



Crown Castle  
12 Gill Street, Suite 5800  
Woburn, MA 01801

September 19, 2016

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

**RE: Notice of Exempt Modification for T-Mobile / L700 Crown Site BU: 876329**  
**T-Mobile Site ID: CT11278A**  
**Located at: 28 Brewer Drive, Bloomfield, CT 06002**  
**Latitude: 41° 50' 6.57"/ Longitude: -72° 44' 28.2"**

Dear Ms. Bachman,

T-Mobile currently maintains six (6) 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 add three (3) new antennas, add three (3) remote radio units (non-antennas), and replace all equipment cabinets with one (1) new equipment cabinet. 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, 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 modification 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-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Amanda Goodall.

Sincerely,

Amanda Goodall

Real Estate Specialist

12 Gill Street, Suite 5800, Woburn, MA 01801

339-205-7017

Melanie A. Bachman

September 19, 2016

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[Amanda.Goodall@crowncastle.com](mailto:Amanda.Goodall@crowncastle.com)

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes

Tab 2: Exhibit-2: Structural Modification Report

Tab 4: Exhibit-3: General Power Density Table report (RF Emissions Analysis Report)

cc: Philip K. Schenck, Jr., Town Manager  
Town of Bloomfield  
800 Bloomfield Avenue, 2nd Fl.  
Bloomfield, CT 06002

Crown Castle (Tower Owner)  
12 Gill Street, Suite 5800  
Woburn, Ma 01801

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





ZBA Meeting

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August 7, 1996

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 Mulhall 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

ZBA Meeting

3

August 5, 1996

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, weather-proofed, 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 Exemption 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



Town of Bloomfield makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation. The assessment information is from the 2011 tax year. Property Tax Maps are for assessment purposes only. Neither the town nor its employees assume responsibility for errors or omissions. ---THIS IS NOT A SURVEY---  
Date printed: 09/19/16 : 14:48:54



<a href="#">Recent Sales in Neighborhood</a>	<a href="#">Previous Parcel</a>	<a href="#">Next Parcel</a>	<a href="#">Field Definitions</a>	<a href="#">Return to Main Search</a>	<a href="#">Bloomfield Home</a>
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**Owner and Parcel Information**

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

**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;

<a href="#">Recent Sales in Neighborhood</a>	<a href="#">Previous Parcel</a>	<a href="#">Next Parcel</a>	<a href="#">Field Definitions</a>	<a href="#">Return to Main Search Page</a>	<a href="#">Bloomfield Home</a>
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The Town of Bloomfield Assessor's Office makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation. Website Updated: September 17, 2016

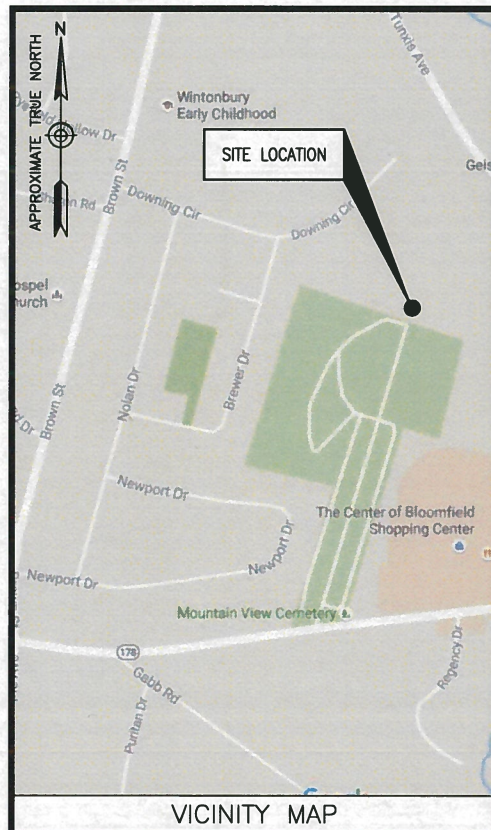
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T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11278A
CROWN CASTLE BU #: 876329
SITE NAME: MTN. VIEW CEM. (FILLELY PARK)
28 BREWER DRIVE
BLOOMFIELD, CT 06002
HARTFORD COUNTY



FROM BLOOMFIELD, CT:

HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD. TURN RIGHT ONTO W NEWBERRY RD. TURN RIGHT ONTO WOODLAND AVE. TURN RIGHT ONTO WINTONBURY AVE. TURN LEFT ONTO CT-189 S. TURN RIGHT ONTO CT-178 W. SITE WILL BE ON THE RIGHT.

ENGINEER: DEWBERRY ENGINEERS INC. 600 PARSIPPANY ROAD SUITE 301 PARSIPPANY, NJ 07054
CONTACT: BRYAN HUFF PHONE #: (973) 576-0147
CONSTRUCTION: CROWN CASTLE 3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065
CONTACT: PATRICIA PELON PHONE #: (518) 373-3507

SITE NAME: MTN. VIEW CEM. (FILLELY PARK)
SITE NUMBER: CT11278A
TOWER OWNER: CROWN CASTLE 3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065
APPLICANT/DEVELOPER: T-MOBILE NORTHEAST LLC 35 GRIFFIN RD SOUTH BLOOMFIELD, CT 06002
COORDINATES: LATITUDE: 41°-50'-06.57" N (NAD83) LONGITUDE: 72°-44'-28.20" W (NAD83) (PER CROWN CASTLE)
CONFIGURATION: 702Cu

SITE ADDRESS: 28 BREWER DRIVE BLOOMFIELD, CT 06002 HARTFORD COUNTY
PROJECT DIRECTORY
SCOPE OF WORK:
- INSTALL (3) NEW ANTENNAS.
- INSTALL (3) NEW RRU'S.
- DE-STACK EXISTING COAX LINES ALONG MONOPOLE EXTERIOR & MOUNT THEM INDIVIDUALLY.
THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.
A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

Table with 2 columns: SHT. NO. and DESCRIPTION. Rows include T-1 TITLE SHEET, G-1 GENERAL NOTES, C-1 COMPOUND PLAN & EQUIPMENT PLANS, C-2 ANTENNA LAYOUTS & ELEVATIONS, C-3 CONSTRUCTION DETAILS, E-1 GROUNDING NOTES & DETAILS.



T-MOBILE NORTHEAST LLC
35 GRIFFIN RD SOUTH
BLOOMFIELD, CT 06002



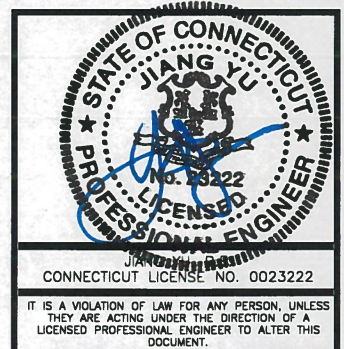
CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

CT11278A
MTN. VIEW CEM.
(FILLELY PARK)

CONSTRUCTION DRAWINGS table with columns for drawing number, date, and description. Includes entries for 0 09/06/16 ISSUED AS FINAL and A 09/06/16 ISSUED FOR REVIEW.



Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710



DRAWN BY: JC
REVIEWED BY: BSH
CHECKED BY: GHN
PROJECT NUMBER: 50066258
JOB NUMBER: 50078131
SITE ADDRESS:

28 BREWER DRIVE
BLOOMFIELD, CT 06002
HARTFORD COUNTY

SHEET TITLE: TITLE SHEET
SHEET NUMBER: T-1



**GENERAL NOTES:**

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
PROJECT MANAGEMENT - CROWN CASTLE  
CONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)  
OWNER - T-MOBILE  
OEM - ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF PROJECT MANAGEMENT.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
5. DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED AND ARE INTENDED TO SHOW OUTLINE ONLY.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY PROJECT MANAGEMENT.
9. CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. CONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. CONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH PROJECT MANAGEMENT.
10. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
14. CONTRACTOR SHALL NOTIFY DEWBERRY 48 HOURS IN ADVANCE OF POURING CONCRETE, OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEER REVIEW.
15. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. CONTRACTOR SHALL NOTIFY PROJECT MANAGEMENT OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
16. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY CONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
17. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

**SITE WORK GENERAL NOTES:**

1. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO:  
A) FALL PROTECTION  
B) CONFINED SPACE  
C) ELECTRICAL SAFETY  
D) TRENCHING & EXCAVATION.
3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
6. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE T-MOBILE SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE TRANSMISSION EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION, SEE SOIL COMPACTION NOTES.
11. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
12. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

**ELECTRICAL INSTALLATION NOTES:**

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
2. CONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLEING TO THE NEW BTS EQUIPMENT. CONTRACTOR SHALL SUBMIT MODIFICATIONS TO PROJECT MANAGEMENT FOR APPROVAL.
3. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
4. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
5. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.
6. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
7. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, AND MATCH EXISTING INSTALLATION REQUIREMENTS.
8. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).
9. PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
10. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
11. POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
12. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL.) PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA AND MATCH EXISTING INSTALLATION REQUIREMENTS.
13. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
14. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
15. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
16. ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
17. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
18. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
19. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
20. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
21. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
22. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
23. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
24. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
25. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
26. CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
27. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
28. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
29. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
30. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
31. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM PROJECT MANAGEMENT BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
32. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

**CONCRETE AND REINFORCING STEEL NOTES:**

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000 PSI) MAY BE USED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE (UNO). SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:  
  
CONCRETE CAST AGAINST EARTH.....3 IN.  
CONCRETE EXPOSED TO EARTH OR WEATHER:  
#6 AND LARGER .....2 IN.  
#5 AND SMALLER & WWF.....1 1/2 IN.  
  
CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:  
SLAB AND WALL .....3/4 IN.  
BEAMS AND COLUMNS.....1 1/2 IN.
5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
7. CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC 1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER:  
(A) RESULTS OF CONCRETE CYLINDER TESTS PERFORMED AT THE SUPPLIER'S PLANT,  
(B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.  
FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
8. AS AN ALTERNATIVE TO ITEM 7, TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

**STRUCTURAL STEEL NOTES:**

1. ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS UNLESS NOTED OTHERWISE. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE PERFORMED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.
3. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"Ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
4. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
5. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
7. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

**CONSTRUCTION NOTES:**

1. FIELD VERIFICATION: CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T-MOBILE ANTENNA PLATFORM LOCATION AND ANTENNAS TO BE REPLACED.
2. COORDINATION OF WORK: CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH PROJECT MANAGEMENT.
3. CABLE LADDER RACK: CONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.
4. GROUNDING OF ALL EQUIPMENT AND ANTENNAS IS NOT CONSIDERED PART OF THE SCOPE OF THIS PROJECT AND IS THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR AT THE TIME OF CONSTRUCTION. ALL EQUIPMENT AND ANTENNAS TO BE INSTALLED AND GROUNDED IN ACCORDANCE WITH GOVERNING BUILDING CODE, MANUFACTURER RECOMMENDATIONS AND OWNER SPECIFICATIONS.



