)	P24x1.075	5.00	0.00	0.0	77.4226	-14.50
L13	73.25 - 68.25 (13)	P24x1.075	5.00	0.00	0.0	77.4226	-16.03
L14	68.25 - 68 (14)	P24x1.075	0.25	0.00	0.0	77.4226	-16.12
L15	68 - 67.75 (15)	P24x0.775	0.25	0.00	0.0	56.5467	-16.18
L16	67.75 - 62.75 (16)	P24x0.775	5.00	0.00	0.0	56.5467	-17.45
L17	62.75 - 60 (17)	P24x0.775	2.75	0.00	0.0	56.5467	-18.17
L18	60 - 59.75 (18)	P30x0.675	0.25	0.00	0.0	62.1859	-19.65
L19	59.75 - 54.75 (19)	P30x0.675	5.00	0.00	0.0	62.1859	-21.14
L20	54.75 - 49.75 (20)	P30x0.675	5.00	0.00	0.0	62.1859	-22.55
L21	49.75 - 45.42 (21)	P30x0.675	4.33	0.00	0.0	62.1859	-23.87
L22	45.42 - 45.17 (22)	P30x0.8375	0.25	0.00	0.0	76.7290	-23.96
L23	45.17 - 40.17 (23)	P30x0.8375	5.00	0.00	0.0	76.7290	-25.62
L24	40.17 - 36.42 (24)	P30x0.8375	3.75	0.00	0.0	76.7290	-26.88
L25	36.42 - 36.17 (25)	P30x1	0.25	0.00	0.0	91.1062	-26.99
L26	36.17 - 32.75 (26)	P30x1	3.42	0.00	0.0	91.1062	-28.28
L27	32.75 - 32.5 (27)	P30x3.025	0.25	0.00	0.0	256.3520	-28.43
L28	32.5 - 32.25 (28)	P30x3.525	0.25	0.00	0.0	293.1870	-28.59
L29	32.25 - 30 (29)	P30x3.525	2.25	0.00	0.0	293.1870	-30.01
L30	30 - 28.66 (30)	P36x2.225	1.34	0.00	0.0	236.0890	-32.47
L31	28.66 - 28.41 (31)	P36x1.45	0.25	0.00	0.0	157.3860	-32.56
L32	28.41 - 26.75 (32)	P36x1.45	1.66	0.00	0.0	157.3860	-33.15
L33	26.75 - 26.5 (33)	P36x0.7125	0.25	0.00	0.0	78.9870	-33.25
L34	26.5 - 21.5 (34)	P36x0.7125	5.00	0.00	0.0	78.9870	-35.01
L35	21.5 - 21 (35)	P36x0.7125	0.50	0.00	0.0	78.9870	-35.19
L36	21 - 20.75 (36)	P36x0.975	0.25	0.00	0.0	107.2830	-35.31
L37	20.75 - 15.75 (37)	P36x0.975	5.00	0.00	0.0	107.2830	-37.54
L38	15.75 - 10.75 (38)	P36x0.975	5.00	0.00	0.0	107.2830	-39.79
L39	10.75 - 5.75 (39)	P36x0.975	5.00	0.00	0.0	107.2830	-42.06

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u
	ft		ft	ft		in^2	K
L40	5.75 - 2 (40)	P36x0.975	3.75	0.00	0.0	107.28 30	-43.76
L41	2 - 1.75 (41)	P36x1.15	0.25	0.00	0.0	125.90 70	-43.88
L42	1.75 - 0 (42)	P36x1.15	1.75	0.00	0.0	125.90 70	-44.67

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}
	ft		kip-ft
L1	120 - 115 (1)	P24x0.25	27.17
L2	115 - 110 (2)	P24x0.25	63.35
L3	110 - 105 (3)	P24x0.25	116.04
L4	105 - 100 (4)	P24x0.25	181.96
L5	100 - 95 (5)	P24x0.25	272.27
L6	95 - 90 (6)	P24x0.25	366.66
L7	90 - 85 (7)	P24x0.375	462.88
L8	85 - 80 (8)	P24x0.375	560.95
L9	80 - 79.75 (9)	P24x0.625	565.90
L10	79.75 - 78.5 (10)	P24x0.625	590.81
L11	78.5 - 78.25 (11)	P24x1.075	595.82
L12	78.25 - 73.25 (12)	P24x1.075	698.12
L13	73.25 - 68.25 (13)	P24x1.075	804.30
L14	68.25 - 68 (14)	P24x1.075	809.71
L15	68 - 67.75 (15)	P24x0.775	815.12
L16	67.75 - 62.75 (16)	P24x0.775	925.17
L17	62.75 - 60 (17)	P24x0.775	986.82
L18	60 - 59.75 (18)	P30x0.675	992.84
L19	59.75 - 54.75 (19)	P30x0.675	1114.66
L20	54.75 - 49.75 (20)	P30x0.675	1239.55
L21	49.75 - 45.42 (21)	P30x0.675	1351.23
L22	45.42 - 45.17 (22)	P30x0.8375	1357.78
L23	45.17 - 40.17 (23)	P30x0.8375	1490.58
L24	40.17 - 36.42 (24)	P30x0.8375	1592.59
L25	36.42 - 36.17 (25)	P30x1	1599.47
L26	36.17 - 32.75 (26)	P30x1	1693.97
L27	32.75 - 32.5 (27)	P30x3.025	1700.91
L28	32.5 - 32.25 (28)	P30x3.525	1707.86
L29	32.25 - 30 (29)	P30x3.525	1770.58
L30	30 - 28.66 (30)	P36x2.225	1810.46
L31	28.66 - 28.41 (31)	P36x1.45	1817.92

Section No.	Elevation ft	Size	M_{ux} kip-ft
L32	28.41 - 26.75 (32)	P36x1.45	1867.55
L33	26.75 - 26.5 (33)	P36x0.7125	1875.04
L34	26.5 - 21.5 (34)	P36x0.7125	2025.93
L35	21.5 - 21 (35)	P36x0.7125	2041.13
L36	21 - 20.75 (36)	P36x0.975	2048.74
L37	20.75 - 15.75 (37)	P36x0.975	2202.09
L38	15.75 - 10.75 (38)	P36x0.975	2357.57
L39	10.75 - 5.75 (39)	P36x0.975	2514.98
L40	5.75 - 2 (40)	P36x0.975	2634.25
L41	2 - 1.75 (41)	P36x1.15	2642.24
L42	1.75 - 0 (42)	P36x1.15	2698.27

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K
L1	120 - 115 (1)	P24x0.25	6.25
L2	115 - 110 (2)	P24x0.25	7.61
L3	110 - 105 (3)	P24x0.25	12.99
L4	105 - 100 (4)	P24x0.25	13.39
L5	100 - 95 (5)	P24x0.25	18.70
L6	95 - 90 (6)	P24x0.25	19.07
L7	90 - 85 (7)	P24x0.375	19.44
L8	85 - 80 (8)	P24x0.375	19.81
L9	80 - 79.75 (9)	P24x0.625	19.84
L10	79.75 - 78.5 (10)	P24x0.625	20.04
L11	78.5 - 78.25 (11)	P24x1.075	20.07
L12	78.25 - 73.25 (12)	P24x1.075	20.86
L13	73.25 - 68.25 (13)	P24x1.075	21.63
L14	68.25 - 68 (14)	P24x1.075	21.66
L15	68 - 67.75 (15)	P24x0.775	21.70
L16	67.75 - 62.75 (16)	P24x0.775	22.35
L17	62.75 - 60 (17)	P24x0.775	22.52
L18	60 - 59.75 (18)	P30x0.675	24.11
L19	59.75 - 54.75 (19)	P30x0.675	24.58
L20	54.75 - 49.75 (20)	P30x0.675	25.42
L21	49.75 - 45.42 (21)	P30x0.675	26.15
L22	45.42 - 45.17 (22)	P30x0.8375	26.18
L23	45.17 - 40.17 (23)	P30x0.8375	26.94
L24	40.17 - 36.42 (24)	P30x0.8375	27.48
L25	36.42 - 36.17 (25)	P30x1	27.50

Section No.	Elevation ft	Size	Actual V_u K
L26	36.17 - 32.75 (26)	P30x1	27.77
L27	32.75 - 32.5 (27)	P30x3.025	27.77
L28	32.5 - 32.25 (28)	P30x3.525	27.79
L29	32.25 - 30 (29)	P30x3.525	27.96
L30	30 - 28.66 (30)	P36x2.225	29.81
L31	28.66 - 28.41 (31)	P36x1.45	29.83
L32	28.41 - 26.75 (32)	P36x1.45	29.96
L33	26.75 - 26.5 (33)	P36x0.7125	29.97
L34	26.5 - 21.5 (34)	P36x0.7125	30.38
L35	21.5 - 21 (35)	P36x0.7125	30.42
L36	21 - 20.75 (36)	P36x0.975	30.44
L37	20.75 - 15.75 (37)	P36x0.975	30.90
L38	15.75 - 10.75 (38)	P36x0.975	31.30
L39	10.75 - 5.75 (39)	P36x0.975	31.68
L40	5.75 - 2 (40)	P36x0.975	31.95
L41	2 - 1.75 (41)	P36x1.15	31.95
L42	1.75 - 0 (42)	P36x1.15	32.10

CCIpole

per TIA-222- G

Site BU: 876329

Work Order:

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	120	30		0	24	24	0.25		A53-B-42
2	90	30		0	24.00	24	0.375		A53-B-42
3	60	30		0	30.00	30	0.375		A53-B-42
4	30	30		0	36.00	36	0.375		A53-B-42

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	68	80	plate	P 3 x 1.25; (1) (1.1875)	4	80	170	260	350														
2	32.5	36.42	channel	MP3-05; (1) (1.21875)_	4					5	95	185	275										
3	36.42	45.42	channel	MP3-03; (1) (1.21875)_	4					5	95	185	275										
4	2	26.75	plate	CCI-SFP-065125	4									30	120	210	300						
5	32.5	60	plate	CCI-AFP-060100	4									30	120	210	300						
6	60	78.5	plate	CCI-SFP-060100	4									30	120	210	300						
7	2	21	plate	CI-060100; (1) (1.1875)	4													60	150	240	330		
8	0	2	plate	FP 1.25 x 6_1	4													34	124	214	304		
9	0	2	plate	FP 1.25 x 5.5_1	4					56	150	236	330										
10	26.75	32.75	plate	FP 1.25 x 6_2	4					50	140	230	320										
11	28.66	32.5	plate	FP 1.25 x 4.25_1	4	0	90	180	270														
12																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	3	1.25	3.75	0.625	n/a	n/a	24.000	2.188	1.1875	A572-65
2	5.3307	2.087	5.6089	0.783	n/a	n/a	18.000	4.968	1.2188	A572-65
3	4.062992126	1.57480315	2.88	0.5873	n/a	n/a	18.000	2.492	1.2188	A572-65
4	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
5	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
6	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
7	6	1	6	0.5	24.000	24.000	16.000	4.750	1.1875	A572-65
8	1.25	6	7.5	3	n/a	n/a	0.000	7.500	0.0000	A572-65
9	1.25	5.5	6.875	2.75	n/a	n/a	0.000	6.875	0.0000	A572-65
10	1.25	6	7.5	15.5	n/a	n/a	0.000	7.500	0.0000	A572-65
11	1.25	4.25	5.3125	12.75	n/a	n/a	0.000	5.313	0.0000	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	120 - 115	5		0	24.000	24.000	0.25	A53-B-42	1.000
2	115 - 110	5		0	24.000	24.000	0.25	A53-B-42	1.000
3	110 - 105	5		0	24.000	24.000	0.25	A53-B-42	1.000
4	105 - 100	5		0	24.000	24.000	0.25	A53-B-42	1.000
5	100 - 95	5		0	24.000	24.000	0.25	A53-B-42	1.000
6	95 - 90	5	0	0	24.000	24.000	0.25	A53-B-42	1.000
7	90 - 85	5		0	24.000	24.000	0.375	A53-B-42	1.000
8	85 - 80	5		0	24.000	24.000	0.375	A53-B-42	1.000
9	80 - 79.75	0.25		0	24.000	24.000	0.625	A53-B-42	0.933
10	79.75 - 78.5	1.25		0	24.000	24.000	0.625	A53-B-42	0.933
11	78.5 - 78.25	0.25		0	24.000	24.000	1.075	A53-B-42	0.863
12	78.25 - 73.25	5		0	24.000	24.000	1.075	A53-B-42	0.863
13	73.25 - 68.25	5		0	24.000	24.000	1.075	A53-B-42	0.863
14	68.25 - 68	0.25		0	24.000	24.000	1.075	A53-B-42	0.863
15	68 - 67.75	0.25		0	24.000	24.000	0.775	A53-B-42	0.917
16	67.75 - 62.75	5		0	24.000	24.000	0.775	A53-B-42	0.917
17	62.75 - 60	2.75	0	0	24.000	24.000	0.775	A53-B-42	0.917
18	60 - 59.75	0.25		0	30.000	30.000	0.675	A53-B-42	0.947
19	59.75 - 54.75	5		0	30.000	30.000	0.675	A53-B-42	0.947
20	54.75 - 49.75	5		0	30.000	30.000	0.675	A53-B-42	0.947
21	49.75 - 45.42	4.33		0	30.000	30.000	0.675	A53-B-42	0.947
22	45.42 - 45.17	0.25		0	30.000	30.000	0.8375	A53-B-42	0.918
23	45.17 - 40.17	5		0	30.000	30.000	0.8375	A53-B-42	0.918
24	40.17 - 36.42	3.75		0	30.000	30.000	0.8375	A53-B-42	0.918
25	36.42 - 36.17	0.25		0	30.000	30.000	1	A53-B-42	0.893
26	36.17 - 32.75	3.42		0	30.000	30.000	1	A53-B-42	0.893
27	32.75 - 32.5	0.25		0	30.000	30.000	3.025	A53-B-42	0.434
28	32.5 - 32.25	0.25		0	30.000	30.000	3.525	A53-B-42	0.294
29	32.25 - 30	2.25	0	0	30.000	30.000	3.525	A53-B-42	0.294
30	30 - 28.66	1.34		0	36.000	36.000	2.225	A53-B-42	0.395
31	28.66 - 28.41	0.25		0	36.000	36.000	1.45	A53-B-42	0.457
32	28.41 - 26.75	1.66		0	36.000	36.000	1.45	A53-B-42	0.457
33	26.75 - 26.5	0.25		0	36.000	36.000	0.7125	A53-B-42	0.943
34	26.5 - 21.5	5		0	36.000	36.000	0.7125	A53-B-42	0.943
35	21.5 - 21	0.5		0	36.000	36.000	0.7125	A53-B-42	0.943
36	21 - 20.75	0.25		0	36.000	36.000	0.975	A53-B-42	0.918
37	20.75 - 15.75	5		0	36.000	36.000	0.975	A53-B-42	0.918
38	15.75 - 10.75	5		0	36.000	36.000	0.975	A53-B-42	0.918
39	10.75 - 5.75	5		0	36.000	36.000	0.975	A53-B-42	0.918
40	5.75 - 2	3.75		0	36.000	36.000	0.975	A53-B-42	0.918
41	2 - 1.75	0.25		0	36.000	36.000	1.15	A53-B-42	0.790
42	1.75 - 0	1.75		0	36.000	36.000	1.15	A53-B-42	0.790

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	120 - 115	2.38	27.17	6.25
2	115 - 110	3.44	63.35	7.61
3	110 - 105	6.83	116.04	12.99
4	105 - 100	7.31	181.96	13.39
5	100 - 95	10.40	272.27	18.71
6	95 - 90	11.00	366.66	19.07
7	90 - 85	11.78	462.88	19.44
8	85 - 80	12.58	560.95	19.81
9	80 - 79.75	12.65	565.90	19.84
10	79.75 - 78.5	12.90	590.81	20.04
11	78.5 - 78.25	12.99	595.82	20.07
12	78.25 - 73.25	14.50	698.12	20.86
13	73.25 - 68.25	16.03	804.30	21.63
14	68.25 - 68	16.12	809.71	21.66
15	68 - 67.75	16.18	815.12	21.70
16	67.75 - 62.75	17.45	925.18	22.35
17	62.75 - 60	18.17	986.82	22.52
18	60 - 59.75	19.65	992.84	24.11
19	59.75 - 54.75	21.14	1114.66	24.58
20	54.75 - 49.75	22.55	1239.55	25.42
21	49.75 - 45.42	23.87	1351.23	26.15
22	45.42 - 45.17	23.96	1357.77	26.18
23	45.17 - 40.17	25.62	1490.58	26.94
24	40.17 - 36.42	26.88	1592.59	27.48
25	36.42 - 36.17	26.99	1599.46	27.50
26	36.17 - 32.75	28.28	1693.97	27.77
27	32.75 - 32.5	28.43	1700.91	27.77
28	32.5 - 32.25	28.59	1707.85	27.79
29	32.25 - 30	30.01	1770.58	27.96
30	30 - 28.66	32.47	1810.46	29.81
31	28.66 - 28.41	32.56	1817.92	29.83
32	28.41 - 26.75	33.15	1867.55	29.96
33	26.75 - 26.5	33.25	1875.04	29.97
34	26.5 - 21.5	35.01	2025.94	30.38
35	21.5 - 21	35.19	2041.14	30.42
36	21 - 20.75	35.31	2048.75	30.44
37	20.75 - 15.75	37.54	2202.10	30.90
38	15.75 - 10.75	39.79	2357.57	31.30
39	10.75 - 5.75	42.06	2514.99	31.68
40	5.75 - 2	43.76	2634.25	31.95
41	2 - 1.75	43.88	2642.24	31.95
42	1.75 - 0	44.67	2698.27	32.10

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
120 - 115	Pole	TP24x24x0.25	Pole	7.2%	Pass
115 - 110	Pole	TP24x24x0.25	Pole	16.5%	Pass
110 - 105	Pole	TP24x24x0.25	Pole	30.4%	Pass
105 - 100	Pole	TP24x24x0.25	Pole	47.1%	Pass
100 - 95	Pole	TP24x24x0.25	Pole	70.5%	Pass
95 - 90	Pole	TP24x24x0.25	Pole	94.4%	Pass
90 - 85	Pole	TP24x24x0.375	Pole	75.5%	Pass
85 - 80	Pole	TP24x24x0.375	Pole	91.3%	Pass
80 - 79.75	Pole + Reinf.	TP24x24x0.625	Reinf. 1 Tension Rupture	78.7%	Pass
79.75 - 78.5	Pole + Reinf.	TP24x24x0.625	Reinf. 1 Tension Rupture	82.1%	Pass
78.5 - 78.25	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	51.5%	Pass
78.25 - 73.25	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	60.3%	Pass
73.25 - 68.25	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	69.4%	Pass
68.25 - 68	Pole + Reinf.	TP24x24x1.075	Reinf. 1 Tension Rupture	69.9%	Pass
68 - 67.75	Pole + Reinf.	TP24x24x0.775	Reinf. 6 Tension Rupture	67.5%	Pass
67.75 - 62.75	Pole + Reinf.	TP24x24x0.775	Reinf. 6 Tension Rupture	76.6%	Pass
62.75 - 60	Pole + Reinf.	TP24x24x0.775	Reinf. 6 Tension Rupture	81.7%	Pass
60 - 59.75	Pole + Reinf.	TP30x30x0.675	Pole	60.3%	Pass
59.75 - 54.75	Pole + Reinf.	TP30x30x0.675	Pole	67.6%	Pass
54.75 - 49.75	Pole + Reinf.	TP30x30x0.675	Pole	75.1%	Pass
49.75 - 45.42	Pole + Reinf.	TP30x30x0.675	Pole	81.9%	Pass
45.42 - 45.17	Pole + Reinf.	TP30x30x0.8375	Pole	68.1%	Pass
45.17 - 40.17	Pole + Reinf.	TP30x30x0.8375	Pole	74.7%	Pass
40.17 - 36.42	Pole + Reinf.	TP30x30x0.8375	Pole	79.8%	Pass
36.42 - 36.17	Pole + Reinf.	TP30x30x1	Pole	68.4%	Pass
36.17 - 32.75	Pole + Reinf.	TP30x30x1	Pole	72.4%	Pass
32.75 - 32.5	Pole + Reinf.	TP30x30x3.025	Reinf. 10 Compression	45.7%	Pass
32.5 - 32.25	Pole + Reinf.	TP30x30x3.525	Reinf. 10 Compression	41.7%	Pass
32.25 - 30	Pole + Reinf.	TP30x30x3.525	Reinf. 10 Compression	43.3%	Pass
30 - 28.66	Pole + Reinf.	TP36x36x2.225	Reinf. 10 Compression	37.8%	Pass
28.66 - 28.41	Pole + Reinf.	TP36x36x1.45	Reinf. 10 Compression	54.1%	Pass
28.41 - 26.75	Pole + Reinf.	TP36x36x1.45	Reinf. 10 Compression	55.6%	Pass
26.75 - 26.5	Pole + Reinf.	TP36x36x0.7125	Pole	76.6%	Pass
26.5 - 21.5	Pole + Reinf.	TP36x36x0.7125	Pole	82.7%	Pass
21.5 - 21	Pole + Reinf.	TP36x36x0.7125	Pole	83.3%	Pass
21 - 20.75	Pole + Reinf.	TP36x36x0.975	Pole	62.6%	Pass
20.75 - 15.75	Pole + Reinf.	TP36x36x0.975	Pole	67.3%	Pass
15.75 - 10.75	Pole + Reinf.	TP36x36x0.975	Pole	72.0%	Pass
10.75 - 5.75	Pole + Reinf.	TP36x36x0.975	Pole	76.8%	Pass
5.75 - 2	Pole + Reinf.	TP36x36x0.975	Pole	80.5%	Pass
2 - 1.75	Pole + Reinf.	TP36x36x1.15	Reinf. 9 Connection	72.2%	Pass
1.75 - 0	Pole + Reinf.	TP36x36x1.15	Reinf. 9 Connection	73.8%	Pass
				Summary	
			Pole	94.4%	Pass
			Reinforcement	82.1%	Pass
			Overall	94.4%	Pass

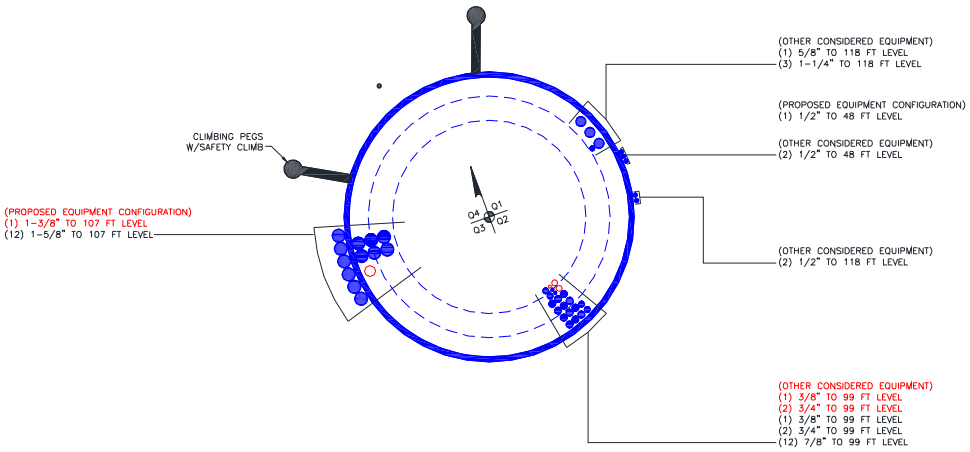
Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity											
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11
120 - 115	1315	n/a	1315	18.65	n/a	18.65	7.2%											
115 - 110	1315	n/a	1315	18.65	n/a	18.65	16.5%											
110 - 105	1315	n/a	1315	18.65	n/a	18.65	30.4%											
105 - 100	1315	n/a	1315	18.65	n/a	18.65	47.1%											
100 - 95	1315	n/a	1315	18.65	n/a	18.65	70.5%											
95 - 90	1315	n/a	1315	18.65	n/a	18.65	94.4%											
90 - 85	1942	n/a	1942	27.83	n/a	27.83	75.5%											
85 - 80	1942	n/a	1942	27.83	n/a	27.83	91.3%											
80 - 79.75	1942	1202	3144	27.83	15.00	42.83	56.8%	78.7%										
79.75 - 78.5	1942	1202	3144	27.83	15.00	42.83	59.3%	82.1%										
78.5 - 78.25	1942	3114	5056	27.83	39.00	66.83	37.2%	51.5%					37.7%					
78.25 - 73.25	1942	3114	5056	27.83	39.00	66.83	43.5%	60.3%					44.1%					
73.25 - 68.25	1942	3114	5056	27.83	39.00	66.83	50.1%	69.4%					50.8%					
68.25 - 68	1942	3114	5056	27.83	39.00	66.83	50.4%	69.9%					51.1%					
68 - 67.75	1942	1912	3854	27.83	24.00	51.83	66.6%						67.5%					
67.75 - 62.75	1942	1912	3854	27.83	24.00	51.83	75.6%						76.6%					
62.75 - 60	1942	1912	3854	27.83	24.00	51.83	80.6%						81.7%					
60 - 59.75	3829	2920	6749	34.90	24.00	58.90	60.3%					58.4%						
59.75 - 54.75	3829	2920	6749	34.90	24.00	58.90	67.6%					65.6%						
54.75 - 49.75	3829	2920	6749	34.90	24.00	58.90	75.1%					72.9%						
49.75 - 45.42	3829	2920	6749	34.90	24.00	58.90	81.9%					79.4%						
45.42 - 45.17	3829	4323	8152	34.90	35.52	70.42	68.1%			65.0%		66.0%						
45.17 - 40.17	3829	4323	8152	34.90	35.52	70.42	74.7%			71.4%		72.5%						
40.17 - 36.42	3829	4323	8152	34.90	35.52	70.42	79.8%			76.2%		77.4%						
36.42 - 36.17	3829	5729	9558	34.90	46.44	81.34	68.4%		62.4%			66.3%						
36.17 - 32.75	3829	5729	9558	34.90	46.44	81.34	72.4%		66.1%			70.2%						
32.75 - 32.5	3829	19729	23559	34.90	76.44	111.34	29.7%		27.1%			28.8%					45.7%	
32.5 - 32.25	3829	22200	26029	34.90	51.25	86.15	27.2%										41.7%	38.0%
32.25 - 30	3829	22200	26029	34.90	51.25	86.15	28.2%										43.3%	39.4%
30 - 28.66	6659	26945	33604	41.97	51.25	93.22	27.5%										37.8%	34.7%
28.66 - 28.41	6659	16881	23540	41.97	30.00	71.97	39.4%										54.1%	
28.41 - 26.75	6659	16881	23540	41.97	30.00	71.97	40.5%										55.6%	
26.75 - 26.5	6659	5696	12355	41.97	32.50	74.47	76.6%				71.1%							
26.5 - 21.5	6659	5696	12355	41.97	32.50	74.47	82.7%				76.8%							
21.5 - 21	6659	5696	12355	41.97	32.50	74.47	83.3%				77.4%							
21 - 20.75	6659	9840	16499	41.97	56.50	98.47	62.6%				58.1%			58.9%				
20.75 - 15.75	6659	9840	16499	41.97	56.50	98.47	67.3%				62.5%			63.3%				
15.75 - 10.75	6659	9840	16499	41.97	56.50	98.47	72.0%				66.9%			67.7%				
10.75 - 5.75	6659	9840	16499	41.97	56.50	98.47	76.8%				71.3%			72.2%				
5.75 - 2	6659	9840	16499	41.97	56.50	98.47	80.5%				74.7%			75.7%				
2 - 1.75	6659	12590	19249	41.97	57.50	99.47	69.3%								60.9%	72.2%		
1.75 - 0	6659	12590	19249	41.97	57.50	99.47	70.7%								62.2%	73.8%		

Note: Section capacity checked in 5 degree increments.

APPENDIX B

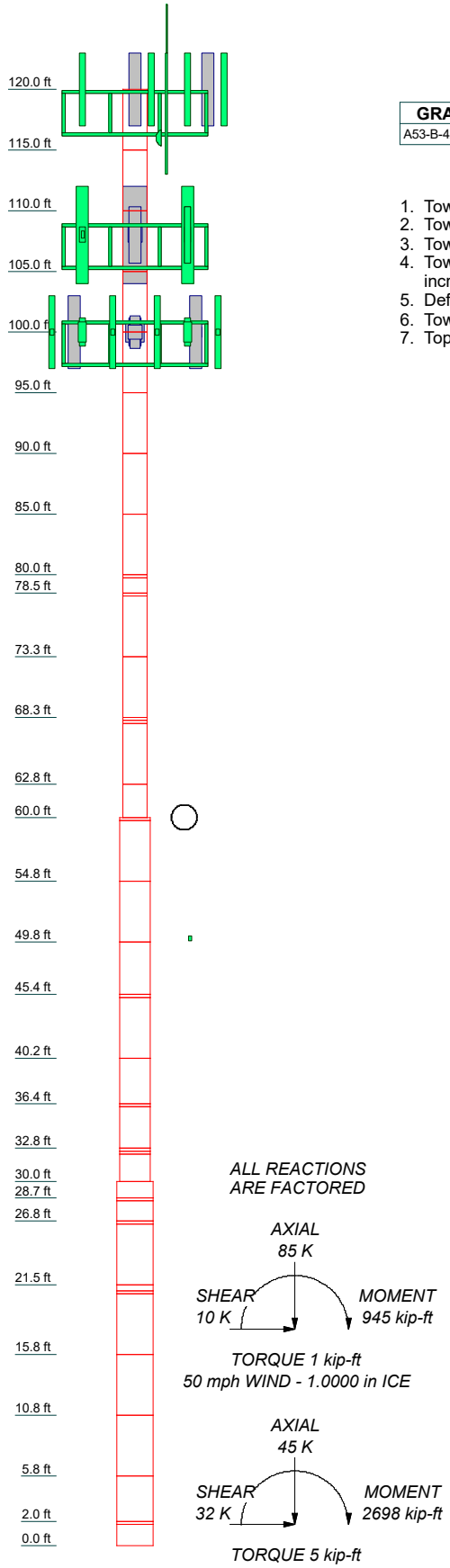
BASE LEVEL DRAWING


(OTHER CONSIDERED EQUIPMENT)
(1) 5/8" TO 118 FT LEVEL
(3) 1-1/4" TO 118 FT LEVEL
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1/2" TO 48 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(2) 1/2" TO 48 FT LEVEL
CLIMBING PEGS
W/SAFETY CLIMB
(PROPOSED EQUIPMENT CONFIGURATION)
(1) 1-3/8" TO 107 FT LEVEL
(12) 1-5/8" TO 107 FT LEVEL
Q1
Q2
Q3
Q4
(OTHER CONSIDERED EQUIPMENT)
(2) 1/2" TO 118 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 3/8" TO 99 FT LEVEL
(2) 3/4" TO 99 FT LEVEL
(1) 3/8" TO 99 FT LEVEL
(2) 3/4" TO 99 FT LEVEL
(12) 7/8" TO 99 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Section	Size	Length (ft)	Grade	Weight (K)
1	P24x0.25	5.00	A53-B-42	0.3
2	P24x0.25	5.00		0.3
3	P24x0.25	5.00		0.3
4	P24x0.25	5.00		0.3
5	P24x0.25	5.00		0.3
6	P24x0.25	5.00		0.3
7	P24x0.375	5.00		0.5
8	P24x0.375	5.00		0.5
11				
12		5.00		1.1
13		5.00		1.1
16		5.00		0.9
17		2.75		0.5
19		5.00		1.0
20	P30x0.675	5.00		1.0
21	P30x0.675	4.33		0.9
23	P30x0.675	5.00		1.2
24	P30x0.83	3.75		0.9
25				
26		3.42		0.9
29				
34		5.00		1.3
37	P36x0.975	5.00		1.7
38	P36x0.975	5.00		1.7
39	P36x0.975	5.00		1.7
40	P36x0.975	3.75		1.3
42				



ALL REACTIONS ARE FACTORED

AXIAL 85 K

SHEAR 10 K *MOMENT 945 kip-ft*

TORQUE 1 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 45 K

SHEAR 32 K *MOMENT 2698 kip-ft*

TORQUE 5 kip-ft
REACTIONS - 97 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

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

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Columbus, OH 43215
Phone: (614) 221-6679
FAX:

Job: *MTN. VIEW CEM. (FILLEY PARK) (BU# 876329*			
Project: *37518-2442 (876329.1558710)*			
Client: Crown Castle	Drawn by: gpenumatsa	App'd:	
Code: TIA-222-G	Date: 10/10/18	Scale: NTS	
Path:		Dwg No. E-1	

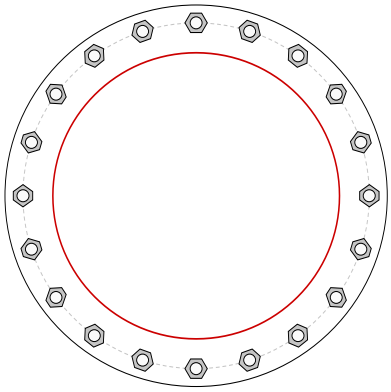
Monopole Flange Plate Connection

Elevation = 90 ft.

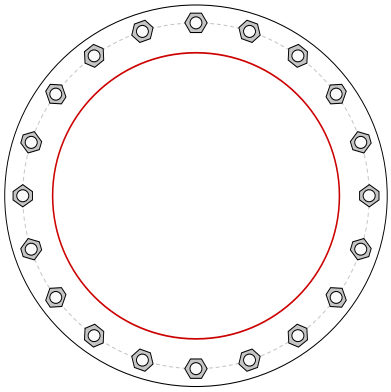
BU #	876329
Site Name	
Order #	
TIA-222 Revision	G

Applied Loads	
Moment (kip-ft)	366.66
Axial Force (kips)	11.00
Shear Force (kips)	19.07

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(20) 1" ø bolts (A325; Fy=92 ksi, Fu=120 ksi) on 29" BC

Top Plate Data

32" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Bottom Plate Data

32" OD x 1.5" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

24" x 0.25" round pole (A53-B-42; Fy=42 ksi, Fu=63 ksi)

Bottom Pole Data

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

Analysis Results

Bolt Capacity

Max Load (kips)	29.78	
Allowable (kips)	54.52	
Stress Ratio:	54.6%	Pass

Top Plate Capacity

Max Stress (ksi):	21.01	
Allowable Stress (ksi):	32.40	
Stress Ratio:	64.8%	Pass
Tension Side Stress Ratio:	31.3%	Pass

Bottom Plate Capacity

Max Stress (ksi):	21.01	
Allowable Stress (ksi):	32.40	
Stress Ratio:	64.8%	Pass
Tension Side Stress Ratio:	31.3%	Pass

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Phone 614.221.6679 www.pauljford.com

v2.1, Effective Date: 05-03-17

Date: 10/10/2018
Project No: 37518-2442.004.7700
Site Name: MTN. View CEM (filley Park)
Site Number/BUN: 876329
Description:
Owner:
Engineer:

Welded Bridge Stiffener Analysis per TIA-222-G & AISC 13th Ed. (Black)

General Parameters and Loading:

Flange Elevation:	60.00	ft
TIA Reference Standard:	TIA-222-G	
AISC Manual:	13th Ed. (Black)	
Method:	LRFD	
ASD Stress Increase, ASIF:	N/A	
Moment, Muf:	986.8	k-ft
Axial, Puf:	18.2	kips
Shear, Vf:	22.5	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	24.00	30.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	60	60	ksi
Flange Diameter, Df:	41.00	41.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	4	0	
Upper Weld Length, L1:	51.19	0.00	in
Lower Weld Length, L2:	51.19	0.00	in
Weld Size, w:	0.3750	0.0000	in
Electrode:	E80	E70	
Effective Stiffener Width, Ws:	6.00	0.00	in
Stiffener Thickness, ts:	1.25	0.00	in
Notch, n:	1.00	0.00	in
Stiffener Fy:	65	0	ksi
Stiffener Fu:	80	0	ksi
Unbraced Length, L:	5.63	0.00	in
K:	0.80	0.00	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	50	0	degrees
Stiffener Circle:	49.00	41.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	12.50	8.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	9.50	5.50	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

Number of Bolt Circles: (1) Bolt Circle

	Bolt Circle 1	Bolt Circle 2	
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	35.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

Weld Analysis per AISC Tables 8-4 & 8-3:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	0	Num. of Sixteenths in Weld
a:	0.2442	0.0000	= e1 / L1
k:	0	0	
C:	3.3332	3.7100	Tabulated Cofficient
C1:	1.0300	1.0000	Coefficient for Electrode
Φ:	0.7500	0.7500	
Stiffener Axial, Pu:	246.4	0.0	kips
Axial Capacity, ΦPn:	790.8	0.0	kips = Φ C C1 D L
Ratio:	31.2%	0.0%	

Lower Pole			
D:	6	0	Num. of Sixteenths in Weld
a:	0.1856	0.0000	= e2 / L2
k:	0	0	
C:	3.5561	3.7100	Tabulated Cofficient
C1:	1.0300	1.0000	Coefficient for Electrode
Φ:	0.7500	0.7500	
Stiffener Axial, Pu:	246.4	0.0	kips
Axial Capacity, ΦPn:	843.7	0.0	kips = Φ C C1 D L
Ratio:	29.2%	0.0%	

Pole Analysis per AISC Table J2.5 & Sect. J4.2:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, Pu:	246.4	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fuv:	2.4	0.0	kips/in= Pu / (2 L1)
Section Modulus, S:	873.4	0.0	in^2 = $L1^2$ / 3
Bending Stress, fub:	3.5	0.0	kips/in = Pu e1 / S
Combined Stress, fu:	4.3	0.0	kips/in = $(fuv^2 + fub^2)^{1/2}$
Φ:	1.0000	0.0000	
Stress Capacity, ΦFn	9.5	0.0	kips/in = Φ 0.6 Fy tp
Ratio:	45.2%	0.0%	

Lower Pole			
Stiffener Axial, Pu:	246.4	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fuv:	2.4	0.0	ksi = Pu / (2 L2)
Section Modulus, S:	873.4	0.0	in^2 = $L2^2$ / 3
Bending Stress, fub:	2.7	0.0	ksi = Pu e2 / S
Combined Stress, fu:	3.6	0.0	kips/in = $(fuv^2 + fub^2)^{1/2}$
Φ:	1.0000	0.0000	
Stress Capacity, ΦFn	9.5	0.0	kips/in = Φ 0.6 Fy tp
Ratio:	38.1%	0.0%	

Stiffener 1 Analysis per AISC Sect. D2, E3 & E7

	Stiffener Type 1	
Gross Area, Ag:	7.5000	in^2
Effective Net Area, Aen:	7.5000	in^2 = Ag U, where U = 1.000
Stiffener Axial, Pu:	246.4	kips
Stiffener Stress, fu:	32.9	ksi = Pu / Ag
b:	15.5000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.4000	in
Q, Where Qa = 1.0:	0.8938	= Qa 1.34 - 0.76 (b / ts) (Fy / E)$^{1/2}$
r:	0.3608	in^3
K L / r:	12.4708	
Φ:	0.9000	
Axial Capacity, ΦFcr:	51.60	ksi = Φ Q [0.658$^{Q Fy / Fe}$] Fy
Φ:	0.9000	
Ten. Yielding Cap., ΦFnt:	58.50	ksi = Φ Fy
Φ:	0.7500	
Ten. Rupture Cap., ΦFnr:	60.00	ksi = Φ Fu (Aen / Ag)
Ratio:	63.7%	

Stiffener 2 Analysis per AISC Sect. D2, E3 & E7

	Stiffener Type 2	
Gross Area, Ag:	0.0000	in^2
Effective Net Area, Aen:	0.0000	in^2 = Ag U, where U = 1.000
Stiffener Axial, Pu:	0.0	kips
Stiffener Stress, fu:	0.0	ksi = Pu / Ag
b:	0.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	0.0000	in
Q, Where Qa = 1.0:	0.0000	
r:	0.0000	in^3
K L / r:	0.0000	
Φ:	0.0000	
Axial Capacity, ΦFcr:	0.00	ksi = Φ Fy
Φ:	0.0000	
Ten. Yielding Cap., ΦFnt:	0.00	ksi = Φ Fy
Φ:	0.0000	
Ten. Rupture Cap., ΦFnr:		ksi = Φ Fu (Aen / Ag)
Ratio:	0.0%	

Analysis Summary:

Bridge Stiffener Type 1	Bridge Stiffener Type 2
Weld Analysis Ratio: 31.2% PASS	Weld Analysis Ratio: 0.0% PASS
Pole Analysis Ratio: 45.2% PASS	Pole Analysis Ratio: 0.0% PASS
Stiffener Analysis Ratio: 63.7% PASS	Stiffener Analysis Ratio: 0.0% PASS

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v2.1, Effective Date: 05-03-17

Date: 10/10/2018
Project No: 37518-2442.004.7700
Site Name: MTN. View CEM (filley Park)
Site Number/BUN: 876329
Description:
Owner:
Engineer:

Welded Bridge Stiffener Analysis per TIA-222-G & AISC 13th Ed. (Black)

General Parameters and Loading:

Flange Elevation:	30.00	ft
TIA Reference Standard:	TIA-222-G	
AISC Manual:	13th Ed. (Black)	
Method:	LRFD	
ASD Stress Increase, ASIF:	N/A	
Moment, Muf:	1770.6	k-ft
Axial, Puf:	30.0	kips
Shear, Vf:	28.0	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	30.00	36.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	60	60	ksi
Flange Diameter, Df:	47.00	47.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	4	4	
Upper Weld Length, L1:	27.00	60.00	in
Lower Weld Length, L2:	21.25	67.00	in
Weld Size, w:	0.3750	0.3750	in
Electrode:	E80	E80	
Effective Stiffener Width, Ws:	4.25	6.00	in
Stiffener Thickness, ts:	1.25	1.25	in
Notch, n:	0.63	1.00	in
Stiffener Fy:	65	65	ksi
Stiffener Fu:	80	80	ksi
Unbraced Length, L:	12.00	5.63	in
K:	0.80	0.80	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	50	degrees
Stiffener Circle:	52.50	55.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	11.25	12.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	8.25	9.50	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

Number of Bolt Circles: (1) Bolt Circle

	Bolt Circle 1	Bolt Circle 2	
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	41.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

Weld Analysis per AISC Tables 8-4 & 8-3:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	6	Num. of Sixteenths in Weld
a:	0.4167	0.2083	= e1 / L1
k:	0	0	
C:	2.5983	3.4767	Tabulated Cofficient
C1:	1.0300	1.0300	Coefficient for Electrode
Φ:	0.7500	0.7500	
Stiffener Axial, Pu:	161.9	239.3	kips
Axial Capacity, ΦPn:	325.2	966.9	kips = Φ C C1 D L
Ratio:	49.8%	24.7%	

Lower Pole			
D:	6	6	Num. of Sixteenths in Weld
a:	0.3882	0.1418	= e2 / L2
k:	0	0	
C:	2.7106	3.6782	Tabulated Cofficient
C1:	1.0300	1.0300	Coefficient for Electrode
Φ:	0.7500	0.7500	
Stiffener Axial, Pu:	161.9	239.3	kips
Axial Capacity, ΦPn:	267.0	1142.2	kips = Φ C C1 D L
Ratio:	60.7%	20.9%	

Pole Analysis per AISC Table J2.5 & Sect. J4.2:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, Pu:	161.9	239.3	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fuv:	3.0	2.0	kips/in= Pu / (2 L1)
Section Modulus, S:	243.0	1200.0	$in^2 = L1^2 / 3$
Bending Stress, fub:	7.5	2.5	kips/in = Pu e1 / S
Combined Stress, fu:	8.1	3.2	kips/in = $(fuv^2 + fub^2)^{1/2}$
Φ:	1.0000	1.0000	
Stress Capacity, ΦFn	9.5	9.5	kips/in = Φ 0.6 Fy tp
Ratio:	85.4%	33.8%	

Lower Pole			
Stiffener Axial, Pu:	161.9	239.3	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fuv:	3.8	1.8	ksi = Pu / (2 L2)
Section Modulus, S:	150.5	1496.3	$in^2 = L2^2 / 3$
Bending Stress, fub:	8.9	1.5	ksi = Pu e2 / S
Combined Stress, fu:	9.7	2.3	kips/in = $(fuv^2 + fub^2)^{1/2}$
Φ:	1.0000	1.0000	
Stress Capacity, ΦFn	9.5	9.5	kips/in = Φ 0.6 Fy tp
Ratio:	64.4%	24.8%	

Stiffener 1 Analysis per AISC Sect. D2, E3 & E7

	Stiffener Type 1	
Gross Area, Ag:	5.3125	in^2
Effective Net Area, Aen:	5.3125	in^2 = Ag U, where U = 1.000
Stiffener Axial, Pu:	161.9	kips
Stiffener Stress, fu:	30.5	ksi = Pu / Ag
b:	13.3750	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	10.7000	in
Q, Where Qa = 1.0:	0.9550	= Qa 1.34 - 0.76 (b / ts) $(Fy / E)^{1/2}$
r:	0.3608	in^3
K L / r:	26.6043	
Φ:	0.9000	
Axial Capacity, ΦFcr:	52.39	ksi = Φ Q $[0.658^{Q Fy / Fe}]$ Fy
Φ:	0.9000	
Ten. Yielding Cap., ΦFnt:	58.50	ksi = Φ Fy
Φ:	0.7500	
Ten. Rupture Cap., ΦFnr:	60.00	ksi = Φ Fu (Aen / Ag)
Ratio:	58.2%	

Stiffener 2 Analysis per AISC Sect. D2, E3 & E7

	Stiffener Type 2	
Gross Area, Ag:	7.5000	in^2
Effective Net Area, Aen:	7.5000	in^2 = Ag U, where U = 1.000
Stiffener Axial, Pu:	239.3	kips
Stiffener Stress, fu:	31.9	ksi = Pu / Ag
b:	15.5000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.4000	in
Q, Where Qa = 1.0:	0.8938	= Qa 1.34 - 0.76 (b / ts) $(Fy / E)^{1/2}$
r:	0.3608	in^3
K L / r:	12.4708	
Φ:	0.9000	
Axial Capacity, ΦFcr:	51.60	ksi = Φ Q $[0.658^{Q Fy / Fe}]$ Fy
Φ:	0.9000	
Ten. Yielding Cap., ΦFnt:	58.50	ksi = Φ Fy
Φ:	0.7500	
Ten. Rupture Cap., ΦFnr:	60.00	ksi = Φ Fu (Aen / Ag)
Ratio:	61.8%	

Analysis Summary:

Bridge Stiffener Type 1
Weld Analysis Ratio: 60.7% PASS
Pole Analysis Ratio: 64.4% PASS
Stiffener Analysis Ratio: 58.2% PASS

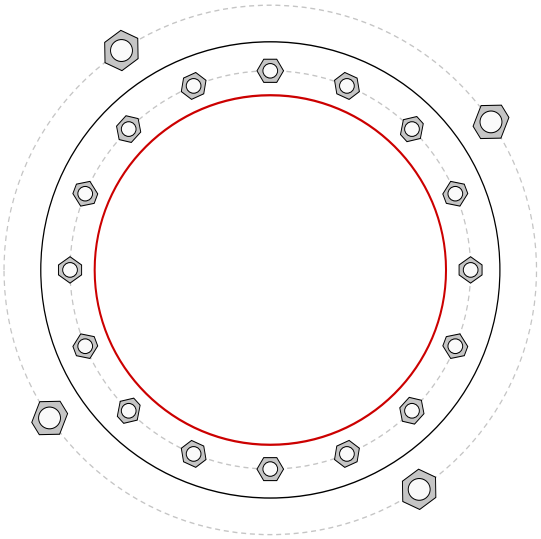
Bridge Stiffener Type 2
Weld Analysis Ratio: 24.7% PASS
Pole Analysis Ratio: 33.8% PASS
Stiffener Analysis Ratio: 61.8% PASS

Monopole Base Plate Connection

Site Info	
BU #	876329
Site Name	
Order #	

Analysis Considerations	
TIA-222 Revision	G
Grout Considered:	No
l_{ar} (in)	1.5
Eta Factor, η	0.5

Applied Loads	
Moment (kip-ft)	2698.00
Axial Force (kips)	45.00
Shear Force (kips)	32.00



Connection Properties

Anchor Rod Data

GROUP 1: (16) 1-1/2" ø bolts (A354-BC; Fy=109 ksi, Fu=125 ksi) on 41" BC
GROUP 2: (4) 2-1/4" ø bolts (A193 Gr. B7; Fy=105 ksi, Fu=125 ksi) on 54.5" BC

Base Plate Data

47" OD x 2" Plate (A36; Fy=36 ksi, Fu=58 ksi)

Stiffener Data

N/A

Pole Data

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

Analysis Results

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

GROUP 1:		
Pu = 100.57	ϕPn = 141	**Stress Rating**
Vu = 2	ϕVn = n/a	**74.2%**
Mu = n/a	ϕMn = n/a	**Pass**
GROUP 2:		
Pu = 299.47	ϕPn = 325	**Stress Rating**
Vu = 0	ϕVn = n/a	**92.1%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	21.73	
Allowable Stress (ksi):	32.4	
Stress Ratio:	**67.1%**	**Pass**

Drilled Pier Foundation

BU # :	876329
Site Name:	MTN. View CEM. (Fille
App. Number:	

TIA-222 Revison:	G
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	2698	
Axial Force (kips)	45	
Shear Force (kips)	32	

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

Pier Design Data		
Depth	25	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 25' below grade		
Pier Diameter	6	ft
Rebar Quantity	24	
Rebar Size	9	
Clear Cover to Ties	3	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	6.62	-
Soil Safety Factor	3.84	-
Max Moment (kip-ft)	2870.19	-
Rating	*34.6%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	526.86	-
End Bearing (kips)	169.65	-
Weight of Concrete (kips)	108.61	-
Total Capacity (kips)	696.50	-
Axial (kips)	153.61	-
Rating	*22.1%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.67	-
Critical Moment (kip-ft)	2870.17	-
Critical Moment Capacity	3295.90	-
Rating	*87.1%*	-

Soil Interaction Rating	**34.6%**
Structural Foundation Rating	**87.1%**

Soil Profile

Groundwater Depth	15	ft	# of Layers: 3

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	3.33	3.33	135	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	3.33	15	11.67	135	150		36	1.350	1.350				50	Cohesionless
3	15	25	10	75	87.6		36	2.151	2.151			8	42	Cohesionless

APPENDIX D

MODIFICATION DRAWINGS

MODIFIED 120'-0" MONOPOLE

BU #876329; MTN VIEW CEM (FILLEY PARK)

28 BREWER DR
BLOOMFIELD, CONNECTICUT 06002
HARTFORD COUNTY
LAT: 41° 50' 6.57"; LONG: -72° 44' 28.2"
ORDER: 446055 REV. 0; WO: 1636402

OCT 17 2018

PJF PAUL J. FORD & COMPANY
250 E Broad St. Ste 600 · Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
3530 TORINGDON WAY SUITE 300 CHARLOTTE, NC 28277
PH: (724) 416-2000

BU #876329; MTN VIEW CEM (FILLEY PARK)
BLOOMFIELD, CONNECTICUT
MODIFIED 120'-0" MONOPOLE

PROJECT CONTACTS

STRUCTURE OWNER:
CROWN CASTLE
MOD PM: DAN VADNEY AT DAN.VADNEY@CROWNCASTLE.COM
PH: (518) 373-3510
MOD CM: JASON D'AMICO AT JASON.D'AMICO@CROWNCASTLE.COM
PH: (860) 209-0104

ENGINEER OF RECORD:
PJFMOD@PAULJFORD.COM

WIND DESIGN DATA	
REFERENCE STANDARD	ANSI/TIA-222-G-2-2009
LOCAL CODE	2016 CSBC
NOMINAL WIND SPEED (3-SECOND GUST)	97 MPH
ICE THICKNESS	1.0 IN
ICE WIND SPEED	50 MPH
SERVICE WIND SPEED	60 MPH
RISK CATEGORY	II
EXPOSURE CATEGORY	C
Kzt	1.0

SHEET INDEX	
SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
MI-1	MI CHECKLIST
N-1	GENERAL NOTES
B-1	FORGBolt® DETAILS
B-2	NEXGEN2™ BOLT DETAIL
B-3	AJAX ONESIDE™ BOLT DETAIL
S-1	MONOPOLE PROFILE
S-2	MONOPOLE SECTIONS AND DETAILS
S-3	BASE PLATE DETAILS
S-4	ANCHOR BRACKET DETAILS
S-5	TRANSITION STIFFENER DETAILS
S-6	BRIDGE STIFFENER DETAILS
S-7	BRIDGE STIFFENER DETAILS

HOT WORK INCLUDED	
NA	BASE GRINDING ONLY
X	BASE WELDING (AND GRINDING)
NA	AERIAL GRINDING ONLY
X	AERIAL WELDING (AND GRINDING)

CCISITES DOC #:
TOWER MANUFACTURER: ROHN
TOWER MANUFACTURER #: 34738/SW

THE ASSOCIATED FAILING SA WO NUMBER FOR THIS PROJECT IS 1601176

QUALIFIED ENGINEERING SERVICES ARE AVAILABLE FROM PAUL J. FORD & COMPANY TO ASSIST CONTRACTORS IN CLASS IV RIGGING PLAN REVIEWS. FOR REQUESTED QUALIFIED ENGINEERING SERVICES, PLEASE CONTACT PJFMOD@PAULJFORD.COM.

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT (800) 788-7011.

SAFETY CLIMB: "LOOK UP"
THE INTEGRITY OF THE WIRE ROPE SAFETY CLIMB SYSTEM SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION AND INSPECTION. TOWER REINFORCEMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF ANY WIRE ROPE SAFETY CLIMB ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO; PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, OR IMPACT TO THE ANCHORAGE POINTS IN ANY WAY. ANY COMPROMISED SAFETY CLIMB MUST BE REPORTED TO YOUR CROWN POC FOR RESOLUTION, INCLUDING EXISTING CONDITIONS

REV	DATE	DESCRIPTION

PROJECT No:	37518-2442.004.7700
DRAWN BY:	FE
DESIGNED BY:	GP
CHECKED BY:	KAT/BKK
DATE:	10-10-2018

TITLE SHEET

T-1

V1.0 37518-2442.004.DWG

MI CHECKLIST

REQUIRED	REPORT ITEM	APPLICABLE CROWN DOC #	BRIEF DESCRIPTION
PRE-CONSTRUCTION			
X	MI CHECKLIST DRAWING	CED-SOW-10007	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	EOR APPROVED SHOP DRAWINGS	CED-SOW-10007	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS ON THE TOWER. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY/SHOP DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATION INSPECTION	CED-SOW-10007	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS, SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR CERTIFIED WELD INSPECTION	CED-SOW-10007 CED-STD-10069	A CWI SHALL INSPECT ALL WELDING PERFORMED ON STRUCTURAL MEMBERS DURING FABRICATION. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORTS (MTR)	CED-SOW-10007	MATERIAL TEST REPORTS SHALL BE PROVIDED FOR MATERIAL USED AS REQUIRED PER SECTION 9.2.5 OF CED-SOW-10007. MTRS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FABRICATOR NDE INSPECTION REPORT	CED-SOW-10066 CED-STD-10069	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED NDT INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	NDE OF MONOPOLE BASE PLATE	ENG-SOW-10033	A NDE OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	CED-SOW-10007	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
ADDITIONAL TESTING AND INSPECTIONS:			
NA			
CONSTRUCTION			
NA	FOUNDATION INSPECTIONS	CED-SOW-10144	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A VISUAL OBSERVATION OF THE REBAR SHALL BE PERFORMED BEFORE PLACING THE EPOXY. A SEALED WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	CONCRETE COMP. STRENGTH AND SLUMP TEST	CED-SOW-10144	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED AS PART OF THE FOUNDATION REPORT.
NA	EARTHWORK	CED-SOW-10144	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND RESULTS INCLUDED AS PART OF THE FOUNDATION REPORT.
NA	MICROPILE/ROCK ANCHOR	CED-SOW-10144	MICROPILES/ROCK ANCHORS SHALL BE INSPECTED BY THE FOUNDATION INSPECTION VENDOR AND SHALL BE INCLUDED AS PART OF THE FOUNDATION INSPECTION REPORT, ADDITIONAL TESTING AND/OR INSPECTION REQUIREMENTS ARE NOTED IN THESE CONTRACT DOCUMENTS.
X	POST-INSTALLED ANCHOR ROD VERIFICATION	CED-SOW-10007	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	BASE PLATE GROUT VERIFICATION	ENG-STD-10323	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS REMOVED AND/OR INSTALLED IN ACCORDANCE WITH CROWN REQUIREMENTS FOR INCLUSION IN THE MI REPORT.
X	FIELD CERTIFIED WELD INSPECTION	CED-SOW-10066 CED-STD-10069	A CROWN APPROVED CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST FIELD WELDS, FOLLOWING ALL PROCEDURES SPECIFIED IN CROWN STANDARD DOCUMENTS APPLICABLE TO WELD INSPECTIONS. A REPORT SHALL BE PROVIDED. NDE OF FIELD WELDS SHALL BE PERFORMED AS REQUIRED BY CROWN STANDARDS AND CONTRACT DOCUMENTS. THE NDE REPORT SHALL BE INCLUDED IN THE CWI REPORT.
X	ON-SITE COLD GALVANIZING VERIFICATION	ENG-STD-10149 ENG-BUL-10149	THE GENERAL CONTRACTOR SHALL PROVIDE WRITTEN AND PHOTOGRAPHIC DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED PER MANUFACTURER SPECIFICATIONS AND APPLICABLE STANDARDS.
NA	TENSION TWIST AND PLUMB	CED-PRC-10182 CED-STD-10261	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT IN ACCORDANCE WITH APPLICABLE STANDARDS DOCUMENTING TENSION TWIST AND PLUMB.
X	GC AS-BUILT DRAWINGS	CED-SOW-10007	THE GENERAL CONTRACTOR SHALL SUBMIT A LEGIBLE COPY OF THE ORIGINAL DESIGN DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD. EOR/RFI FORMS APPROVING ALL CHANGES SHALL BE SUBMITTED WHEN THE EOR IS SPECIFYING ADDITIONAL INSPECTIONS DESCRIPTION AND APPLICABLE STANDARDS SHALL BE APPLIED.
ADDITIONAL TESTING AND INSPECTIONS:			
NA			
POST-CONSTRUCTION			
X	CONSTRUCTION COMPLIANCE LETTER	CED-SOW-10007	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS, INCLUDING LISTING ADDITIONAL PARTIES TO THE MODIFICATION PROCESS.
X	POST-INSTALLED ANCHOR ROD PULL TESTS	CED-PRC-10119	POST-INSTALLED ANCHOR RODS SHALL BE TESTED BY A CROWN APPROVED PULL TEST INSPECTOR AND A REPORT SHALL BE PROVIDED INDICATING TESTING RESULTS.
X	PHOTOGRAPHS	CED-SOW-10007	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI. PHOTOS SHALL DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
NA	BOLT INSTALLATION VERIFICATION REPORT	CED-SOW-10007	THE MI INSPECTOR SHALL VERIFY THE INSTALLATION AND TIGHTNESS 10% OF ALL NON PRE-TENSIONED BOLTS INSTALLED AS PART OF THE MODIFICATION. THE MI INSPECTOR SHALL LOOSEN THE NUT AND VERIFY THE BOLT HOLE SIZE AND CONDITION. THE MI REPORT SHALL CONTAIN THE COMPLETED BOLT INSTALLATION VERIFICATION REPORT, INCLUDING THE SUPPORTING PHOTOGRAPHS.
X	PUNCHLIST DEVELOPMENT AND CORRECTION DOCUMENTATION	CED-PRC-10283 CED-FRM-10285	FINAL PUNCHLIST INDICATING ALL NONCONFORMANCE(S) IDENTIFIED AND THE FINAL RESOLUTION AND APPROVAL.
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	CED-SOW-10007	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTOR'S REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
ADDITIONAL TESTING AND INSPECTIONS:			
NA			

MODIFICATION INSPECTION NOTES

GENERAL

THE MI IS AN ON-SITE VISUAL AND HANDS-ON INSPECTION OF TOWER MODIFICATIONS INCLUDING A REVIEW OF CONSTRUCTION REPORTS AND ADDITIONAL PERTINENT DOCUMENTATION PROVIDED BY THE GENERAL CONTRACTOR (GC), AS WELL AS ANY INSPECTION DOCUMENTS PROVIDED BY 3RD PARTY INSPECTORS. THE MI IS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS; IN ACCORDANCE WITH APPLICABLE CROWN STANDARDS; AND AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

NO DOCUMENT, CODE OR POLICY CAN ANTICIPATE EVERY SITUATION THAT MAY ARISE. ACCORDINGLY, THIS CHECKLIST IS INTENDED TO SERVE AS A SOURCE OF GUIDING PRINCIPLES IN ESTABLISHING GUIDELINES FOR MODIFICATION INSPECTION.

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, AND THE MI INSPECTOR DOES NOT TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES. THE MI INSPECTOR SHALL INSPECT AND NOTE CONFORMANCE/NONCONFORMANCE AND PROVIDE TO THE CROWN POINT OF CONTACT (CROWN POC) FOR EVALUATION.

ALL MI'S SHALL BE CONDUCTED BY A CROWN APPROVED MI INSPECTOR, WORKING FOR A CROWN APPROVED MI VENDOR. SEE CROWN CED-LST-10173, "APPROVED MI VENDORS".

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER (PO) IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN THE GC AND/OR INSPECTOR SHALL CONTACT THE CROWN POINT OF CONTACT (POC).

REFER TO CROWN CED-SOW-10007, "MODIFICATION INSPECTION SOW", FOR FURTHER DETAILS AND REQUIREMENTS.

SERVICE LEVEL COMMITMENT

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:

- THE GC SHALL PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY MINOR DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN ONLY FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO CROWN DOCUMENT # CED-SOW-10007.

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED
PROFESSIONAL ENGINEER

OCT 17 2018

REV	DATE	DESCRIPTION

PJF PAUL J. FORD & COMPANY
250 E Broad St. Ste 600 · Columbus, OH 43215
Phone 614.221.6679
www.pauljford.com

CROWN CASTLE
3530 TORINGDON WAY SUITE 300 CHARLOTTE, NC 28277
PH: (724) 416-2000

BU #876329; MTN VIEW CEM (FILLEY PARK)
BLOOMFIELD, CONNECTICUT
MODIFIED 120'-0" MONOPOLE

PROJECT No:	37518-2442.004.7700
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DATE:	10-10-2018

MI CHECKLIST

MI-1

V1.0 37518-2442.004.DWG

1. GENERAL NOTES
   - 1.1. THE MONOPOLE STRUCTURE IN ITS EXISTING CONDITION DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE PROPOSED AND EXISTING LOADS FROM THE ATTACHED STRUCTURAL MODIFICATION REPORT AT THE REQUIRED MINIMUM WIND SPEEDS. DO NOT INSTALL ANY NEW LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
   - 1.2. THESE DRAWINGS WERE PREPARED FROM INFORMATION PROVIDED BY CROWN CASTLE. THE INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY THE ENGINEER OF RECORD (EOR) FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT DRAWINGS AND THEIR FIELD VERIFIED CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO THE EOR AND CROWN CASTLE BEFORE PROCEEDING WITH THE WORK. ANY WORK PERFORMED WITHOUT A PREFABRICATION MAPPING IS DONE AT THE RISK OF THE GENERAL CONTRACTOR AND/OR THE FABRICATOR
   - 1.3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
   - 1.4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN SUCCESSFULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
   - 1.5. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN STANDARD CED-STD-10253 INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH THE ANSI/TIA-322 (LATEST EDITION).
   - 1.6. OBSERVATION VISITS TO THE SITE BY CROWN CASTLE AND/OR THE EOR SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES. ANY SUPPORT SERVICES PERFORMED BY THE EOR DURING CONSTRUCTION ARE SOLELY FOR THE PURPOSE OF ACHIEVING GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE THE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
   - 1.7. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY CROWN CASTLE AND EOR PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
   - 1.8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
   - 1.9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
   - 1.10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED AND RELOCATED, REPLACED, OR RE-INSTALLED AS REQUIRED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH CROWN CASTLE, TESTING AGENCY, AND EOR.
   - 1.11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS.
   - 1.12. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE YOUR CROWN POC. ALL ALTERATIONS TO A SAFETY CLIMB'S ORIGINAL MANUFACTURER'S CONFIGURATION MUST BE DESIGNED BY THE ENGINEER OF RECORD. IF THE GENERAL CONTRACTOR FINDS THAT THE CLIMBING FACILITIES ARE IMPEDED, EITHER DURING BIDDING, DURING PRE-FABRICATION MAPPING, OR WHILE ON-SITE, THE GENERAL CONTRACTOR SHALL CONTACT THE CROWN POC TO DETERMINE A METHOD OF RESOLUTION.
   - 1.13. FOR STANDARD CROWN PARTS SEE THE MOST RECENT VERSION OF THE "CCI APPROVED REINFORCEMENT COMPONENTS" CATALOG.
   - 1.14. ALL SOLUTIONS FOR THE REPLACEMENT, RELOCATION OR MODIFICATION OF THE SAFETY CLIMB AND/OR ANY OF THE MONOPOLE CLIMBING FACILITIES SHALL BE COORDINATED WITH TUF-TUG PRODUCTS. CONTACT DETAILS: 3434 ENCRETE LANE, MORAINE, OHIO 45439 PHONE: 937-299-1213 EMAIL: TUFTUG@AOL.COM

2. STRUCTURAL STEEL
   - 2.1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
     - 2.1.1. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
       - 2.1.1.1. "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS."
       - 2.1.1.2. "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS.
       - 2.1.1.3. "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"
     - 2.1.2. BY THE AMERICAN WELDING SOCIETY (AWS):
       - 2.1.2.1. "STRUCTURAL WELDING CODE - STEEL D1.1."
       - 2.1.2.2. "STANDARD SYMBOLS FOR WELDING, BRAZING, AND NONDESTRUCTIVE EXAMINATION"
   - 2.2. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM HIGH STRENGTH BOLTS', DEC. 31, 2009.
   - 2.3. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
   - 2.4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
   - 2.5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO CROWN CASTLE'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
   - 2.6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65(FY = 65 KSI MIN) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
   - 2.7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
   - 2.8. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
   - 2.9. FIELD CUTTING OF STEEL:
     - 2.9.1. IMPORTANT CUTTING AND WELDING SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING SAFETY PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT". ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
     - 2.9.2. ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. CONTRACTOR TO AVOID 90 DEGREE CORNERS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS.

3. TOUCH UP OF GALVANIZING
   - 3.1. THE CONTRACTOR SHALL TOUCH UP ANY AND ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
   - 3.2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. CROWN CASTLE'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
   - 3.3. CROWN CASTLE'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE ADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

4. HOT-DIP GALVANIZING
   - 4.1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
   - 4.2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES WITH EOR APPROVAL OF LOCATIONS.
   - 4.3. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

5. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER
   - 5.1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY CROWN CASTLE, CROWN CASTLE WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
   - 5.2. ANY FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE EXISTING GALVANIZED STEEL POLE STRUCTURE AND THE WELDED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT CROWN CASTLE REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.
   - 5.3. CROWN CASTLE SHALL REFER TO ANSI/TIA-222-G-2-2009, SECTION 14 AND ANNEX J FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY CROWN CASTLE BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. THE EOR RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT. ACCORDING TO ANSI/TIA-222-G-2-2009 SECTION 14.2: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

6. FIELD NDE MINIMUM REQUIREMENTS
   - 6.1. ALL NDE SHALL BE IN ACCORDANCE WITH AWS D1.1.
   - 6.2. FOR NEW BASE STIFFENERS (INCLUSIVE OF TRANSITION STIFFENERS) AND ANCHOR ROD BRACKETS, COMPLETE JOINT PENETRATION WELDS SHALL BE 100% INSPECTED BY UT. ALL PARTIAL JOINT PENETRATION AND FILLET WELDS SHALL BE 100% INSPECTED BY MT.
   - 6.3. FOR NEW FLAT PLATE REINFORCEMENT AT THE BASE OF THE TOWER, COMPLETE JOINT PENETRATION WELDS SHALL BE 100% INSPECTED BY UT. ALL PARTIAL JOINT PENETRATION AND FILLET WELDS SHALL BE 100% INSPECTED BY MT, BUT MAY BE LIMITED TO A HEIGHT OF 10'-0".
   - 6.4. FOR NDE OF THE EXISTING BASE PLATE CIRCUMFERENTIAL WELD, GC SHALL REFERENCE THE MI CHECKLIST FOR APPLICABILITY. PLEASE SEE ENG-SOW-10033: 'TOWER BASE PLATE NDE, AND ENG-BUL-10051: 'NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE'. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING MODIFICATIONS THAT HAVE BEEN WELDED TO THE BASE PLATE.
   - 6.5. ALL TESTING LIMITATIONS SHALL BE DETAILED IN THE NDE REPORT.

7. FOUNDATION WORK - (NOT REQUIRED

8. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)

9. EPOXY GROUTED REINFORCING ANCHOR RODS
   - 9.1. UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 150 KSI ALL-THREAD BARS CONFORMING TO ASTM A722. RECOMMENDED MANUFACTURERS/SUPPLIERS OF 150 KSI ALL-THREAD BARS ARE WILLIAMS FORM ENGINEERING CORPORATION AND DYWIDAG SYSTEMS INTERNATIONAL.
   - 9.2. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A123.
   - 9.3. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
   - 9.4. ALLFASTENER AF35LVE EPOXY SHALL BE USED TO ANCHOR THE BAR IN THE DRILL HOLES UNLESS OTHERWISE NOTED. IF THE DESIGNED EMBEDMENT IS GREATER THAN 12 FT, CONTRACTOR HAS THE OPTION TO USE PILE ANCHOR GROUT BY E-CHEM AS AN ALTERNATE. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO THE EOR FOR REVIEW PRIOR TO CONSTRUCTION.
   - 9.5. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHORS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PRC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING SHEETS FOR SPECIFIED ANCHOR ROD TARGET TENSION LOAD.
   - 9.6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED THE CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.
   - 9.7. TAKE ALL MEASUREMENTS NECESSARY TO AVOID DAMAGING EXISTING REINFORCING BARS DURING CORING OPERATIONS. NOTIFY ENGINEER OF RECORD IMMEDIATELY IF EXISTING REINFORCING BARS ARE ENCOUNTERED AND INTERFERE WITH PLACEMENT OF NEW ANCHORS. MINOR ADJUSTMENT TO PROPOSED LOCATION OF NEW ANCHORS MAY BE REQUIRED.
   - 9.8. IF BASE PLATE GROUT REMOVAL IS REQUIRED FOR ANCHOR ROD INSTALLATION SEE ENG-PRC-10012; "BASE PLATE GROUT REPAIR' FOR PROCEDURES AND RECOMMENDED MANUFACTURERS. CONTRACTOR TO DETERMINE THE QUANTITY REQUIRED.
   - 9.9. HILTI HIT-HY 200 SHALL BE USED FOR ALL HORIZONTAL DOWEL UNLESS OTHERWISE NOTED.
   - 9.10. HILTI RE-500 V3 EPOXY SHALL BE USED FOR ANCHORS WITH DIAMETERS LESS THAN 1 1/2 INCHES AND ALL VERTICAL DOWELS UNLESS OTHERWISE NOTED.

10. BASE PLATE GROUT REMOVAL
    - 10.1. THE GC SHALL BEGIN THIS PROCEDURE AS EARLY AS POSSIBLE DURING THE MODIFICATION PROCESS SO THAT IF ISSUES ARISE, THEY CAN BE RESOLVED WITHIN THE ANTICIPATED MODIFICATION TIMELINE.
    - 10.2. IF ANY DETERIORATED GROUT EXISTS, BEGIN AT THIS LOCATION. REMOVE DETERIORATED GROUT AND THE GROUT AROUND THE NEAREST ONE OR TWO ANCHOR RODS TO FULLY EXPOSE THE LEVELING NUT. IF THE GC DISCOVERS THAT A HALF NUT OR JAM NUT WAS USED AS A LEVELING NUT, OR IF NO LEVELING NUT IS PRESENT, IMMEDIATELY CONTACT CED AND THE CROWN POC (TYPICALLY THE MOD PM) FOR A RESOLUTION. DO NOT REMOVE ANY ADDITIONAL GROUT UNTIL DIRECTED TO BY CROWN.
    - 10.3. OTHERWISE, CHECK THE LEVELING NUT FOR TIGHTNESS IN ACCORDANCE WITH SECTION 1.3.2.3 OF ENG-PRC-10012 "BASE PLATE GROUT REPAIR". IF SEVERE CORROSION / MATERIAL LOSS IS FOUND OR CORROSION EXISTS TO THE POINT WHERE THE LEVELING NUT IS UNABLE TO BE TIGHTENED WHEN OBVIOUSLY LOOSE, IMMEDIATELY NOTIFY THE CROWN POC (TYPICALLY THE MOD PM). REFERENCE ENG-BUL-10114 "RUST CLASSIFICATION" FOR EXAMPLES OF MATERIAL LOSS. DO NOT REMOVE ANY ADDITIONAL GROUT UNTIL DIRECTED TO BY CROWN.
    - 10.4. IN THE EVENT THAT SEVERE CORROSION IS NOT ENCOUNTERED, AND BEING SURE TO CHECK EACH ANCHOR ROD FOR CORROSION PER ENG-BUL-10114 "RUST CLASSIFICATION", REMOVE ALL EXISTING BASEPLATE GROUT WHILE CHECKING EACH LEVELING NUT FOR TIGHTNESS IN ACCORDANCE WITH SECTION 1.3.2.3 OF ENG-PRC-10012 "BASE PLATE GROUT REPAIR".
    - 10.5. CONSISTENT WITH SECTION 1.3.2.4 OF ENG-PRC-10012 "BASE PLATE GROUT REPAIR", HAND TOOL CLEAN TO SSPC-SP2 AND SOLVENT CLEAN TO SSPC-SP1, ALL EXPOSED STRUCTURAL STEEL ELEMENTS, INCLUDING ANCHOR RODS, LEVELING NUTS, AND UNDERSIDE OF BASE PLATE TO THE GREATEST EXTENT POSSIBLE. ENSURE THAT ALL OLD GROUT IS REMOVED TO ALLOW COLD GALVANIZING TO ADHERE TO THE STEEL.
    - 10.6. APPLY BY BRUSH TWO COATS OF A CROWN-APPROVED COLD-GALVANIZING COMPOUND TO ALL EXPOSED STRUCTURAL STEEL ELEMENTS BENEATH THE BASE PLATE, AND ALLOW CURING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. A LIST OF CROWN-APPROVED DIRECT APPLICATION COLD-GALVANIZING COMPOUNDS CAN BE FOUND IN ENG-STD-10149 "TOWER PROTECTIVE COATINGS GUIDELINES" SECTION 2.1.1.

11. BASE PLATE GROUT - (NOT REQUIRED)

STATE OF CONNECTICUT
JOSEPH PACHICARAN JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

OCT 17 2018

REV	DATE	DESCRIPTION

PJF PAUL J. FORD & COMPANY
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Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
3530 TORINGDON WAY SUITE 300 CHARLOTTE, NC 28277
PH: (724) 416-2000

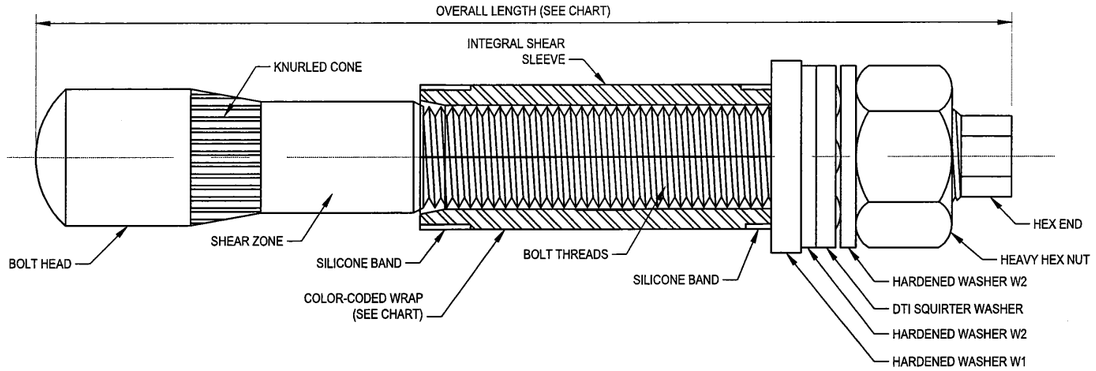
BU #876329; MTN VIEW CEM (FILLEY PARK)
BLOOMFIELD, CONNECTICUT
MODIFIED 120'-0" MONOPOLE

PROJECT No:	37518-2442.004.7700
DRAWN BY:	FE
DESIGNED BY:	GP
CHECKED BY:	KAT/BKK
DATE:	10-10-2018

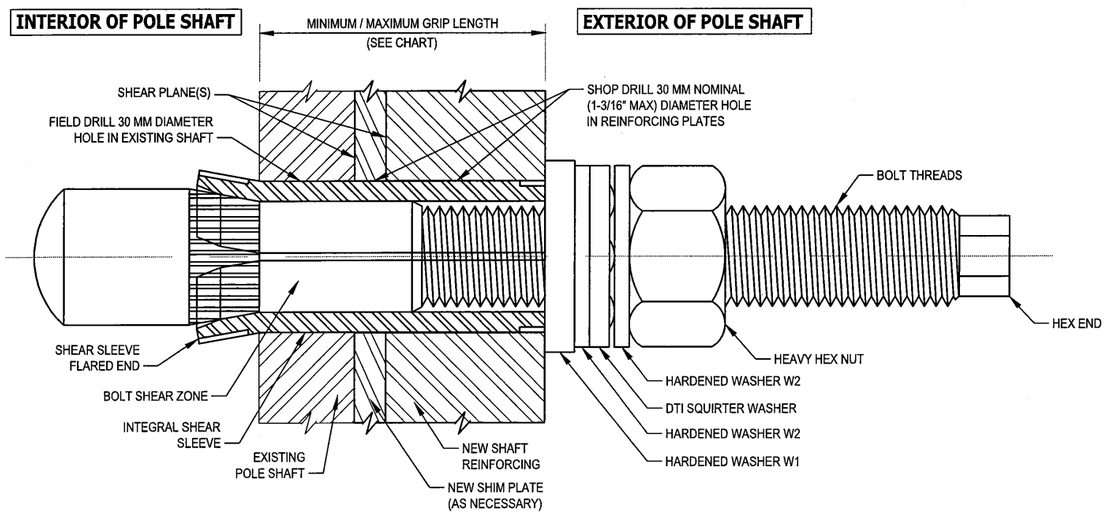
GENERAL NOTES

N-1

V1.0 37518-2442.004.DWG



PRE-INSTALLED FORGBolt® ASSEMBLY DETAIL 1 / B-1



INSTALLED FORGBolt® ASSEMBLY DETAIL 2 / B-1

FORGBolt®		AISC Group A Material: ASTM A325 and PC8.8 (Tensile Stress, Fu = 120 ksi minimum)					
GROUP A		FORGBolt® Size (mm)	Overall Length (inches)	Estimated Weight Each (lbs)	Grip Range (inch)	Comment	Color Code
FORGBolt® A325 - PC8.8	1	135	5.31	1.3	3/8" to 1"	--	RED
	2	160	6.30	1.6	3/4" to 1-1/2"	--	GREEN
	3	195	7.68	1.9	1-1/4" to 2-1/4"	--	BLUE
	4	260	10.24	2.6	2" to 3-1/2"	Splice Bolt	YELLOW
	5	365	14.37	3.6	3-1/2" to 5-1/2"	Flange Jump Bolt	ORANGE
	6	440	17.32	4.3	5-1/2" to 8-1/2"	Flange Jump Bolt	BLACK
DTI Note		Each Group A (A325/PC8.8) FORGBolt® assembly shall have a 'Squirter' DTI that is compatible with a M20-PC8.8 bolt.					