T-MOBILE NORTHEAST LLC  
35 GRIFFIN RD SOUTH  
BLOOMFIELD, CT 06002



CROWN CASTLE  
3 CORPORATE PARK DRIVE, SUITE 101  
CLIFTON PARK, NY 12065

**CT11278A**  
**MTN. VIEW CEM.**  
**(FILLEY PARK)**

**CONSTRUCTION DRAWINGS**

0	08/08/16 ISSUED AS FINAL
A	08/08/16 ISSUED FOR REVIEW



**Dewberry Engineers Inc.**  
800 PARSIPPANY ROAD  
SUITE 301  
PARSIPPANY, NJ 07054  
PHONE: 973.739.9400  
FAX: 973.739.9710



DRAWN BY: JC

REVIEWED BY: BSH

CHECKED BY: GHN

PROJECT NUMBER: 50066258

JOB NUMBER: 50078131

SITE ADDRESS:

28 BREWER DRIVE  
BLOOMFIELD, CT 06002  
HARTFORD COUNTY

SHEET TITLE

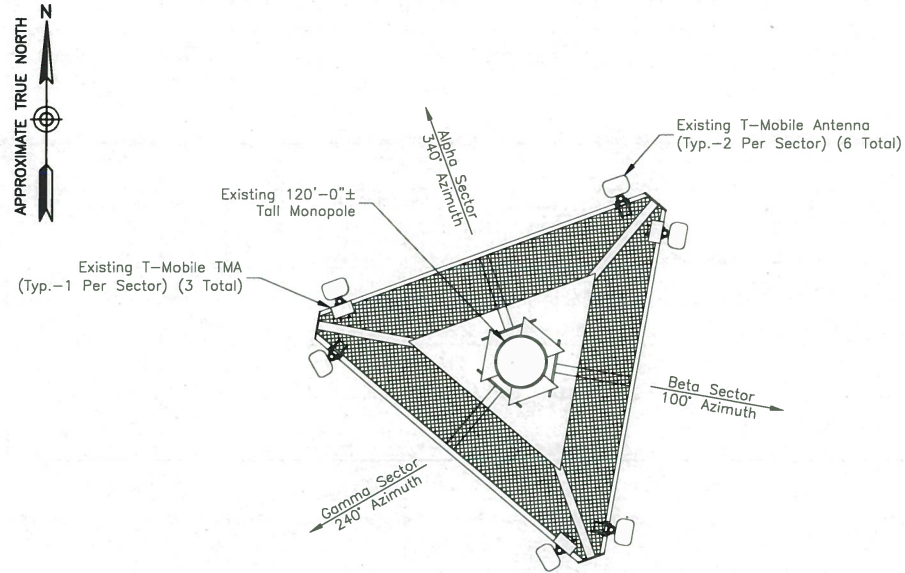
GENERAL NOTES

SHEET NUMBER



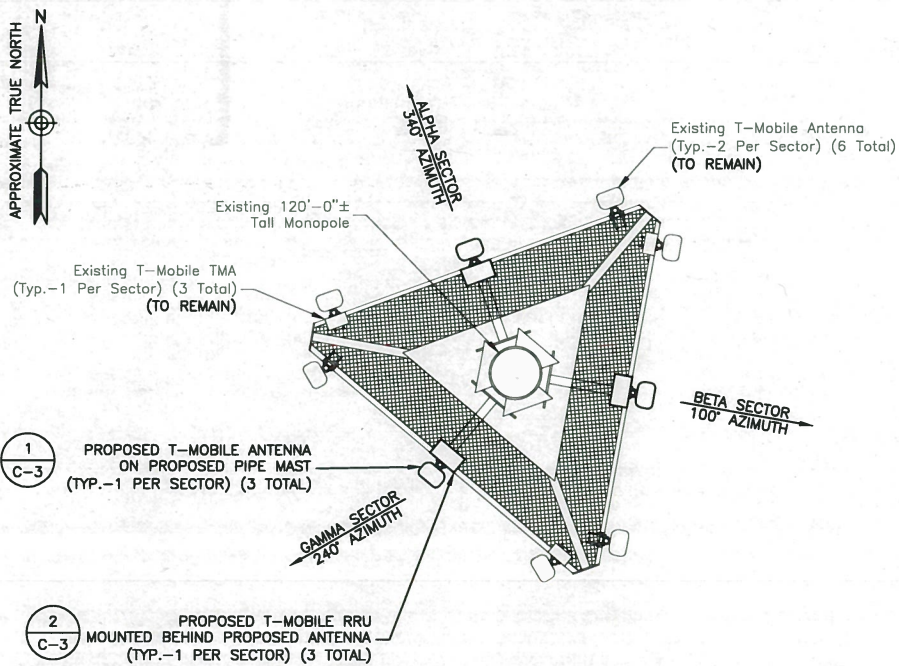






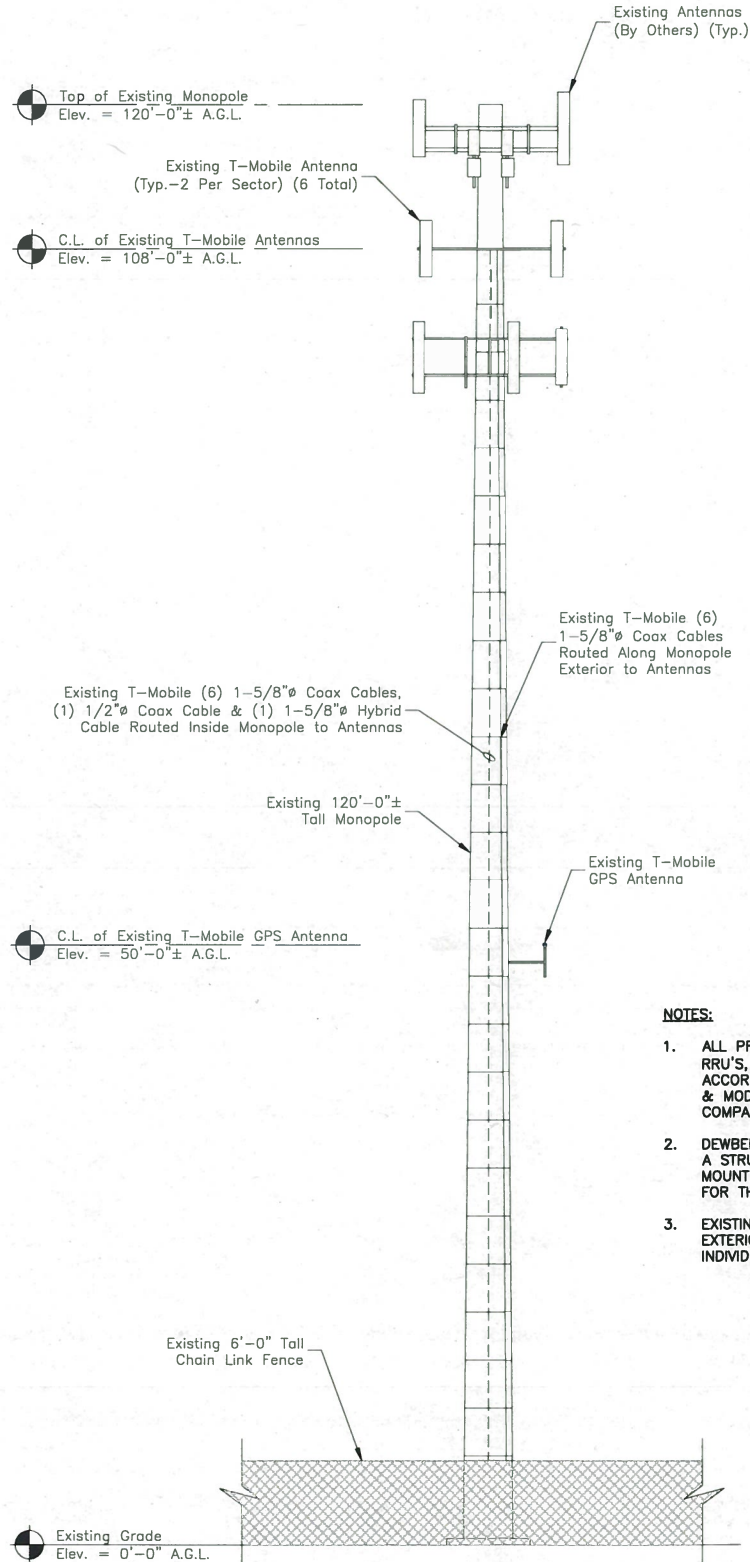
**EXISTING ANTENNA LAYOUT**  
SCALE: N.T.S.