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

INSTALLATION NOTES:
1. FIELD DRILL HOLES TO 30 MM DIAMETER.
2. SELECT CORRECT BOLT SIZE FOR INSTALLATION GRIP (REFER TO PLANS).
3. INSERT BOLT ASSEMBLY THROUGH HOLES IN SHAFT REINFORCING PLATES AND SEAT THE HARDENED WASHER W1 FLUSH AGAINST OUTSIDE OF PLATE.
4. HAND TIGHTEN NUT TO FINGER TIGHT.
5. TIGHTEN NUT TO PRETENSIONED CONDITION AND UNTIL DTI SHOWS PROPER INDICATION.
6. PROPERLY DOCUMENT AND INSPECT BOLT TIGHTENING PER PLAN REQUIREMENTS.

BOLT HOLE NOTES:
1. ALL SHOP-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM SHOP-DRILLED HOLE DIAMETER PERMITTED IS 1-3/16".
2. ALL FIELD-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM FIELD-DRILLED HOLE DIAMETER PERMITTED IS 30 MM.

BOLT TIGHTENING AND INSPECTION NOTES:
1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

AISC GROUP A MATERIAL: ASTM A325 AND PC8.8
(Fu = 120 KSI MIN TENSILE STRESS)

CONTAINS PROPRIETARY INFORMATION
U.S. PATENT NUMBER 9,562,558 B2

DISTRIBUTOR CONTACT:
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FORGBolt® DETAILS

B-1

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FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

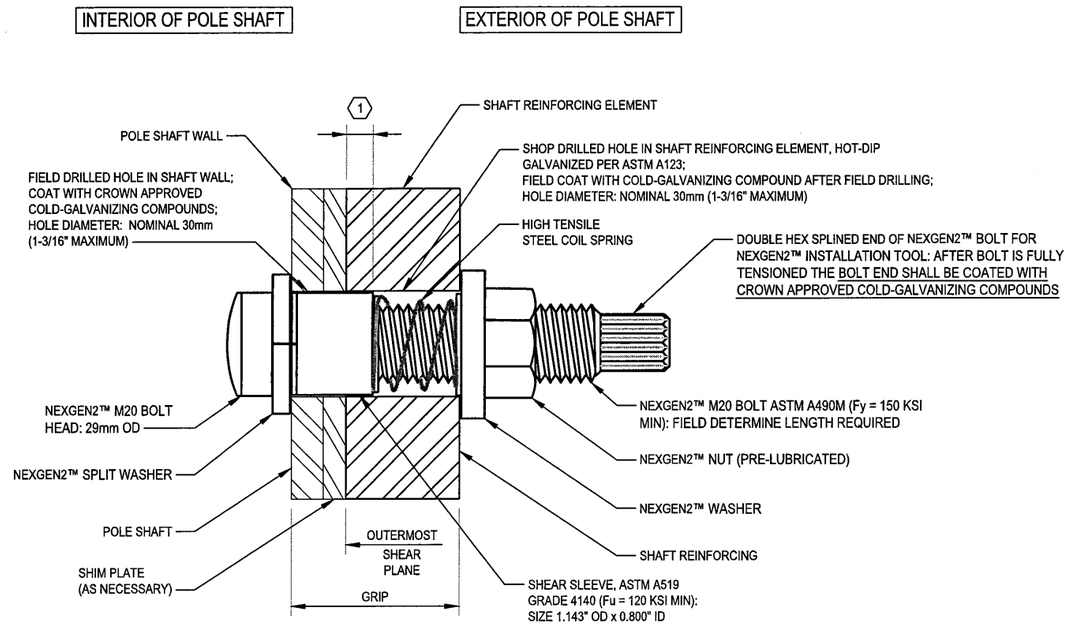
BOLT HOLE NOTES:

1. ALL SHOP-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM SHOP-DRILLED HOLE DIAMETER PERMITTED IS 1-3/16".
2. ALL FIELD-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM FIELD-DRILLED HOLE DIAMETER PERMITTED IS 30 MM.

BOLT TIGHTENING AND INSPECTION NOTES:

1. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF SECTION 8.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. PER SECTION 8.2.3: ALL FASTENER ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN AISC SECTION 8.1 WITHOUT SEVERING THE SPLINED END AND WITH WASHERS POSITIONED AS REQUIRED IN AISC SECTION 6.2. PER REQUIREMENTS IN SECTION 8.1: PRIOR TO BOLT PRETENSIONING, THE JOINT SHALL FIRST BE COMPACTED TO THE SNUG-TIGHT CONDITION. SNUG TIGHT IS THE CONDITION THAT EXISTS WHEN ALL OF THE PLIES IN THE CONNECTION HAVE BEEN PULLED INTO FIRM CONTACT BY THE BOLTS AND THE BOLTS HAVE BEEN TIGHTENED SUFFICIENTLY TO PREVENT THE REMOVAL OF THE NUTS WITHOUT THE USE OF A WRENCH. ONCE THE SNUG TIGHT CONDITION IS ACHIEVED, THEN THE BOLT ASSEMBLY CAN BE TIGHTENED TO THE PRETENSIONED CONDITION.
2. ALL NEXGEN2™ BOLT ASSEMBLIES SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF SECTION 9.2.3 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. NOTE THAT COMPLETE INSPECTION OF ALL NEXGEN2™ BOLT ASSEMBLIES IS REQUIRED IN ADDITION TO ROUTINE OBSERVATION.
3. ALL NEXGEN2™ BOLTS SHALL BE INSPECTED BY A QUALIFIED BOLT INSPECTOR PER NOTES 1 AND 2, ABOVE. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE NEXGEN2™ BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THAT THE DOUBLE HEX SPLINED END OF THE BOLTS HAVE BEEN TWISTED OFF AND COATED WITH CROWN APPROVED COLD-GALVANIZING COMPOUND..

(1) NOTE: SHEAR SLEEVE LENGTH: THE SHEAR SLEEVE SHALL PROJECT A MINIMUM OF 3/8" BEYOND THE OUTERMOST SHEAR PLANE. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS SHOWING NEXGEN2™ BOLT LENGTHS AND SHEAR SLEEVE LENGTHS TO THE EOR FOR REVIEW AND APPROVAL.



TYPICAL NEXGEN2™ BOLT DETAIL (1) B-2

PART NUMBER	BOLT LENGTH	SLEEVE LENGTH	MIN GRIP RANGE	MAX GRIP RANGE
2NG2032	M20x75	1/2"	5/8"	1 3/8"
2NG2036	M20x95	11/16"	15/16"	1 7/16"
2NG2048	M20x95	1 3/16"	1 7/16"	1 7/8"
2NG2057	M20x95	1 5/8"	1 7/8"	2 1/4"
2NG2068	M20x135	2"	2 1/4"	2 11/16"
2NG2096	M20x135	2 7/16"	2 11/16"	3 3/4"
2NG2127	M20x175	3"	3 3/4"	5"
2NG2212	M20x250	4"	5"	8 5/16"

NOTE: NEXGEN2™ BOLT ASSEMBLY SHALL BE MAGNI 565 COATED PER ASTM F2833 AND MANUFACTURER SPECIFICATIONS.

NOTE: INSTALL NEXGEN2™ BOLT ASSEMBLY PER MANUFACTURER'S INSTRUCTIONS.

DISTRIBUTOR CONTACT DETAILS:
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959 LAKE ROAD
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FAX 440-232-6062
WEBSITES: WWW.ALLFASTENERS.COM
WWW.AFTOWER.COM

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
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NEXGEN2™ BOLT DETAIL

B-2

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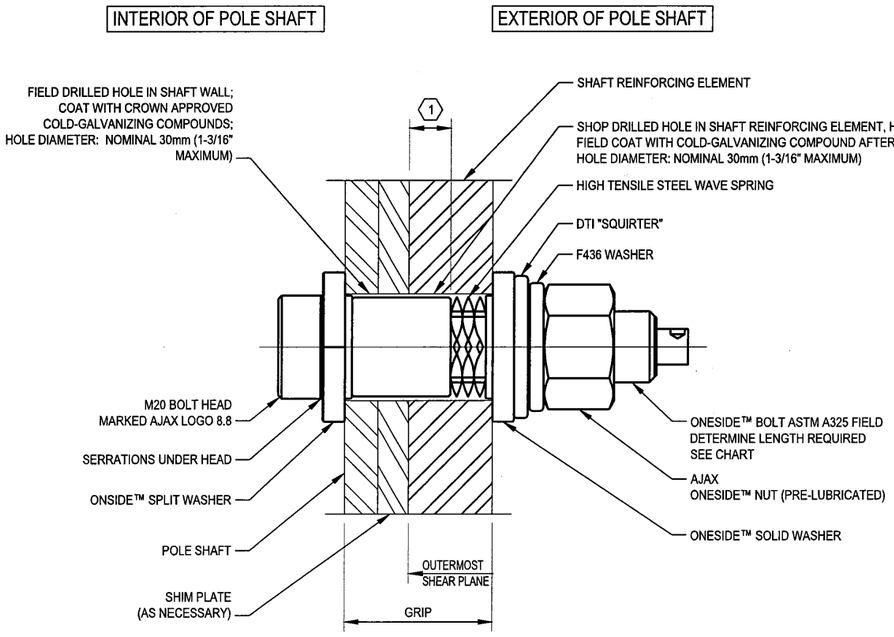
(1) NOTE: SHEAR SLEEVE LENGTH: THE SHEAR SLEEVE SHALL PROJECT A MINIMUM OF 3/8" BEYOND THE OUTERMOST SHEAR PLANE. THE CONTRACTOR SHALL SUBMIT FABRICATION DRAWINGS SHOWING AJAX ONESIDE™ BOLT LENGTHS AND SHEAR SLEEVE LENGTHS TO THE EOR FOR REVIEW AND APPROVAL.



TYPICAL AJAX ONESIDE™ BOLT DETAIL 1 / B-3

FOLLOW ALL MANUFACTURER / DISTRIBUTOR RECOMMENDATIONS FOR INSTALLATION, TIGHTENING, AND INSPECTION

BOLT HOLE NOTES:

1. ALL SHOP-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM SHOP-DRILLED HOLE DIAMETER PERMITTED IS 1-3/16".
2. ALL FIELD-DRILLED HOLES SHALL BE NOMINAL 30 MM DIAMETER. THE MAXIMUM FIELD-DRILLED HOLE DIAMETER PERMITTED IS 30 MM.

BOLT TIGHTENING AND INSPECTION NOTES:

1. ALL AJAX ONESIDE™ BOLT ASSEMBLIES SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF SECTION 8.2.4 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. PER SECTION 8.2.4: ALL FASTENER ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN AISC SECTION 8.1 WITH WASHERS POSITIONED AS REQUIRED IN AISC SECTION 6.2. PER REQUIREMENTS IN SECTION 8.1: PRIOR TO BOLT PRETENSIONING, THE JOINT SHALL FIRST BE COMPACTED TO THE SNUG-TIGHT CONDITION. SNUG TIGHT IS THE CONDITION THAT EXISTS WHEN ALL OF THE PLIES IN THE CONNECTION HAVE BEEN PULLED INTO FIRM CONTACT BY THE BOLTS AND THE BOLTS HAVE BEEN TIGHTENED SUFFICIENTLY TO PREVENT THE REMOVAL OF THE NUTS WITHOUT THE USE OF A WRENCH. ONCE THE SNUG TIGHT CONDITION IS ACHIEVED, THEN THE BOLT ASSEMBLY CAN BE TIGHTENED TO THE PRETENSIONED CONDITION.
2. ALL AJAX ONESIDE™ BOLT ASSEMBLIES SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF SECTION 9.2.4 OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009. NOTE THAT COMPLETE INSPECTION OF ALL AJAX ONESIDE™ BOLT ASSEMBLIES IS REQUIRED IN ADDITION TO ROUTINE OBSERVATION.
3. ALL AJAX ONESIDE™ BOLTS SHALL BE INSPECTED BY A QUALIFIED BOLT INSPECTOR PER NOTES 1 AND 2, ABOVE. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX ONESIDE™ BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THAT THE DIRECT TENSION INDICATOR WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED.
4. A MINIMUM OF 4 OUT OF 5 SQUIRTER® DTI PROTRUSIONS SHALL BE ENGAGED IN ANY AJAX ONESIDE™/DTI BOLT ASSEMBLY IN THE REINFORCING MEMBERS. A FEELER GAGE MAY BE USED TO VERIFY PROTRUSION COMPRESSION.
5. INSPECTIONS SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS AND CROWN DOCUMENT ENG-SOW-10007: *MODIFICATION INSPECTION SOW*.

BOLT ASSEMBLY AND INSTALLATION:

1. BOLT MUST BE PURCHASED PRE-ASSEMBLED.
2. FOLLOW BOLT AND DTI MANUFACTURERS INSTRUCTIONS FOR INSTALLATION.

AJAX ONESIDE™ BOLT DETAIL

CODE	SIZE	COLOR	SLEEVE LENGTH	GRIP	GRIP IMP
OSBA20.65-6	M20 x 65	ORANGE	6.0 (0.236")	12.5 / 20.0	0.500" / 0.787"
OSBA20.95-14	M20 x 95	BLACK	14.0 (0.551")	20.0 / 32.0	0.787" / 1.259"
OSBA20.95-22	M20 x 95	GREEN	22.0 (0.866")	30.0 / 50.0	1.181" / 1.968"
OSBA20.95-30	M20 x 95	YELLOW	30.0 (1.181")	40.5 / 50.0	1.595" / 1.968"
OSBA20.135-39	M20 x 135	BLUE	39.0 (1.535")	49.0 / 77.0	1.929" / 3.031"
OSBA20.135-48	M20 x 135	BROWN	48.0 (1.889")	60.5 / 77.0	2.375" / 3.031"
OSBA20.135-57	M20 x 135	PURPLE	57.0 (2.244")	67.0 / 90.0	2.637" / 3.543"
OSBA20.165-76	M20 x 165	RED	76.0 (3.000")	87.0 / 120.0	3.425" / 4.724"
OSBA20.250	M20 x 250	SILVER	MTO	121.0 / 211.0	4.724" / 8.310"

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SALES + TECH: ONESIDE@AJAXFAST.COM.AU

STATE OF CONNECTICUT
JOSEPH PACHICAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

OCT 17 2018

REV	DATE	DESCRIPTION

PJF PAUL J. FORD & COMPANY
250 E Broad St. Ste 600 · Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
3530 TORINGDON WAY SUITE 300 CHARLOTTE, NC 28277
PH: (724) 416-2000

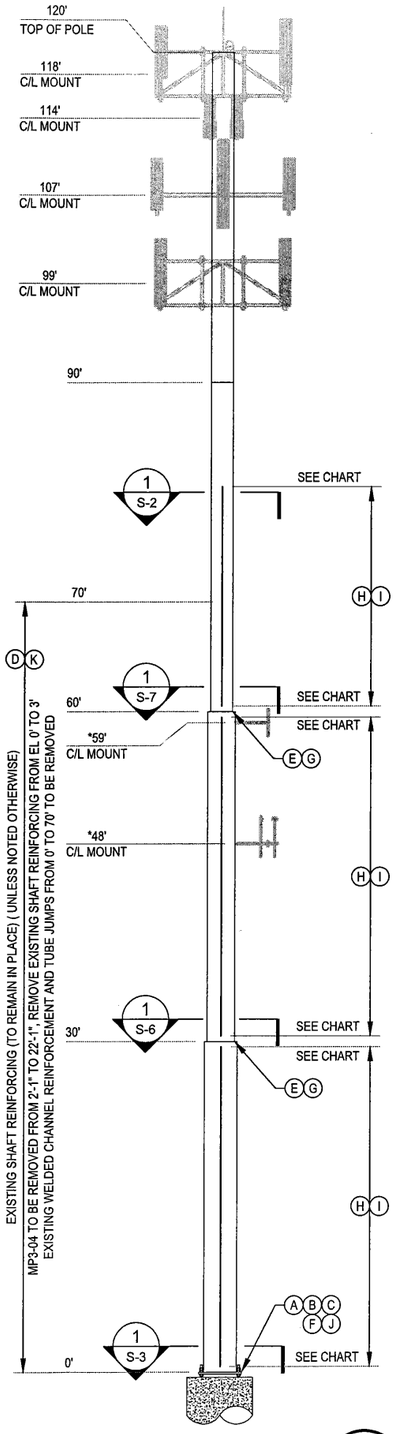
BU #876329; MTN VIEW CEM (FILLEY PARK)
BLOOMFIELD, CONNECTICUT
MODIFIED 120'-0" MONOPOLE

PROJECT No:	37518-2442.004.7700
DRAWN BY:	FE
DESIGNED BY:	GP
CHECKED BY:	KAT/BKK
DATE:	10-10-2018

AJAX ONESIDE™ BOLT DETAIL

B-3

V1.0 37518-2442.004.DWG



POLE ELEVATION 1 / S-1

TOWER MODIFICATION SCHEDULE

	ELEVATION	TOWER MODIFICATION DESCRIPTION	REFERENCE SHEETS
A	0'	REMOVE EXISTING BASE PLATE GROUT. SEE BASE PLATE GROUT REMOVAL NOTES	N-1, S-4, S-5
B	0'	REMOVE EXISTING POST INSTALLED ANCHOR RODS AND BRACKETS	S-3
C	0'	INSTALL TRANSITION STIFFENERS AT THE BASE	S-3 & S-5
D	0' TO 70'	REMOVE EXISTING SHAFT REINFORCING AS NECESSARY	S-3
E	30' & 60'	REMOVE EXISTING TUBE JUMPS	S-6
F	0'	INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE	S-3 & S-4
G	30' & 60'	INSTALL NEW WELDED FLANGE BRIDGE STIFFENERS	S-6 & S-7
H	0'-6" TO 29'-6", 30'-6" TO 59'-6" & 60'-6" TO 80'-6"	INSTALL NEW SHAFT REINFORCING	S-1 & S-2
I	0'-6" TO 29'-6", 30'-6" TO 59'-6" & 60'-6" TO 80'-6"	REMOVE AND REPLACE STEP BOLTS AS REQUIRED FOR INSTALLATION OF NEW SHAFT REINFORCING. SEE CROWN DOCUMENT CED-CAT-10300 FOR STEP BOLT ATTACHMENT DETAILS.	S-1 & S-2
J	-	** CONTRACTOR TO POST SIGNAGE INDICATING OBSTRUCTED CLIMBING FACILITIES	S-1
K	0' TO 70'	AFTER REMOVAL OF EXISTING REINFORCING, INSPECT POLE SHAFT FOR DAMAGE AND CONFIRM THERE HAS BEEN NO SECTION LOSS DUE TO EXISTING POOR WELDS.	S-1

** CONTRACTOR NOTE: REFER TO THE OBSTRUCTION CLIMBING FACILITIES SIGNAGE SHEET OF CROWN DOCUMENT CAT-CED-10300 FOR INFORMATION REGARDING OBSTRUCTION SIGNAGE.

* EXISTING MOUNTS MAY NEED TO BE ADJUSTED, MOVED AND/OR TEMPORARILY SUPPORTED DURING THE INSTALLATION OF SHAFT REINFORCING

MANUFACTURER POLE SPECIFICATIONS

TAPER	NA
BASE PLATE STEEL	ASTM A36 GRADE 36 (36 KSI)
ANCHOR RODS	1 1/2"ø ASTM A354 GRADE BC
FLANGE PLATE STEEL	ASTM A36
FLANGE BOLTS	1" & 1 1/2"ø A325

SHAFT SECTION DATA

SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (FT)	DIAMETER ACROSS FLATS (IN) @ TOP	DIAMETER ACROSS FLATS (IN) @ BOTTOM	POLE GRADE (ksi)	POLE SHAPE
1	30.00	0.2500		24.000	24.000	42	ROUND
2	30.00	0.3750		24.000	24.000	42	ROUND
3	30.00	0.3750		30.000	30.000	42	ROUND
4	30.00	0.3750		36.000	36.000	42	ROUND

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

PRIOR TO FABRICATION AND INSTALLATION CONTRACTOR SHALL VERIFY ALL LENGTHS AND QUANTITIES GIVEN. LENGTH AND QUANTITIES PROVIDED ARE FOR QUOTING PURPOSES ONLY AND SHALL NOT BE USED FOR FABRICATION.

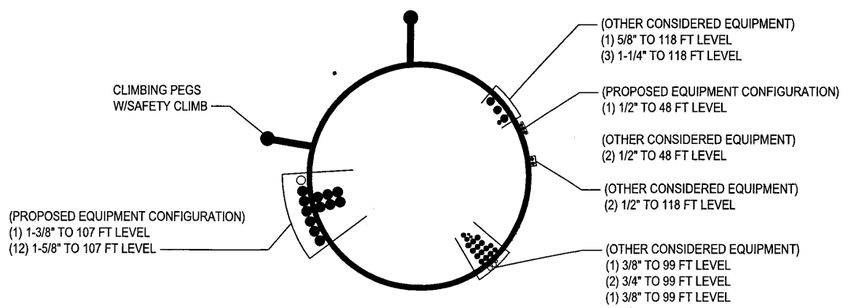
NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE

BOTTOM ELEVATION	TOP ELEVATION	ELEMENT	FLAT # / DEGREE SEPARATION	ELEMENT LENGTH	ELEMENT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	APPROXIMATE BOLTS PER ELEMENT	STEEL WEIGHT PER PLATE	APPROXIMATE TOTAL BOLT QUANTITY	ESTIMATED TOTAL STEEL WEIGHT	NOTES
0' - 6"	23' - 6"	CFP-06010023 #1	60, 150, 240 & 330	23' - 0"	4	0	8	16"	19	470 LBS.	38	1880 LBS.	SHAFT REINFORCING
0' - 6"	29' - 6"	CFP-06512529 #3	30, 120, 210 & 300	29' - 0"	4	0	11	19"	23	802 LBS.	92	3208 LBS.	SHAFT REINFORCING
30' - 6"	59' - 6"	CFP-06010029 #4	30, 120, 210 & 300	29' - 0"	4	8	8	16"	34	592 LBS.	136	2368 LBS.	SHAFT REINFORCING
60' - 6"	80' - 6"	CCI-SFP-06010020	30, 120, 210 & 300	20' - 0"	4	8	8	16"	27	408 LBS.	108	1632 LBS.	SHAFT REINFORCING
											336	9088 LBS.	

NOTES:

1.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC -RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
2.) ALL REINFORCING SHALL BE ASTM A572 GR. 65.
3.) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
4.) HOLES FOR BOLTS ARE 30mm UNLESS NOTED OTHERWISE.
5.) ALL SHIMS SHALL BE ASTM A-36.
6.) ALL HOLES ARE TO BE DRILLED, DO NOT BURN OR PUNCH.
7.) FOR PLATES STARTING AT 6", THE BOTTOM OF THE FLAT PLATE SHALL BEGIN AT 6" ± 1". FOR SINGLE PLATES OR MULTIPLE PLATES SPLICED TOGETHER, THE BOTTOM OF THE FLAT PLATE SHALL BEGIN AT THE PROPOSED ELEVATION ± 3". FOR MULTIPLE PLATES SPLICED TOGETHER, THE TOP OF THE FLAT PLATE IS TO BE PLACED SUCH THAT THERE IS NO MORE THAN 3" DIFFERENCE BETWEEN THE ACTUAL OVERALL LENGTH OF THE SPAN AND THE PROPOSED OVERALL LENGTH OF THE SPAN, FROM THE BOTTOM OF THE PLATE

* FOR JUMP PLATES, TERMINATION BOLTS LISTED ARE INCLUDED IN TERMINATION BOLTS FOR SHAFT REINFORCING



COAX LAYOUT 2 / S-1

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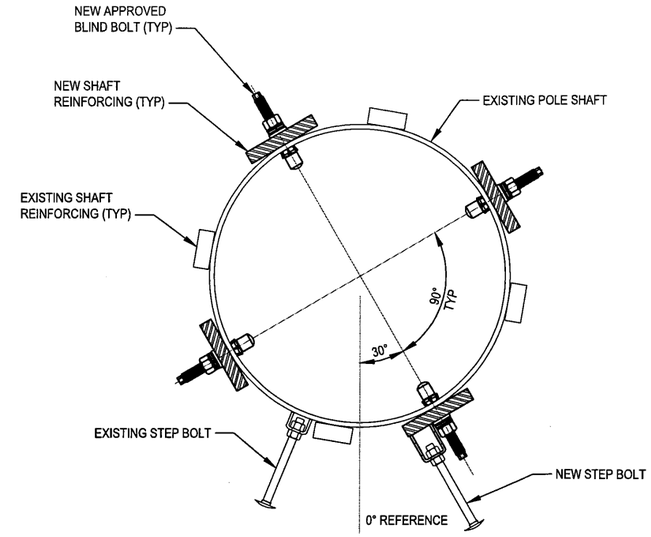
MONOPOLE PROFILE

S-1

CROWN CASTLE US PATENT NOS 8,046,972; 8,156,712; 7,849,659; 8,424,269 AND PATENT PENDING

REV	DATE	DESCRIPTION

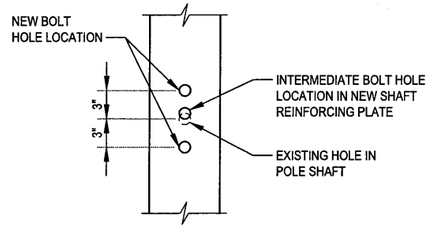
V1.0 37518-2442.004.DWG



SECTION 1 / S-2

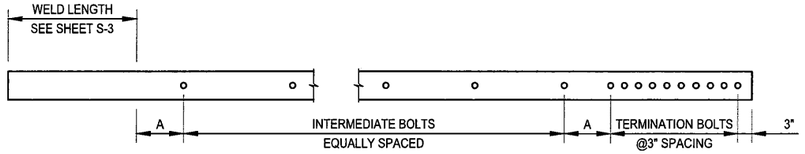
EL 80'

NOTE:
EXISTING STEP BOLTS AND STEP BOLT CLIPS THAT ARE REMOVED SHALL NOT BE REUSED



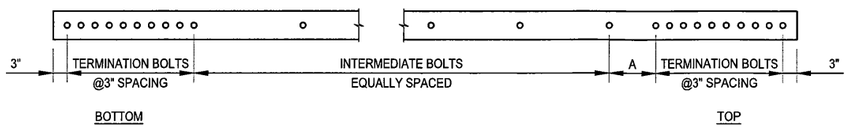
INTERMEDIATE BOLT HOLE FIX 2 / S-2

SCALE: NTS



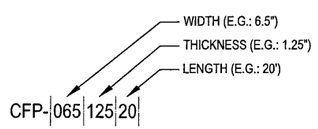
CUSTOM WELDED FLAT PLATE DETAIL

NOTE: "A" DIMENSION MAY VARY,
NOT TO EXCEED MAXIMUM
INTERMEDIATE BOLT SPACING



CUSTOM BOLTED FLAT PLATE DETAIL

NOTE: "A" DIMENSION MAY VARY,
NOT TO EXCEED MAXIMUM
INTERMEDIATE BOLT SPACING



CUSTOM FLAT PLATE PART NUMBER BREAKDOWN

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MONOPOLE SECTIONS & DETAILS

S-2

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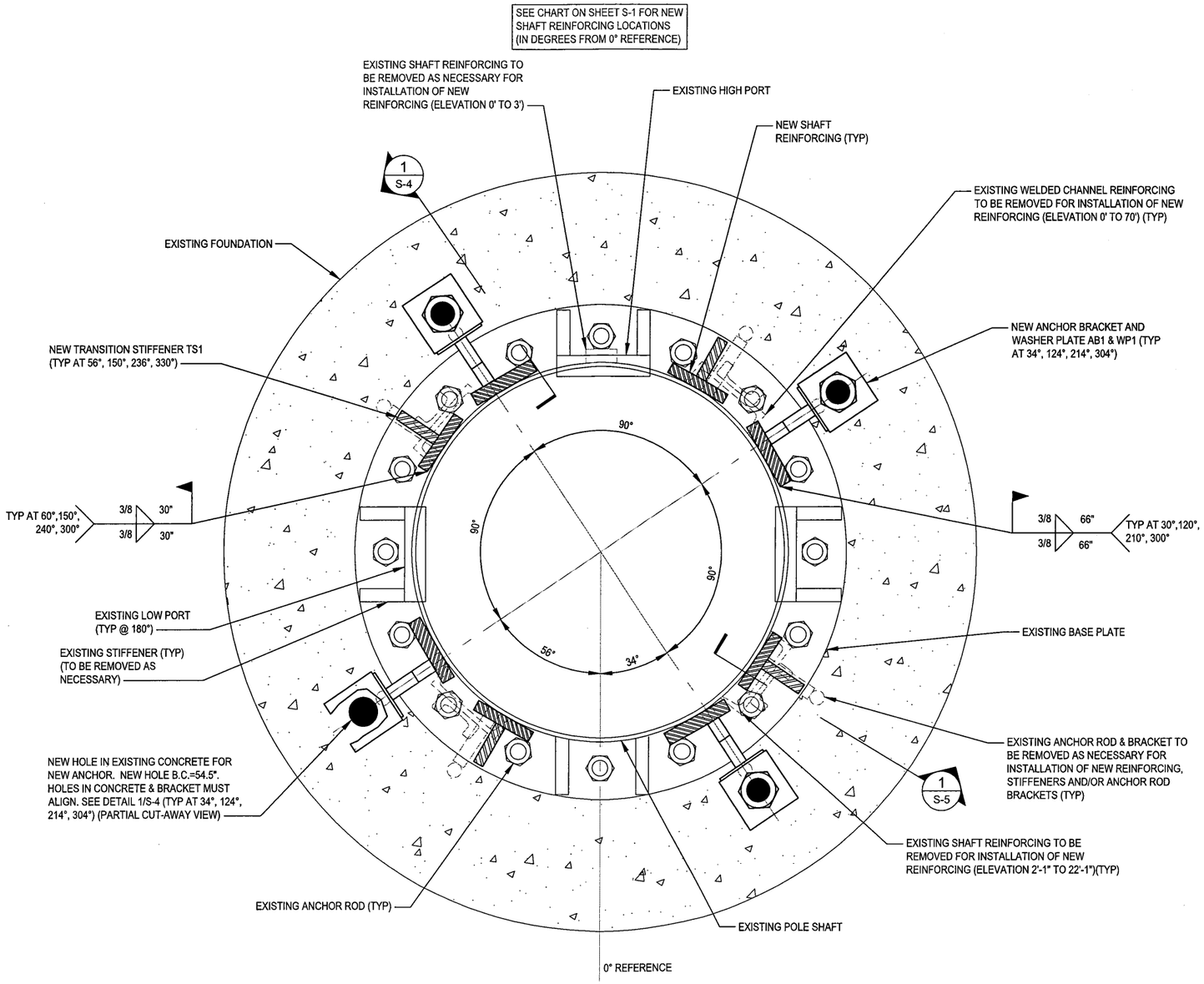

BASE PLATE 1 / S-3

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BASE PLATE DETAILS

S-3

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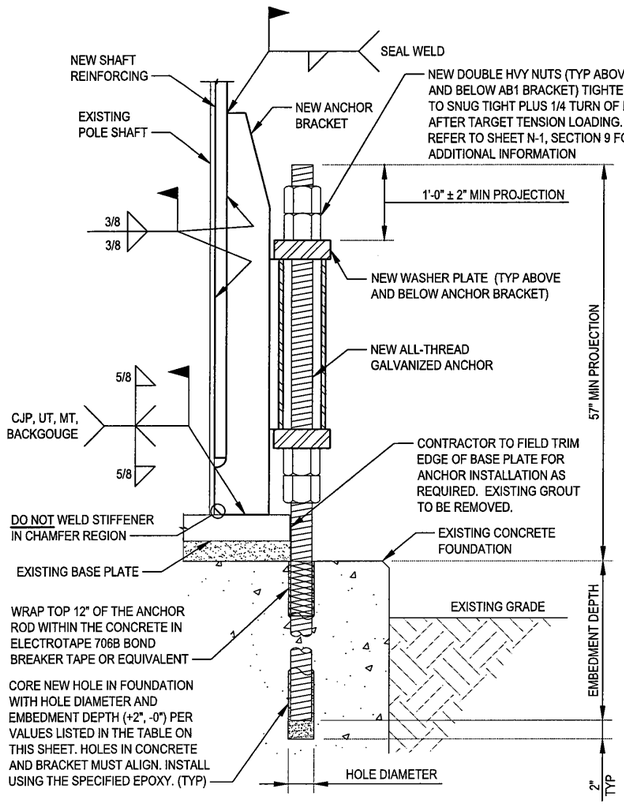
NEW ANCHOR RODS

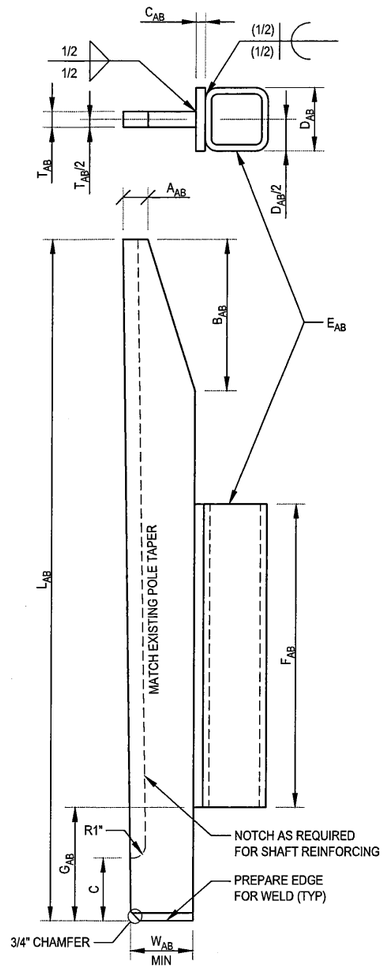
PART #	DIAMETER (IN)	QTY	LENGTH (IN)	MATERIAL	EMBEDMENT DEPTH (IN)	HOLE DIAMETER (IN)	EPOXY	TARGET TENSION LOAD (KIPS)
CCI-AR-0225	2 1/4	6	132	A193 GR B7	72	2 1/2	ALLFASTENERS AF35LVE	190

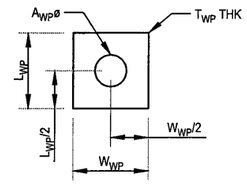


NEW ANCHOR & BRACKET DETAIL 1 / S-4

NOTES:

1. PLATE WASHER SHALL FULLY BEAR ON THE TUBE.
2. REFERENCE CC APPROVED COMPONENTS (CURRENT VERSION) FOR ANCHOR ROD DIMENSIONS.
3. RODS SHALL BE GALVANIZED FROM THE TOP OF THE PROJECTION TO 15" BELOW THE SURFACE OF THE CONCRETE, AT A MINIMUM.
4. CORED HOLES SHALL BE MECHANICALLY ROUGHENED USING A CARBIDE HOLE ROUGHENER OR EQUIVALENT. BRUSHING WITH A NYLON OR WIRE BRUSH SHALL BE USED IN THE PROCESS OF HOLE CLEANING, BUT DOES NOT SATISFY THE HOLE ROUGHENING REQUIREMENT.
5. FOLLOW EPOXY MANUFACTURER'S RECOMMENDATIONS FOR HOLE CLEANING.
6. ALL HOLES SHALL BE DRY PRIOR TO PLACING EPOXY.
7. FOLLOW EPOXY MANUFACTURER'S RECOMMENDATIONS REGARDING HANDLING OF THREADED ROD AND EPOXY, AS WELL AS ALL INSTALLATIONS INSTRUCTIONS AND REQUIREMENTS.
8. TAKE ALL MEASUREMENTS NECESSARY TO AVOID DAMAGING EXISTING REINFORCING BARS DURING CORING OPERATIONS. NOTIFY EOR IMMEDIATELY IF EXISTING REINFORCING BARS ARE ENCOUNTERED AND INTERFERE WITH PLACEMENT OF NEW ANCHORS. MINOR ADJUSTMENT TO PROPOSED LOCATION OF NEW ANCHORS MAY BE REQUIRED.
9. IF BASE PLATE GROUT REPAIR IS REQUIRED FOR ANCHOR ROD INSTALLATION, SEE ENG-PRC-10012: BASE PLATE GROUT REPAIR, FOR PROCEDURES AND RECOMMENDED MANUFACTURERS. CONTRACTOR SHALL DETERMINE THE QUANTITY REQUIRED.
10. ONCE ALL RESIN AND GROUT HAVE CURED, NEW ANCHOR ROD REINFORCING SHALL BE TARGET TENSIONED TO THE VALUE LISTED IN THE TABLE ON THIS SHEET. SEE ENG-PRC-10119: PULL-OUT TESTING POST-INSTALLED ANCHOR RODS, FOR SPECIFICATIONS.
11. CONTRACTOR SHALL VERIFY THAT A PULL TEST IS ABLE TO BE PERFORMED USING THE ANCHOR ROD PROJECTION SHOWN.
12. WHEN COMPLETED WITH EPOXY INSTALLATION, THE TOP OF THE EPOXY SHALL BE EQUAL TO OR HIGHER THAN THE TOP OF THE FOUNDATION, SUCH THAT WATER IS NOT ABLE TO COLLECT IN THE ANNULAR AREA AROUND THE EXPOSED PORTION OF THE ANCHOR ROD.