1



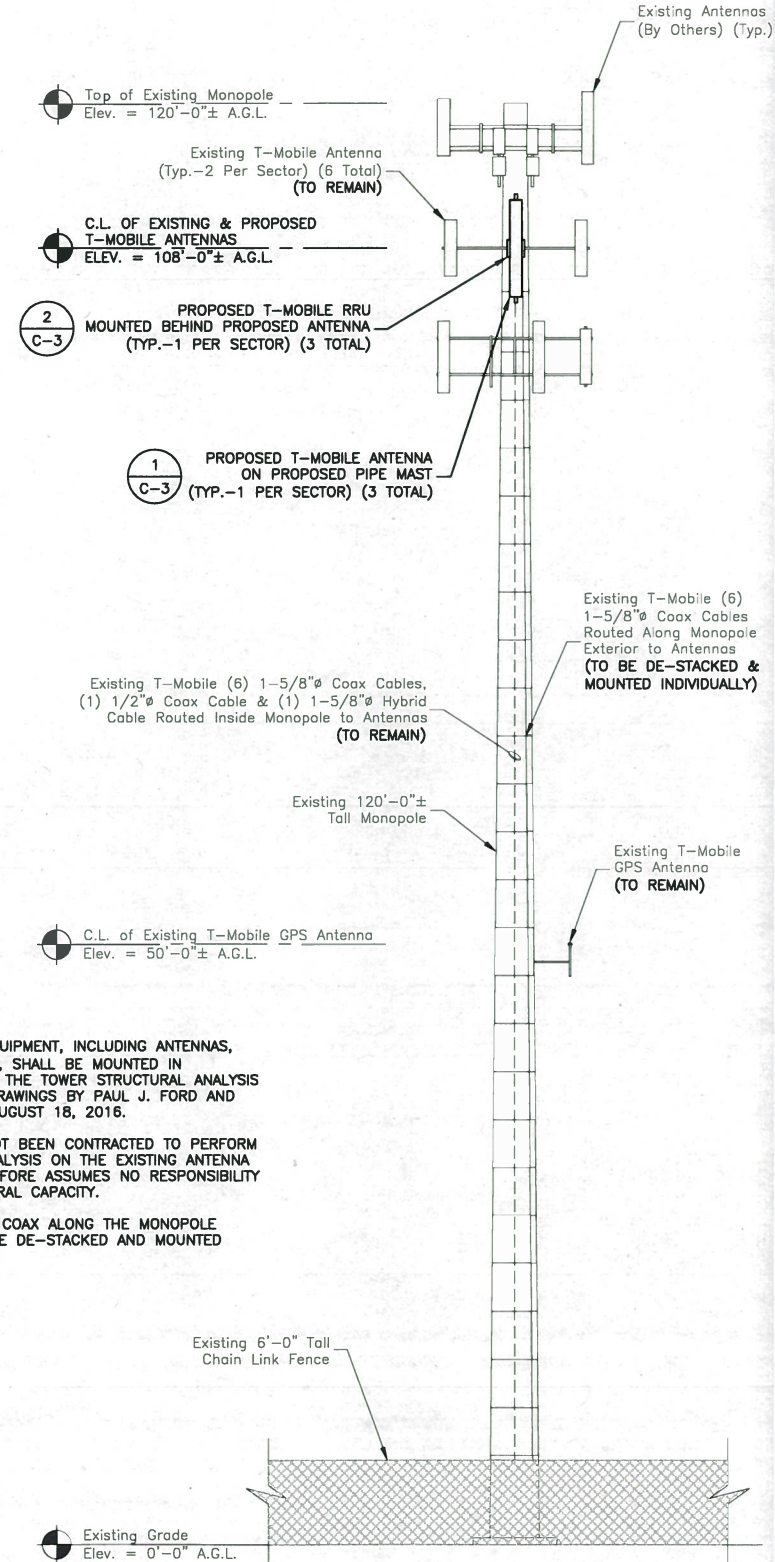
**PROPOSED ANTENNA LAYOUT**  
SCALE: N.T.S.

2



**EXISTING ELEVATION**  
1/16"=1' FOR 11"x17"  
1/8"=1' FOR 22"x34"

3

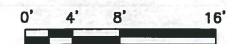


**PROPOSED ELEVATION**  
1/16"=1' FOR 11"x17"  
1/8"=1' FOR 22"x34"

4

**NOTES:**

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, RRU'S, COAX, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS & MODIFICATION DRAWINGS BY PAUL J. FORD AND COMPANY DATED AUGUST 18, 2016.
2. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THE EXISTING ANTENNA MOUNT AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.
3. EXISTING STACKED COAX ALONG THE MONOPOLE EXTERIOR SHALL BE DE-STACKED AND MOUNTED INDIVIDUALLY.



**T-Mobile**

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BLOOMFIELD, CT 06002

**CROWN CASTLE**

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CLIFTON PARK, NY 12065

**CT11278A  
MTN. VIEW CEM.  
(FILLEY PARK)**

CONSTRUCTION DRAWINGS

0 09/08/16 ISSUED AS FINAL  
A 09/08/16 ISSUED FOR REVIEW

**Dewberry**

Dewberry Engineers Inc.  
600 PARSIPPANY ROAD  
SUITE 301  
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FAX: 973.739.9710



DRAWN BY: JC  
REVIEWED BY: BSH  
CHECKED BY: GHN  
PROJECT NUMBER: 50066258  
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28 BREWER DRIVE  
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HARTFORD COUNTY

SHEET TITLE

ANTENNA LAYOUTS &  
ELEVATIONS

SHEET NUMBER

C-2











# **PJF PAUL J. FORD & COMPANY**

Date: **August 18, 2016**

Timothy Howell  
Crown Castle  
3530 Toringdon Way, Suite 300  
Charlotte, NC 28277  
980.209.8242

Paul J Ford and Company  
250 E. Broad Street, Suite 600  
Columbus, OH 43215  
614.221.6679  
nparente@pjfweb.com

**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:** 378260  
**Crown Castle Work Order Number:** 1269143  
**Crown Castle Application Number:** 345613 Rev. 1

**Engineering Firm Designation:**

**Paul J Ford and Company Project Number:** 37516-0115.006.7700

**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. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 924795, in accordance with application 345613, revision 1.

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/ Existing + Reserved + Proposed Equipment  
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

**Sufficient Capacity**

The analysis has been performed in accordance with the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda, as allowed by Sections 104.10 and 104.11 of the 2005 Connecticut State Building Code with 2009 Amendments, based upon a 3-second gust wind speed of 95 mph with no ice, 50 mph with 1 inch ice thickness and 60 mph under service loads, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

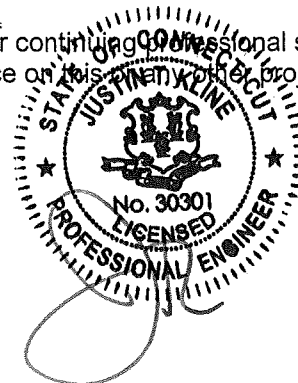
All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at Paul J Ford and Company appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

  
Nick Parente, E.I. *WJF*  
Structural Designer

tnxTower Report - version 7.0.5.1



AUG 19 2016

Date: **August 18, 2016**

Timothy Howell  
Crown Castle  
3530 Toringdon Way, Suite 300  
Charlotte, NC 28277  
980.209.8242

Paul J Ford and Company  
250 E. Broad Street, Suite 600  
Columbus, OH 43215  
614.221.6679  
nparente@pjfweb.com

**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. (FILLEEY PARK)

**Crown Castle JDE Job Number:**

378260

**Crown Castle Work Order Number:**

1269143

**Crown Castle Application Number:**

345613 Rev. 1

**Engineering Firm Designation:**

**Paul J Ford and Company Project Number:** 37516-0115.006.7700

**Site Data:**

**28 Brewer Dr., BLOOMFIELD, Hartford County, CT**

**Latitude 41° 50' 6.57", Longitude -72° 44' 28.2"**

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Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda, as allowed by Sections 104.10 and 104.11 of the 2005 Connecticut State Building Code with 2009 Amendments, based upon a 3-second gust wind speed of 95 mph with no ice, 50 mph with 1 inch ice thickness and 60 mph under service loads, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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## 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-E.

## 2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda, as allowed by Sections 104.10 and 104.11 of the 2005 Connecticut State Building Code with 2009 Amendments, based upon a 3-second gust wind speed of 95 mph with no ice, 50 mph with 1 inch ice thickness and 60 mph under service loads, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

**Table 1 - Proposed Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
107.0	108.0	3	commscope	LNx-6515DS-A1M w/ Mount Pipe	-	-	-
		3	ericsson	RRUS 11 B12			

**Table 2 - Existing and Reserved Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
118.0	120.0	3	alcatel lucent	TD-RRH8x20-25	1 3 2	5/8 1-1/4 1/2	1
		1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe			
		2	rfs celwave	APXVSP18-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	tower mounts	Platform Mount [LP 501-1]			
	116.0	116.0	1	andrew			
1			andrew	VHLP1-23-DW1			
2			dragonwave	HORIZON COMPACT			
114.0	115.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	-	-	1
	114.0	1	tower mounts	Pipe Mount [PM 601-3]			
	113.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
107.0	108.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	13	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
	107.0	1	tower mounts	Platform Mount [LP 712-1]			
99.0	100.0	3	ericsson	RRUS 32	1	3/8	2
		6	quintel technology	QS66512-2 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		6	cci antennas	TPX-070821	2	3/4	1
		3	communication components inc.	DTMABP7819VG12A			
		6	ericsson	RRUS-11			
	6	kathrein	782-10250				
1	raycap	DC6-48-60-18-8F					
	99.0	1	tower mounts	Platform Mount [LP 501-1]			
59.0	59.0	1	tower mounts	Side Arm Mount [SO 702-1]	-	-	1
48.0	50.0	1	gps	GPS_A	-	-	1
		1	lucent	KS24019-L112A	-	-	3
		48.0	1	tower mounts	Side Arm Mount [SO 702-1]	3	1/2

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Equipment To Be Removed

**Table 3 - Design Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
-	-	-	-	-	-	-

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welte, P.E., P.C., 08/09/96	88065	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn, 34738SW, 10/11/96	1616549	CCISITES
4-TOWER MANUFACTURER DRAWINGS	UNR-Rohn, A963248, 10/23/96	2158527	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Semaan Engineering, CT03SC076, 8/25/03	3386189	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions, 080063.001, 1/18/08	2205450	CCISITES
4-POST-MODIFICATION INSPECTION	B&T, 79582, 11/3/08	2343686	CCISITES
4-POST-MODIFICATION INSPECTION	GPD, 2011111.27, 5/31/11	4092494	CCISITES
TOWER MAPPING	HIGHTOWER, 876329, 08/01/2016	-	PJF

#### 3.1) Analysis Method

tnxTower (version 7.0.5.1), 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 reinforced in conformance with the referenced modification drawings.
- 5) The bridge stiffeners carry the entire load through the flange connections at 30' and 60'.
- 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) Monopole will be reinforced in conformance with the attached 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 5 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	120 - 90	Pole	P24x0.25	1	-10.27	662.26	79.6	Pass
L2	90 - 80.25	Pole	P24x0.375	2	-11.74	1052.07	77.3	Pass
L3	80.25 - 68.5	Pole	RPS 24" x 0.64677"	3	-14.46	1257.27	89.0	Pass
L4	68.5 - 63.5	Pole	RPS 24" x 0.61306"	4	-15.57	1339.80	94.6	Pass
L5	63.5 - 60	Pole	RPS 24" x 1.13718"	5	-16.88	2083.30	67.5	Pass
L6	60 - 56.5	Pole	RPS 30" x 0.90733"	6	-18.16	2232.33	53.9	Pass
L7	56.5 - 45.417	Pole	RPS 30" x 0.55714"	7	-20.95	1550.04	96.6	Pass
L8	45.417 - 36.417	Pole	RPS 30" x 0.70733"	8	-23.72	1947.31	91.2	Pass
L9	36.417 - 33.5	Pole	RPS 30" x 0.86188"	9	-24.78	2348.91	79.8	Pass
L10	33.5 - 30	Pole	RPS 30" x 1.23648"	10	-26.53	2971.52	67.7	Pass
L11	30 - 26.5	Pole	RPS 36" x 0.7835"	11	-27.89	2411.44	72.4	Pass
L12	26.5 - 20.583	Pole	RPS 36" x 0.62423"	12	-29.82	1961.77	97.0	Pass
L13	20.583 - 2	Pole	RPS 36" x 0.8638"	13	-37.87	2759.79	89.6	Pass
L14	2 - 0	Pole	RPS 36" x 0.95358"	14	-38.82	2964.20	85.8	Pass
							Summary	
						Pole (L12)	97.0	Pass
						<b>RATING =</b>	<b>97.0</b>	Pass

**Table 6 - Tower Component Stresses vs. Capacity - LC4.7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	71.4	Pass
1	Base Plate	0	63.7	Pass
1	Base Foundation (Steel)	0	75.1	Pass
1	Base Foundation Soil Interaction	0	29.8	Pass
1	Flange Connection	30	64.5	Pass
1	Flange Connection	60	67.5	Pass
1,2	Flange Connection	90	79.6	Pass

<b>Structure Rating (max from all components) =</b>	<b>97%</b>
---	------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) See Assumption #6.

#### 4.1) Recommendations

Reinforce monopole per the attached modification drawings.

**APPENDIX A**  
**TNXTOWER OUTPUT**

## Tower Input Data

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

- 1) Tower is located in Hartford County, Connecticut.
- 2) Basic wind speed of 95 mph.
- 3) Structure Class II.
- 4) Exposure Category C.
- 5) Topographic Category 1.
- 6) Crest Height 0.00 ft.
- 7) Nominal ice thickness of 1.0000 in.
- 8) Ice thickness is considered to increase with height.
- 9) Ice density of 56 pcf.
- 10) A wind speed of 50 mph is used in combination with ice.
- 11) Temperature drop of 50 °F.
- 12) Deflections calculated using a wind speed of 60 mph.
- 13) A non-linear (P-delta) analysis was used.
- 14) Pressures are calculated at each section.
- 15) Stress ratio used in pole design is 1.
- 16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

- |  |  |   |
|--|--|---|
| Consider Moments - Legs<br>Consider Moments - Horizontals<br>Consider Moments - Diagonals<br>Use Moment Magnification<br>✓ Use Code Stress Ratios<br>✓ Use Code Safety Factors - Guys<br>Escalate Ice<br>Always Use Max Kz<br>Use Special Wind Profile<br><br>Include Bolts In Member Capacity<br><br>Leg Bolts Are At Top Of Section<br>Secondary Horizontal Braces Leg<br>Use Diamond Inner Bracing (4 Sided)<br>SR Members Have Cut Ends<br>SR Members Are Concentric | Distribute Leg Loads As Uniform<br>Assume Legs Pinned<br>✓ Assume Rigid Index Plate<br>✓ Use Clear Spans For Wind Area<br>Use Clear Spans For KL/r<br>Retension Guys To Initial Tension<br>✓ Bypass Mast Stability Checks<br>✓ Use Azimuth Dish Coefficients<br>✓ Project Wind Area of Appurt.<br><br>✓ Autocalc Torque Arm Areas<br><br>Add IBC .6D+W Combination<br>Sort Capacity Reports By Component<br>Triangulate Diamond Inner Bracing<br>Treat Feed Line Bundles As Cylinder | Use ASCE 10 X-Brace Ly Rules<br>Calculate Redundant Bracing Forces<br>Ignore Redundant Members in FEA<br>SR Leg Bolts Resist Compression<br>All Leg Panels Have Same Allowable<br>Offset Girt At Foundation<br>✓ Consider Feed Line Torque<br>Include Angle Block Shear Check<br>Use TIA-222-G Bracing Resist.<br>Exemption<br>Use TIA-222-G Tension Splice<br>Exemption<br><br><div style="text-align: center; background-color: #e0e0e0; padding: 2px;"><b>Poles</b></div> ✓ Include Shear-Torsion Interaction<br>Always Use Sub-Critical Flow<br>Use Top Mounted Sockets |
|--|--|---|

## Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	120.00-90.00	30.00	P24x0.25	A36M-42 (42 ksi)	
L2	90.00-80.25	9.75	P24x0.375	A36M-42 (42 ksi)	
L3	80.25-68.50	11.75	RPS 24" x 0.64677"	Reinf 29.44 ksi (29 ksi)	
L4	68.50-63.50	5.00	RPS 24" x	Reinf 33.05	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
			0.61306"	ksi (33 ksi)	
L5	63.50-60.00	3.50	RPS 24" x 1.13718"	Reinf 28.34 ksi (28 ksi)	
L6	60.00-56.50	3.50	RPS 30" x 0.90733"	Reinf 29.91 ksi (30 ksi)	
L7	56.50-45.42	11.08	RPS 30" x 0.55714"	Reinf 33.42 ksi (33 ksi)	
L8	45.42-36.42	9.00	RPS 30" x 0.70733"	Reinf 33.24 ksi (33 ksi)	
L9	36.42-33.50	2.92	RPS 30" x 0.86188"	Reinf 33.08 ksi (33 ksi)	
L10	33.50-30.00	3.50	RPS 30" x 1.23648"	Reinf 29.55 ksi (30 ksi)	
L11	30.00-26.50	3.50	RPS 36" x 0.7835"	Reinf 30.91 ksi (31 ksi)	
L12	26.50-20.58	5.92	RPS 36" x 0.62423"	Reinf 31.42 ksi (31 ksi)	
L13	20.58-2.00	18.58	RPS 36" x 0.8638"	Reinf 32.16 ksi (32 ksi)	
L14	2.00-0.00	2.00	RPS 36" x 0.95358"	Reinf 31.37 ksi (31 ksi)	

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
*** HB058-M12- XXXF(5/8")	C	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	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	CaAa (Out Of Face)	118.00 - 0.00	1	No Ice	0.05	0.14
						1/2" Ice	0.15	0.76
						1" Ice	0.25	2.00
FSJ4-50B(1/2")	C	No	CaAa (Out Of Face)	118.00 - 0.00	1	No Ice	0.00	0.14
						1/2" Ice	0.00	0.76
						1" Ice	0.00	2.00
*** 561(1-5/8")	C	No	CaAa (Out Of Face)	107.00 - 70.00	1	No Ice	0.16	1.35
						1/2" Ice	0.26	2.65
						1" Ice	0.36	4.56
561(1-5/8")	C	No	CaAa (Out Of Face)	70.00 - 0.00	1	No Ice	0.00	1.35
						1/2" Ice	0.00	2.65
						1" Ice	0.00	4.56
FLC 158-50J(1-5/8")	C	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	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
*** FB-L98B-034-	C	No	Inside Pole	99.00 - 0.00	1	No Ice	0.00	0.06

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
XXX(3/8")						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4")	C	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
FB-L98B-002-75000(3/8")	C	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	Inside Pole	99.00 - 0.00	2	No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
LDF5-50A(7/8")	C	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
***								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	48.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	48.00 - 0.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
***								
C8x18.75	C	No	CaAa (Out Of Face)	26.50 - 0.00	2	No Ice	0.42	0.00
						1/2" Ice	0.53	0.00
						1" Ice	0.64	0.00
C8x11.5 brace	C	No	CaAa (Out Of Face)	56.50 - 33.50	2	No Ice	0.42	0.00
						1/2" Ice	0.53	0.00
						1" Ice	0.64	0.00
C8x11.5 brace	C	No	CaAa (Out Of Face)	70.00 - 63.50	2	No Ice	0.42	0.00
						1/2" Ice	0.53	0.00
						1" Ice	0.64	0.00

**Feed Line/Linear Appurtenances Section Areas**

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	120.00-90.00	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	4.219	0.36
L2	90.00-80.25	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	2.091	0.21
L3	80.25-68.50	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	3.540	0.25
L4	68.50-63.50	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	4.472	0.11
L5	63.50-60.00	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	0.182	0.08
L6	60.00-56.50	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	0.182	0.08
L7	56.50-45.42	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	9.912	0.24
L8	45.42-36.42	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	8.049	0.20
L9	36.42-33.50	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	2.609	0.06
L10	33.50-30.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation	Face	A <sub>R</sub>	A <sub>F</sub>	C <sub>AA</sub>	C <sub>AA</sub>	Weight
n	ft		ft <sup>2</sup>	ft <sup>2</sup>	In Face ft <sup>2</sup>	Out Face ft <sup>2</sup>	K
L11	30.00-26.50	C	0.000	0.000	0.000	0.182	0.08
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L12	26.50-20.58	C	0.000	0.000	0.000	0.182	0.08
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L13	20.58-2.00	C	0.000	0.000	0.000	5.292	0.13
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
L14	2.00-0.00	C	0.000	0.000	0.000	16.619	0.41
		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	1.789	0.04

**Feed Line/Linear Appurtenances Section Areas - With Ice**

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A <sub>R</sub>	A <sub>F</sub>	C <sub>AA</sub>	C <sub>AA</sub>	Weight
n	ft		in	ft <sup>2</sup>	ft <sup>2</sup>	In Face ft <sup>2</sup>	Out Face ft <sup>2</sup>	K
L1	120.00-90.00	A	2.245	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	24.427	2.04
L2	90.00-80.25	A	2.199	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	10.667	1.04
L3	80.25-68.50	A	2.169	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	14.531	1.23
L4	68.50-63.50	A	2.144	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	11.379	0.51
L5	63.50-60.00	A	2.129	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	1.673	0.36
L6	60.00-56.50	A	2.117	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	1.664	0.35
L7	56.50-45.42	A	2.089	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	24.831	1.15
L8	45.42-36.42	A	2.043	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	19.901	1.04
L9	36.42-33.50	A	2.012	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	6.390	0.33
L10	33.50-30.00	A	1.992	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	1.577	0.39
L11	30.00-26.50	A	1.969	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	1.560	0.38
L12	26.50-20.58	A	1.934	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	12.665	0.64
L13	20.58-2.00	A	1.797	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	38.135	1.85
L14	2.00-0.00	A	1.410	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	3.606	0.15