WASHER PLATE

PART #	ANGLE	QTY	MAT'L SPEC	T_{WP} (IN)	W_{WP} (IN)	L_{WP} (IN)	A_{WP} (IN)
WP1	34°, 124°, 214°, 304°	8	ASTM A572 GR 65KSI	1 1/4	5 1/2	5 1/2	2 3/8

ANCHOR BRACKET

PART #	ANGLE	QTY	ANCHOR PLATE						BACKER PLATE			TUBE			G_{AB} (IN)	NOTCH	
			MAT'L SPEC	T_{AB} (IN)	W_{AB} (IN)	L_{AB} (IN)	A_{AB} (IN)	B_{AB} (IN)	MAT'L SPEC	C_{AB} (IN)	D_{AB} (IN)	E_{AB} (SIZE)	MAT'L SPEC	F_{AB} (IN)		REQ'D	C (IN)
AB1	34°, 124°, 214°, 304°	4	ASTM A572 GR 65KSI	1 1/4	6	66	2	12	ASTM A572 GR 65KSI	3/4	5	HSS5x5x1/2	ASTM A500 GR C (50 KSI)	24	12	YES	6

CONTRACTOR SHALL VERIFY THAT HEAVY HEX NUTS ARE INSTALLED BELOW BASE PLATE ON ALL EXISTING ANCHOR RODS DURING THE GROUT REMOVAL PROCESS. SEE "BASE PLATE GROUT" NOTES ON SHEET N-1. IF HEAVY HEX NUTS ARE NOT INSTALLED, SPLIT NUTS SHALL BE ADDED TO ALL EXISTING ANCHOR RODS.

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ANCHOR BRACKET DETAILS

S-4

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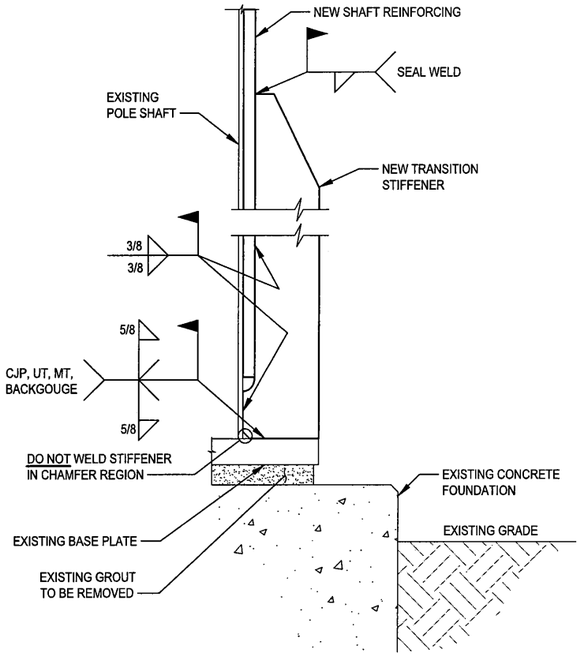

TRANSITION STIFFENER DETAIL 1 / S-5

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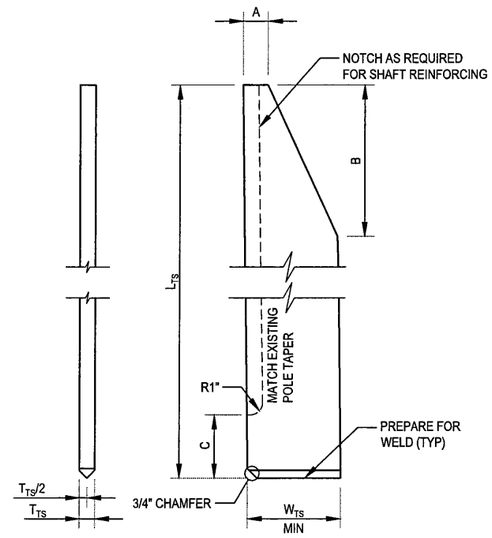
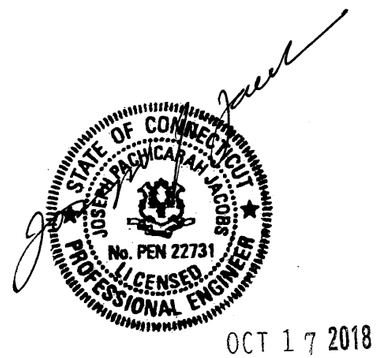


TRANSITION STIFFENER										
PART #	ANGLE	QTY	MAT'L SPEC	T_{TS} (IN)	W_{TS} (IN)	L_{TS} (IN)	A (IN)	B (IN)	NOTCH	
									REQ'D	C (IN)
TS1	56°, 150°, 236°, 330°	4	ASTM A572 GR 65KSI	1 1/4	5 1/2	30	2	12	YES	6



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TRANSITION STIFFENER DETAILS

S-5

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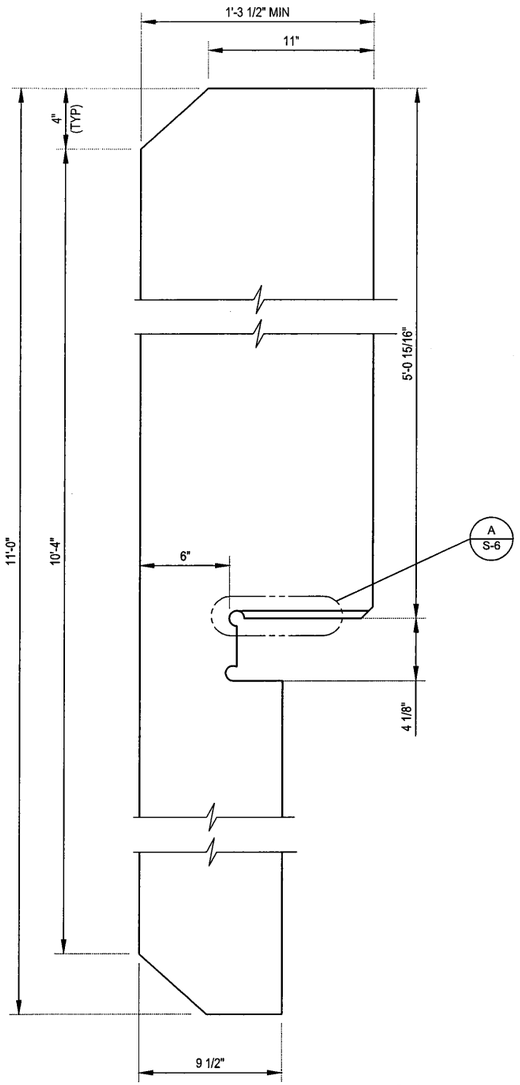
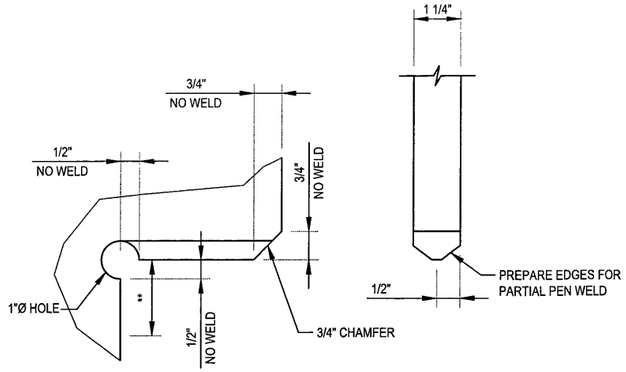


BRIDGE STIFFENER MK~BS1

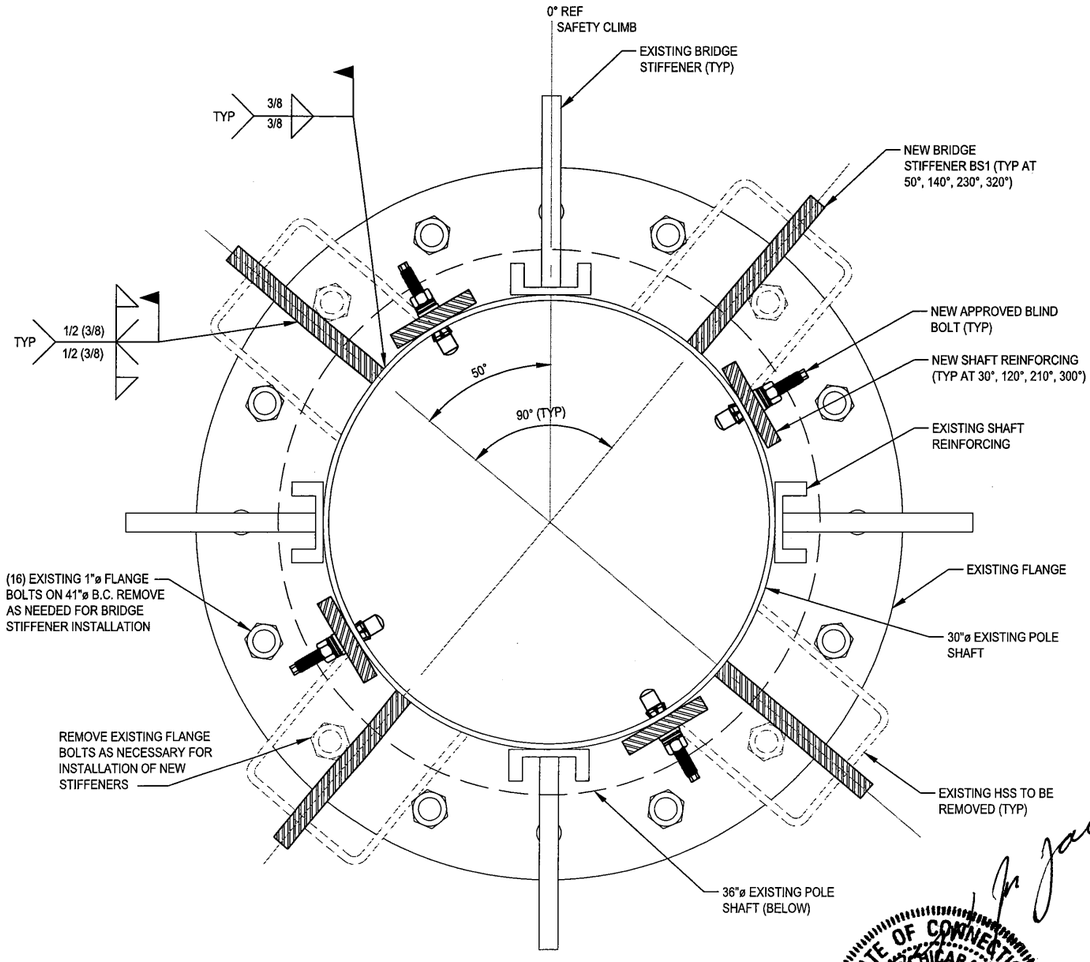
(4 REQUIRED) (Fy = 65 KSI)



** NO WELD REGION SHOULD EXTEND BEYOND FLANGE LOCATIONS

DETAIL A

(TYPICAL)



SHAFT PLAN

EL 30'

1 / S-6

WELDED FLANGE JUMP TYPICAL DETAILS. CONTRACTOR TO SEE ORIGINAL MANUFACTURER DOCUMENTS FOR EXISTING POLE INFORMATION, EXISTING FLANGE PLATE INFORMATION AND FLANGE BOLT INFORMATION. EXISTING CONDITIONS TO BE FIELD VERIFIED PRIOR TO FABRICATION.

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BRIDGE STIFFENER DETAILS

S-6

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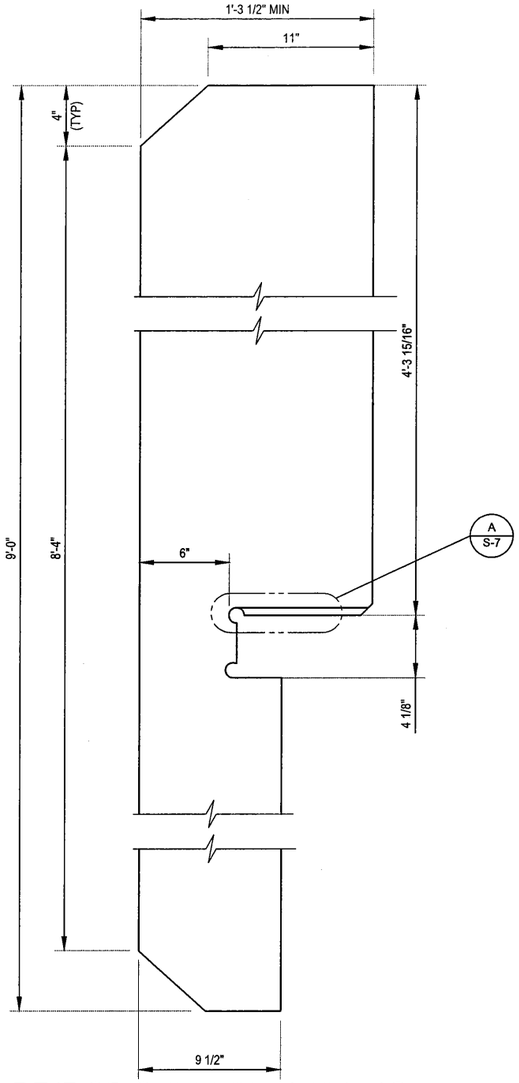
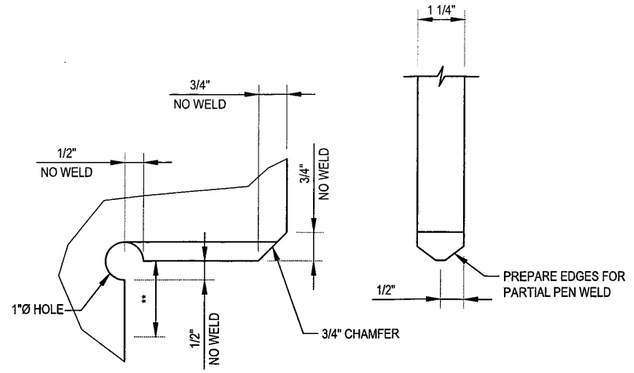


BRIDGE STIFFENER MK~BS1

(4 REQUIRED) (Fy = 65 KSI)



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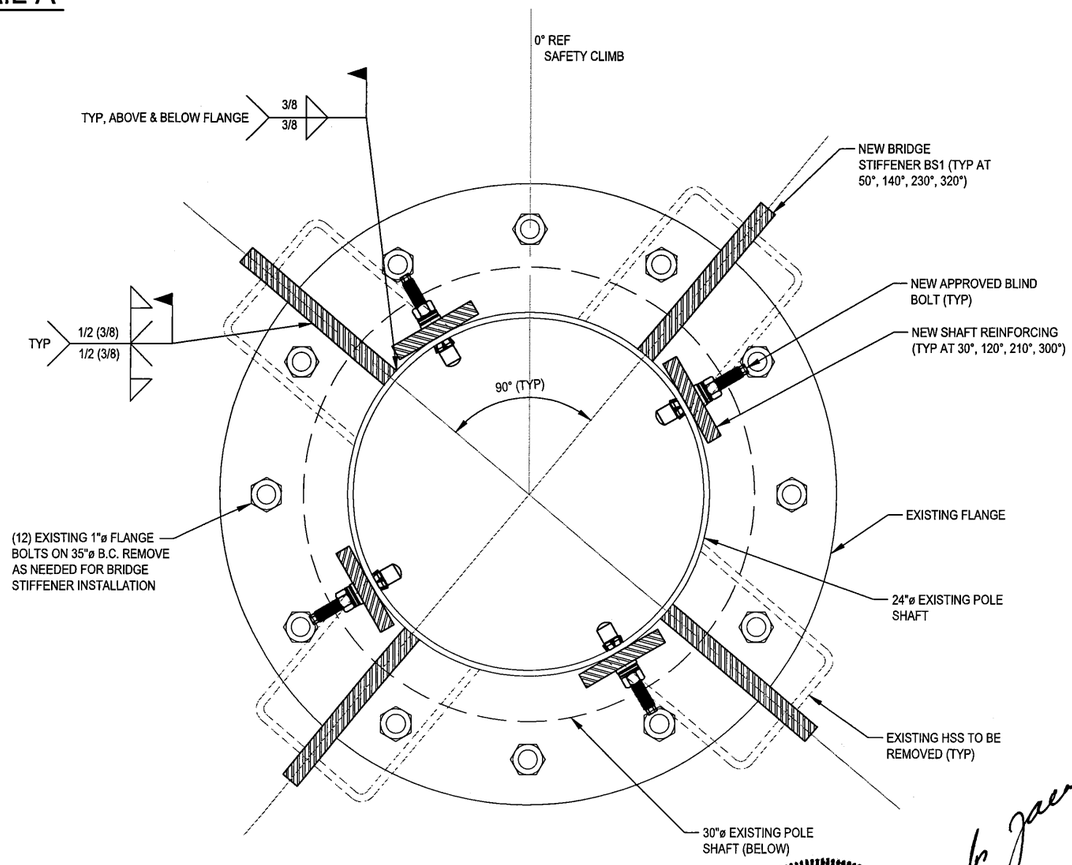
DETAIL A

(TYPICAL)



SHAFT PLAN

EL 60'

1 / S-7

WELDED FLANGE JUMP TYPICAL DETAILS. CONTRACTOR TO SEE ORIGINAL MANUFACTURER DOCUMENTS FOR EXISTING POLE INFORMATION, EXISTING FLANGE PLATE INFORMATION AND FLANGE BOLT INFORMATION. EXISTING CONDITIONS TO BE FIELD VERIFIED PRIOR TO FABRICATION.

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED
PROFESSIONAL ENGINEER

OCT 17 2018

REV	DATE	DESCRIPTION

PJF PAUL J. FORD & COMPANY
250 E Broad St. Ste 600 · Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

CROWN CASTLE
3530 TORINGDON WAY SUITE 300 CHARLOTTE, NC 28277
PH: (724) 416-2000

BU #876329; MTN VIEW CEM (FILLEY PARK)
BLOOMFIELD, CONNECTICUT
MODIFIED 120'-0" MONOPOLE

PROJECT No:	37518-2442.004.7700
DRAWN BY:	FE
DESIGNED BY:	GP
CHECKED BY:	KAT/BKK
DATE:	10-10-2018

BRIDGE STIFFENER DETAILS

S-7

V1.0 37518-2442.004.DWG

Date: **October 15, 2018**

MASER CONSULTING
— CONNECTICUT —

Charles McGuirt
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6607

Maser Consulting, Connecticut.
331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
(732) 383-1950

Subject:	**Mount Modification Design and Analysis Report**	
Carrier Designation:	**T-Mobile Equipment Change-Out**	
	Carrier Site Number:	CT11278A
	Carrier Site Name:	CT11278A
Crown Castle Designation:	**Crown Castle BU Number:**	876329
	Crown Castle Site Name:	MT. VIEW CEM (FILLEY PARK)
	Crown Castle JDE Job Number:	512592
	Crown Castle Order Number:	446055, Rev 0
Engineering Firm Designation:	Maser Consulting, Connecticut. **Report Designation:** 18922049A	
Site Data:	**28 Brewer Dr. , Bloomfield, Hartford County, CT, 06002**	
	Latitude 41°50'6.57" Longitude -72°44'28.2"	
Structure Information:	**Tower Height & Type:**	**120 ft Monopole**
	Mount Elevation:	**107 ft**
	Mount Type:	**10 ft Platform**

Dear Charles McGuirt,

Maser Consulting, Connecticut. is pleased to submit this **"Mount Modification Design and Analysis Report"** to determine the structural integrity of T-Mobile's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis.

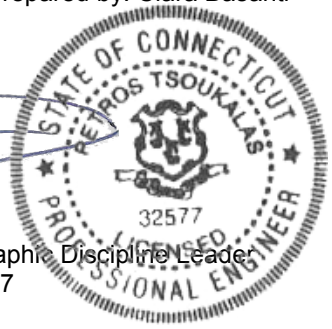
The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Platform (Typical of 1) **Sufficient***

***Sufficient upon completion of the changes listed in the 'Recommendations' section of this repot.**

The analysis has been performed in accordance with the TIA-222-H Standard. This analysis utilizes an ultimate 3-second gust wind speed of 125 mph from the 2016 Connecticut State Building Code, Incorporating the 2012 International Building Code. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category II was used in this analysis.

Mount structural analysis prepared by: Clara Basanti
Respectfully Submitted by:



Petros E. Tsoukalas, P.E.
Principal Associate/Geographic Discipline Leader
Connecticut License: 32557
856-797-0412
Ptsoukalas@Maserconsulting.com

Clara Basanti.
Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This mount is a existing 10 ft Platform mapped by Tower Engineering Professionals (TEP).This mount is installed at the 107 ft elevation on 3 sectors of the 120 ft Monopole**.**

2) ANALYSIS CRITERIA

Building Code:	2016 Connecticut State Building Code incorporating the 2012 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	125 mph
Exposure Category:	B
Topographic Factor at Base:	1
Topographic Factor at Mount:	1
Ice Thickness:	2 in
Wind Speed with Ice:	50 mph
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
107	108	3	Ericsson	AIR 32 B2A/B66AA	Platform
		3	Ericsson	APXVAARR24_43-U-NA20	
		3	Ericsson	Radio 4449 B12/B71	
		3	Ericsson	AIR 21 B2A B4P	
		3	Ericsson	KRY 112 144/1	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Mount Mapping Report	Tower Engineering Professionals	25704.177458	CCISites

3.1) Analysis Method

RISA-3D, a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.The program performs design checks of structures under user specified loads. The user specified loads have been calculated separately based on the requirements of the above referenced codes. The program performs an analysis based on the steel code to determine the adequacy of the members and produces the reactions at the connection points of the mounts to the existing structure.

Proprietary excel sheets were used to calculate appurtenance and member loading for various load cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 Tower Mount Analysis (Revision B).

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) The existing Welds to the tower mount are assumed to be 5/16”
5) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Maser Consulting, Connecticut. should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3(a) - Mount Component Stresses vs. Capacity (Platform)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
2	Face Horizontals	-	107	59.6	Pass
2	Inner Double Angles			31.5	Pass
2	Inner Angles			31.6	Pass
2	HSS Support 1 (HSS 4.5x4.5)			10.3	Pass
2	HSS Support 2 (HSS 4x4)			27.0	Pass
2	Antenna Pipe 1 (2.0 STD Pipe)			65.6	Pass
2	Antenna Pipe (2.5 STD Pipe)			12.3	Pass
1,2	Mount Connection Check			47.4	Pass

Structure Rating (max from all components) =	**65.6%**

Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical

4.1) Recommendations

The existing platform mount with the proposed modifications has sufficient capacity to support the proposed loading configuration, therefore, the proposed installation **can** be installed as intended, once the proposed modifications are installed as intended. The proposed modifications shall consist of the following:

1. Installing three (3) proposed 8’-0” long 2.0 STD pipes, which shall replace the existing pipes in position 3 in all sectors to accomodate the proposed APXVAARR24_43-U-NA20 antennas.

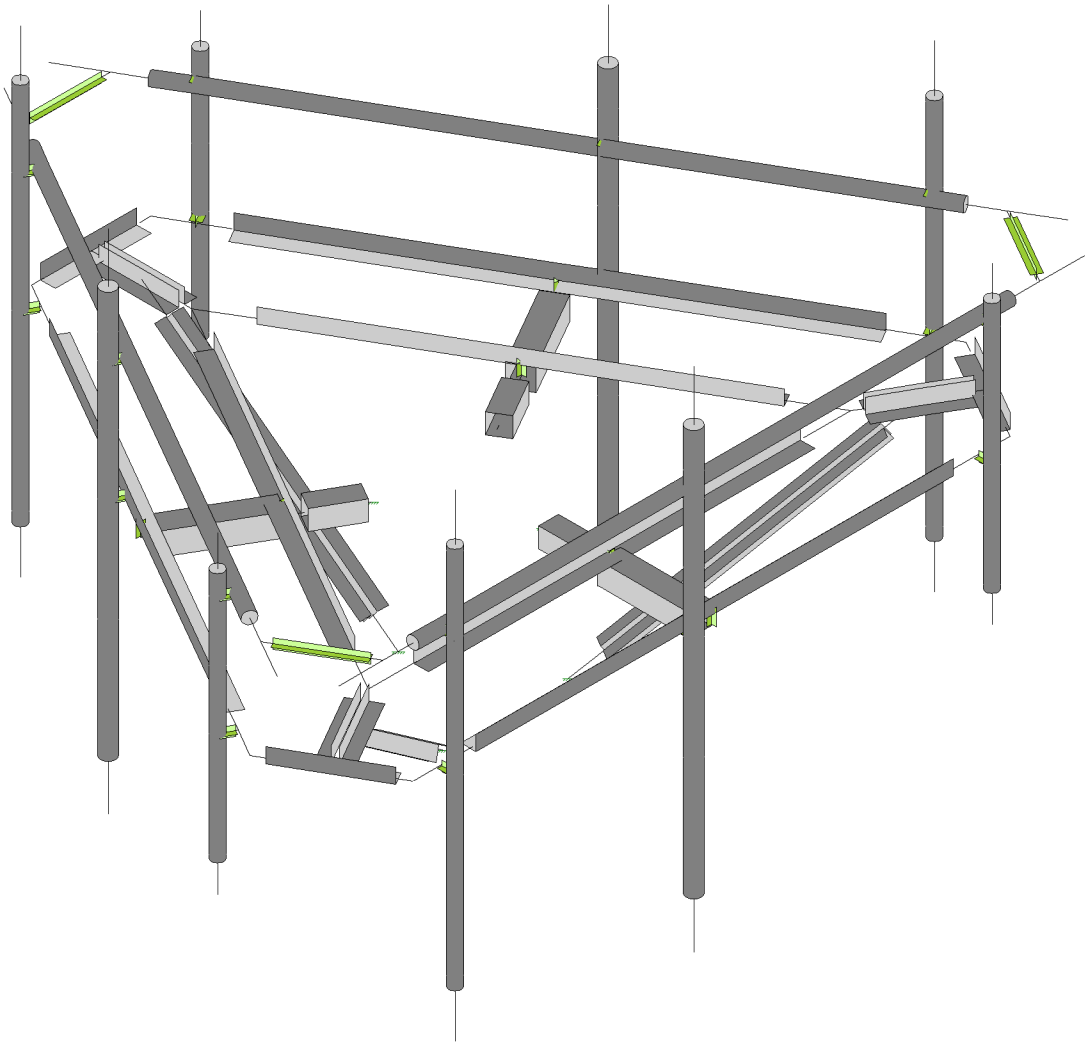
2. Installting one (1) Platform Kickers Kit (SitePro1 P/N: PRK-1245L) mid-way along the existing LL3x3x4 members, and 3ft below the existing platform’s attachement to the monopole.

3. Installing one (1) Handrail Kit (SitePro1 P/N: HRK12-U) 2ft above the existing face horzinontals.

Please see Appendix E for the modification design details.

APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

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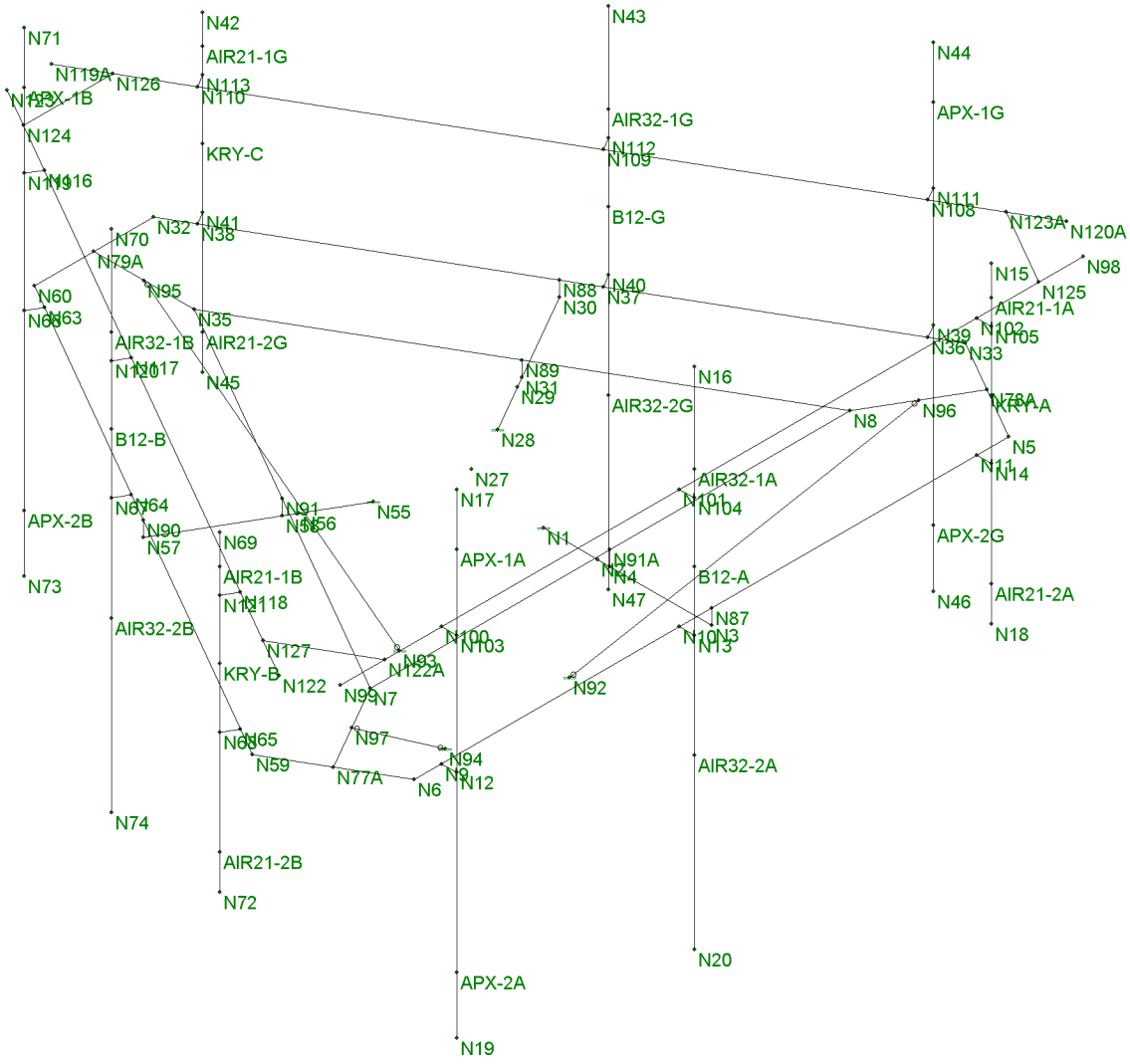
18922049A	Rendered View	Mods.r3d



Envelope Only Solution

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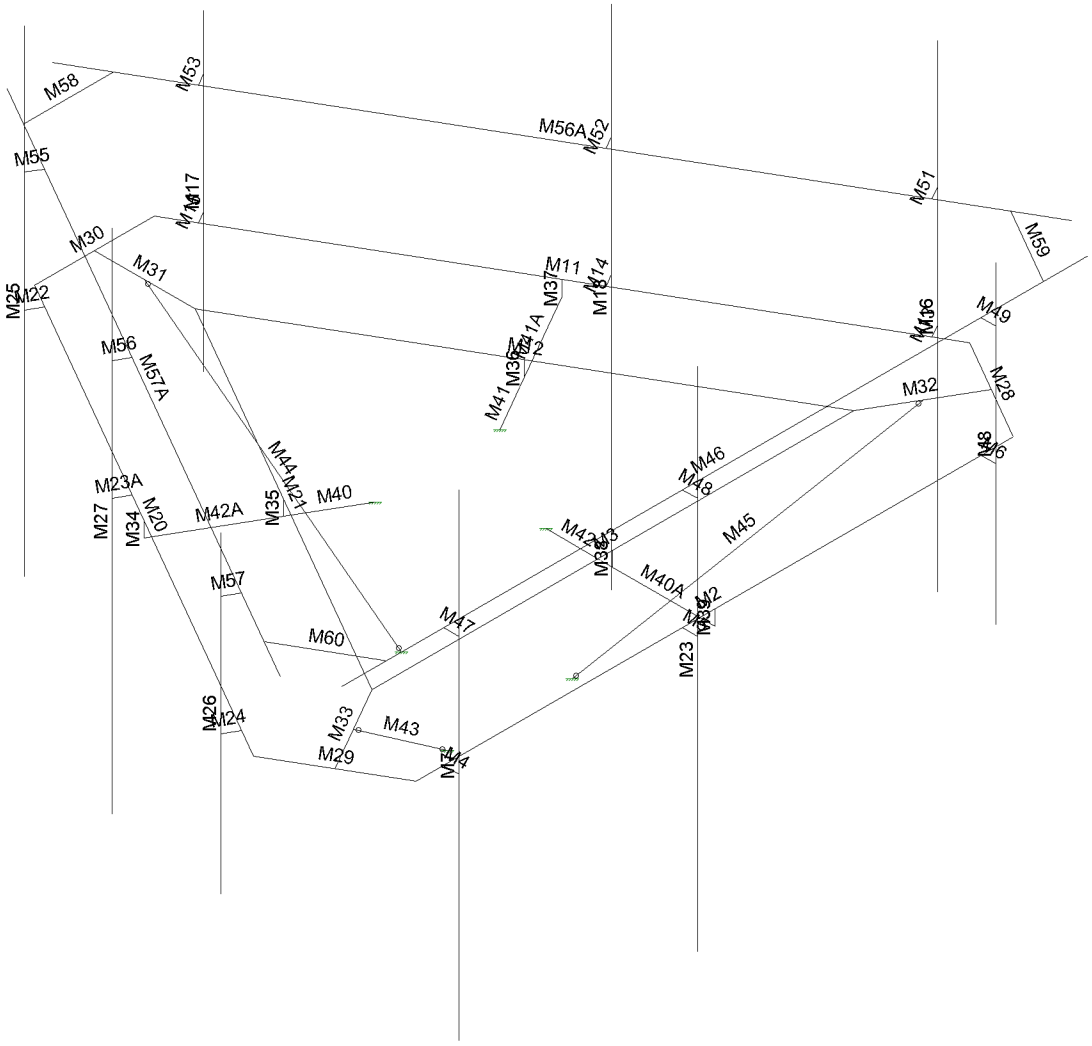

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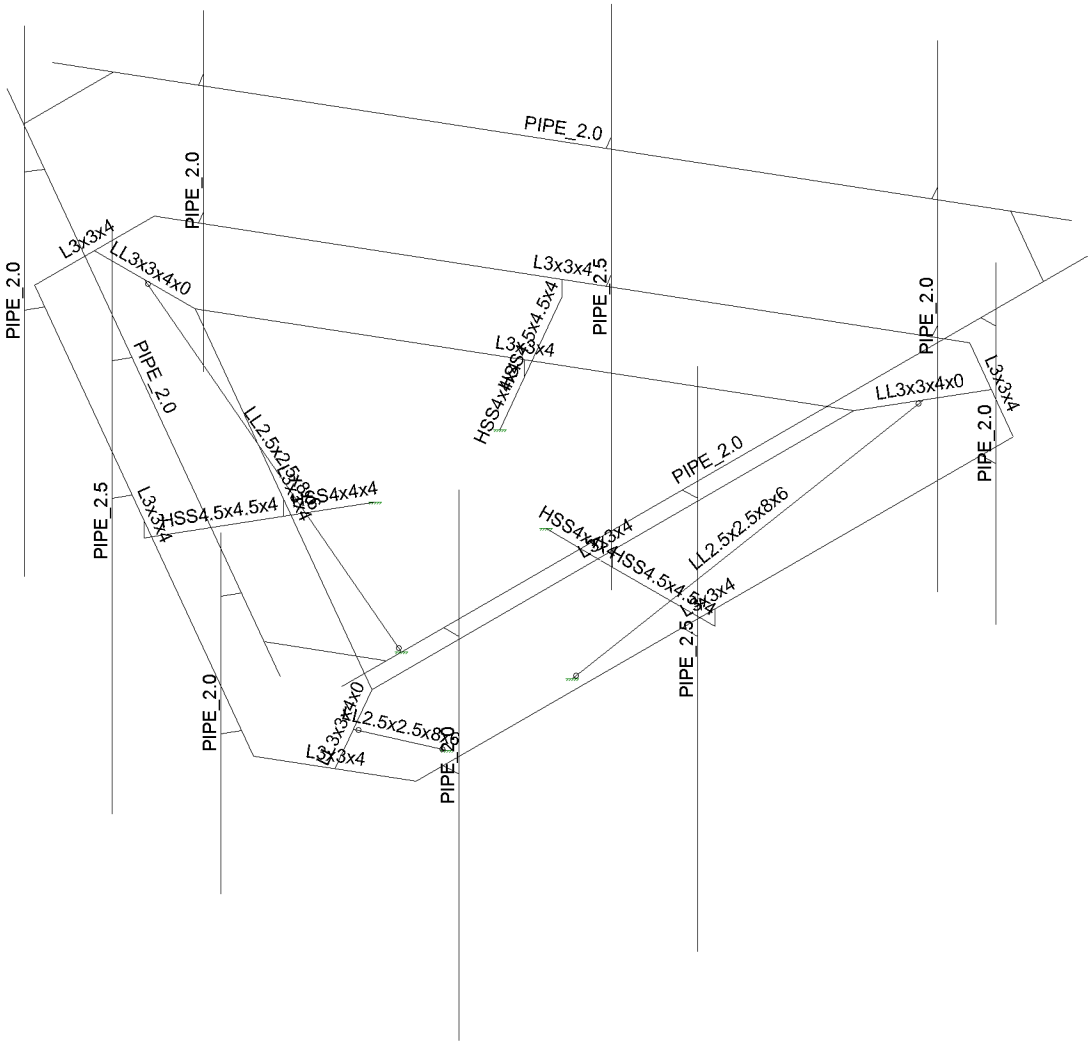