### Feed Line Center of Pressure

Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub> Ice	CP <sub>z</sub> Ice
	ft	in	in	in	in
L1	120.00-90.00	-0.1707	0.0985	-0.6635	0.3831
L2	90.00-80.25	-0.2517	0.1453	-0.8214	0.4742
L3	80.25-68.50	-0.3401	0.1964	-0.8929	0.5155
L4	68.50-63.50	-0.8028	0.4635	-1.2762	0.7368
L5	63.50-60.00	-0.0658	0.0380	-0.4383	0.2530
L6	60.00-56.50	-0.0662	0.0382	-0.4639	0.2678
L7	56.50-45.42	-0.8557	0.4940	-1.4299	0.8255
L8	45.42-36.42	-0.8557	0.4940	-1.4215	0.8207
L9	36.42-33.50	-0.8557	0.4940	-1.4155	0.8173
L10	33.50-30.00	-0.0662	0.0382	-0.4457	0.2573
L11	30.00-26.50	-0.0664	0.0383	-0.4604	0.2658
L12	26.50-20.58	-0.8950	0.5167	-1.5270	0.8816
L13	20.58-2.00	-0.8950	0.5167	-1.4944	0.8628
L14	2.00-0.00	-0.8950	0.5167	-1.3947	0.8052

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustmen t	Placement  ft	C <sub>AA</sub> Front  ft <sup>2</sup>	C <sub>AA</sub> Side  ft <sup>2</sup>	Weight  K	
			ft ft ft	°					
***									
APXVTM14-C-120 w/ Mount Pipe	A	From Face	4.00	0.0000	118.00	No Ice	6.58	4.96	0.08
			0.00			1/2"	7.03	5.75	0.13
			2.00			Ice	7.47	6.47	0.19
(2) APXVTM14-C-120 w/ Mount Pipe	B	From Face	4.00	0.0000	118.00	1" Ice	6.58	4.96	0.08
			0.00			1/2"	7.03	5.75	0.13
			2.00			Ice	7.47	6.47	0.19
TD-RRH8x20-25	A	From Face	4.00	0.0000	118.00	No Ice	4.05	1.53	0.07
			0.00			1/2"	4.30	1.71	0.10
			2.00			Ice	4.56	1.90	0.13
(2) TD-RRH8x20-25	B	From Face	4.00	0.0000	118.00	1" Ice	4.05	1.53	0.07
			0.00			1/2"	4.30	1.71	0.10
			2.00			Ice	4.56	1.90	0.13
APXV9ERR18-C-A20 w/ Mount Pipe	A	From Face	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
APXVSP18-C-A20 w/ Mount Pipe	B	From Face	4.00	0.0000	118.00	1" 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
APXVSP18-C-A20 w/ Mount Pipe	C	From Face	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
IBC1900HG-2A	A	From Face	4.00	0.0000	118.00	1" 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
IBC1900HG-2A	B	From Face	4.00	0.0000	118.00	1" 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
IBC1900HG-2A	C	From Face	4.00	0.0000	118.00	1" 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:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
IBC1900BB-1	A	From Face	4.00		0.0000	118.00	1" Ice			
			0.00				No Ice	0.97	0.46	0.02
			2.00				1/2"	1.09	0.56	0.03
IBC1900BB-1	B	From Face	4.00		0.0000	118.00	Ice	1.22	0.66	0.04
			0.00				1" Ice			
			2.00				No Ice	0.97	0.46	0.02
IBC1900BB-1	C	From Face	4.00		0.0000	118.00	1/2"	1.09	0.56	0.03
			0.00				Ice	1.22	0.66	0.04
			2.00				No Ice	0.97	0.46	0.02
(2) HORIZON COMPACT	B	From Face	4.00		0.0000	118.00	1" Ice			
			0.00				No Ice	0.72	0.37	0.01
			-2.00				1/2"	0.83	0.45	0.02
Platform Mount [LP 501-1]	C	None			0.0000	118.00	Ice	0.94	0.54	0.03
							1" Ice			
							No Ice	32.04	32.04	0.98
***	A	From Leg	2.00		0.0000	114.00	1/2"	45.28	45.28	1.28
			0.00				Ice	58.51	58.51	1.57
			1.00				No Ice	2.32	2.24	0.06
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.00		0.0000	114.00	1" Ice			
			0.00				No Ice	2.32	2.24	0.06
			1.00				1/2"	2.53	2.44	0.08
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.00		0.0000	114.00	Ice	2.74	2.65	0.11
			0.00				1" Ice			
			1.00				No Ice	2.32	2.24	0.06
800MHz 2X50W RRH W/FILTER	A	From Leg	2.00		0.0000	114.00	1/2"	2.53	2.44	0.08
			0.00				Ice	2.74	2.65	0.11
			-1.00				No Ice	2.06	1.93	0.06
800MHz 2X50W RRH W/FILTER	B	From Leg	2.00		0.0000	114.00	1" Ice			
			0.00				No Ice	2.06	1.93	0.06
			-1.00				1/2"	2.24	2.11	0.09
800MHz 2X50W RRH W/FILTER	C	From Leg	2.00		0.0000	114.00	Ice	2.43	2.29	0.11
			0.00				1" Ice			
			-1.00				No Ice	2.06	1.93	0.06
Pipe Mount [PM 601-3]	C	None			0.0000	114.00	1/2"	5.48	5.48	0.24
							Ice	6.57	6.57	0.28
							No Ice	4.39	4.39	0.20
***	A	From Leg	4.00		0.0000	107.00	1" Ice			
			0.00				No Ice	6.33	5.64	0.11
			1.00				1/2"	6.78	6.43	0.17
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00		0.0000	107.00	Ice	7.21	7.13	0.23
			0.00				1" Ice			
			1.00				No Ice	6.33	5.64	0.11
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00		0.0000	107.00	1/2"	6.78	6.43	0.17
			0.00				Ice	7.21	7.13	0.23
			1.00				No Ice	6.33	5.64	0.11
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00		0.0000	107.00	1" Ice			
			0.00				No Ice	6.32	5.63	0.11
			1.00				1/2"	6.76	6.42	0.17





Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>AA</sub> <sub>Front</sub>	C <sub>AA</sub> <sub>Side</sub>	Weight
			Horz	Lateral	Vert					
			1.00							
(2) RRUS-11	B	From Leg	4.00	0.0000	99.00		Ice	3.21	1.50	0.09
			0.00				1" Ice			
			1.00				No Ice	2.79	1.19	0.05
							1/2"	3.00	1.34	0.07
							Ice	3.21	1.50	0.09
(2) RRUS-11	C	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	2.79	1.19	0.05
			1.00				1/2"	3.00	1.34	0.07
							Ice	3.21	1.50	0.09
(2) 782-10250	A	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	0.45	0.25	0.01
			1.00				1/2"	0.54	0.32	0.01
							Ice	0.64	0.40	0.02
(2) 782-10250	B	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	0.45	0.25	0.01
			1.00				1/2"	0.54	0.32	0.01
							Ice	0.64	0.40	0.02
(2) 782-10250	C	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	0.45	0.25	0.01
			1.00				1/2"	0.54	0.32	0.01
							Ice	0.64	0.40	0.02
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	0.92	0.92	0.02
			1.00				1/2"	1.46	1.46	0.04
							Ice	1.64	1.64	0.06
(2) QS66512-2 w/ Mount Pipe	A	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	8.37	8.46	0.14
			1.00				1/2"	8.93	9.66	0.21
							Ice	9.46	10.55	0.30
(2) QS66512-2 w/ Mount Pipe	B	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	8.37	8.46	0.14
			1.00				1/2"	8.93	9.66	0.21
							Ice	9.46	10.55	0.30
(2) QS66512-2 w/ Mount Pipe	C	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	8.37	8.46	0.14
			1.00				1/2"	8.93	9.66	0.21
							Ice	9.46	10.55	0.30
(2) TPX-070821	A	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	0.47	0.10	0.01
			1.00				1/2"	0.56	0.15	0.01
							Ice	0.66	0.20	0.02
(2) TPX-070821	B	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	0.47	0.10	0.01
			1.00				1/2"	0.56	0.15	0.01
							Ice	0.66	0.20	0.02
(2) TPX-070821	C	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	0.47	0.10	0.01
			1.00				1/2"	0.56	0.15	0.01
							Ice	0.66	0.20	0.02
RRUS 32	A	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	2.86	1.78	0.06
			1.00				1/2"	3.08	1.97	0.08
							Ice	3.32	2.17	0.10
RRUS 32	B	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	2.86	1.78	0.06
			1.00				1/2"	3.08	1.97	0.08
							Ice	3.32	2.17	0.10
RRUS 32	C	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	2.86	1.78	0.06
			1.00				1/2"	3.08	1.97	0.08
							Ice	3.32	2.17	0.10
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	99.00		1" Ice			
			0.00				No Ice	0.92	0.92	0.02
			1.00				1/2"	1.46	1.46	0.04
							Ice	1.64	1.64	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>AA</sub> <sub>Front</sub> ft <sup>2</sup>	C <sub>AA</sub> <sub>Side</sub> ft <sup>2</sup>	Weight K
Platform Mount [LP 501-1]	C	None		0.0000	99.00	1" Ice	32.04	32.04	0.98
						No Ice	45.28	45.28	1.28
						1/2" Ice	58.51	58.51	1.57
						1" Ice			
***									
Side Arm Mount [SO 702-1]	A	None		0.0000	59.00	No Ice	1.00	1.43	0.03
						1/2" Ice	1.00	2.05	0.04
						Ice	1.00	2.67	0.05
						1" Ice			
***									
GPS_A	A	From Leg	4.00 0.00 2.00	0.0000	48.00	No Ice	0.26	0.26	0.00
						1/2" Ice	0.32	0.32	0.00
						Ice	0.39	0.39	0.01
						1" Ice			
Side Arm Mount [SO 702-1]	A	None		0.0000	48.00	No Ice	1.00	1.43	0.03
						1/2" Ice	1.00	2.05	0.04
						Ice	1.00	2.67	0.05
						1" Ice			
***									
(2) bridge stiffener	C	None		0.0000	60.00	No Ice	12.77	0.00	0.00
						1/2" Ice	0.00	0.00	0.00
						Ice	0.00	0.00	0.00
						1" Ice			
(2) bridge stiffener	C	None		0.0000	30.00	No Ice	12.77	0.00	0.00
						1/2" Ice	0.00	0.00	0.00
						Ice	0.00	0.00	0.00
						1" Ice			

### Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft <sup>2</sup>	Weight K	
VHLP1-23-DW1	B	Paraboloid w/o Radome	From Leg	4.00	-6.0000		118.00	1.27	No Ice	1.28	0.01
				0.00					1/2" Ice	1.45	0.02
				-2.00					1" Ice	1.62	0.03
VHLP1-18	B	Paraboloid w/o Radome	From Leg	4.00	-6.0000		118.00	1.27	No Ice	1.28	0.01
				0.00					1/2" Ice	1.45	0.02
				-2.00					1" Ice	1.62	0.03
***											

### Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>Z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> <sub>In Face</sub> ft <sup>2</sup>	C <sub>AA</sub> <sub>Out Face</sub> ft <sup>2</sup>
L1 120.00-90.00	105.00	1.279	28	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	4.219
L2 90.00-	85.13	1.223	27	19.500	A	0.000	19.500	19.500	100.00	0.000	0.000

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>
80.25					B	0.000	19.500		100.00	0.000	0.000
					C	0.000	19.500		100.00	0.000	2.091
L3 80.25-68.50	74.38	1.189	26	23.500	A	0.000	23.500	23.500	100.00	0.000	0.000
					B	0.000	23.500		100.00	0.000	0.000
					C	0.000	23.500		100.00	0.000	3.540
L4 68.50-63.50	66.00	1.16	25	10.000	A	0.000	10.000	10.000	100.00	0.000	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	0.000	4.472
L5 63.50-60.00	61.75	1.143	25	7.000	A	0.000	7.000	7.000	100.00	0.000	0.000
					B	0.000	7.000		100.00	0.000	0.000
					C	0.000	7.000		100.00	0.000	0.182
L6 60.00-56.50	58.25	1.13	25	8.750	A	0.000	8.750	8.750	100.00	0.000	0.000
					B	0.000	8.750		100.00	0.000	0.000
					C	0.000	8.750		100.00	0.000	0.182
L7 56.50-45.42	50.96	1.098	24	27.708	A	0.000	27.708	27.708	100.00	0.000	0.000
					B	0.000	27.708		100.00	0.000	0.000
					C	0.000	27.708		100.00	0.000	9.912
L8 45.42-36.42	40.92	1.049	23	22.500	A	0.000	22.500	22.500	100.00	0.000	0.000
					B	0.000	22.500		100.00	0.000	0.000
					C	0.000	22.500		100.00	0.000	8.049
L9 36.42-33.50	34.96	1.014	22	7.293	A	0.000	7.293	7.293	100.00	0.000	0.000
					B	0.000	7.293		100.00	0.000	0.000
					C	0.000	7.293		100.00	0.000	2.609
L10 33.50-30.00	31.75	0.994	22	8.750	A	0.000	8.750	8.750	100.00	0.000	0.000
					B	0.000	8.750		100.00	0.000	0.000
					C	0.000	8.750		100.00	0.000	0.182
L11 30.00-26.50	28.25	0.97	21	10.500	A	0.000	10.500	10.500	100.00	0.000	0.000
					B	0.000	10.500		100.00	0.000	0.000
					C	0.000	10.500		100.00	0.000	0.182
L12 26.50-20.58	23.54	0.933	20	17.751	A	0.000	17.751	17.751	100.00	0.000	0.000
					B	0.000	17.751		100.00	0.000	0.000
					C	0.000	17.751		100.00	0.000	5.292
L13 20.58-2.00	11.29	0.85	19	55.749	A	0.000	55.749	55.749	100.00	0.000	0.000
					B	0.000	55.749		100.00	0.000	0.000
					C	0.000	55.749		100.00	0.000	16.619
L14 2.00-0.00	1.00	0.85	19	6.000	A	0.000	6.000	6.000	100.00	0.000	0.000
					B	0.000	6.000		100.00	0.000	0.000
					C	0.000	6.000		100.00	0.000	1.789

### Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	t <sub>z</sub> in	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>
L1 120.00-90.00	105.00	1.279	8	2.2454	71.227	A	0.000	71.227	71.227	100.00	0.000	0.000
						B	0.000	71.227		100.00	0.000	0.000
						C	0.000	71.227		100.00	0.000	24.427
L2 90.00-80.25	85.13	1.223	7	2.1988	23.073	A	0.000	23.073	23.073	100.00	0.000	0.000
						B	0.000	23.073		100.00	0.000	0.000
						C	0.000	23.073		100.00	0.000	10.667
L3 80.25-68.50	74.38	1.189	7	2.1693	27.748	A	0.000	27.748	27.748	100.00	0.000	0.000
						B	0.000	27.748		100.00	0.000	0.000
						C	0.000	27.748		100.00	0.000	14.531
L4 68.50-63.50	66.00	1.16	7	2.1435	11.786	A	0.000	11.786	11.786	100.00	0.000	0.000
						B	0.000	11.786		100.00	0.000	0.000
						C	0.000	11.786		100.00	0.000	11.379
L5 63.50-60.00	61.75	1.143	7	2.1293	8.242	A	0.000	8.242	8.242	100.00	0.000	0.000
						B	0.000	8.242		100.00	0.000	0.000
						C	0.000	8.242		100.00	0.000	1.673
L6 60.00-56.50	58.25	1.13	7	2.1169	9.985	A	0.000	9.985	9.985	100.00	0.000	0.000
						B	0.000	9.985		100.00	0.000	0.000
						C	0.000	9.985		100.00	0.000	1.664

Section Elevation ft	z ft	K <sub>z</sub>	q <sub>z</sub> psf	t <sub>z</sub> in	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>
L7 56.50-45.42	50.96	1.098	7	2.0888	31.566	A	0.000	31.566	31.566	100.00	0.000	0.000
						B	0.000	31.566		100.00	0.000	0.000
						C	0.000	31.566		100.00	0.000	24.831
L8 45.42-36.42	40.92	1.049	6	2.0435	25.565	A	0.000	25.565	25.565	100.00	0.000	0.000
						B	0.000	25.565		100.00	0.000	0.000
						C	0.000	25.565		100.00	0.000	19.901
L9 36.42-33.50	34.96	1.014	6	2.0116	8.270	A	0.000	8.270	8.270	100.00	0.000	0.000
						B	0.000	8.270		100.00	0.000	0.000
						C	0.000	8.270		100.00	0.000	6.390
L10 33.50-30.00	31.75	0.994	6	1.9923	9.912	A	0.000	9.912	9.912	100.00	0.000	0.000
						B	0.000	9.912		100.00	0.000	0.000
						C	0.000	9.912		100.00	0.000	1.577
L11 30.00-26.50	28.25	0.97	6	1.9692	11.649	A	0.000	11.649	11.649	100.00	0.000	0.000
						B	0.000	11.649		100.00	0.000	0.000
						C	0.000	11.649		100.00	0.000	1.560
L12 26.50-20.58	23.54	0.933	6	1.9336	19.658	A	0.000	19.658	19.658	100.00	0.000	0.000
						B	0.000	19.658		100.00	0.000	0.000
						C	0.000	19.658		100.00	0.000	12.665
L13 20.58-2.00	11.29	0.85	5	1.7966	61.313	A	0.000	61.313	61.313	100.00	0.000	0.000
						B	0.000	61.313		100.00	0.000	0.000
						C	0.000	61.313		100.00	0.000	38.135
L14 2.00-0.00	1.00	0.85	5	1.4099	6.470	A	0.000	6.470	6.470	100.00	0.000	0.000
						B	0.000	6.470		100.00	0.000	0.000
						C	0.000	6.470		100.00	0.000	3.606

### Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K <sub>z</sub>	q <sub>z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>
L1 120.00-90.00	105.00	1.279	10	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	4.219
L2 90.00-80.25	85.13	1.223	10	19.500	A	0.000	19.500	19.500	100.00	0.000	0.000
					B	0.000	19.500		100.00	0.000	0.000
					C	0.000	19.500		100.00	0.000	2.091
L3 80.25-68.50	74.38	1.189	9	23.500	A	0.000	23.500	23.500	100.00	0.000	0.000
					B	0.000	23.500		100.00	0.000	0.000
					C	0.000	23.500		100.00	0.000	3.540
L4 68.50-63.50	66.00	1.16	9	10.000	A	0.000	10.000	10.000	100.00	0.000	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	0.000	4.472
L5 63.50-60.00	61.75	1.143	9	7.000	A	0.000	7.000	7.000	100.00	0.000	0.000
					B	0.000	7.000		100.00	0.000	0.000
					C	0.000	7.000		100.00	0.000	0.182
L6 60.00-56.50	58.25	1.13	9	8.750	A	0.000	8.750	8.750	100.00	0.000	0.000
					B	0.000	8.750		100.00	0.000	0.000
					C	0.000	8.750		100.00	0.000	0.182
L7 56.50-45.42	50.96	1.098	9	27.708	A	0.000	27.708	27.708	100.00	0.000	0.000
					B	0.000	27.708		100.00	0.000	0.000
					C	0.000	27.708		100.00	0.000	9.912
L8 45.42-36.42	40.92	1.049	8	22.500	A	0.000	22.500	22.500	100.00	0.000	0.000
					B	0.000	22.500		100.00	0.000	0.000
					C	0.000	22.500		100.00	0.000	8.049
L9 36.42-33.50	34.96	1.014	8	7.293	A	0.000	7.293	7.293	100.00	0.000	0.000
					B	0.000	7.293		100.00	0.000	0.000
					C	0.000	7.293		100.00	0.000	2.609
L10 33.50-30.00	31.75	0.994	8	8.750	A	0.000	8.750	8.750	100.00	0.000	0.000
					B	0.000	8.750		100.00	0.000	0.000
					C	0.000	8.750		100.00	0.000	0.182

Section Elevation ft	z ft	$K_z$	$q_z$ psf	$A_G$ ft <sup>2</sup>	F a c e	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>
L11 30.00- 26.50	28.25	0.97	8	10.500	A	0.000	10.500	10.500	100.00	0.000	0.000
					B	0.000	10.500	10.500	100.00	0.000	0.000
					C	0.000	10.500	10.500	100.00	0.000	0.182
L12 26.50- 20.58	23.54	0.933	7	17.751	A	0.000	17.751	17.751	100.00	0.000	0.000
					B	0.000	17.751	17.751	100.00	0.000	0.000
					C	0.000	17.751	17.751	100.00	0.000	5.292
L13 20.58- 2.00	11.29	0.85	7	55.749	A	0.000	55.749	55.749	100.00	0.000	0.000
					B	0.000	55.749	55.749	100.00	0.000	0.000
					C	0.000	55.749	55.749	100.00	0.000	16.619
L14 2.00-0.00	1.00	0.85	7	6.000	A	0.000	6.000	6.000	100.00	0.000	0.000
					B	0.000	6.000	6.000	100.00	0.000	0.000
					C	0.000	6.000	6.000	100.00	0.000	1.789