Envelope Only Solution

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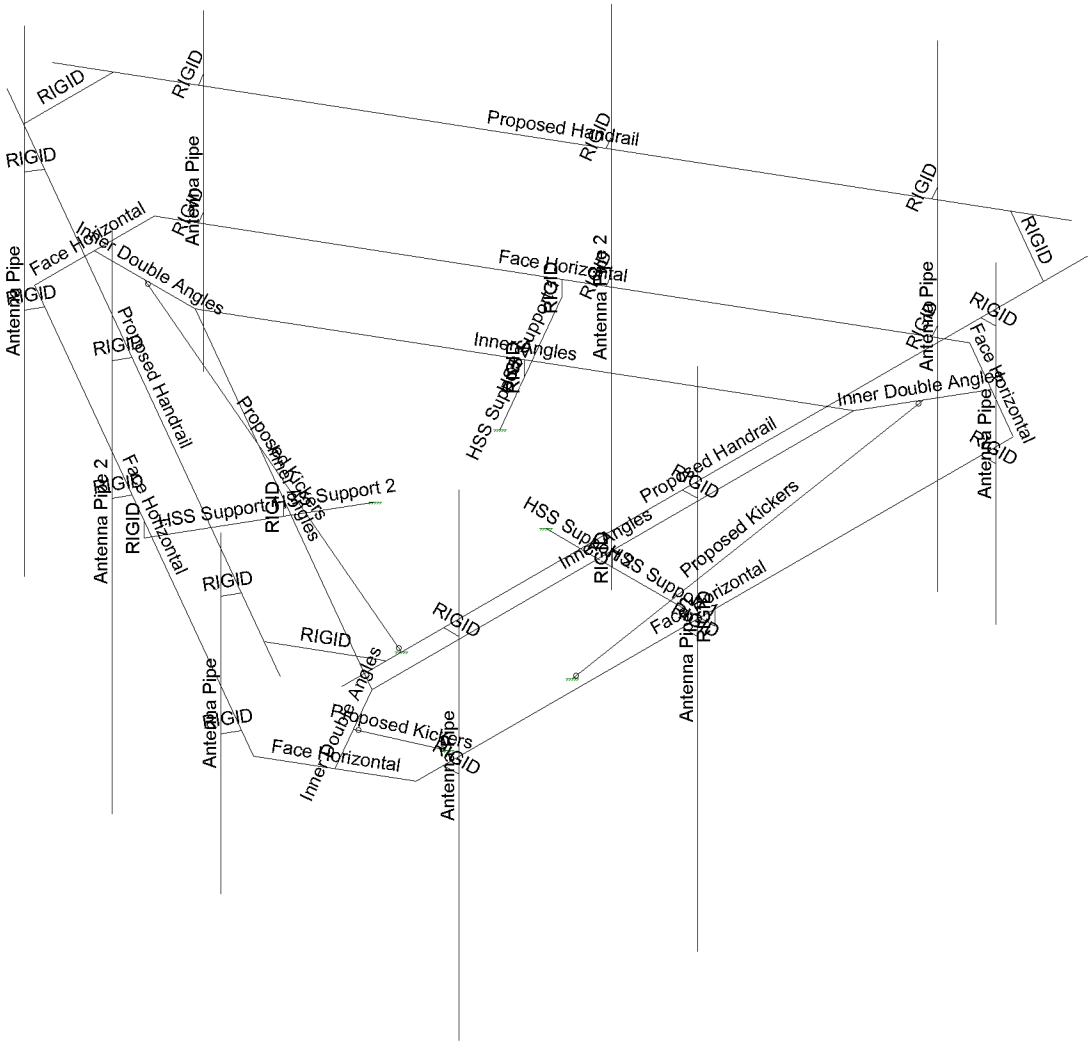

Envelope Only Solution

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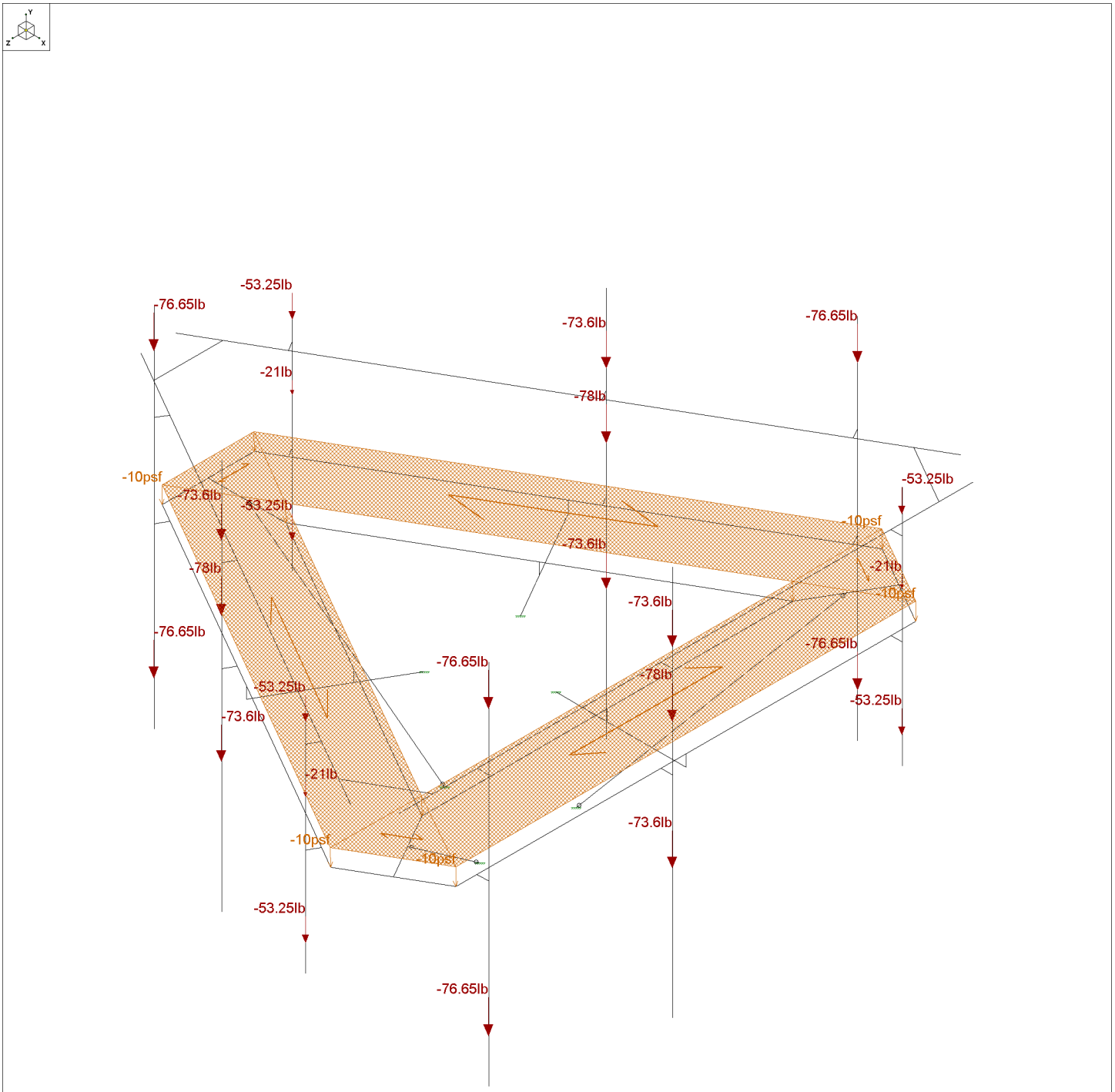

Loads: BLC 1, Dead
Envelope Only Solution

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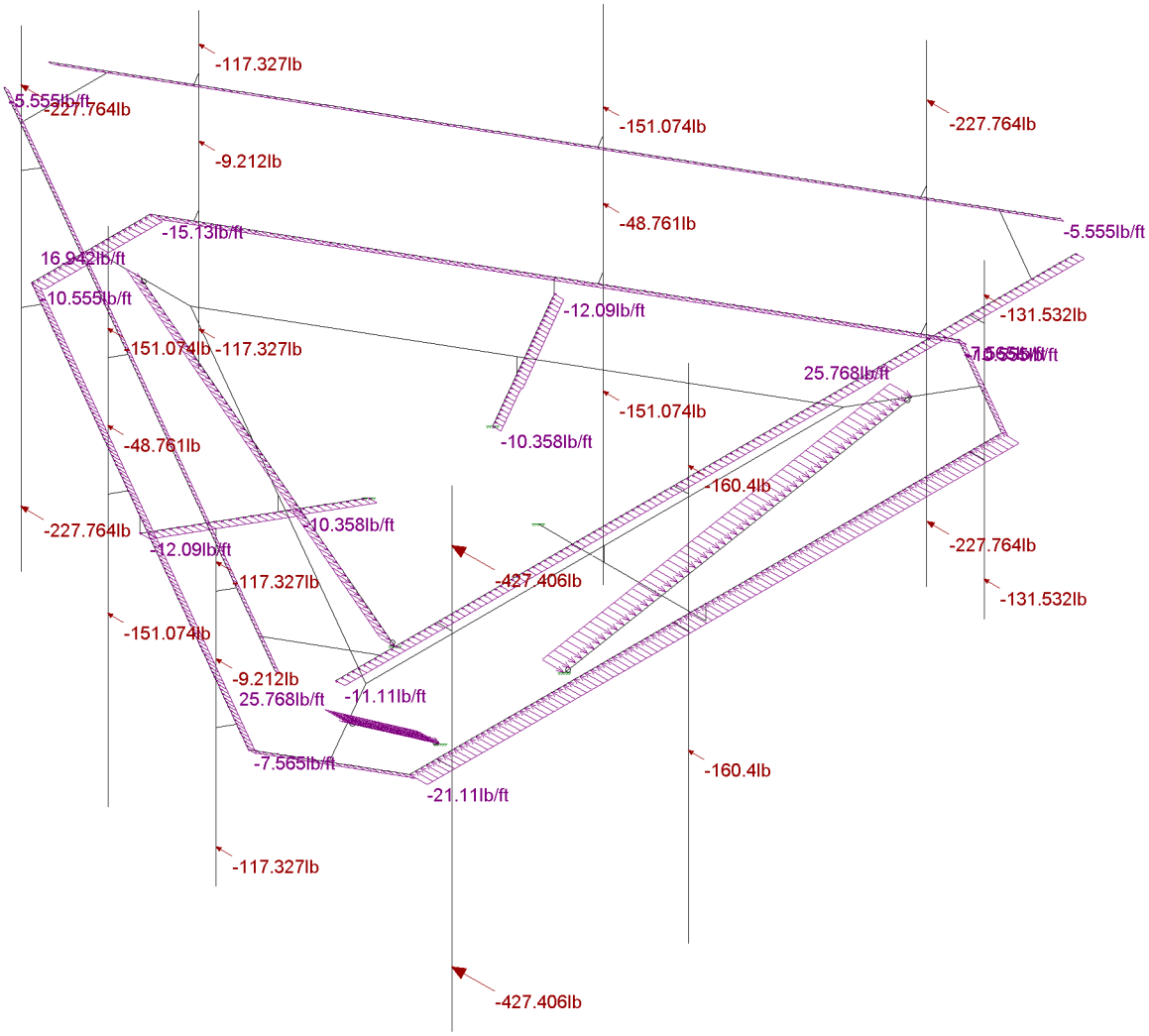
18922049A	Dead Load	Mods.r3d



Loads: BLC 2, Wx
Envelope Only Solution

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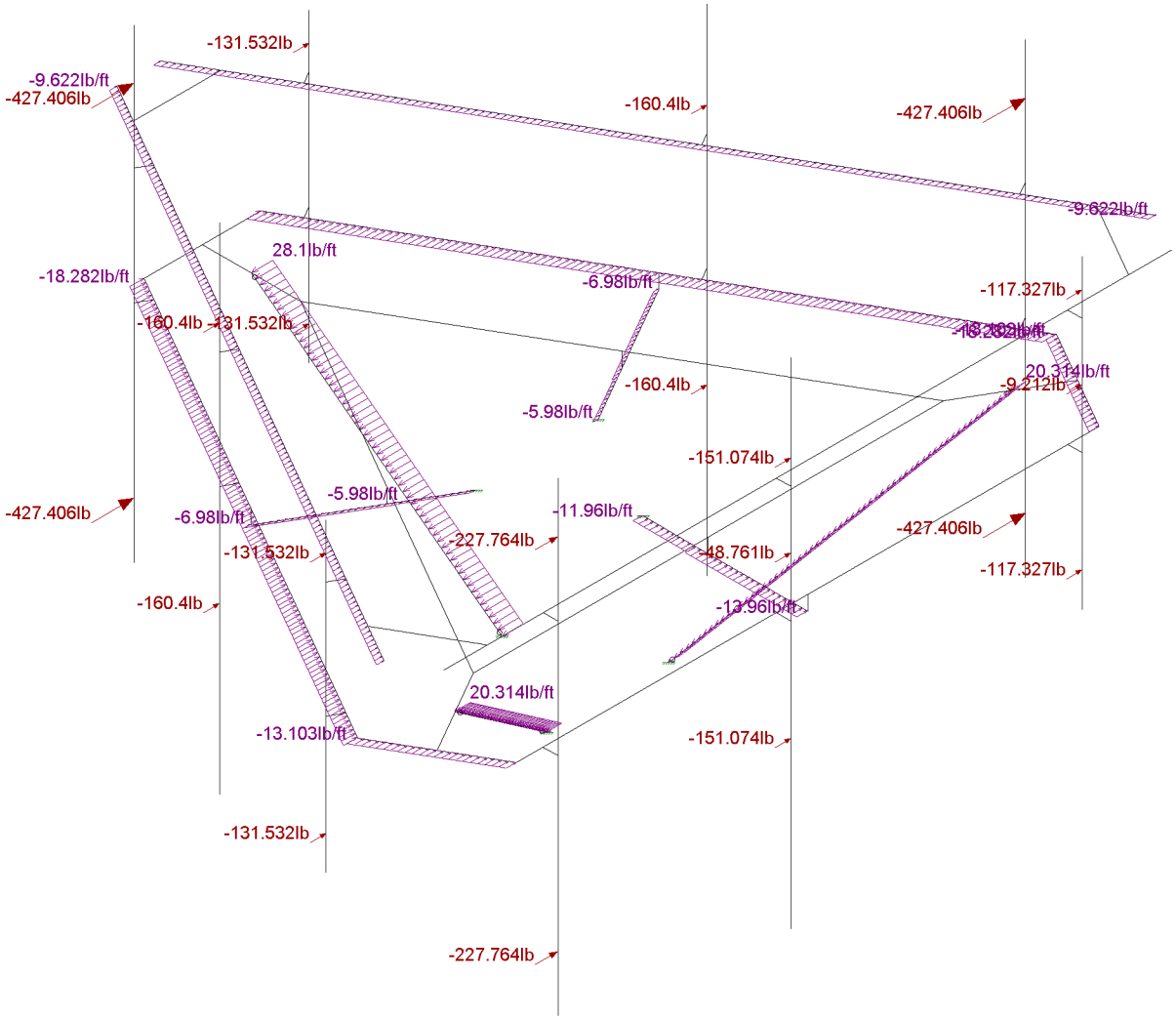

Loads: BLC 3, Wz
Envelope Only Solution

Maser Consulting P.A.		SK - 8
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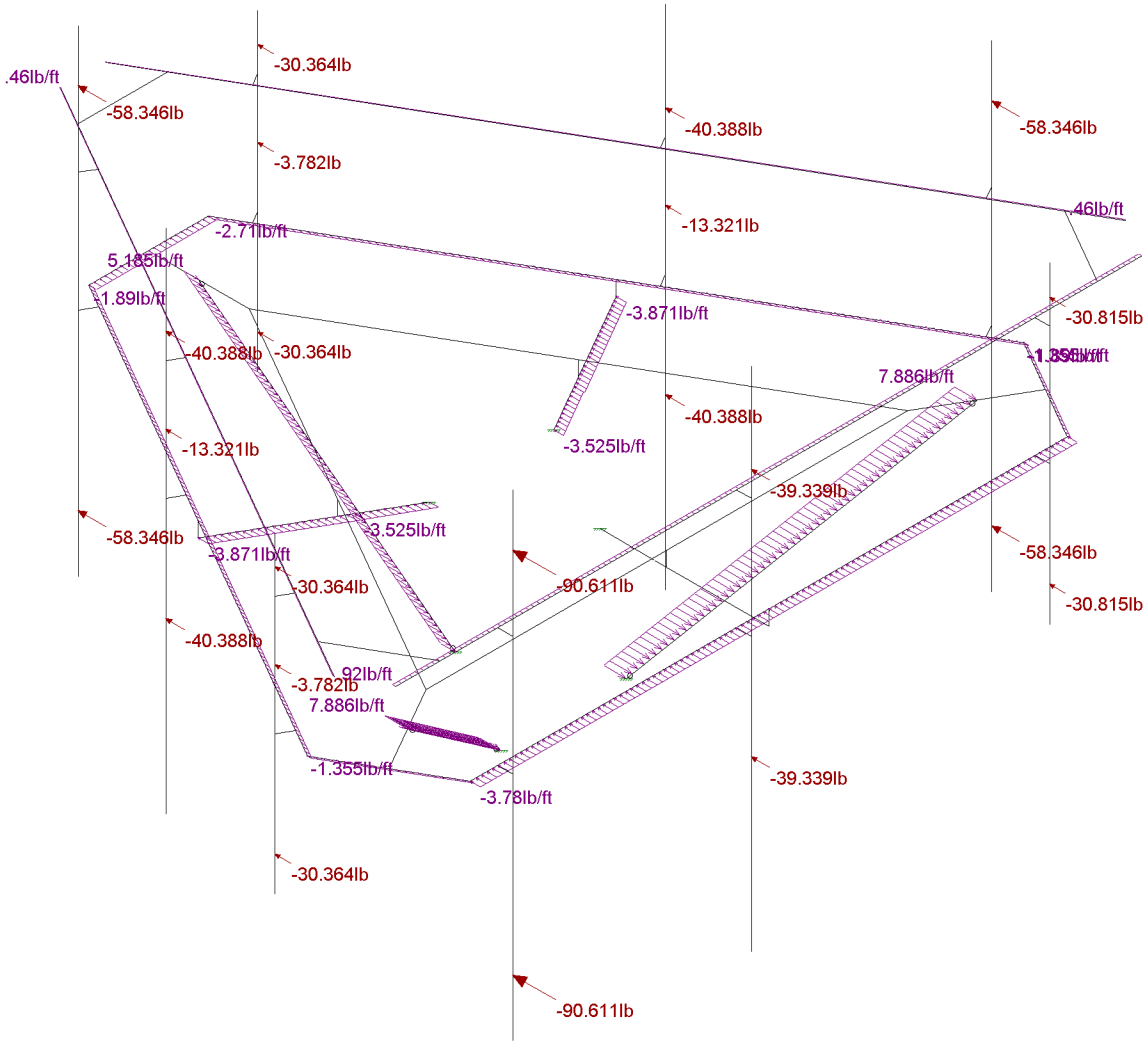

Loads: BLC 4, Ice Wx
Envelope Only Solution

Maser Consulting P.A.		SK - 9
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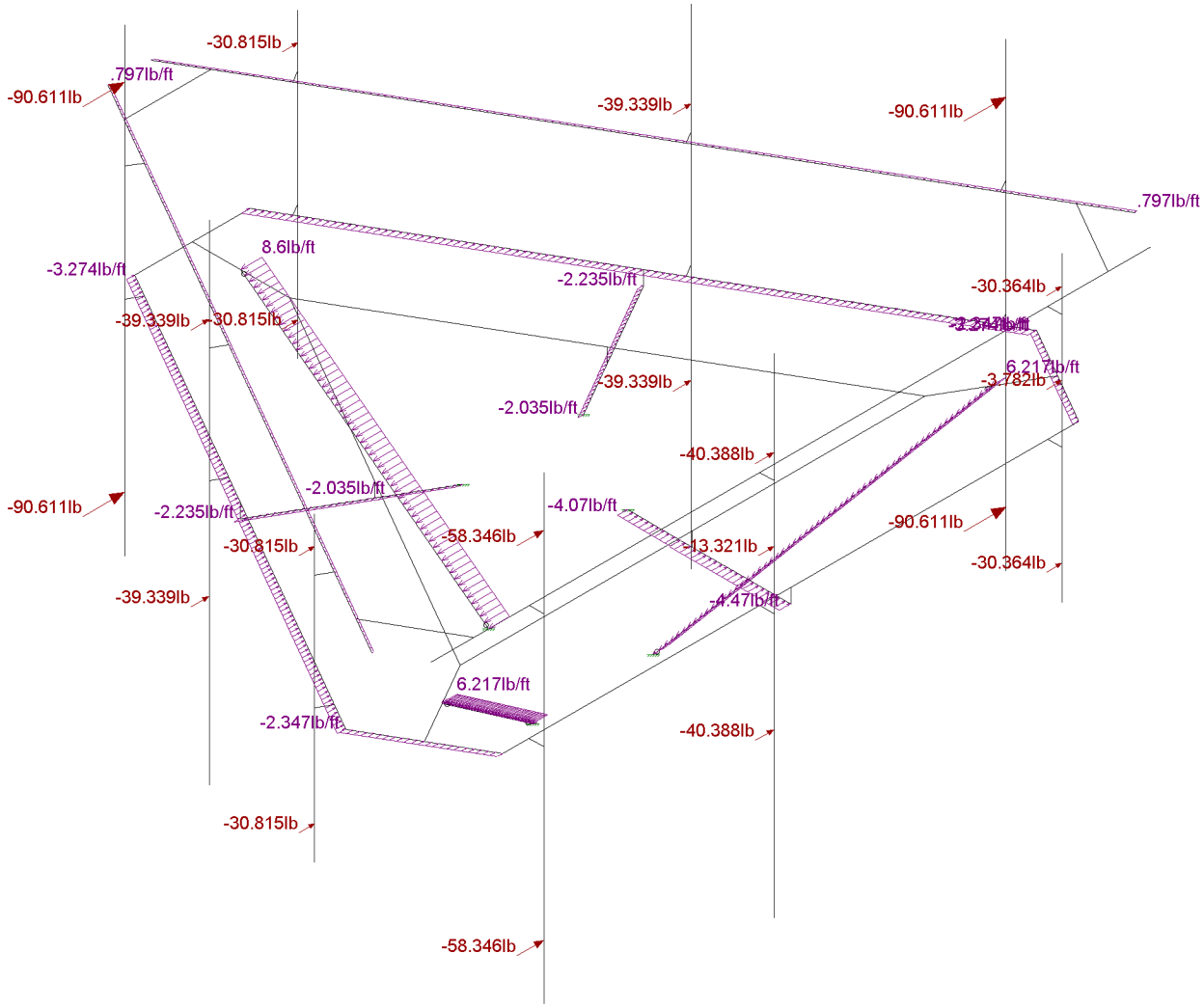
18922049A	Ice Wind X	Mods.r3d



Loads: BLC 5, Ice Wz
Envelope Only Solution

Maser Consulting P.A.		SK - 10
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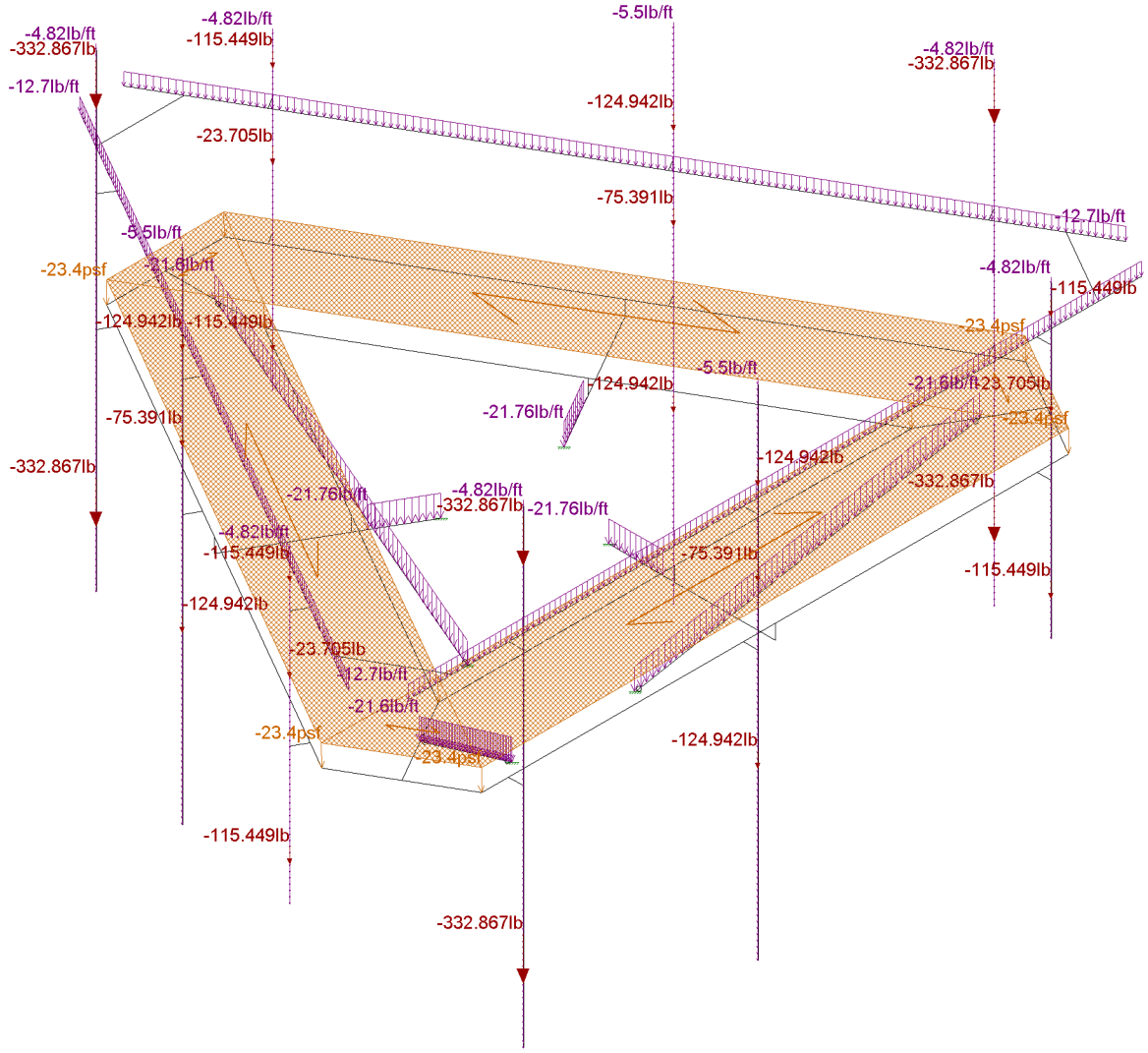

Loads: BLC 6, Ice weight
Envelope Only Solution

Maser Consulting P.A.		SK - 11
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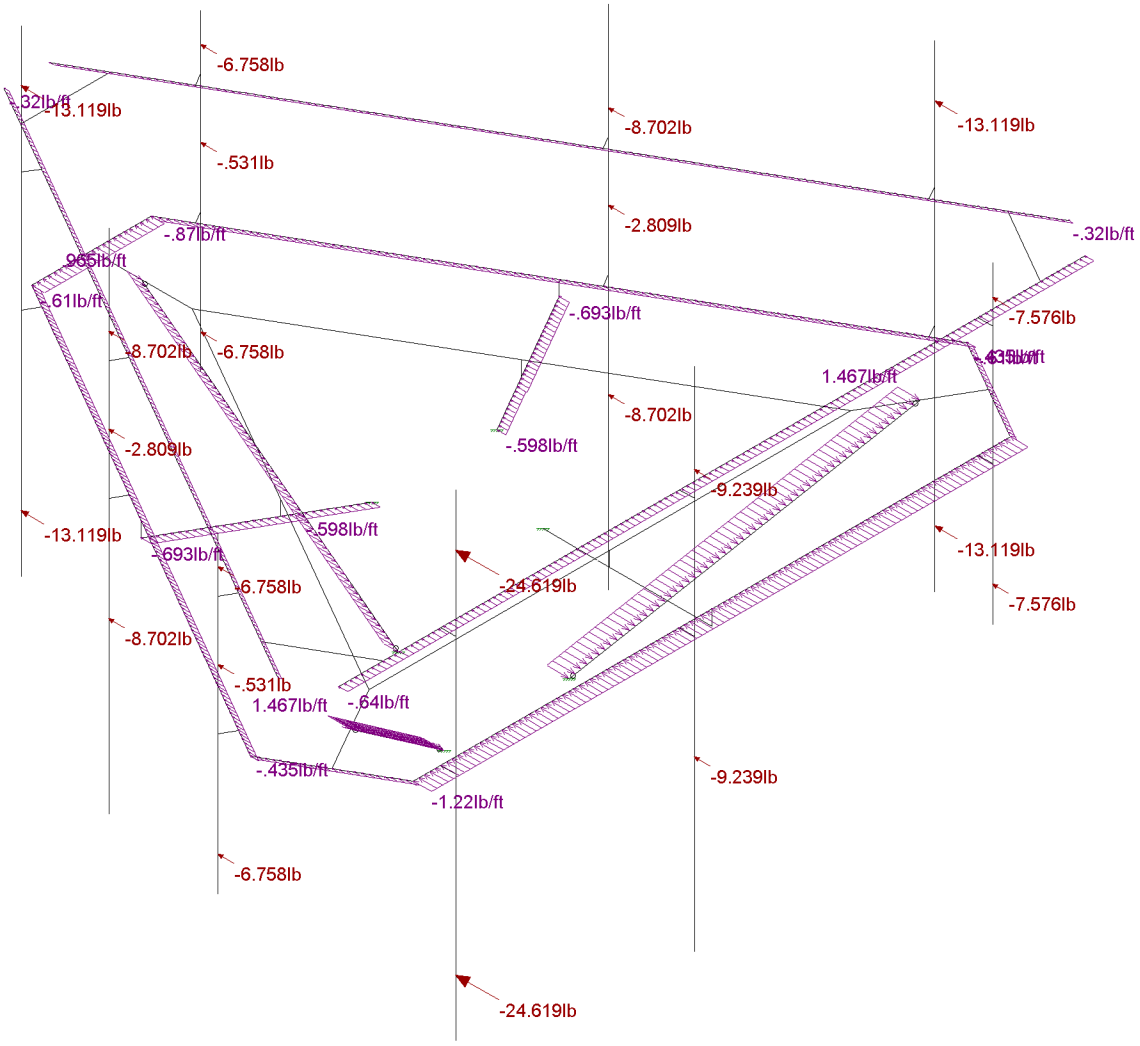
18922049A	Dead Ice Load	Mods.r3d



Loads: BLC 7, Service X
Envelope Only Solution

Maser Consulting P.A.		SK - 12
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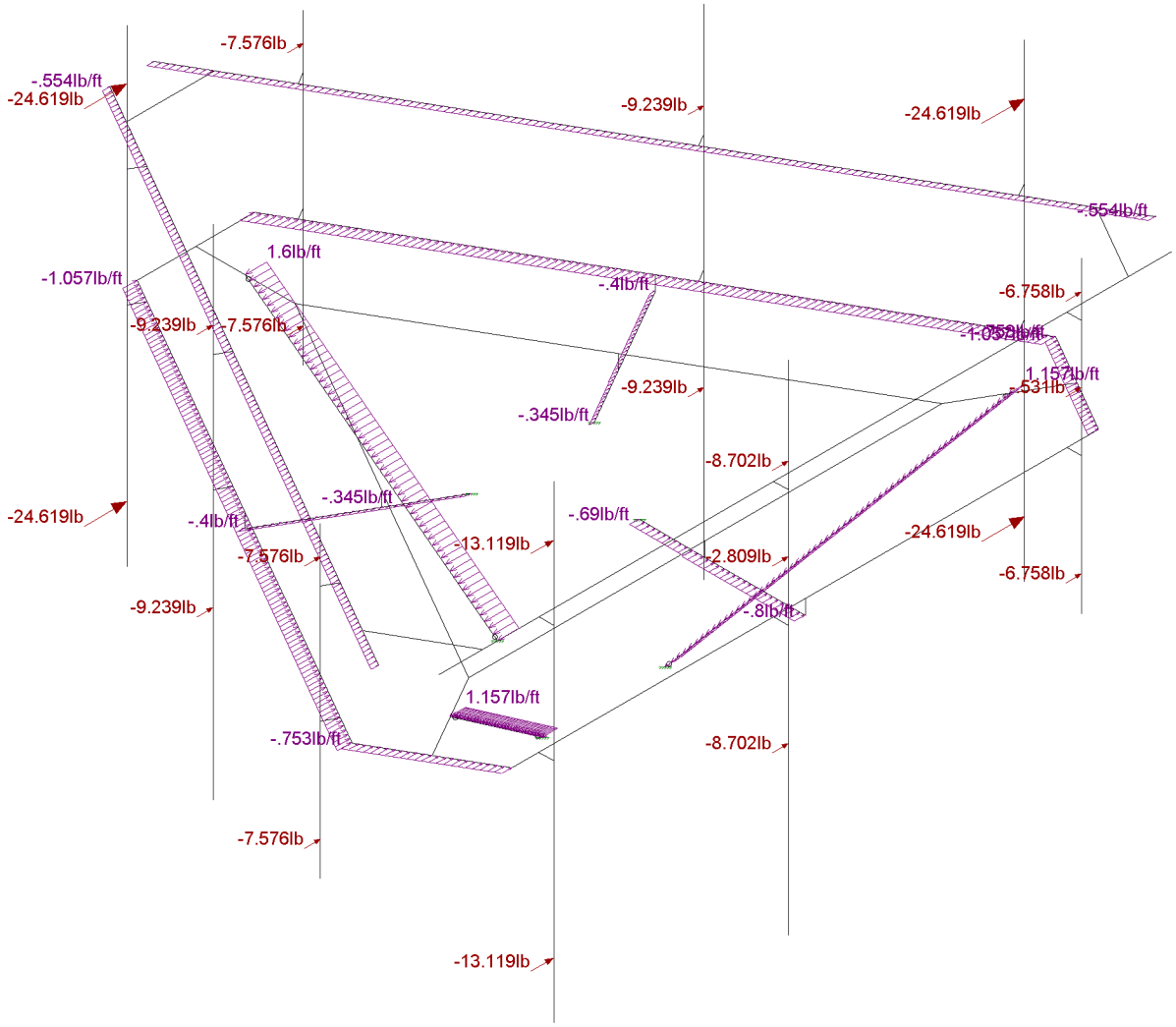
18922049A	Service Wind X	Mods.r3d



Loads: BLC 8, Service Z
Envelope Only Solution

Maser Consulting P.A.		SK - 13
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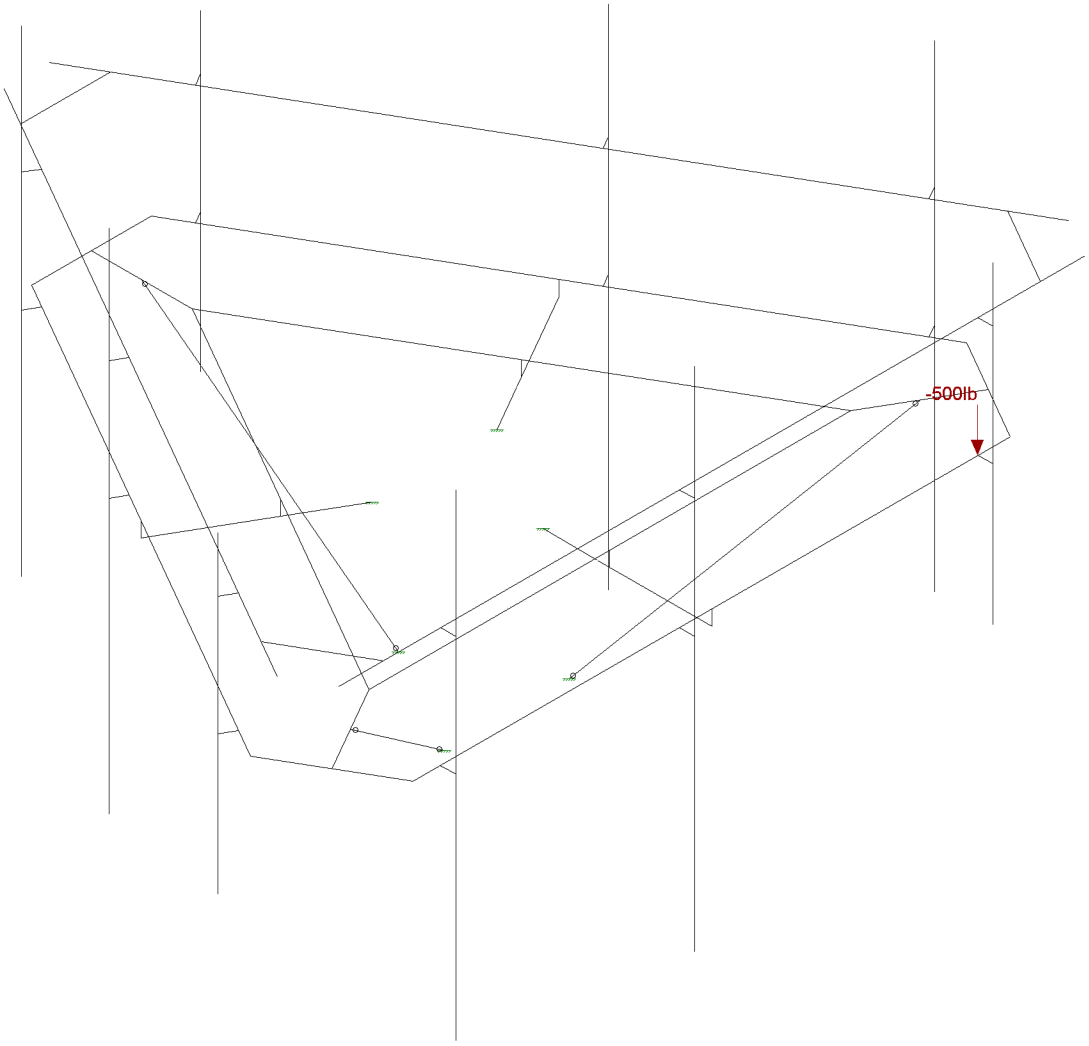
18922049A	Service Wind Z	Mods.r3d