### 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
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

Comb. No.	Description
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 - 90	Pole	Max Tension	2	0.00	0.00	-0.00
			Max. Compression	26	-31.68	-2.81	5.66
			Max. Mx	8	-10.27	-308.43	4.33
			Max. My	2	-10.31	0.24	300.34
			Max. Vy	20	-16.72	308.10	0.84
			Max. Vx	2	-16.36	0.24	300.34
L2	90 - 80.25	Pole	Max. Torque	11			2.89
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.56	-2.03	5.31
			Max. Mx	20	-11.74	474.27	0.87
			Max. My	2	-11.79	1.02	462.90
			Max. Vy	20	-17.36	474.27	0.87
L3	80.25 - 68.5	Pole	Max. Vx	2	-17.00	1.02	462.90
			Max. Torque	11			2.84
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.93	-1.09	4.86
			Max. Mx	20	-14.46	683.43	0.90
			Max. My	2	-14.49	1.96	667.70
L4	68.5 - 63.5	Pole	Max. Vy	20	-18.23	683.43	0.90
			Max. Vx	2	-17.87	1.96	667.70
			Max. Torque	11			2.75
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.73	-0.69	4.66
			Max. Mx	20	-15.57	776.34	0.91
L5	63.5 - 60	Pole	Max. My	2	-15.61	2.36	758.76
			Max. Vy	20	-18.93	776.34	0.91
			Max. Vx	2	-18.57	2.36	758.76
			Max. Torque	11			2.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.50	-0.42	4.52
L6	60 - 56.5	Pole	Max. Mx	20	-16.88	842.97	0.92
			Max. My	2	-16.91	2.64	824.09
			Max. Vy	20	-19.14	842.97	0.92
			Max. Vx	2	-18.78	2.64	824.09
			Max. Torque	11			2.44
			Max Tension	1	0.00	0.00	0.00
L7	56.5 - 45.417	Pole	Max. Compression	26	-44.42	-0.08	4.34
			Max. Mx	20	-18.16	914.51	0.92
			Max. My	2	-18.19	2.93	894.32
			Max. Vy	20	-20.59	914.51	0.92
			Max. Vx	2	-20.23	2.93	894.32
			Max. Torque	11			2.43
L8	45.417 - 36.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.96	1.01	3.87
			Max. Mx	20	-20.95	1152.58	0.93
			Max. My	2	-20.98	3.84	1128.25
			Max. Vy	20	-22.39	1152.58	0.93
			Max. Vx	2	-22.03	3.84	1128.25
L9	36.417 -	Pole	Max. Torque	11			2.42
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.16	2.00	3.29
			Max. Mx	20	-23.72	1360.06	0.93
			Max. My	2	-23.74	4.58	1332.40
			Max. Vy	20	-23.71	1360.06	0.93

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
	33.5		Max. Compression	26	-54.67	2.31	3.11
			Max. Mx	20	-24.78	1429.82	0.93
			Max. My	2	-24.80	4.81	1401.07
			Max. Vy	20	-24.12	1429.82	0.93
			Max. Vx	2	-23.77	4.81	1401.07
			Max. Torque	21			-1.86
L10	33.5 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.94	2.68	2.89
			Max. Mx	20	-26.53	1514.56	0.93
			Max. My	2	-26.54	5.10	1484.52
			Max. Vy	20	-24.31	1514.56	0.93
			Max. Vx	2	-23.95	5.10	1484.52
			Max. Torque	21			-1.79
L11	30 - 26.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.90	3.12	2.64
			Max. Mx	20	-27.89	1603.41	0.92
			Max. My	2	-27.90	5.40	1572.06
			Max. Vy	20	-25.49	1603.41	0.92
			Max. Vx	2	-25.13	5.40	1572.06
			Max. Torque	21			-1.79
L12	26.5 - 20.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.77	3.84	2.22
			Max. Mx	20	-29.82	1756.78	0.91
			Max. My	2	-29.83	5.89	1723.24
			Max. Vy	20	-26.35	1756.78	0.91
			Max. Vx	2	-26.00	5.89	1723.24
			Max. Torque	21			-1.78
L13	20.583 - 2	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.49	5.91	1.00
			Max. Mx	20	-37.87	2268.95	0.87
			Max. My	2	-37.87	7.44	2228.59
			Max. Vy	20	-28.73	2268.95	0.87
			Max. Vx	2	-28.38	7.44	2228.59
			Max. Torque	21			-1.64
L14	2 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-73.64	6.07	0.90
			Max. Mx	20	-38.82	2326.64	0.86
			Max. My	2	-38.82	7.60	2285.56
			Max. Vy	20	-28.97	2326.64	0.86
			Max. Vx	2	-28.62	7.60	2285.56
			Max. Torque	19			-1.46

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	73.64	0.00	-0.00
	Max. H <sub>x</sub>	21	29.13	28.95	0.00
	Max. H <sub>z</sub>	3	29.13	0.07	28.61
	Max. M <sub>x</sub>	2	2285.56	0.07	28.61
	Max. M <sub>z</sub>	8	2319.44	-28.89	0.08
	Max. Torsion	5	1.36	-14.51	24.74
	Min. Vert	3	29.13	0.07	28.61
	Min. H <sub>x</sub>	9	29.13	-28.89	0.08
	Min. H <sub>z</sub>	15	29.13	0.05	-28.56
	Min. M <sub>x</sub>	14	-2277.58	0.05	-28.56
	Min. M <sub>z</sub>	20	-2326.64	28.95	0.00
	Min. Torsion	19	-1.46	25.16	-14.25



## Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	32.36	-0.00	0.00	-0.93	-0.23	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	38.83	-0.07	-28.61	-2285.56	7.60	-1.03
0.9 Dead+1.6 Wind 0 deg - No Ice	29.13	-0.07	-28.61	-2267.28	7.62	-1.03
1.2 Dead+1.6 Wind 30 deg - No Ice	38.83	14.51	-24.74	-1975.99	-1168.11	-1.36
0.9 Dead+1.6 Wind 30 deg - No Ice	29.13	14.51	-24.74	-1960.11	-1158.76	-1.36
1.2 Dead+1.6 Wind 60 deg - No Ice	38.83	25.04	-14.35	-1149.05	-2011.66	-1.31
0.9 Dead+1.6 Wind 60 deg - No Ice	29.13	25.04	-14.35	-1139.67	-1995.65	-1.31
1.2 Dead+1.6 Wind 90 deg - No Ice	38.83	28.89	-0.08	-11.40	-2319.44	-0.95
0.9 Dead+1.6 Wind 90 deg - No Ice	29.13	28.89	-0.08	-10.98	-2301.02	-0.96
1.2 Dead+1.6 Wind 120 deg - No Ice	38.83	24.99	14.23	1131.92	-2004.92	-0.48
0.9 Dead+1.6 Wind 120 deg - No Ice	29.13	24.99	14.23	1123.32	-1988.99	-0.49
1.2 Dead+1.6 Wind 150 deg - No Ice	38.83	14.37	24.71	1969.37	-1150.32	0.14
0.9 Dead+1.6 Wind 150 deg - No Ice	29.13	14.37	24.71	1954.17	-1141.16	0.13
1.2 Dead+1.6 Wind 180 deg - No Ice	38.83	-0.05	28.56	2277.58	6.63	0.88
0.9 Dead+1.6 Wind 180 deg - No Ice	29.13	-0.05	28.56	2259.99	6.65	0.88
1.2 Dead+1.6 Wind 210 deg - No Ice	38.83	-14.53	24.73	1972.26	1170.39	1.33
0.9 Dead+1.6 Wind 210 deg - No Ice	29.13	-14.53	24.73	1957.02	1161.20	1.33
1.2 Dead+1.6 Wind 240 deg - No Ice	38.83	-25.16	14.25	1134.67	2025.97	1.46
0.9 Dead+1.6 Wind 240 deg - No Ice	29.13	-25.16	14.25	1126.04	2010.00	1.46
1.2 Dead+1.6 Wind 270 deg - No Ice	38.83	-28.95	-0.00	-0.86	2326.64	1.18
0.9 Dead+1.6 Wind 270 deg - No Ice	29.13	-28.95	-0.00	-0.55	2308.33	1.19
1.2 Dead+1.6 Wind 300 deg - No Ice	38.83	-25.06	-14.25	-1136.17	2012.88	0.39
0.9 Dead+1.6 Wind 300 deg - No Ice	29.13	-25.06	-14.25	-1126.92	1997.04	0.39
1.2 Dead+1.6 Wind 330 deg - No Ice	38.83	-14.50	-24.71	-1971.48	1165.53	-0.49
0.9 Dead+1.6 Wind 330 deg - No Ice	29.13	-14.50	-24.71	-1955.64	1156.39	-0.49
1.2 Dead+1.0 Ice+1.0 Temp	73.64	-0.00	0.00	-0.90	6.07	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	73.64	-0.03	-8.74	-804.81	10.18	-0.77
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	73.64	4.40	-7.55	-695.25	-399.49	-0.72
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	73.64	7.60	-4.37	-403.19	-694.78	-0.48
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	73.64	8.78	-0.01	-2.43	-803.16	-0.12
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	73.64	7.60	4.36	399.55	-694.42	0.23
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	73.64	4.38	7.56	693.52	-397.07	0.53
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	73.64	-0.00	8.73	801.03	6.59	0.73
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	73.64	-4.40	7.55	692.73	412.73	0.72

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	73.64	-7.64	4.34	397.52	711.58	0.52
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	73.64	-8.80	-0.01	-2.61	817.86	0.18
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	73.64	-7.62	-4.37	-402.23	709.34	-0.26
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	73.64	-4.42	-7.56	-695.56	414.14	-0.63
Dead+Wind 0 deg - Service	32.36	-0.02	-6.38	-508.30	1.50	0.34
Dead+Wind 30 deg - Service	32.36	3.24	-5.52	-439.52	-259.58	0.03
Dead+Wind 60 deg - Service	32.36	5.58	-3.20	-255.90	-446.91	-0.29
Dead+Wind 90 deg - Service	32.36	6.44	-0.02	-3.26	-515.27	-0.55
Dead+Wind 120 deg - Service	32.36	5.57	3.17	250.63	-445.41	-0.69
Dead+Wind 150 deg - Service	32.36	3.21	5.51	436.59	-255.63	-0.64
Dead+Wind 180 deg - Service	32.36	-0.01	6.37	505.06	1.28	-0.38
Dead+Wind 210 deg - Service	32.36	-3.24	5.52	437.23	259.70	-0.03
Dead+Wind 240 deg - Service	32.36	-5.61	3.18	251.24	449.71	0.33
Dead+Wind 270 deg - Service	32.36	-6.46	-0.00	-0.92	516.49	0.60
Dead+Wind 300 deg - Service	32.36	-5.59	-3.18	-253.04	446.80	0.66
Dead+Wind 330 deg - Service	32.36	-3.23	-5.51	-438.52	258.62	0.55