Loads: BLC 9, Service 1 Pipe
Envelope Only Solution

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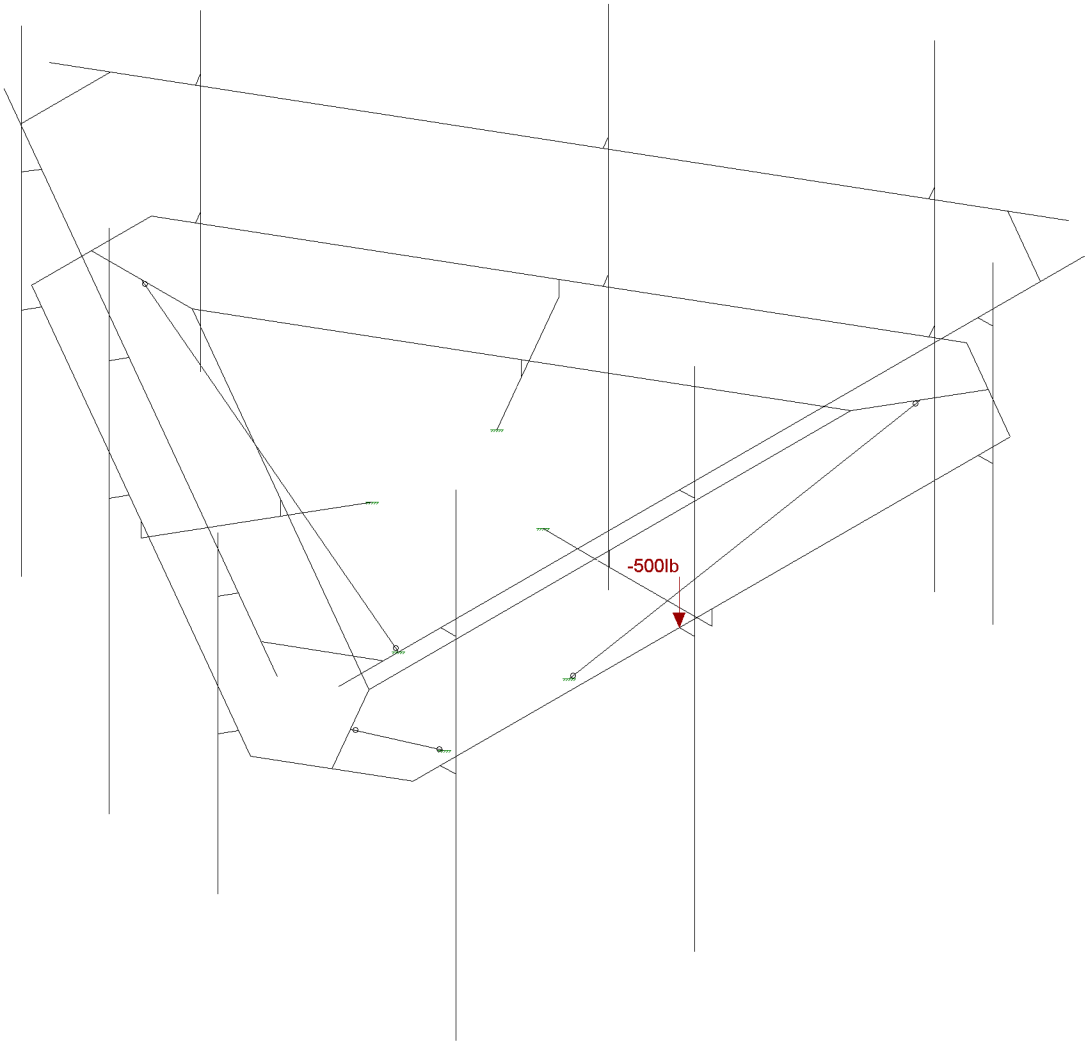

Loads: BLC 10, Service 2 Pipe
Envelope Only Solution

Maser Consulting P.A.		SK - 15
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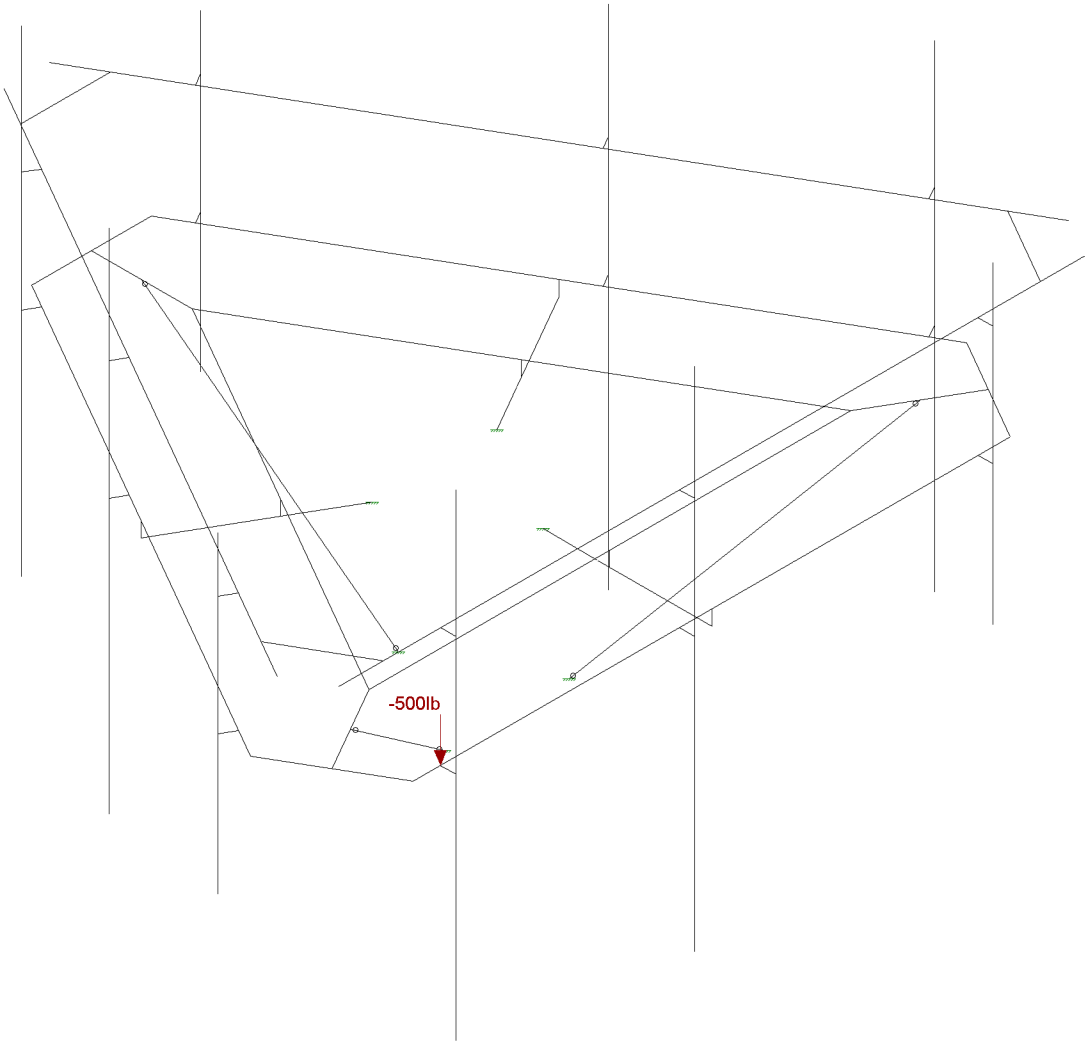

Loads: BLC 11, Service 3 Pipe
Envelope Only Solution

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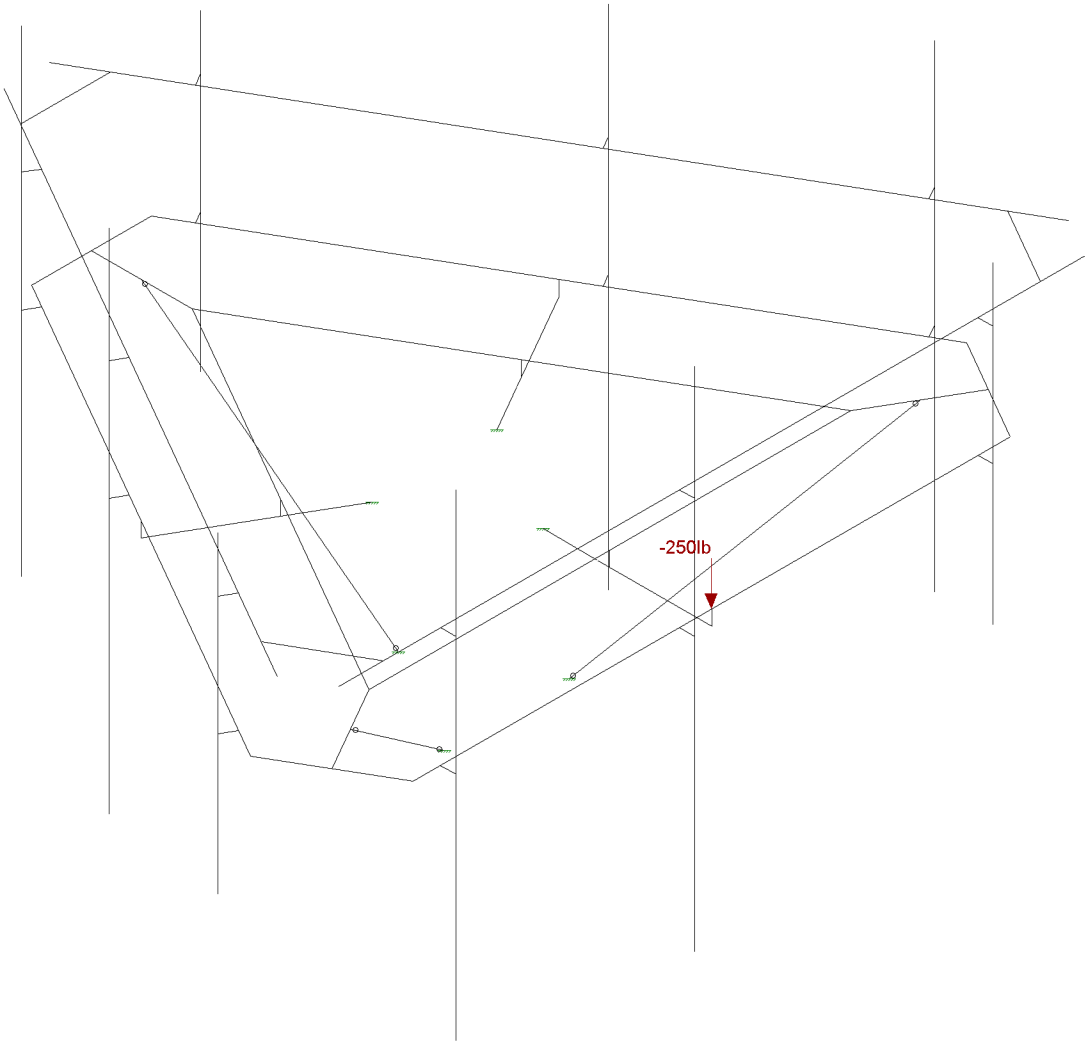

Loads: BLC 13, Service 5 Middle
Envelope Only Solution

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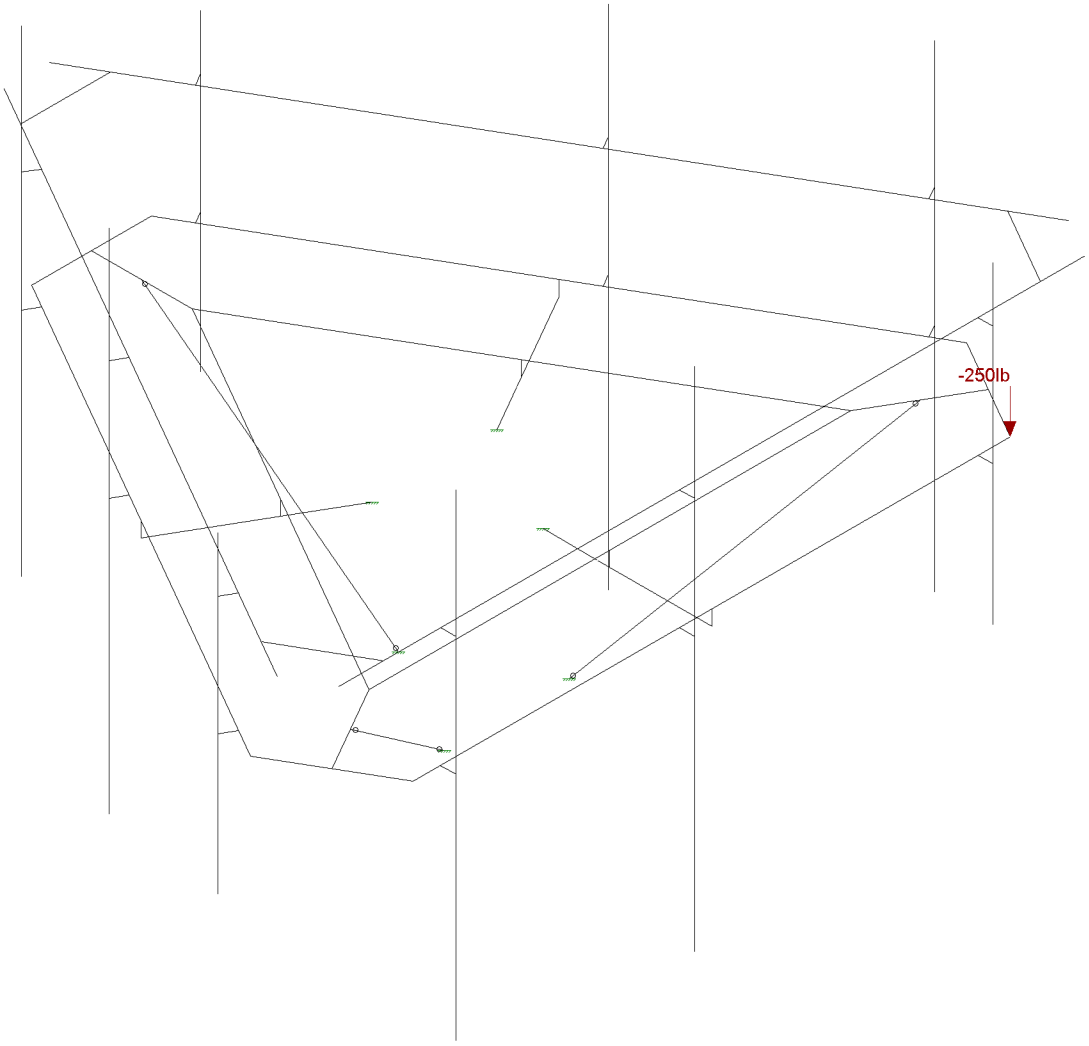


Loads: BLC 14, Service 6 End
Envelope Only Solution

Maser Consulting P.A.		SK - 18
CB	Mount analysis - Mods	Oct 15, 2018 at 3:54 PM
18922049A	Maintenance 5	Mods.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Client:	T-Mobile	Computed By:	CB
Site Name:	CT11278A	Date:	10/15/2018
Project No.	18922049A	Verified By:	SMS
Title:	Antenna Mount Modification Design & Analysis	Page:	1

Version 2.0

LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
3	ERICSSON	AIR 21 B2A B4P	Existing	Alpha, Beta, & Gamma
3	**ERICSSON**	**Air 32 DB B2A B66Aa**	**Proposed**	**Alpha, Beta, & Gamma**
3	**RFS**	**APXVAARR24_43-U-NA20**	**Proposed**	**Alpha, Beta, & Gamma**
3	ERICSSON	KRY 112 144/1	Existing	Alpha, Beta, & Gamma
3	**ERICSSON**	**RRU 4449 B71 + B12**	**Proposed**	**Alpha, Beta, & Gamma**

I. DESIGN INPUTS

Calculations for gravity and lateral loading on equipment and support mounts are determined as per the ANSI/TIA-222-H Code

				Reference	Equation
Wind Load Inputs Parameters					
Antenna Centerline	z	108	ft		
Ultimate Wind Speed	V_u	125	mph		
Normal Wind Speed with Ice (3 sec. Gust):	V_i	50	mph	Figure B9, p. 238	
Maintenace Wind Speed:	V_s	30	mph	Section 2.8.3	
Design Ice Thickness	t_i	2	in	Figure B9, p. 238	
Surface Roughness:		B		Section 2.6.5.1.1	
Exposure Category:		B		Section 2.6.5.1.2	
Risk Category:		II		Table 2-1	
Roof Top Wind Speed-Up Factor	K_s	1.0		Section 2.6.7	
Ground Elevation Factor:	K_e	1		Table 2-6	
Gust Effect Factor:	G_h	1.10		Section 2.6.9	
Wind Directionality Factor:	K_d	0.95		Table 2-2	
Topographic Category:		1		Section 2.6.6.2	
Wind Load Coefficients					
Importance Factors:					
Iced:	I_{ice}	1		Table 2-3	
Exposure Category Coefficients:					
3-s Gust-Speed Power Law Exponent:	α	7.0		Table 2-4	
Nominal Height of the Atmospheric Boundary Layer:	Z_g	1200	ft	Table 2-4	
Min. Value for k_z:	Kz_{min}	1.03		Table 2-4	
Terrain Constant:	K_e	1.10		Table 2-4	
Velocity Pressure Exposure Coefficient:	K_z	1.010		Section 2.6.5.2	$=2.01 \cdot (z/z_g)^{2/\alpha'}$
Topographic Category Coefficients:					
Topographic Constant:	K_t	N/A		Table 2-5	
Height Attenuation Factor:	f	N/A		Table 2-5	
Height Reduction Factor:	K_h	N/A		Section 2.6.6.2.1	$=e^{(f \cdot z/H)}$
Topographic Factor:	K_{zt}	1.00		Section 2.6.6.2	$=[1+(K_c \cdot K_t/K_h)]^2$
Ice Accumulation:					
Ice Velocity Pressure Exposure Coefficient:	K_{iz}	1.13			$=(z/33)^{0.10}$
Factored Ice Thickness:	t_{iz}	2.25	in	Section 2.6.10	$=t_i \cdot I \cdot K_{iz} \cdot (K_{zt})^{0.35}$
Ice Density:	ρ_i	56.00	pcf		
Design Wind Pressures:					
Velocity Pressure:	q_z	38.39	psf	Section 2.6.11.6	$=0.00256 \cdot K_z \cdot K_{zt \cdot Ks \cdot Ke} \cdot K_d \cdot V^2$
Velocity Pressure (With Ice):	q_{zi}	6.14	psf	Section 2.6.11.6	$=0.00256 \cdot K_z \cdot K_{zt \cdot Ks \cdot Ke} \cdot K_d \cdot V_i^2$
Velocity Pressure (Maintenance):	q_{zm}	2.21	psf	Section 2.6.11.6	$=0.00256 \cdot K_z \cdot K_{zt \cdot Ks \cdot Ke} \cdot K_d \cdot V_m^2$

II. CALCULATIONS

- ***Wind Load on Appurtenances***

Dimensions and Force Coefficients

Antenna/ Appurtenance	Non-Iced Condition								Iced Condition							
	Mounting Pipe			Equipment					Mounting Pipe			Equipment				
	Length (in)	Diameter (in)	Force Coefficient C_a	Height (in)	Width (in)	Depth (in)	Force Coefficient $C_{a\ Front}$	Force Coefficient $C_{a\ Side}$	Length (in)	Diameter (in)	Force Coefficient C_a	Height (in)	Width (in)	Depth (in)	Force Coefficient $C_{a\ Front}$	Force Coefficient $C_{a\ Side}$
AIR 21 B2A B4P	63.0	2.375	1.200	56.00	12.10	7.90	1.29	1.40	67.5	6.9	0.863	60.50	16.60	12.40	1.25	1.31
Air 32 DB B2A B66Aa	102.0	2.875	1.200	56.60	12.90	8.70	1.28	1.38	106.5	7.4	0.965	61.10	17.40	13.20	1.24	1.29
APXVAARR24_43-U-NA20	96.0	2.375	1.200	95.90	24.00	8.70	1.27	1.53	100.5	6.9	0.969	100.40	28.50	13.20	1.25	1.42
KRY 112 144/1	0.0	0.000	0.000	7.70	7.50	3.40	1.20	1.20	0.0	0.0	0.000	12.20	12.00	7.90	1.20	1.20
RRU 4449 B71 + B12	0.0	0.000	0.000	14.90	13.20	9.30	1.20	1.20	0.0	0.0	0.000	19.40	17.70	13.80	1.20	1.20

Antenna/ Appurtenance	# of Brackets	Non-Iced Condition			Iced Condition			Maintenance Condition	
		Wind Force (lbs.)		Gravity (lbs.)	Wind Force (lbs.)		Gravity (lbs.)	Wind Force (lbs.)	
		F_N	F_T		F_N	F_T		F_N	F_T
AIR 21 B2A B4P	2	131.5	117.3	**58.8**	30.8	32.4	**115.8**	7.6	6.8
Air 32 DB B2A B66Aa	2	160.4	151.1	**73.6**	40.5	42.3	**124.8**	9.2	8.7
APXVAARR24_43-U-NA20	2	427.4	227.8	**76.7**	83.6	59.9	**319.7**	24.6	13.1
KRY 112 144/1	1	20.3	9.2	**21.0**	8.2	5.4	**29.3**	1.2	0.5
RRU 4449 B71 + B12	1	69.2	48.8	**78.0**	19.3	15.1	**81.8**	4.0	2.8

**** ALL CALCULATED LOADS ARE PER MOUNTING BRACKET. TO GET THE TOTAL EQUIPMENT LOAD, MULTIPLY THE INDIVIDUAL LOADS BY THE NUMBER OF BRACKETS***

- ***Wind Load on Framing Members***

Member Category	Member Shape	Length (in)	Member Surface	Non-Iced Condition			Iced Condition						Maintenance Condition
				Exposed Wind Height (in)	Force Coefficient C_a	Wind Load (plf)	Exposed Wind Height (in)	Depth (in)	Length (in)	Force Coefficient C_a	Wind Load (plf)	Ice Weight (plf)	Wind Load (plf)
Equal Angle	L3x3	120	Square	3.00	2.00	21.11	7.50	7.50	124.50	2.00	8.45	17.87	1.22
Equal Angle	L3x3	96	Square	3.00	2.00	21.11	7.50	7.50	100.50	2.00	8.45	17.87	1.22
Equal Angle	L3x3	24	Square	3.00	1.43	15.13	7.50	7.50	28.50	1.43	6.06	17.87	0.87
Square HSS	HSS 4x4x1/4	10	HSS	4.00	0.85	11.96	8.50	8.50	14.50	0.85	4.07	21.76	0.69
Pipe	Pipe 2.0	96	Round	2.38	1.20	10.03	6.88	6.88	100.50	1.20	4.65	12.73	0.58
Pipe	Pipe 2.5	102	Round	2.88	1.20	12.14	7.38	7.38	106.50	1.20	4.99	14.10	0.70
Square HSS	HSS 4.5x4.5x1/4	24	HSS	4.50	0.88	13.96	9.00	9.00	28.50	0.88	4.47	23.70	0.80
Double Angle	2L2.5x2.5	64.6	Square	5.00	1.60	28.10	9.50	7.00	69.10	1.60	8.55	21.57	1.62
Pipe	Pipe 2.0	150	Round	2.38	1.20	10.03	6.88	6.88	154.50	1.20	4.65	12.73	0.58
											Grating	23.35	psf

BASIC EQUATIONS

ANSI/TIA-222-H Reference

Force Coefficient: (Square)

$$C_{f\_square}(h,w) := \begin{cases} 1.2 & \text{if } \frac{h}{w} \le 2.5 \\ \left[1.2 + \frac{0.2}{4.5}\cdot\left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[1.4 + \frac{0.6}{18}\cdot\left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 2.0 & \text{otherwise} \end{cases}$$

Table 2-9

Force Coefficient: (Round)

$$C_{f\_round}(h,w) := \begin{cases} 0.7 & \text{if } \frac{h}{w} \le 2.5 \\ \left[0.7 + \frac{0.1}{4.5}\cdot\left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[0.8 + \frac{0.4}{18}\cdot\left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 1.2 & \text{otherwise} \end{cases}$$

Table 2-9

Terrain Exposure Constants:

Table 2-5

$$\alpha := \begin{cases} 7.0 & \text{if Exp = "B"} \\ 9.5 & \text{if Exp = "C"} \\ 11.5 & \text{if Exp = "D"} \end{cases} \quad Z_g := \begin{cases} 1200\text{ft} & \text{if Exp = "B"} \\ 900\text{ft} & \text{if Exp = "C"} \\ 700\text{ft} & \text{if Exp = "D"} \end{cases} \quad K_{zmin} := \begin{cases} 0.70 & \text{if Exp = "B"} \\ 0.85 & \text{if Exp = "C"} \\ 1.03 & \text{if Exp = "D"} \end{cases}$$

BASIC EQUATIONS

ANSI/TIA-222-H Reference

Velocity Pressure Coefficient:

$$Kz(z) := \left| \begin{array}{l} K_z \leftarrow \max\left[2.01 \cdot \left(\frac{z}{Z_g} \right)^{\frac{2}{\alpha}}, K_{zmin} \right] \\ K_z \leftarrow \min\left(K_z, 2.01 \right) \end{array} \right.$$

Section 2.6.5.6

$$K_z := Kz(z)$$

$$Kzt(z) := K_{zt} \leftarrow \left| \begin{array}{l} 1.0 \text{ if } Topo = "1" \\ \text{otherwise} \\ \quad \left| \begin{array}{l} K_e \leftarrow \left| \begin{array}{l} 0.90 \text{ if } Exp = "B" \\ 1.00 \text{ if } Exp = "C" \\ 1.10 \text{ if } Exp = "D" \end{array} \right. \\ K_t \leftarrow \left| \begin{array}{l} 0.43 \text{ if } Topo = "2" \\ 0.53 \text{ if } Topo = "3" \\ 0.72 \text{ if } Topo = "4" \end{array} \right. \\ f \leftarrow \left| \begin{array}{l} 1.25 \text{ if } Topo = "2" \\ 2.00 \text{ if } Topo = "3" \\ 1.50 \text{ if } Topo = "4" \end{array} \right. \\ K_h \leftarrow e^{\left(\frac{f \cdot z}{CH} \right)} \\ \left(1 + \frac{K_e \cdot K_t}{K_h} \right)^2 \end{array} \right. \end{array} \right.$$

Table 2-4

$$K_{zt} := Kzt(z)$$

Velocity Pressure:

$$q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot V^2 \cdot psf$$

Section 2.6.9.6

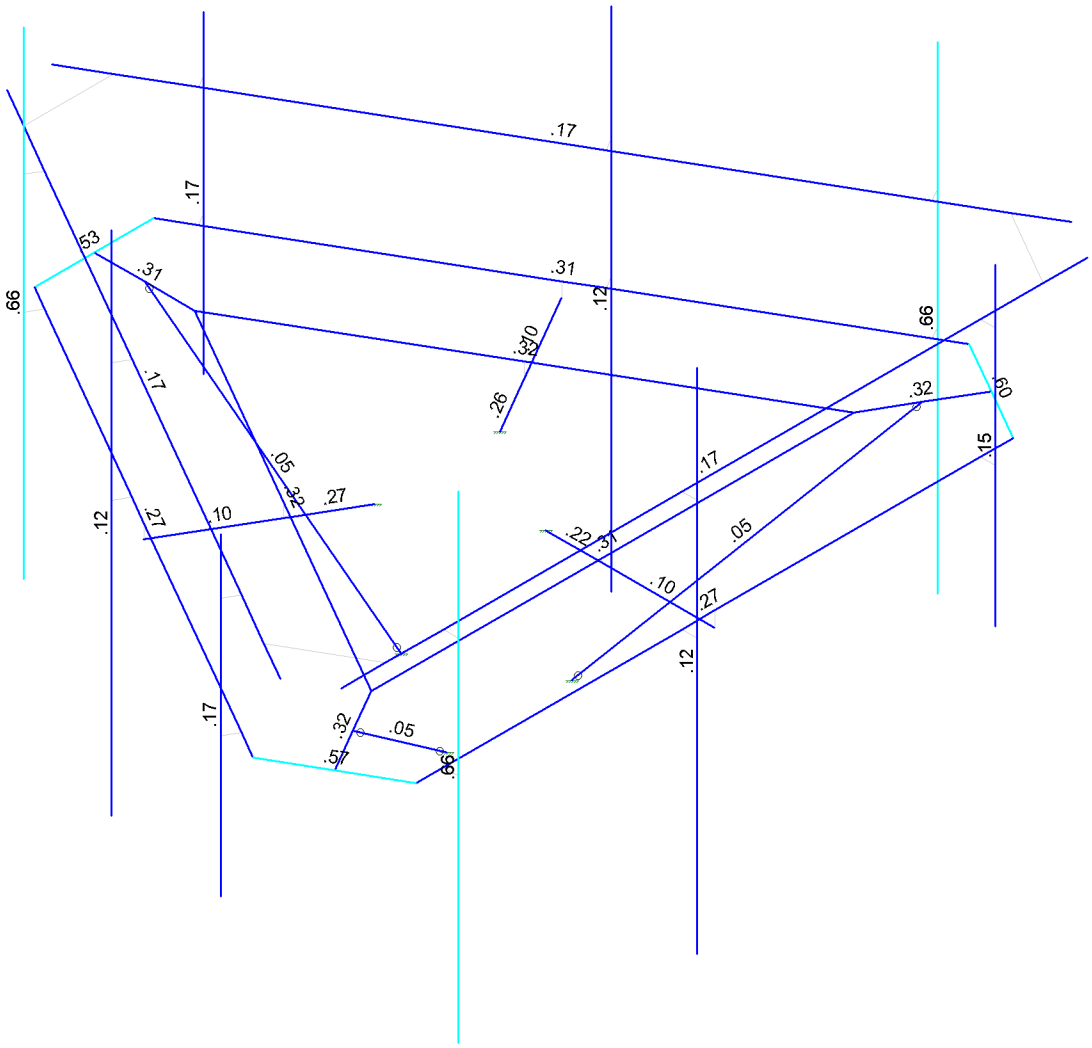
LOAD EQUATIONS

WIND LOAD

Area (Normal):	$AN_{area} = H_{ant} \cdot Want$
Area (Side):	$AT_{area} = H_{ant} \cdot Dant$
Force Coefficient (Normal):	$C_{fn} = C_{fsquare}(H_{ant}, Want)$
Force Coefficient (Side):	$C_{fs} = C_{fsquare}(H_{ant}, Dant)$
Pipe Area (Normal):	$AN_p = \max[(L_p - H_{ant}) * Dp, 0]$
Pipe Area (Side):	$AT_p = L_p \cdot Dp$
Force Coefficient (Normal):	$C_{fp} = C_{fround}(Lp, Dp)$
Normal Effective Projected Area:	$E_{pan} = (C_{fn} \cdot ANarea) + (Cfp \cdot ANp)$
Side Effective Projected Area:	$E_{pat} = (C_{fs} \cdot ATarea) + (Cfp \cdot ATp)$
Effective Projected Area:	$EPA = max(E_{pan}, Epat)$
Wind Force:	$F_{ant} = q_z \cdot Gh \cdot EPA$

APPENDIX C

SOFTWARE ANALYSIS OUTPUT



Member Code Checks Displayed
Envelope Only Solution

Maser Consulting P.A.		SK - 19
CB	Mount analysis - Mods	Oct 15, 2018 at 3:54 PM
18922049A	Members Code Check	Mods.r3d

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M2	N6	N5		270	Face Horizontal	Beam	Single Angle	A36 Gr.36	Typical
2	M3	N7	N8			Inner Angles	Beam	Single Angle	A36 Gr.36	Typical
3	M4	N9	N12			RIGID	None	None	RIGID	Typical
4	M5	N10	N13			RIGID	None	None	RIGID	Typical
5	M6	N11	N14			RIGID	None	None	RIGID	Typical
6	M7	N17	N19			Antenna Pipe	Beam	Pipe	A53 Gr. B	Typical
7	M8	N15	N18			Antenna Pipe	Beam	Pipe	A53 Gr. B	Typical
8	M23	N16	N20			Antenna Pipe 2	Beam	Pipe	A53 Gr. B	Typical
9	M11	N33	N32		270	Face Horizontal	Beam	Single Angle	A36 Gr.36	Typical
10	M12	N8	N35			Inner Angles	Beam	Single Angle	A36 Gr.36	Typical
11	M13	N36	N39			RIGID	None	None	RIGID	Typical
12	M14	N37	N40			RIGID	None	None	RIGID	Typical
13	M15	N38	N41			RIGID	None	None	RIGID	Typical
14	M16	N44	N46			Antenna Pipe	Beam	Pipe	A53 Gr. B	Typical
15	M17	N42	N45			Antenna Pipe	Beam	Pipe	A53 Gr. B	Typical
16	M18	N43	N47			Antenna Pipe 2	Beam	Pipe	A53 Gr. B	Typical
17	M20	N60	N59		270	Face Horizontal	Beam	Single Angle	A36 Gr.36	Typical
18	M21	N35	N7			Inner Angles	Beam	Single Angle	A36 Gr.36	Typical
19	M22	N63	N66			RIGID	None	None	RIGID	Typical
20	M23A	N64	N67			RIGID	None	None	RIGID	Typical
21	M24	N65	N68			RIGID	None	None	RIGID	Typical
22	M25	N71	N73			Antenna Pipe	Beam	Pipe	A53 Gr. B	Typical
23	M26	N69	N72			Antenna Pipe	Beam	Pipe	A53 Gr. B	Typical
24	M27	N70	N74			Antenna Pipe 2	Beam	Pipe	A53 Gr. B	Typical
25	M28	N33	N5			Face Horizontal	Beam	Single Angle	A36 Gr.36	Typical
26	M29	N59	N6		270	Face Horizontal	Beam	Single Angle	A36 Gr.36	Typical
27	M30	N32	N60		270	Face Horizontal	Beam	Single Angle	A36 Gr.36	Typical
28	M31	N79A	N35		180	Inner Double A...	Beam	Double Angle (...	A36 Gr.36	Typical
29	M32	N8	N78A		180	Inner Double A...	Beam	Double Angle (...	A36 Gr.36	Typical
30	M33	N7	N77A		180	Inner Double A...	Beam	Double Angle (...	A36 Gr.36	Typical
31	M34	N57	N90			RIGID	None	None	RIGID	Typical
32	M35	N58	N91			RIGID	None	None	RIGID	Typical
33	M36	N31	N89			RIGID	None	None	RIGID	Typical
34	M37	N30	N88			RIGID	None	None	RIGID	Typical
35	M38	N4	N91A			RIGID	None	None	RIGID	Typical
36	M39	N3	N87			RIGID	None	None	RIGID	Typical
37	M40	N56	N55			HSS Support 2	Beam	Tube	A500 Gr. ...	Typical
38	M41	N28	N29			HSS Support 2	Beam	Tube	A500 Gr. ...	Typical
39	M42	N1	N2			HSS Support 2	Beam	Tube	A500 Gr. ...	Typical
40	M40A	N3	N2			HSS Support 1	Beam	Tube	A500 Gr. ...	Typical
41	M41A	N30	N29			HSS Support 1	Beam	Tube	A500 Gr. ...	Typical
42	M42A	N57	N56			HSS Support 1	Beam	Tube	A500 Gr. ...	Typical
43	M43	N97	N94			Proposed Kick...	Beam	Double Angle (...	A36 Gr.36	Typical
44	M44	N95	N93			Proposed Kick...	Beam	Double Angle (...	A36 Gr.36	Typical
45	M45	N96	N92			Proposed Kick...	Beam	Double Angle (...	A36 Gr.36	Typical
46	M46	N99	N98		270	Proposed Han...	Beam	Pipe	A53 Gr. B	Typical
47	M47	N100	N103			RIGID	None	None	RIGID	Typical
48	M48	N101	N104			RIGID	None	None	RIGID	Typical
49	M49	N102	N105			RIGID	None	None	RIGID	Typical
50	M51	N108	N111			RIGID	None	None	RIGID	Typical
51	M52	N109	N112			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
52	M53	N110	N113			RIGID	None	None	RIGID	Typical
53	M55	N116	N119			RIGID	None	None	RIGID	Typical
54	M56	N117	N120			RIGID	None	None	RIGID	Typical
55	M57	N118	N121			RIGID	None	None	RIGID	Typical
56	M56A	N120A	N119A		270	Proposed Han...	Beam	Pipe	A53 Gr. B	Typical
57	M57A	N123	N122		270	Proposed Han...	Beam	Pipe	A53 Gr. B	Typical
58	M58	N124	N126			RIGID	None	None	RIGID	Typical
59	M59	N125	N123A			RIGID	None	None	RIGID	Typical
60	M60	N122A	N127			RIGID	None	None	RIGID	Typical

Joint Loads and Enforced Displacements (BLC 1 : Dead)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	AIR21-1A	L	Y	-53.25
2	AIR21-2A	L	Y	-53.25
3	AIR21-1B	L	Y	-53.25
4	AIR21-2B	L	Y	-53.25
5	AIR21-1G	L	Y	-53.25
6	AIR21-2G	L	Y	-53.25
7	AIR32-1A	L	Y	-73.6
8	AIR32-2A	L	Y	-73.6
9	AIR32-1B	L	Y	-73.6
10	AIR32-2B	L	Y	-73.6
11	AIR32-1G	L	Y	-73.6
12	AIR32-2G	L	Y	-73.6
13	APX-1A	L	Y	-76.65
14	APX-2A	L	Y	-76.65
15	APX-1B	L	Y	-76.65
16	APX-2B	L	Y	-76.65
17	APX-1G	L	Y	-76.65
18	APX-2G	L	Y	-76.65
19	KRY-A	L	Y	-21
20	KRY-B	L	Y	-21
21	KRY-C	L	Y	-21
22	B12-A	L	Y	-78
23	B12-B	L	Y	-78
24	B12-G	L	Y	-78

Joint Loads and Enforced Displacements (BLC 2 : Wx)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	KRY-C	L	X	-9.212
2	KRY-B	L	X	-9.212
3	KRY-A	L	X	0
4	B12-G	L	X	-48.761
5	B12-B	L	X	-48.761
6	B12-A	L	X	0
7	APX-2G	L	X	-227.764
8	APX-2B	L	X	-227.764
9	APX-2A	L	X	-427.406
10	APX-1G	L	X	-227.764
11	APX-1B	L	X	-227.764

Joint Loads and Enforced Displacements (BLC 2 : Wx) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
12	APX-1A	L	X	-427.406
13	AIR32-2G	L	X	-151.074
14	AIR32-2B	L	X	-151.074
15	AIR32-2A	L	X	-160.4
16	AIR32-1G	L	X	-151.074
17	AIR32-1B	L	X	-151.074
18	AIR32-1A	L	X	-160.4
19	AIR21-2G	L	X	-117.327
20	AIR21-2B	L	X	-117.327
21	AIR21-2A	L	X	-131.532
22	AIR21-1G	L	X	-117.327
23	AIR21-1B	L	X	-117.327
24	AIR21-1A	L	X	-131.532

Joint Loads and Enforced Displacements (BLC 3 : Wz)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	KRY-C	L	Z	0
2	KRY-B	L	Z	0
3	KRY-A	L	Z	-9.212
4	B12-G	L	Z	0
5	B12-B	L	Z	0
6	B12-A	L	Z	-48.761
7	APX-2G	L	Z	-427.406
8	APX-2B	L	Z	-427.406
9	APX-2A	L	Z	-227.764
10	APX-1G	L	Z	-427.406
11	APX-1B	L	Z	-427.406
12	APX-1A	L	Z	-227.764
13	AIR32-2G	L	Z	-160.4
14	AIR32-2B	L	Z	-160.4
15	AIR32-2A	L	Z	-151.074
16	AIR32-1G	L	Z	-160.4
17	AIR32-1B	L	Z	-160.4
18	AIR32-1A	L	Z	-151.074
19	AIR21-2G	L	Z	-131.532
20	AIR21-2B	L	Z	-131.532
21	AIR21-2A	L	Z	-117.327
22	AIR21-1G	L	Z	-131.532
23	AIR21-1B	L	Z	-131.532
24	AIR21-1A	L	Z	-117.327

Joint Loads and Enforced Displacements (BLC 4 : Ice Wx)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	KRY-C	L	X	-3.782
2	KRY-B	L	X	-3.782
3	KRY-A	L	X	0
4	B12-G	L	X	-13.321
5	B12-B	L	X	-13.321
6	B12-A	L	X	0
7	APX-2G	L	X	-58.346
8	APX-2B	L	X	-58.346

Joint Loads and Enforced Displacements (BLC 4 : Ice Wx) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
9	APX-2A	L	X	-90.611
10	APX-1G	L	X	-58.346
11	APX-1B	L	X	-58.346
12	APX-1A	L	X	-90.611
13	AIR32-2G	L	X	-40.388
14	AIR32-2B	L	X	-40.388
15	AIR32-2A	L	X	-39.339
16	AIR32-1G	L	X	-40.388
17	AIR32-1B	L	X	-40.388
18	AIR32-1A	L	X	-39.339
19	AIR21-2G	L	X	-30.364
20	AIR21-2B	L	X	-30.364
21	AIR21-2A	L	X	-30.815
22	AIR21-1G	L	X	-30.364
23	AIR21-1B	L	X	-30.364
24	AIR21-1A	L	X	-30.815

Joint Loads and Enforced Displacements (BLC 5 : Ice Wz)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	KRY-C	L	Z	0
2	KRY-B	L	Z	0
3	KRY-A	L	Z	-3.782
4	B12-G	L	Z	0
5	B12-B	L	Z	0
6	B12-A	L	Z	-13.321
7	APX-2G	L	Z	-90.611
8	APX-2B	L	Z	-90.611
9	APX-2A	L	Z	-58.346
10	APX-1G	L	Z	-90.611
11	APX-1B	L	Z	-90.611
12	APX-1A	L	Z	-58.346
13	AIR32-2G	L	Z	-39.339
14	AIR32-2B	L	Z	-39.339
15	AIR32-2A	L	Z	-40.388
16	AIR32-1G	L	Z	-39.339
17	AIR32-1B	L	Z	-39.339
18	AIR32-1A	L	Z	-40.388
19	AIR21-2G	L	Z	-30.815
20	AIR21-2B	L	Z	-30.815
21	AIR21-2A	L	Z	-30.364
22	AIR21-1G	L	Z	-30.815
23	AIR21-1B	L	Z	-30.815
24	AIR21-1A	L	Z	-30.364

Joint Loads and Enforced Displacements (BLC 6 : Ice weight)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	AIR21-1A	L	Y	-115.449
2	AIR21-2A	L	Y	-115.449
3	AIR21-1B	L	Y	-115.449
4	AIR21-2B	L	Y	-115.449
5	AIR21-1G	L	Y	-115.449

Joint Loads and Enforced Displacements (BLC 6 : Ice weight) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
6	AIR21-2G	L	Y	-115.449
7	AIR32-1A	L	Y	-124.942
8	AIR32-2A	L	Y	-124.942
9	AIR32-1B	L	Y	-124.942
10	AIR32-2B	L	Y	-124.942
11	AIR32-1G	L	Y	-124.942
12	AIR32-2G	L	Y	-124.942
13	APX-1A	L	Y	-332.867
14	APX-2A	L	Y	-332.867
15	APX-1B	L	Y	-332.867
16	APX-2B	L	Y	-332.867
17	APX-1G	L	Y	-332.867
18	APX-2G	L	Y	-332.867
19	KRY-A	L	Y	-23.705
20	KRY-B	L	Y	-23.705
21	KRY-C	L	Y	-23.705
22	B12-A	L	Y	-75.391
23	B12-B	L	Y	-75.391
24	B12-G	L	Y	-75.391

Joint Loads and Enforced Displacements (BLC 7 : Service X)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	KRY-C	L	X	-.531
2	KRY-B	L	X	-.531
3	KRY-A	L	X	0
4	B12-G	L	X	-2.809
5	B12-B	L	X	-2.809
6	B12-A	L	X	0
7	APX-2G	L	X	-13.119
8	APX-2B	L	X	-13.119
9	APX-2A	L	X	-24.619
10	APX-1G	L	X	-13.119
11	APX-1B	L	X	-13.119
12	APX-1A	L	X	-24.619
13	AIR32-2G	L	X	-8.702
14	AIR32-2B	L	X	-8.702
15	AIR32-2A	L	X	-9.239
16	AIR32-1G	L	X	-8.702
17	AIR32-1B	L	X	-8.702
18	AIR32-1A	L	X	-9.239
19	AIR21-2G	L	X	-6.758
20	AIR21-2B	L	X	-6.758
21	AIR21-2A	L	X	-7.576
22	AIR21-1G	L	X	-6.758
23	AIR21-1B	L	X	-6.758
24	AIR21-1A	L	X	-7.576

Joint Loads and Enforced Displacements (BLC 8 : Service Z)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	KRY-C	L	Z	0
2	KRY-B	L	Z	0

Joint Loads and Enforced Displacements (BLC 8 : Service Z) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
3	KRY-A	L	Z	-.531
4	B12-G	L	Z	0
5	B12-B	L	Z	0
6	B12-A	L	Z	-2.809
7	APX-2G	L	Z	-24.619
8	APX-2B	L	Z	-24.619
9	APX-2A	L	Z	-13.119
10	APX-1G	L	Z	-24.619
11	APX-1B	L	Z	-24.619
12	APX-1A	L	Z	-13.119
13	AIR32-2G	L	Z	-9.239
14	AIR32-2B	L	Z	-9.239
15	AIR32-2A	L	Z	-8.702
16	AIR32-1G	L	Z	-9.239
17	AIR32-1B	L	Z	-9.239
18	AIR32-1A	L	Z	-8.702
19	AIR21-2G	L	Z	-7.576
20	AIR21-2B	L	Z	-7.576
21	AIR21-2A	L	Z	-6.758
22	AIR21-1G	L	Z	-7.576
23	AIR21-1B	L	Z	-7.576
24	AIR21-1A	L	Z	-6.758

Joint Loads and Enforced Displacements (BLC 9 : Service 1 Pipe)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N11	L	Y	-500

Joint Loads and Enforced Displacements (BLC 10 : Service 2 Pipe)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N10	L	Y	-500

Joint Loads and Enforced Displacements (BLC 11 : Service 3 Pipe)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N9	L	Y	-500

Joint Loads and Enforced Displacements (BLC 13 : Service 5 Middle)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N87	L	Y	-250

Joint Loads and Enforced Displacements (BLC 14 : Service 6 End)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/in, lb*s^2*in)]
1	N5	L	Y	-250

Member Point Loads

Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
No Data to Print ...			

Member Distributed Loads (BLC 2 : Wx)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M2	PX	-21.11	-21.11	0	0
2	M11	PX	-21.11	-21.11	0	0
3	M20	PX	-21.11	-21.11	0	0
4	M28	PX	0	0	0	0
5	M29	PX	0	0	0	0
6	M30	PX	0	0	0	0
7	M28	PX	-15.13	-15.13	0	0
8	M29	PX	-15.13	-15.13	0	0
9	M30	PX	-15.13	-15.13	0	0
10	M40A	PX	-13.96	-13.96	0	0
11	M41A	PX	-13.96	-13.96	0	0
12	M42A	PX	-13.96	-13.96	0	0
13	M40	PX	-11.96	-11.96	0	0
14	M41	PX	-11.96	-11.96	0	0
15	M42	PX	-11.96	-11.96	0	0
16	M43	PX	28.1	28.1	0	0
17	M44	PX	28.1	28.1	0	0
18	M45	PX	28.1	28.1	0	0
19	M46	PX	-21.11	-21.11	0	0
20	M56A	PX	-21.11	-21.11	0	0
21	M57A	PX	-21.11	-21.11	0	0
22	M46	PX	10	10	0	0
23	M56A	PX	10	10	0	0
24	M57A	PX	10	10	0	0

Member Distributed Loads (BLC 3 : Wz)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M2	PZ	-21.11	-21.11	0	0
2	M11	PZ	-21.11	-21.11	0	0
3	M20	PZ	-21.11	-21.11	0	0
4	M28	PZ	-15.13	-15.13	0	0
5	M29	PZ	-15.13	-15.13	0	0
6	M30	PZ	-15.13	-15.13	0	0
7	M40A	PZ	-13.96	-13.96	0	0
8	M41A	PZ	-13.96	-13.96	0	0
9	M42A	PZ	-13.96	-13.96	0	0
10	M40	PZ	-11.96	-11.96	0	0
11	M41	PZ	-11.96	-11.96	0	0
12	M42	PZ	-11.96	-11.96	0	0
13	M43	PZ	28.1	28.1	0	0
14	M44	PZ	28.1	28.1	0	0
15	M45	PZ	28.1	28.1	0	0
16	M46	PZ	-21.11	-21.11	0	0
17	M56A	PZ	-21.11	-21.11	0	0
18	M57A	PZ	-21.11	-21.11	0	0
19	M46	PZ	10	10	0	0
20	M56A	PZ	10	10	0	0
21	M57A	PZ	10	10	0	0

Member Distributed Loads (BLC 4 : Ice Wx)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M2	PX	-3.78	-3.78	0	0
2	M11	PX	-3.78	-3.78	0	0
3	M20	PX	-3.78	-3.78	0	0
4	M28	PX	-2.71	-2.71	0	0
5	M29	PX	-2.71	-2.71	0	0
6	M30	PX	-2.71	-2.71	0	0
7	M40A	PX	-4.47	-4.47	0	0
8	M41A	PX	-4.47	-4.47	0	0
9	M42A	PX	-4.47	-4.47	0	0
10	M40	PX	-4.07	-4.07	0	0
11	M41	PX	-4.07	-4.07	0	0
12	M42	PX	-4.07	-4.07	0	0
13	M43	PX	8.6	8.6	0	0
14	M44	PX	8.6	8.6	0	0
15	M45	PX	8.6	8.6	0	0
16	M46	PX	-3.78	-3.78	0	0
17	M56A	PX	-3.78	-3.78	0	0
18	M57A	PX	-3.78	-3.78	0	0
19	M46	PX	4.7	4.7	0	0
20	M56A	PX	4.7	4.7	0	0
21	M57A	PX	4.7	4.7	0	0

Member Distributed Loads (BLC 5 : Ice Wz)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M2	PZ	-3.78	-3.78	0	0
2	M11	PZ	-3.78	-3.78	0	0
3	M20	PZ	-3.78	-3.78	0	0
4	M28	PZ	-2.71	-2.71	0	0
5	M29	PZ	-2.71	-2.71	0	0
6	M30	PZ	-2.71	-2.71	0	0
7	M40A	PZ	-4.47	-4.47	0	0
8	M41A	PZ	-4.47	-4.47	0	0
9	M42A	PZ	-4.47	-4.47	0	0
10	M40	PZ	-4.07	-4.07	0	0
11	M41	PZ	-4.07	-4.07	0	0
12	M42	PZ	-4.07	-4.07	0	0
13	M43	PZ	8.6	8.6	0	0
14	M44	PZ	8.6	8.6	0	0
15	M45	PZ	8.6	8.6	0	0
16	M46	PZ	-3.78	-3.78	0	0
17	M56A	PZ	-3.78	-3.78	0	0
18	M57A	PZ	-3.78	-3.78	0	0
19	M46	PZ	4.7	4.7	0	0
20	M56A	PZ	4.7	4.7	0	0
21	M57A	PZ	4.7	4.7	0	0

Member Distributed Loads (BLC 6 : Ice weight)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M7	Y	-4.82	-4.82	0	0
2	M8	Y	-4.82	-4.82	0	0
3	M16	Y	-4.82	-4.82	0	0

Member Distributed Loads (BLC 6 : Ice weight) (Continued)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
4	M17	Y	-4.82	-4.82	0	0
5	M25	Y	-4.82	-4.82	0	0
6	M26	Y	-4.82	-4.82	0	0
7	M23	Y	-5.5	-5.5	0	0
8	M18	Y	-5.5	-5.5	0	0
9	M27	Y	-5.5	-5.5	0	0
10	M40	Y	-21.76	-21.76	0	0
11	M41	Y	-21.76	-21.76	0	0
12	M42	Y	-21.76	-21.76	0	0
13	M43	Y	-21.6	-21.6	0	0
14	M44	Y	-21.6	-21.6	0	0
15	M45	Y	-21.6	-21.6	0	0
16	M46	Y	-12.7	-12.7	0	0
17	M56A	Y	-12.7	-12.7	0	0
18	M57A	Y	-12.7	-12.7	0	0

Member Distributed Loads (BLC 7 : Service X)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M2	PX	-1.22	-1.22	0	0
2	M11	PX	-1.22	-1.22	0	0
3	M20	PX	-1.22	-1.22	0	0
4	M28	PX	-.87	-.87	0	0
5	M29	PX	-.87	-.87	0	0
6	M30	PX	-.87	-.87	0	0
7	M40A	PX	-.8	-.8	0	0
8	M41A	PX	-.8	-.8	0	0
9	M42A	PX	-.8	-.8	0	0
10	M40	PX	-.69	-.69	0	0
11	M41	PX	-.69	-.69	0	0
12	M42	PX	-.69	-.69	0	0
13	M43	PX	1.6	1.6	0	0
14	M44	PX	1.6	1.6	0	0
15	M45	PX	1.6	1.6	0	0
16	M46	PX	-1.22	-1.22	0	0
17	M56A	PX	-1.22	-1.22	0	0
18	M57A	PX	-1.22	-1.22	0	0
19	M46	PX	.58	.58	0	0
20	M56A	PX	.58	.58	0	0
21	M57A	PX	.58	.58	0	0

Member Distributed Loads (BLC 8 : Service Z)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M2	PZ	-1.22	-1.22	0	0
2	M11	PZ	-1.22	-1.22	0	0
3	M20	PZ	-1.22	-1.22	0	0
4	M28	PZ	-.87	-.87	0	0
5	M29	PZ	-.87	-.87	0	0
6	M30	PZ	-.87	-.87	0	0
7	M40A	PZ	-.8	-.8	0	0
8	M41A	PZ	-.8	-.8	0	0
9	M42A	PZ	-.8	-.8	0	0

Member Distributed Loads (BLC 8 : Service Z) (Continued)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
10	M40	PZ	-.69	-.69	0	0
11	M41	PZ	-.69	-.69	0	0
12	M42	PZ	-.69	-.69	0	0
13	M43	PZ	1.6	1.6	0	0
14	M44	PZ	1.6	1.6	0	0
15	M45	PZ	1.6	1.6	0	0
16	M46	PZ	-1.22	-1.22	0	0
17	M56A	PZ	-1.22	-1.22	0	0
18	M57A	PZ	-1.22	-1.22	0	0
19	M46	PZ	.58	.58	0	0
20	M56A	PZ	.58	.58	0	0
21	M57A	PZ	.58	.58	0	0

Member Distributed Loads (BLC 15 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M28	Y	-1.205	-1.205	4.801	8.642
2	M28	Y	-1.205	-18.766	8.642	12.482
3	M28	Y	-18.766	-47.441	12.482	16.323
4	M28	Y	-47.441	-46.506	16.323	20.164
5	M28	Y	-46.506	-22.408	20.164	24.004
6	M29	Y	-1.036	-1.488	4.801	8.642
7	M29	Y	-1.488	-18.941	8.642	12.482
8	M29	Y	-18.941	-46.806	12.482	16.323
9	M29	Y	-46.806	-47.312	16.323	20.164
10	M29	Y	-47.312	-26.597	20.164	24.004
11	M32	Y	-50.924	-56.96	0	4.042
12	M32	Y	-56.96	-36.89	4.042	8.085
13	M32	Y	-36.89	-40.972	8.085	12.127
14	M32	Y	-40.972	-66.856	12.127	16.169
15	M32	Y	-66.856	-63.318	16.169	20.212
16	M33	Y	-50.749	-56.435	0	4.042
17	M33	Y	-56.435	-36.521	4.042	8.085
18	M33	Y	-36.521	-40.326	8.085	12.127
19	M33	Y	-40.326	-65.252	12.127	16.169
20	M33	Y	-65.252	-61.02	16.169	20.212
21	M29	Y	-26.597	-47.312	0	3.841
22	M29	Y	-47.312	-46.806	3.841	7.681
23	M29	Y	-46.806	-18.941	7.681	11.522
24	M29	Y	-18.941	-1.488	11.522	15.363
25	M29	Y	-1.488	-1.036	15.363	19.204
26	M30	Y	-1.205	-1.205	4.801	8.642
27	M30	Y	-1.205	-18.766	8.642	12.482
28	M30	Y	-18.766	-47.441	12.482	16.323
29	M30	Y	-47.441	-46.506	16.323	20.164
30	M30	Y	-46.506	-22.408	20.164	24.004
31	M31	Y	-65.617	-68.46	0	4.042
32	M31	Y	-68.46	-41.618	4.042	8.085
33	M31	Y	-41.618	-37.258	8.085	12.127
34	M31	Y	-37.258	-57.486	12.127	16.169
35	M31	Y	-57.486	-51.099	16.169	20.212
36	M2	Y	-3.506	-.956	0	6

Member Distributed Loads (BLC 15 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
37	M2	Y	-.956	.319	6	12
38	M20	Y	.382	-1.145	108	114
39	M20	Y	-1.145	-4.199	114	120
40	M2	Y	.319	-.956	108	114
41	M2	Y	-.956	-3.506	114	120
42	M11	Y	-4.199	-1.145	0	6
43	M11	Y	-1.145	.382	6	12
44	M28	Y	-26.597	-47.312	0	3.841
45	M28	Y	-47.312	-46.806	3.841	7.681
46	M28	Y	-46.806	-18.941	7.681	11.522
47	M28	Y	-18.941	-1.488	11.522	15.363
48	M28	Y	-1.488	-1.036	15.363	19.204
49	M30	Y	-22.408	-46.506	0	3.841
50	M30	Y	-46.506	-47.441	3.841	7.681
51	M30	Y	-47.441	-18.766	7.681	11.522
52	M30	Y	-18.766	-1.205	11.522	15.363
53	M30	Y	-1.205	-1.205	15.363	19.204
54	M11	Y	.382	-1.145	108	114
55	M11	Y	-1.145	-4.199	114	120
56	M20	Y	-3.506	-.956	0	6
57	M20	Y	-.956	.319	6	12

Member Distributed Loads (BLC 16 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
1	M28	Y	-2.82	-2.82	4.801	8.642
2	M28	Y	-2.82	-43.912	8.642	12.482
3	M28	Y	-43.912	-111.012	12.482	16.323
4	M28	Y	-111.012	-108.825	16.323	20.164
5	M28	Y	-108.825	-52.434	20.164	24.004
6	M29	Y	-2.424	-3.482	4.801	8.642
7	M29	Y	-3.482	-44.322	8.642	12.482
8	M29	Y	-44.322	-109.526	12.482	16.323
9	M29	Y	-109.526	-110.711	16.323	20.164
10	M29	Y	-110.711	-62.238	20.164	24.004
11	M32	Y	-119.163	-133.287	0	4.042
12	M32	Y	-133.287	-86.322	4.042	8.085
13	M32	Y	-86.322	-95.875	8.085	12.127
14	M32	Y	-95.875	-156.443	12.127	16.169
15	M32	Y	-156.443	-148.165	16.169	20.212
16	M33	Y	-118.754	-132.057	0	4.042
17	M33	Y	-132.057	-85.46	4.042	8.085
18	M33	Y	-85.46	-94.363	8.085	12.127
19	M33	Y	-94.363	-152.691	12.127	16.169
20	M33	Y	-152.691	-142.786	16.169	20.212
21	M29	Y	-62.238	-110.711	0	3.841
22	M29	Y	-110.711	-109.526	3.841	7.681
23	M29	Y	-109.526	-44.322	7.681	11.522
24	M29	Y	-44.322	-3.482	11.522	15.363
25	M29	Y	-3.482	-2.424	15.363	19.204
26	M30	Y	-2.82	-2.82	4.801	8.642
27	M30	Y	-2.82	-43.912	8.642	12.482

Member Distributed Loads (BLC 16 : BLC 6 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb...	End Magnitude[lb/ft,F]	Start Location[in,%]	End Location[in,%]
28	M30	Y	-43.912	-111.012	12.482	16.323
29	M30	Y	-111.012	-108.825	16.323	20.164
30	M30	Y	-108.825	-52.434	20.164	24.004
31	M31	Y	-153.545	-160.196	0	4.042
32	M31	Y	-160.196	-97.387	4.042	8.085
33	M31	Y	-97.387	-87.184	8.085	12.127
34	M31	Y	-87.184	-134.517	12.127	16.169
35	M31	Y	-134.517	-119.572	16.169	20.212
36	M2	Y	-8.203	-2.237	0	6
37	M2	Y	-2.237	.746	6	12
38	M20	Y	.893	-2.68	108	114
39	M20	Y	-2.68	-9.827	114	120
40	M2	Y	.746	-2.237	108	114
41	M2	Y	-2.237	-8.203	114	120
42	M11	Y	-9.827	-2.68	0	6
43	M11	Y	-2.68	.893	6	12
44	M28	Y	-62.238	-110.711	0	3.841
45	M28	Y	-110.711	-109.526	3.841	7.681
46	M28	Y	-109.526	-44.322	7.681	11.522
47	M28	Y	-44.322	-3.482	11.522	15.363
48	M28	Y	-3.482	-2.424	15.363	19.204
49	M30	Y	-52.434	-108.825	0	3.841
50	M30	Y	-108.825	-111.012	3.841	7.681
51	M30	Y	-111.012	-43.912	7.681	11.522
52	M30	Y	-43.912	-2.82	11.522	15.363
53	M30	Y	-2.82	-2.82	15.363	19.204
54	M11	Y	.893	-2.68	108	114
55	M11	Y	-2.68	-9.827	114	120
56	M20	Y	-8.203	-2.237	0	6
57	M20	Y	-2.237	.746	6	12

Member Area Loads (BLC 1 : Dead)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N6	N5	N8	N7	Y	A-B	-10
2	N59	N60	N35	N7	Y	A-B	-10
3	N6	N59	N7		Y	A-B	-10
4	N5	N33	N8		Y	A-B	-10
5	N33	N32	N35	N8	Y	A-B	-10
6	N60	N32	N35		Y	A-B	-10

Member Area Loads (BLC 6 : Ice weight)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N6	N5	N8	N7	Y	A-B	-23.4
2	N59	N60	N35	N7	Y	A-B	-23.4
3	N6	N59	N7		Y	A-B	-23.4
4	N5	N33	N8		Y	A-B	-23.4
5	N33	N32	N35	N8	Y	A-B	-23.4
6	N60	N32	N35		Y	A-B	-23.4

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu..	Area(M...	Surface...
1	Dead	DL		-1.05		24			6	
2	Wx	WL				24		24		
3	Wz	WL				24		21		
4	Ice Wx	WL				24		21		
5	Ice Wz	None				24		21		
6	Ice weight	None				24		18	6	
7	Service X	None				24		21		
8	Service Z	None				24		21		
9	Service 1 Pipe	None				1				
10	Service 2 Pipe	None				1				
11	Service 3 Pipe	None				1				
12	Service 4 Pipe	None								
13	Service 5 Middle	None				1				
14	Service 6 End	None				1				
15	BLC 1 Transient Area Loads	None						57		
16	BLC 6 Transient Area Loads	None						57		

Load Combinations

	Description	So...	PDelta	S...	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	1.2D+1.0W1	Yes	Y		1	1.2	2	1	3													
3	1.2D+1.0W2	Yes	Y		1	1.2	2	.866	3	.5												
4	1.2D+1.0W3	Yes	Y		1	1.2	2	.5	3	.866												
5	1.2D+1.0W4	Yes	Y		1	1.2	2		3	1												
6	1.2D+1.0W5	Yes	Y		1	1.2	2	-.5	3	.866												
7	1.2D+1.0W6	Yes	Y		1	1.2	2	-.866	3	.5												
8	1.2D+1.0W7	Yes	Y		1	1.2	2	-1	3													
9	1.2D+1.0W8	Yes	Y		1	1.2	2	-.866	3	-.5												
10	1.2D+1.0W9	Yes	Y		1	1.2	2	-.5	3	-.866												
11	1.2D+1.0W10	Yes	Y		1	1.2	2		3	-1												
12	1.2D+1.0W11	Yes	Y		1	1.2	2	.5	3	-.866												
13	1.2D+1.0W12	Yes	Y		1	1.2	2	.866	3	-.5												
14	1.2D+1.0 Ice	Yes	Y		1	1.2	6	1														
15	1.2D+1.0ICE+1.0W1ICE	Yes	Y		1	1.2	6	1	4	1	5											
16	1.2D+1.0ICE+1.0W2ICE	Yes	Y		1	1.2	6	1	4	.866	5	.5										
17	1.2D+1.0ICE+1.0W3ICE	Yes	Y		1	1.2	6	1	4	.5	5	.866										
18	1.2D+1.0ICE+1.0W4ICE	Yes	Y		1	1.2	6	1	4		5	1										
19	1.2D+1.0ICE+1.0W5ICE	Yes	Y		1	1.2	6	1	4	-.5	5	.866										
20	1.2D+1.0ICE+1.0W6ICE	Yes	Y		1	1.2	6	1	4	-.866	5	.5										
21	1.2D+1.0ICE+1.0W7ICE	Yes	Y		1	1.2	6	1	4	-1	5											
22	1.2D+1.0ICE+1.0W8ICE	Yes	Y		1	1.2	6	1	4	-.866	5	-.5										
23	1.2D+1.0ICE+1.0W9ICE	Yes	Y		1	1.2	6	1	4	-.5	5	-.866										
24	1.2D+1.0ICE+1.0W10ICE	Yes	Y		1	1.2	6	1	4		5	-1										
25	1.2D+1.0ICE+1.0W11ICE	Yes	Y		1	1.2	6	1	4	.5	5	-.866										
26	1.2D+1.0ICE+1.0W12ICE	Yes	Y		1	1.2	6	1	4	.866	5	-.5										
27	1.2D+1.5LM1+1.0W1SER	Yes	Y		1	1.2	9	1.5	7	1	8											
28	1.2D+1.5LM1+1.0W2SER	Yes	Y		1	1.2	9	1.5	7	.866	8	.5										
29	1.2D+1.5LM1+1.0W3SER	Yes	Y		1	1.2	9	1.5	7	.5	8	.866										
30	1.2D+1.5LM1+1.0W4SER	Yes	Y		1	1.2	9	1.5	7		8	1										

Load Combinations (Continued)

	Description	So...	PDelta	S...	BLC	Fac...	BLC	Fac...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
31	1.2D+1.5LM1+1.0W5SER	Yes	Y		1	1.2	9	1.5	7	-.5	8	.866						
32	1.2D+1.5LM1+1.0W6SER	Yes	Y		1	1.2	9	1.5	7	-.866	8	.5						
33	1.2D+1.5LM1+1.0W7SER	Yes	Y		1	1.2	9	1.5	7	-1	8							
34	1.2D+1.5LM1+1.0W8SER	Yes	Y		1	1.2	9	1.5	7	-.866	8	-.5						
35	1.2D+1.5LM1+1.0W9SER	Yes	Y		1	1.2	9	1.5	7	-.5	8	-.866						
36	1.2D+1.5LM1+1.0W10SER	Yes	Y		1	1.2	9	1.5	7		8	-1						
37	1.2D+1.5LM1+1.0W11SER	Yes	Y		1	1.2	9	1.5	7	.5	8	-.866						
38	1.2D+1.5LM1+1.0W12SER	Yes	Y		1	1.2	9	1.5	7	.866	8	-.5						
39																		
40	1.2D+1.5LM2+1.0W1SER	Yes	Y		1	1.2	10	1.5	7	1	8							
41	1.2D+1.5LM2+1.0W2SER	Yes	Y		1	1.2	10	1.5	7	.866	8	.5						
42	1.2D+1.5LM2+1.0W3SER	Yes	Y		1	1.2	10	1.5	7	.5	8	.866						
43	1.2D+1.5LM2+1.0W4SER	Yes	Y		1	1.2	10	1.5	7		8	1						
44	1.2D+1.5LM2+1.0W5SER	Yes	Y		1	1.2	10	1.5	7	-.5	8	.866						
45	1.2D+1.5LM2+1.0W6SER	Yes	Y		1	1.2	10	1.5	7	-.866	8	.5						
46	1.2D+1.5LM2+1.0W7SER	Yes	Y		1	1.2	10	1.5	7	-1	8							
47	1.2D+1.5LM2+1.0W8SER	Yes	Y		1	1.2	10	1.5	7	-.866	8	-.5						
48	1.2D+1.5LM2+1.0W9SER	Yes	Y		1	1.2	10	1.5	7	-.5	8	-.866						
49	1.2D+1.5LM2+1.0W10SER	Yes	Y		1	1.2	10	1.5	7		8	-1						
50	1.2D+1.5LM2+1.0W11SER	Yes	Y		1	1.2	10	1.5	7	.5	8	-.866						
51	1.2D+1.5LM2+1.0W12SER	Yes	Y		1	1.2	10	1.5	7	.866	8	-.5						
52																		
53	1.2D+1.5LV1	Yes	Y		1	1.2	13	1.5										
54	1.2D+1.5LV2	Yes	Y		1	1.2	14	1.5										
55			Y															
56	1.2D+1.5LM3+1.0W1SER	Yes	Y		1	1.2	11	1.5	7	1	8							
57	1.2D+1.5LM3+1.0W2SER	Yes	Y		1	1.2	11	1.5	7	.866	8	.5						
58	1.2D+1.5LM3+1.0W3SER	Yes	Y		1	1.2	11	1.5	7	.5	8	.866						
59	1.2D+1.5LM3+1.0W4SER	Yes	Y		1	1.2	11	1.5	7		8	1						
60	1.2D+1.5LM3+1.0W5SER	Yes	Y		1	1.2	11	1.5	7	-.5	8	.866						
61	1.2D+1.5LM3+1.0W6SER	Yes	Y		1	1.2	11	1.5	7	-.866	8	.5						
62	1.2D+1.5LM3+1.0W7SER	Yes	Y		1	1.2	11	1.5	7	-1	8							
63	1.2D+1.5LM3+1.0W8SER	Yes	Y		1	1.2	11	1.5	7	-.866	8	-.5						
64	1.2D+1.5LM3+1.0W9SER	Yes	Y		1	1.2	11	1.5	7	-.5	8	-.866						
65	1.2D+1.5LM3+1.0W10SER	Yes	Y		1	1.2	11	1.5	7		8	-1						
66	1.2D+1.5LM3+1.0W11SER	Yes	Y		1	1.2	11	1.5	7	.5	8	-.866						
67	1.2D+1.5LM3+1.0W12SER	Yes	Y		1	1.2	11	1.5	7	.866	8	-.5						
68			Y															
69	1.2D+1.5LM4+1.0W1SER		Y		1	1.2	12	1.5	7	1	8							
70	1.2D+1.5LM4+1.0W2SER		Y		1	1.2	12	1.5	7	.866	8	.5						
71	1.2D+1.5LM4+1.0W3SER		Y		1	1.2	12	1.5	7	.5	8	.866						
72	1.2D+1.5LM4+1.0W4SER		Y		1	1.2	12	1.5	7		8	1						
73	1.2D+1.5LM4+1.0W5SER		Y		1	1.2	12	1.5	7	-.5	8	.866						
74	1.2D+1.5LM4+1.0W6SER		Y		1	1.2	12	1.5	7	-.866	8	.5						
75	1.2D+1.5LM4+1.0W7SER		Y		1	1.2	12	1.5	7	-1	8							
76	1.2D+1.5LM4+1.0W8SER		Y		1	1.2	12	1.5	7	-.866	8	-.5						
77	1.2D+1.5LM4+1.0W9SER		Y		1	1.2	12	1.5	7	-.5	8	-.866						
78	1.2D+1.5LM4+1.0W10SER		Y		1	1.2	12	1.5	7		8	-1						
79	1.2D+1.5LM4+1.0W11SER		Y		1	1.2	12	1.5	7	.5	8	-.866						
80	1.2D+1.5LM4+1.0W12SER		Y		1	1.2	12	1.5	7	.866	8	-.5						

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	706.592	2	925.244	46	2235.825	5	.444	5	2.13	11	2.789	46
2		min	-419.003	8	234.924	2	-2229.487	11	-.564	11	-2.142	5	.595	2
3	N94	max	1730.447	21	2685.119	22	2959.075	23	.071	8	.214	2	.123	8
4		min	487.051	3	833.434	4	836.498	4	-.076	2	-.2	8	-.132	2
5	N92	max	1706.876	20	2682.143	18	-871.353	12	.036	3	.118	9	.072	9
6		min	480.5	13	853.648	12	-2970.191	18	-.041	9	-.104	3	-.063	3
7	N93	max	-999.273	7	2689.694	25	34.564	11	.191	5	.267	5	0	1
8		min	-3426.019	26	837.762	7	-29.661	5	-.181	11	-.253	11	0	1
9	N28	max	1950.63	13	683.943	17	1242.708	6	2.277	18	2.485	6	-.002	8
10		min	-2086.635	7	183.124	35	-1496.081	12	.36	11	-2.501	12	-1.123	15
11	N55	max	2266.407	3	676.956	26	1599.08	4	-.381	5	2.872	3	-.048	8
12		min	-2412.58	9	215.251	60	-1351.429	10	-2.061	24	-2.882	9	-1.473	15
13	Totals:	max	3995.979	2	9990.952	24	4291.196	5						
14		min	-3995.987	8	3834.318	5	-4291.198	11						

Envelope AISC 13th(360-05): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Lo...		LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
1	M25	PIPE_2.0	.656	50	11	.083	26		10	1491..	32130	1.872	1.872	...	H1-...
2	M7	PIPE_2.0	.655	50	8	.073	26		7	1491..	32130	1.872	1.872	...	H1-...
3	M16	PIPE_2.0	.655	50	5	.085	26		12	1491..	32130	1.872	1.872	...	H1-...
4	M28	L3x3x4	.595	12.002	11	.152	12...	y	17	4269..	46656	1.688	3.756	...	H2-1
5	M29	L3x3x4	.572	12.002	3	.154	12...	z	21	4269..	46656	1.688	3.756	...	H2-1
6	M30	L3x3x4	.532	12.002	7	.154	12...	z	25	4269..	46656	1.688	3.756	...	H2-1
7	M21	L3x3x4	.316	96.995	22	.019	0	y	19	1183..	46656	1.688	3.423	...	H2-1
8	M12	L3x3x4	.315	96.995	25	.019	0	y	23	1183..	46656	1.688	3.419	...	H2-1
9	M32	LL3x3x4x0	.315	10.106	23	.114	10...	y	16	8300..	93312	6.48	4.911	...	H1-...
10	M33	LL3x3x4x0	.315	10.106	26	.119	10...	y	61	8300..	93312	6.48	4.911	...	H1-...
11	M3	L3x3x4	.314	96.995	18	.019	0	y	15	1183..	46656	1.688	3.423	...	H2-1
12	M31	LL3x3x4x0	.313	10.106	17	.116	10...	y	24	8300..	93312	6.48	4.911	...	H1-...
13	M11	L3x3x4	.312	60	4	.263	0	y	4	7731..	46656	1.688	3.055	...	H2-1
14	M40	HSS4x4x4	.270	11	3	.128	11	z	3	1269..	1273..	14.774	14.774	...	H1-...
15	M20	L3x3x4	.269	60	13	.309	0	y	11	7731..	46656	1.688	3.076	...	H2-1
16	M2	L3x3x4	.266	60	22	.316	0	y	8	7731..	46656	1.688	3.192	...	H2-1
17	M41	HSS4x4x4	.263	0	6	.112	0	z	7	1269..	1273..	14.774	14.774	...	H1-...
18	M42	HSS4x4x4	.217	0	11	.109	0	z	11	1269..	1273..	14.774	14.774	...	H1-...
19	M17	PIPE_2.0	.174	34.781	12	.044	23...		12	2308..	32130	1.872	1.872	...	H1-...
20	M46	PIPE_2.0	.172	20.313	57	.246	9....		2	6295..	32130	1.872	1.872	...	H1-...
21	M56A	PIPE_2.0	.171	21.875	13	.216	9....		10	6295..	32130	1.872	1.872	...	H1-...
22	M57A	PIPE_2.0	.167	129.687	62	.252	9....		5	6295..	32130	1.872	1.872	...	H1-...
23	M26	PIPE_2.0	.166	34.781	9	.041	23...		7	2308..	32130	1.872	1.872	...	H1-...
24	M8	PIPE_2.0	.150	34.781	4	.044	23...		3	2308..	32130	1.872	1.872	...	H1-...
25	M23	PIPE_2.5	.123	46.75	17	.045	35...		7	2807..	50715	3.596	3.596	...	H1-...
26	M27	PIPE_2.5	.122	46.75	21	.046	35...		11	2807..	50715	3.596	3.596	3	H1-...
27	M18	PIPE_2.5	.121	46.75	25	.041	35...		3	2807..	50715	3.596	3.596	...	H1-...
28	M40A	HSS4.5x4.5x4	.103	23	45	.090	23	z	11	1435..	1451..	19.089	19.089	...	H1-...
29	M41A	HSS4.5x4.5x4	.102	23	18	.093	23	z	7	1435..	1451..	19.089	19.089	...	H1-...
30	M42A	HSS4.5x4.5x4	.101	23	23	.106	23	z	3	1435..	1451..	19.089	19.089	...	H1-...
31	M43	LL2.5x2.5x8x6	.047	35.712	15	.007	0	z	2	9738..	1464..	13.118	6.211	...	H1-...
32	M44	LL2.5x2.5x8x6	.046	35.038	19	.008	0	z	5	9738..	1464..	13.118	6.211	...	H1-...

Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Lo...	...	LC	phi*...	phi*...	phi*...	phi*...	...	Eqn
33	M45	LL2.5x2.5x8x6	.045	35.038	23	.005	0	z	9	9738..	1464..	13.118	6.211	...	H1-...

APPENDIX D

ADDITIONAL CALCULATIONS

Rectangular Weld Check (Assuming 5/16" weld all around) :

Y-Direction Tension (lbs): $T_y := 925.2 \cdot lbf$ (From RISA 3-D, resulting in worst case reaction combination)

X-Direction Shear (lbs): $V_x := 2412.6 \cdot lbf$ (From RISA 3-D, resulting in worst case reaction combination)

Z-Direction Shear (lbs): $V_z := 2235.8 \cdot lbf$ (From RISA 3-D, resulting in worst case reaction combination)

X-Moment (lbs): $M_x := 2.277 \cdot kip \cdot ft$ (From RISA 3-D, resulting in worst case reaction combination)

Y-Moment (lbs): $M_y := 2.882 \cdot kip \cdot ft$ (From RISA 3-D, resulting in worst case reaction combination)

Z-Moment (lbs): $M_z := 2.789 \cdot kip \cdot ft$ (From RISA 3-D, resulting in worst case reaction combination)

Length of Weld, d (in): $d := 4in$ (Length of Baseplate)

Width of Weld, b (in): $b := 4in$ (Width of W-Flange)

Section Modulus Bending: $Sx\_z := b \cdot d + \frac{d^2}{3} = 21.333 \cdot in^2$ $Sx\_y := b \cdot d + \frac{b^2}{3} = 21.333 \cdot in^2$

Polar Moment of Inertia: $Jw := \frac{(b + d)^3}{6} = 85.333 \cdot in^3$

Shear Component on Weld:

Shear from Concentrated Load: $f_{vx} := \frac{V_x}{2d} = 301.6 \cdot \frac{lbf}{in}$ $f_{vz} := \frac{V_z}{2b} = 279.5 \cdot \frac{lbf}{in}$

Shear from Moment Load: $f_{vh\_my} := \frac{M_y \cdot \left(\frac{d}{2}\right)}{Jw} = 810.563 \cdot \frac{lbf}{in}$ $f_{vv\_my} := \frac{M_y \cdot \left(\frac{b}{2}\right)}{Jw} = 810.563 \cdot \frac{lbf}{in}$

Horizontal Shear: $f_{vh} := f_{vh\_my} + f_{vz} = 1.09 \times 10^3 \cdot \frac{lbf}{in}$

Vertical Shear: $f_{vv} := f_{vv\_my} + f_{vx} = 1.112 \times 10^3 \cdot \frac{lbf}{in}$

Resultant Shear: $F_v := \sqrt{f_{vh}^2 + f_{vv}^2} = 1.557 \times 10^3 \cdot \frac{lbf}{in}$

Tensile Component on Weld:

Tension from Concentrated Load: $f_{ty} := \frac{T_y}{2d + 2 \cdot b} = 57.8 \cdot \frac{lbf}{in}$

Tension from Moment Load: $f_{t\_mx} := \frac{M_x}{Sx\_y} = 1.281 \times 10^3 \cdot \frac{lbf}{in}$ $f_{t\_mz} := \frac{M_z}{Sx\_y} = 1568.813 \cdot \frac{lbf}{in}$

Resultant Tension: $F_t := f_{ty} + f_{t\_mx} + f_{t\_mz} = 2.907 \cdot \frac{kip}{in}$

Total Force on Weld: (force per linear inch): $f_r := \sqrt{F_v^2 + F_t^2} = 3298.2 \cdot \frac{lbf}{in}$

Weld sized (1/16 inch): $D := 5$ (Assumed)

Weld Capacity using 1/4" weld (kip/in): $Weld_{Cap} := 1.392 \cdot D \cdot \frac{kip}{in} = 6.96 \cdot \frac{kip}{in}$

$$Check := \begin{cases} \text{"OK, connection can be used"} & \text{if } f_r \le Weld_{Cap} \\ \text{"No Good"} & \text{otherwise} \end{cases}$$

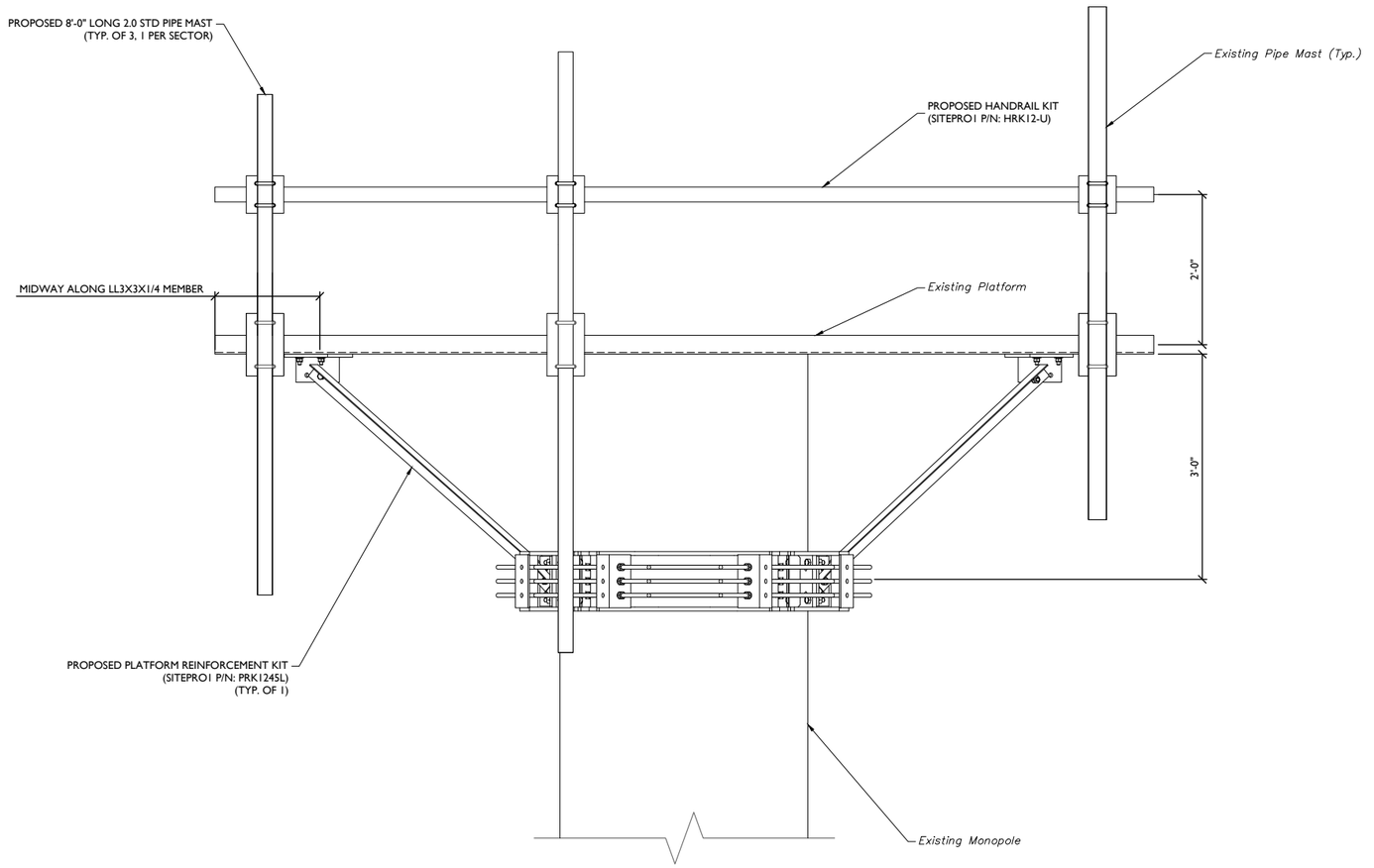
Check = "OK, connection can be used"

$$Interaction := \frac{f_r}{Weld_{Cap}} = 47.4 \cdot \%$$

The Existing rectangular weld has been determined to have **ADEQUATE** structural capacity to support the existing and proposed equipment, together with the existing loading.

APPENDIX E

MOUNT MODIFICATION DESIGN DRAWINGS (MDD)



PLATFORM MODIFICATION DETAILS ELEVATION VIEW

NOT TO SCALE

NOTE:

MASER CONSULTING CONNECTICUT HAS DETERMINED THAT THE SUPPORT MOUNTS, WITH THE PROPOSED MODIFICATIONS, HAVE ADEQUATE STRUCTURAL CAPACITY TO SUPPORT THE EXISTING AND PROPOSED LOADING. THE SUPPORT MOUNTS HAVE BEEN DETERMINED TO BE STRESSED TO A MAXIMUM OF 65.6% OF ITS STRUCTURAL CAPACITY, ONCE THE PROPOSED MODIFICATIONS IN THIS DRAWING ARE INSTALLED AS INTENDED AT EACH SUPPORT MOUNT.

LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
3	ERICSSON	AIR 21 B2A B4P	Existing	Alpha, Beta, & Gamma
3	**ERICSSON**	**Air 32 DB B2A B66Aa**	**Proposed**	**Alpha, Beta, & Gamma**
3	**RFS**	**APXVAARR24_43-U-NA20**	**Proposed**	**Alpha, Beta, & Gamma**
3	ERICSSON	KRY 112 144/1	Existing	Alpha, Beta, & Gamma
3	**ERICSSON**	**RRU 4449 B71 + B12**	**Proposed**	**Alpha, Beta, & Gamma**

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AS SHOWN	18922050A

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STATE OF CONNECTICUT — PETROS TSOUKALAS — 32325 — REGISTERED PROFESSIONAL ENGINEER — SEAL AND SIGNATURE MUST BE VALID ON ALL DOCUMENTS — 10/15/18

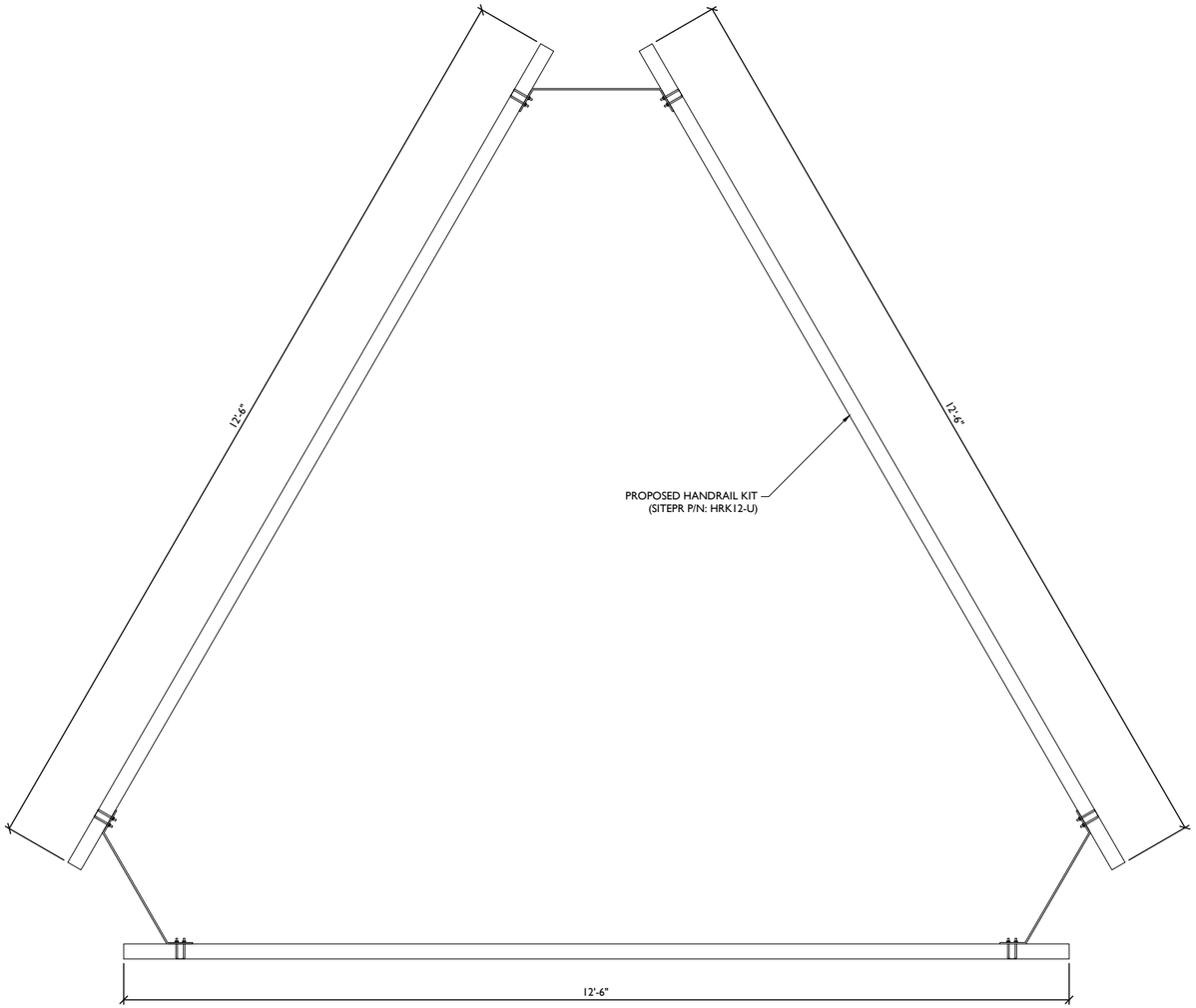
PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER LICENSE NUMBER 32325

SITE NAME:
BU: 876329
SITE NAME:
MT. VIEW CEM (FILLEY PARK)
CARRIER SITE NUMBER:
CT11278A
28 BREWER DRIVE
BLOOMFIELD, CT 06002
HARTFORD COUNTY

MT. LAUREL OFFICE
2000 Midlantic Drive
Suite 100
Mt. Laurel NJ 08054
Phone: .856.797.0412
Fax: .856.722.1120
email: solutions@maserconsulting.com

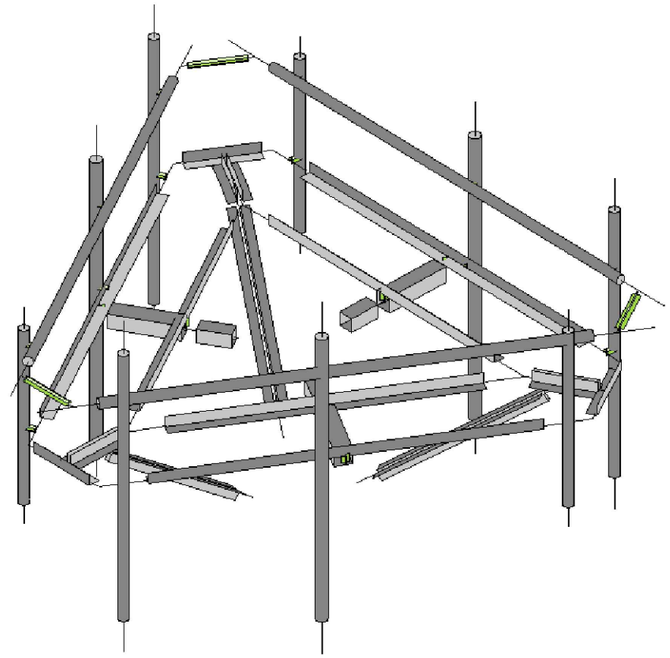
SHEET TITLE :
STRUCTURAL MODIFICATION DETAILS

SHEET NUMBER :
S-1



PROPOSED HANDRAIL DETAILS PLAN VIEW

NOT TO SCALE



MOUNT MODIFICATIONS RISA 3D MODEL

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STATE OF CONNECTICUT
PETROS TSOUKALAS
35
LICENSED
PROFESSIONAL ENGINEER

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER, LICENSE NUMBER 20338

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFFESIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:
BU: 876329
SITE NAME:
MT. VIEW CEM (FILLEY PARK)
CARRIER SITE NUMBER:
CT11278A
28 BREWER DRIVE
BLOOMFIELD, CT 06002
HARTFORD COUNTY

MT. LAUREL OFFICE
2000 Midlantic Drive
Suite 100
Mt. Laurel NJ 08054
Phone: .856.797.0412
Fax: .856.722.1120
email: solutions@maserconsulting.com

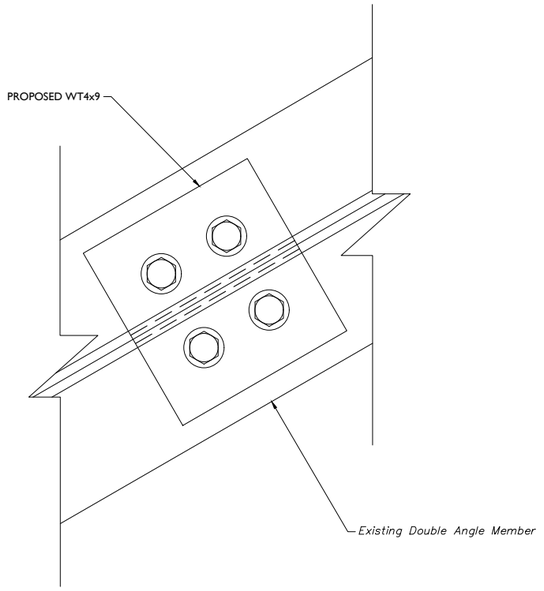
SHEET TITLE :
STRUCTURAL MODIFICATION DETAILS

SHEET NUMBER :
S-2

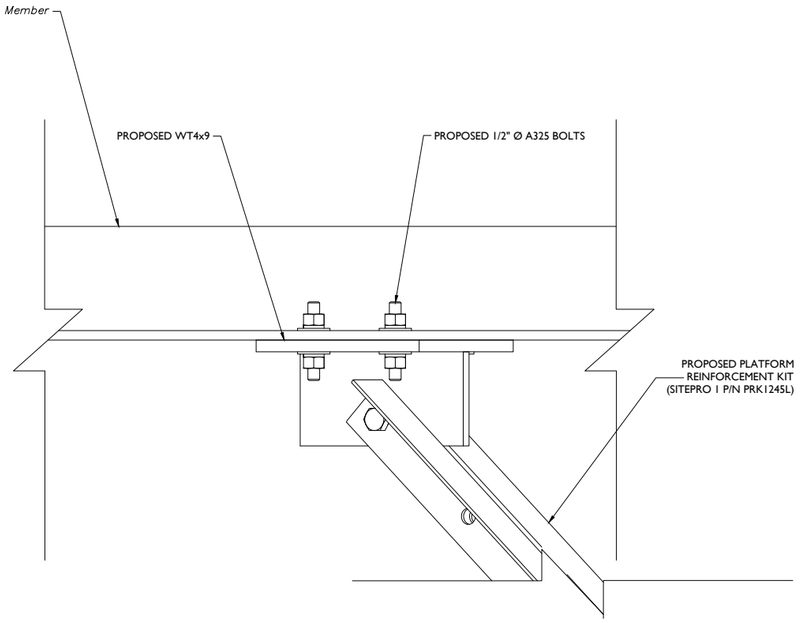
STRUCTURAL STEEL

1. DESIGN, FABRICATION, ERECTION AND WORKMANSHIP SHALL CONFORM TO AISC MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION.
2. CONNECTION BOLTS SHALL BE 3/4"Ø ASTM A325N UNLESS OTHERWISE NOTED.
3. FIELD WELDING SHALL BE PERFORMED BY WELDERS THAT ARE CERTIFIED (AWS "STANDARD QUALIFICATION PROCEDURE") TO PERFORM THE TYPE OF WORK REQUIRED. WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS) D1.1 "STRUCTURAL WELDING CODE - STEEL". PROVIDE THE MINIMUM SIZE PER PART 8 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", LRFD 3RD EDITION, WHEN WELD SIZES ARE NOT SHOWN. USE E70XX ELECTRODES FOR ALL WELDING.
4. RETURN ALL WELDS AT CORNERS TWICE THE NOMINAL SIZE OF THE WELD MINIMUM, UNLESS OTHERWISE NOTED.
5. TO REDUCE WARPING TO A MINIMUM WHEN WELDING TO EXISTING MEMBERS CARRYING LOAD, SHORE OR BRACE EXISTING MEMBER DURING WELDING.
6. ALL COPES, BLOCKS, CUT OUTS, AND OTHER CUTTING OF STRUCTURAL MEMBERS SHALL HAVE ALL RE-ENTRANT CORNERS SHAPED, NOTCHED FREE TO A RADIUS OF AT LEAST 1/2".
7. CONTRACTOR IS RESPONSIBLE FOR ADEQUATE BRACING OF STEEL CONSTRUCTION.
8. ALL NEW STRUCTURAL STEEL SHAPES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
9. ALL NEW STEEL BOLTS, NUTS, AND HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
10. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
11. ALL STRUCTURAL STEEL SHALL ABIDE BY THE FOLLOWING MATERIAL STRENGTH LIST UNLESS OTHERWISE NOTED:

PLATES	ASTM A572 (GR 50)
ANGLES	ASTM A36 (GR 36)
PIPES	ASTM A53 (GR B)
SOLID ROUND	ASTM A572 (GR 50)
BOLTS	ASTM A325 (ALL BOLT HOLES STANDARD SIZE U.N.O.
NUTS	ASTM A194-2H
WASHERS	ASTM F436
HOT-DIPPED GALVANIZING	ASTM A123
WELDS	E70XX



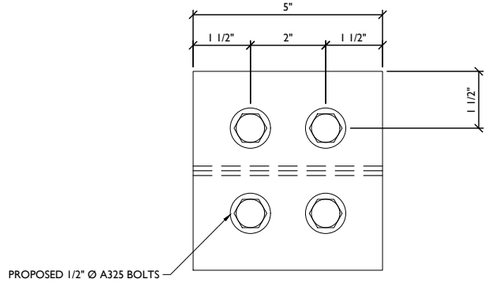
CUSTOM MOUNTING BRACKET PLAN VIEW
NOT TO SCALE



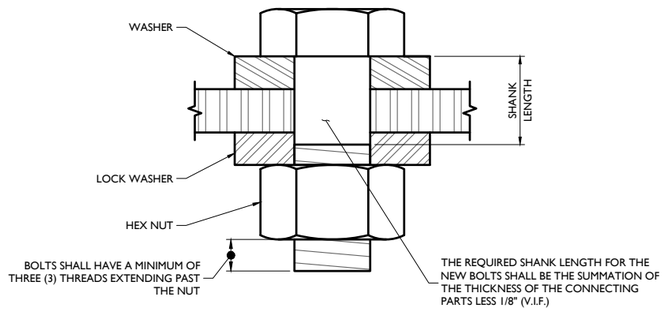
CUSTOM MOUNTING BRACKET ELEVATION VIEW
NOT TO SCALE

NOTE:

1. CONTRACTOR SHALL FIELD DRILL INTO THE EXISTING STEEL AS REQUIRED FOR THE PROPOSED CONNECTIONS. DAMAGED GALVANIZED SURFACES, SUCH AS THE PROPOSED BOLT HOLE LOCATIONS, SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.



WT4x9 DETAIL
NOT TO SCALE



BOLT DETAIL
NOT TO SCALE

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SCALE :	JOB NUMBER :
AS SHOWN	18922050A

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STATE OF CONNECTICUT — PETROS TSOUKALAS — 32 — PROFESSIONAL ENGINEER

PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LIFE - LICENSE NUMBER: 32371

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:
BU: 876329
SITE NAME:
MT. VIEW CEM (FILLEY PARK)
CARRIER SITE NUMBER:
CT11278A
28 BREWER DRIVE
BLOOMFIELD, CT 06002
HARTFORD COUNTY

MT. LAUREL OFFICE
2000 Midlantic Drive
Suite 100
Mt. Laurel NJ 08054
Phone: 856.797.0412
Fax: 856.722.1120
email: solutions@maserconsulting.com

SHEET TITLE :
STRUCTURAL MODIFICATION DETAILS

SHEET NUMBER :
S-3

GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR DISSEMINATION OF REVISIONS TO CONTRACT DOCUMENTS AND REQUIREMENTS TO ALL SUBCONTRACTORS. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES AND EQUIPMENT MANUFACTURERS.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND EXISTING FIELD CONDITIONS BEFORE PROCEEDING WITH CONSTRUCTION. DETERMINE EXACT LOCATIONS OF EXISTING UTILITIES, GROUNDS, DRAIN PIPES AND VENTS BEFORE COMMENCING WORK. CONTRACTOR SHALL NOTIFY ENGINEER IF ACTUAL CONDITIONS DIFFER SIGNIFICANTLY FROM WHAT IS SHOWN ON DRAWINGS.
3. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A NEAT AND ORDERLY PROJECT SITE, REMOVE AND DISPOSE OF OFF SITE RUBBISH, WASTE MATERIALS, LITTER, AND ALL FOREIGN SUBSTANCES DAILY.
4. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE OWNER'S WRITTEN APPROVAL.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUCH COVERING, SHIELDING, AND BARRICADES AS REQUIRED TO PROTECT BYSTANDERS AND PASSERSBY, EQUIPMENT, SUPPLIES, ETC. FROM DUST, DEBRIS AND OTHER CAUSE OF DAMAGE RESULTING FROM CONSTRUCTION. ANY DAMAGE DURING CONSTRUCTION SHALL BE RESTORED TO PREVIOUS CONDITIONS.
6. IN AREAS WHERE EXISTING ANTENNA MOUNTS, TRANSMISSION LINES OR OTHER SUPPORTING EQUIPMENT IS TO BE REMOVED, THE EXISTING STRUCTURE SHALL BE REPAIRED AS REQUIRED.
7. ALL SAFETY AND OSHA REGULATIONS SHALL BE FOLLOWED STRICTLY. METHODS OF CONSTRUCTION AND ERECTION OF STRUCTURAL MATERIAL ARE THE CONTRACTOR'S RESPONSIBILITY.
8. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT FOR ALL EXISTING ANTENNAS, TRANSMISSION LINES OR OTHER APPURTENANCES DURING CONSTRUCTION.
9. CONTRACTOR SHALL PROTECT EXISTING APPURTENANCES FROM DAMAGE DURING CONSTRUCTION.
10. NO ANTENNAS, CABLES, OR OTHER APPURTENANCES SHALL BE ADDED TO THE TOWER UNTIL THE MODIFICATION WORK IS COMPLETE.
11. ALL DIMENSIONS SHOWN ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE DIMENSIONS WITH TOWER MANUFACTURER OR FIELD VERIFY DIMENSIONS PRIOR TO FABRICATING MEMBERS.
12. THE CONTRACTOR SHALL LOCATE ALL UTILITIES IN THE AREA OF CONSTRUCTION AND PREVENT DAMAGE TO THEM. SHOULD DAMAGE OCCUR TO ANY UTILITIES, THE CONTRACTOR IS REQUIRED TO REPAIR THE DAMAGE TO THE SATISFACTION OF THE OWNER AT HIS OWN EXPENSE.
13. ALL EXISTING PLANS, DETAILS, DIMENSIONS, AND ELEVATIONS INDICATE EXISTING CONDITIONS AS KNOWN. THE EXISTING INFORMATION SHOWN IS NOT INTENDED TO BE "AS BUILT" AND THE ACTUAL CONSTRUCTION MAY DIFFER FROM THAT SHOWN. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING DIMENSIONS AND ELEVATIONS PRIOR TO STARTING CONSTRUCTION. MINOR VARIATIONS CAN BE EXPECTED AND ANY REQUIRED DEVIATION FROM THE CONTRACT DOCUMENTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
14. MODIFICATION DETAILS REPRESENTS TYPICAL CONDITIONS. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DEVIATION AS A RESULT OF SITE SPECIFIC CONDITIONS. REINFORCE ALL TOWER FACES IDENTICALLY, UNLESS OTHERWISE NOTED.
15. IN AREAS TO BE MODIFIED, ANY ANTENNA, COAX, OR CONDUIT SHALL BE TEMPORARILY MOVED AND THEN REPLACED AFTER COMPLETION OF WORK. COORDINATE WITH OWNER.
16. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL MATERIAL TO BE REMOVED.
17. CONTRACTOR SHALL ENSURE STABILITY OF THE ANTENNA PLATFORM DURING ALL WORK.
18. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE TEMPORARY BRACING OF THE STRUCTURE DURING ALL STAGES OF CONSTRUCTION. THE STRUCTURE IS DESIGNED FOR A COMPLETED CONDITION ONLY AND THEREFORE MAY REQUIRE ADDITIONAL SUPPORT BEFORE COMPLETIONS.
19. THIS DESIGN ASSUMES THE ANTENNA PLATFORM HAVE BEEN WELL MAINTAINED, IN GOOD CONDITION, AND ARE WITHOUT DEFECT. BENT MEMBERS, CORRODED MEMBERS, LOOSE BOLTS, CRACKED WELDS AND OTHER MEMBER DEFECTS HAVE NOT BEEN CONSIDERED. THE TOWER IS ASSUMED TO BE PLUMB AND THE SITE IS ASSUMED TO BE LEVEL. THIS DESIGN IS BEING PROVIDED WITHOUT THE BENEFIT OF A CONDITION BY MASER CONSULTING P.A.. CONTRACTOR SHALL COMMISSION A COMPLETE CONDITION ASSESSMENT PRIOR TO ORDERING ANY REINFORCING MATERIALS. CONTRACTOR SHALL SUPPLY CONDITION ASSESSMENT TD ENGINEER FOR REVIEW. SEE CONTRACTOR NOTES.
20. ALL SUBSTITUTES PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE FOR USE AND MEETS THE ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE. REPAIR AND REPLACEMENT, SHALL BE NOTED. ESTIMATES OF COSTS/CREDITS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING RE-DESIGN COSTS AND COSTS TO SUB-CONTRACTORS) SHALL BE PROVIDED TO THE ENGINEER. CONTRACTOR SHALL PROVIDE ADDITIONAL DOCUMENTATION AND/OR SPECIFICATIONS TO THE ENGINEER AS REQUESTED.
21. PROVIDE STRUCTURAL STEEL SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO FABRICATION.
22. INSPECTION OF THE MODIFICATIONS SHALL BE COMPLETED BY A THIRD PARTY. INSPECTION SHALL TAKE PLACE WITHIN 72 HOURS OF THE COMPLETION OF THE ANTENNA PLATFORM MODIFICATIONS. NO PROPOSED LOADING SHALL BE INSTALLED PRIOR TO INSPECTOR APPROVAL.

DESIGN LOADS

1. WIND: ANSI/TIA/EIA-222-H
   ULTIMATE WIND SPEED: 125 MPH
2. ANTENNA PLATFORM MODIFICATIONS WERE DESIGNED IN ACCORDANCE TO TIA-222-H AND 2016 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2012 IBC, AS WELL AS APPLICABLE LOCAL BUILDING CODES.

STRUCTURAL STEEL

1. DESIGN, FABRICATION, ERECTION AND WORKMANSHIP SHALL CONFORM TO AISC MANUAL OF STEEL CONSTRUCTION, FOURTEENTH EDITION.
2. CONNECTION BOLTS SHALL BE 3/4"Ø ASTM A325N UNLESS OTHERWISE NOTED.
3. FIELD WELDING SHALL BE PERFORMED BY WELDERS THAT ARE CERTIFIED (AWS "STANDARD QUALIFICATION PROCEDURE") TO PERFORM THE TYPE OF WORK REQUIRED. WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS) D1.1 "STRUCTURAL WELDING CODE - STEEL". PROVIDE THE MINIMUM SIZE PER PART 8 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", LRFD 3RD EDITION, WHEN WELD SIZES ARE NOT SHOWN. USE E70XX ELECTRODES FOR ALL WELDING.
4. RETURN ALL WELDS AT CORNERS TWICE THE NOMINAL SIZE OF THE WELD MINIMUM, UNLESS OTHERWISE NOTED.
5. TO REDUCE WARPING TO A MINIMUM WHEN WELDING TO EXISTING MEMBERS CARRYING LOAD, SHORE OR BRACE EXISTING MEMBER DURING WELDING.
6. ALL COPES, BLOCKS, CUT OUTS, AND OTHER CUTTING OF STRUCTURAL MEMBERS SHALL HAVE ALL RE-ENTRANT CORNERS SHAPED, NOTCHED FREE TO A RADIUS OF AT LEAST 1/2".
7. CONTRACTOR IS RESPONSIBLE FOR ADEQUATE BRACING OF STEEL CONSTRUCTION.
8. ALL NEW STRUCTURAL STEEL SHAPES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
9. ALL NEW STEEL BOLTS, NUTS, AND HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
10. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
11. ALL STRUCTURAL STEEL SHALL ABIDE BY THE FOLLOWING MATERIAL STRENGTH LIST UNLESS OTHERWISE NOTED:

PIPES	A-53 (GR B)
PLATES	ASTM A572 (GR 50)
ANGLES	ASTM A36 (GR 36)
SOLID ROUND	ASTM A572 (GR 50)
BOLTS	ASTM A325 (ALL BOLT HOLES STANDARD SIZE U.N.O.)
NUTS	ASTM A194-2H
WASHERS	ASTM F436
HOT-DIPPED GALVANIZING	ASTM A123
WELDS	E70XX
PAINT	NEW STEEL TO BE PAINTED TO MATCH EXISTING TOWER

CONTRACTOR NOTES

1. ALL CONTRACTORS AND LOWER TIER CONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER AND MASER CONSULTING P.A. THAT THEY HAVE OBTAINED, UNDERSTAND, AND WILL FOLLOW TOWER OWNER STANDARDS OF PRACTICE, CONSTRUCTION GUIDELINES, ALL SITE AND TOWER SAFETY PROCEDURES, ALL PRODUCT LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROPOSED MODIFICATIONS DESCRIBED. RECEIPT OF ACKNOWLEDGMENT MUST OCCUR PRIOR TO BEGINNING CONSTRUCTION OR CLIMBING. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THIS DOCUMENTATION FOR TOWER OWNER AND MASER CONSULTING P.A. ON COMPANY LETTERHEAD AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN THIS DOCUMENTATION FROM LOWER TIER SUBCONTRACTORS (ON SUBCONTRACTOR LETTERHEAD) AND DELIVER IT TO TOWER OWNER AND MASER CONSULTING P.A.
2. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THESE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE MODIFICATIONS, MASER CONSULTING P.A. SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DEVIATION.
3. IT IS ASSUMED THAT ANY STRUCTURAL MODIFICATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TELECOMMUNICATION CONSTRUCTION EXPERIENCE. THIS INCLUDES PROVIDING THE NECESSARY CERTIFICATIONS TO THE TOWER OWNER AND ENGINEER.
4. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES, AND PROCEDURES.
5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PROGRAMS AND PRECAUTIONS IN CONNECTION WITH THIS WORK.
6. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING; ANY PROBLEMS WITH ACCESS, INTERFERENCE, ETC. SHALL BE RESOLVED PRIOR TO MOBILIZATION. THE CONTRACTOR MUST VISIT THE SITE PRIOR TO ORDERING ANY MATERIAL AND MUST RESOLVE ALL ISSUES WITH THE OWNER PREVENTING A CONTINUOUS INSTALLATION. CONTRACTOR SHALL NOTE ALL ANTENNAS, MOUNTS, COAX, LIGHTING AND ANY OTHER TOWER APPURTENANCES IN THE REGION OF THE MODIFICATIONS.
7. CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY REMOVING ALL COAX, T-BRACKETS, ANTENNA MOUNTS, AND ANY OTHER TOWER APPURTENANCE THAT MAY INTERFERE WITH THE ANTENNA PLATFORM MODIFICATIONS. ALL TOWER APPURTENANCES MUST BE REPLACED AND/OR RESTORED TO ITS ORIGINAL LOCATION. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.
8. SOME ATTACHMENTS MAY REQUIRE CUSTOM MODIFICATIONS TO PROPERLY FIT THE MODIFIED REGION OF THE STRUCTURE. THESE CUSTOMIZATIONS ARE DESIGNED BY OTHERS AND MUST BE APPROVED BY THE ENGINEER PRIOR TO REMOVING SUCH ATTACHMENTS. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.
9. CONTRACTOR SHALL ONLY WORK WITHIN THE LIMITS OF THE TOWER OWNER'S PROPERTY OR LEASE AREA AND APPROVED EASEMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN THESE BOUNDARIES. CONTRACTOR SHALL EMPLOY A SURVEYOR AS REQUIRED. ANY WORK OUTSIDE THESE BOUNDARIES SHALL BE APPROVED IN WRITING BY THE LAND OWNER PRIOR TO MOBILIZATION. CONSTRUCTION STAKING AND BOUNDARY MARKING IS THE RESPONSIBILITY OF THE CONTRACTOR.
10. WORK SHALL ONLY BE PERFORMED DURING CALM DRY DAYS (WINDS LESS THAN 10-MPH) CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY LOCAL ANTENNA PLATFORM SHORING, TEMPORARY GLOBAL ANTENNA PLATFORM SHORING, AND ALL SHORING OF SURROUNDING BUILDINGS, PADS, AND OTHER OUTDOOR SITE OBSTRUCTIONS. ALL SHORING. TEMPORARY BRACING, AND TEMPORARY SUPPORTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.

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SCALE : AS SHOWN | JOB NUMBER : 18922050A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	10/15/18	FOR CONSTRUCTION	CB	SMS

STATE OF CONNECTICUT — PETROS TSOUKALAS — 32507 — REGISTERED PROFESSIONAL ENGINEER — SEAL AND SIGNATURE MUST BE VALID FOR ANY USE HEREOF
PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER LICENSE NUMBER 32507

SITE NAME:
BU: 876329
SITE NAME:
MT. VIEW CEM (FILLEY PARK)
CARRIER SITE NUMBER:
CT11278A
28 BREWER DRIVE
BLOOMFIELD, CT 06002
HARTFORD COUNTY

MT. LAUREL OFFICE
2000 Midlantic Drive
Suite 100
Mt. Laurel NJ 08054
Phone: .856.797.0412
Fax: .856.722.1120
email: solutions@maserconsulting.com

SHEET TITLE : STRUCTURAL NOTES

SHEET NUMBER : S-4

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: CT11278A

Bloomfield/DTWN
28 Brewer Drive
Bloomfield, CT 06002

October 3, 2018

EBI Project Number: 6218006475

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	14.06 %

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

EBI Consulting
environmental | engineering | due diligence

October 3, 2018

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

Emissions Analysis for Site: **CT11278A – Bloomfield/DTWN**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **28 Brewer Drive, Bloomfield, CT**, 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 (μW/cm2). 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) and 2100 MHz (AWS) 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 **28 Brewer Drive, Bloomfield, CT**, 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 manufactures supplied specifications, minus 10 dB for directional panel antennas, 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) 1 GSM channels (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.

2) 1 UMTS channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

6) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

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

9) The antennas used in this modeling are the **Ericsson AIR32 B66A/B2A** & **Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **RFS APXVAARR24_43-U-NA20** for 600 MHz and 700 MHz channels. 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 manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerline of the proposed antennas is **108 feet** above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	108 feet	Height (AGL):	108 feet	Height (AGL):	108 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	200	Total TX Power(W):	200	Total TX Power(W):	200
ERP (W):	7,780.90	ERP (W):	7,780.90	ERP (W):	7,780.90
Antenna A1 MPE%	**2.69**	Antenna B1 MPE%	**2.69**	Antenna C1 MPE%	**2.69**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	108 feet	Height (AGL):	108 feet	Height (AGL):	108 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	55	Total TX Power(W):	55	Total TX Power(W):	55
ERP (W):	2,139.75	ERP (W):	2,139.75	ERP (W):	2,139.75
Antenna A2 MPE%	**0.74**	Antenna B2 MPE%	**0.74**	Antenna C2 MPE%	**0.74**
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
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd
Height (AGL):	108 feet	Height (AGL):	108 feet	Height (AGL):	108 feet
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,443.03	ERP (W):	2,443.03	ERP (W):	2,443.03
Antenna A3 MPE%	**2.00**	Antenna B3 MPE%	**2.00**	Antenna C3 MPE%	**2.00**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**5.43 %**
Verizon Wireless	**3.31** %
AT&T	**4.68** %
Clearwire	**0.15** %
Sprint	**0.07** %
Town of Bloomfield	**0.42** %
Site Total MPE %:	**14.06 %**

T-Mobile Sector A Total:	5.43 %
T-Mobile Sector B Total:	5.43 %
T-Mobile Sector C Total:	5.43 %
Site Total:	14.06 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	108	10.75	PCS - 1900 MHz	1000.00	1.08%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	108	16.13	AWS - 2100 MHz	1000.00	1.61%
T-Mobile PCS - 1900 MHz GSM	1	583.57	108	2.02	PCS - 1900 MHz	1000.00	0.20%
T-Mobile AWS - 2100 MHz UMTS	1	1,556.18	108	5.38	AWS - 2100 MHz	1000.00	0.54%
T-Mobile 600 MHz LTE	2	788.97	108	5.45	600 MHz	400.00	1.36%
T-Mobile 700 MHz LTE	2	432.54	108	2.99	700 MHz	467.00	0.64%
						Total:	**5.43%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	5.43 %
Sector B:	5.43 %
Sector C:	5.43 %
T-Mobile Maximum MPE % (Per Sector):	5.43 %
Site Total:	14.06 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **14.06%** 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.