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-32.36	0.00	0.00	32.36	-0.00	0.001%
2	-0.07	-38.83	-28.61	0.07	38.83	28.61	0.004%
3	-0.07	-29.13	-28.61	0.07	29.13	28.61	0.003%
4	14.51	-38.83	-24.74	-14.51	38.83	24.74	0.000%
5	14.51	-29.13	-24.74	-14.51	29.13	24.74	0.000%
6	25.04	-38.83	-14.35	-25.04	38.83	14.35	0.000%
7	25.04	-29.13	-14.35	-25.04	29.13	14.35	0.000%
8	28.89	-38.83	-0.08	-28.89	38.83	0.08	0.001%
9	28.89	-29.13	-0.08	-28.89	29.13	0.08	0.001%
10	24.99	-38.83	14.23	-24.99	38.83	-14.23	0.000%
11	24.99	-29.13	14.23	-24.99	29.13	-14.23	0.000%
12	14.37	-38.83	24.71	-14.37	38.83	-24.71	0.000%
13	14.37	-29.13	24.71	-14.37	29.13	-24.71	0.000%
14	-0.05	-38.83	28.56	0.05	38.83	-28.56	0.004%
15	-0.05	-29.13	28.56	0.05	29.13	-28.56	0.003%
16	-14.53	-38.83	24.73	14.53	38.83	-24.73	0.000%
17	-14.53	-29.13	24.73	14.53	29.13	-24.73	0.000%
18	-25.16	-38.83	14.25	25.16	38.83	-14.25	0.000%
19	-25.16	-29.13	14.25	25.16	29.13	-14.25	0.000%
20	-28.96	-38.83	-0.00	28.95	38.83	0.00	0.001%
21	-28.96	-29.13	-0.00	28.95	29.13	0.00	0.001%
22	-25.06	-38.83	-14.25	25.06	38.83	14.25	0.000%
23	-25.06	-29.13	-14.25	25.06	29.13	14.25	0.000%
24	-14.50	-38.83	-24.71	14.50	38.83	24.71	0.000%
25	-14.50	-29.13	-24.71	14.50	29.13	24.71	0.000%
26	0.00	-73.64	0.00	0.00	73.64	-0.00	0.001%
27	-0.03	-73.64	-8.74	0.03	73.64	8.74	0.000%
28	4.40	-73.64	-7.55	-4.40	73.64	7.55	0.000%
29	7.60	-73.64	-4.37	-7.60	73.64	4.37	0.000%
30	8.78	-73.64	-0.01	-8.78	73.64	0.01	0.000%
31	7.60	-73.64	4.36	-7.60	73.64	-4.36	0.000%
32	4.38	-73.64	7.56	-4.38	73.64	-7.56	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
33	-0.00	-73.64	8.73	0.00	73.64	-8.73	0.000%
34	-4.40	-73.64	7.55	4.40	73.64	-7.55	0.000%
35	-7.64	-73.64	4.34	7.64	73.64	-4.34	0.000%
36	-8.80	-73.64	-0.01	8.80	73.64	0.01	0.000%
37	-7.62	-73.64	-4.37	7.62	73.64	4.37	0.000%
38	-4.42	-73.64	-7.56	4.42	73.64	7.56	0.000%
39	-0.02	-32.36	-6.38	0.02	32.36	6.38	0.003%
40	3.24	-32.36	-5.52	-3.24	32.36	5.52	0.003%
41	5.59	-32.36	-3.20	-5.58	32.36	3.20	0.003%
42	6.44	-32.36	-0.02	-6.44	32.36	0.02	0.003%
43	5.57	-32.36	3.18	-5.57	32.36	-3.17	0.003%
44	3.21	-32.36	5.51	-3.21	32.36	-5.51	0.003%
45	-0.01	-32.36	6.37	0.01	32.36	-6.37	0.003%
46	-3.24	-32.36	5.52	3.24	32.36	-5.52	0.003%
47	-5.61	-32.36	3.18	5.61	32.36	-3.18	0.003%
48	-6.46	-32.36	-0.00	6.46	32.36	0.00	0.003%
49	-5.59	-32.36	-3.18	5.59	32.36	3.18	0.003%
50	-3.23	-32.36	-5.51	3.23	32.36	5.51	0.003%

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 90	14.891	41	1.1087	0.0088
L2	90 - 80.25	8.224	41	0.9392	0.0042
L3	80.25 - 68.5	6.428	48	0.8140	0.0030
L4	68.5 - 63.5	4.581	48	0.6809	0.0021
L5	63.5 - 60	3.907	48	0.6061	0.0017
L6	60 - 56.5	3.474	48	0.5728	0.0016
L7	56.5 - 45.417	3.063	48	0.5508	0.0015
L8	45.417 - 36.417	1.928	48	0.4219	0.0010
L9	36.417 - 33.5	1.226	48	0.3200	0.0007
L10	33.5 - 30	1.040	48	0.2894	0.0006
L11	30 - 26.5	0.838	48	0.2614	0.0005
L12	26.5 - 20.583	0.656	48	0.2358	0.0005
L13	20.583 - 2	0.399	48	0.1781	0.0003
L14	2 - 0	0.004	48	0.0180	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	APXVTM14-C-120 w/ Mount Pipe	41	14.422	1.1036	0.0087	28281
116.00	VHLP1-23-DW1	41	13.952	1.0984	0.0084	28281
114.00	PCS 1900MHz 4x45W-65MHz	41	13.485	1.0928	0.0080	23567
107.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	41	11.868	1.0683	0.0069	10877
99.00	DTMABP7819VG12A	41	10.088	1.0235	0.0056	6733
60.00	(2) bridge stiffener	48	3.474	0.5728	0.0016	6549
59.00	Side Arm Mount [SO 702-1]	48	3.355	0.5664	0.0016	6815
48.00	GPS_A	48	2.167	0.4554	0.0012	4940
30.00	(2) bridge stiffener	48	0.838	0.2614	0.0006	7164

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 90	66.971	20	4.9571	0.0349
L2	90 - 80.25	37.097	20	4.2277	0.0145
L3	80.25 - 68.5	29.000	20	3.6698	0.0097
L4	68.5 - 63.5	20.664	20	3.0729	0.0064
L5	63.5 - 60	17.620	20	2.7361	0.0051
L6	60 - 56.5	15.670	20	2.5854	0.0045
L7	56.5 - 45.417	13.811	20	2.4858	0.0042
L8	45.417 - 36.417	8.692	20	1.9034	0.0026
L9	36.417 - 33.5	5.527	20	1.4432	0.0017
L10	33.5 - 30	4.687	20	1.3051	0.0014
L11	30 - 26.5	3.776	20	1.1785	0.0012
L12	26.5 - 20.583	2.954	20	1.0630	0.0011
L13	20.583 - 2	1.796	20	0.8025	0.0007
L14	2 - 0	0.017	20	0.0811	0.0001

**Critical Deflections and Radius of Curvature - Design Wind**

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
118.00	APXVTM14-C-120 w/ Mount Pipe	20	64.868	4.9369	0.0335	6521
116.00	VHLP1-23-DW1	20	62.769	4.9159	0.0321	6521
114.00	PCS 1900MHz 4x45W-65MHz	20	60.676	4.8934	0.0306	5434
107.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	20	53.438	4.7917	0.0257	2507
99.00	DTMABP7819VG12A	20	45.464	4.5993	0.0202	1550
60.00	(2) bridge stiffener	20	15.670	2.5854	0.0045	1460
59.00	Side Arm Mount [SO 702-1]	20	15.130	2.5564	0.0044	1518
48.00	GPS_A	20	9.769	2.0546	0.0030	1097
30.00	(2) bridge stiffener	20	3.776	1.1785	0.0012	1589

**Compression Checks**

**Pole Design Data**

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KI/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
L1	120 - 90 (1)	P24x0.25	30.00	0.00	0.0	18.653	-10.27	662.26	0.016
L2	90 - 80.25 (2)	P24x0.375	9.75	0.00	0.0	27.832	-11.74	1052.07	0.011
L3	80.25 - 68.5 (3)	RPS 24" x 0.64677"	11.75	0.00	0.0	47.451	-14.46	1257.27	0.011
L4	68.5 - 63.5 (4)	RPS 24" x 0.61306"	5.00	0.00	0.0	45.042	-15.57	1339.80	0.012
L5	63.5 - 60 (5)	RPS 24" x 1.13718"	3.50	0.00	0.0	81.678	-16.88	2083.30	0.008
L6	60 - 56.5 (6)	RPS 30" x 0.90733"	3.50	0.00	0.0	82.927	-18.16	2232.33	0.008
L7	56.5 - 45.417 (7)	RPS 30" x 0.55714"	11.08	0.00	0.0	51.534	-20.95	1550.04	0.014
L8	45.417 - 36.417 (8)	RPS 30" x 0.70733"	9.00	0.00	0.0	65.092	-23.72	1947.31	0.012
L9	36.417 - 33.5 (9)	RPS 30" x 0.86188"	2.92	0.00	0.0	78.896	-24.78	2348.91	0.011
L10	33.5 - 30 (10)	RPS 30" x 1.23648"	3.50	0.00	0.0	111.73	-26.53	2971.52	0.009

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KI/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
L11	30 - 26.5 (11)	RPS 36" x 0.7835"	3.50	0.00	0.0	86.683	-27.89	2411.44	0.012
L12	26.5 - 20.583 (12)	RPS 36" x 0.62423"	5.92	0.00	0.0	69.374	-29.82	1961.77	0.015
L13	20.583 - 2 (13)	RPS 36" x 0.8638"	18.58	0.00	0.0	95.349	-37.87	2759.79	0.014
L14	2 - 0 (14)	RPS 36" x 0.95358"	2.00	0.00	0.0	104.99	-38.82	2964.20	0.013

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>rx</sub> kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	M <sub>uy</sub> kip-ft	φM <sub>ny</sub> kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	120 - 90 (1)	P24x0.25	308.61	396.68	0.778	0.00	396.68	0.000
L2	90 - 80.25 (2)	P24x0.375	474.27	623.72	0.760	0.00	623.72	0.000
L3	80.25 - 68.5 (3)	RPS 24" x 0.64677"	683.43	779.03	0.877	0.00	779.03	0.000
L4	68.5 - 63.5 (4)	RPS 24" x 0.61306"	776.34	831.35	0.934	0.00	831.35	0.000
L5	63.5 - 60 (5)	RPS 24" x 1.13718"	842.97	1264.47	0.667	0.00	1264.47	0.000
L6	60 - 56.5 (6)	RPS 30" x 0.90733"	914.51	1723.26	0.531	0.00	1723.26	0.000
L7	56.5 - 45.417 (7)	RPS 30" x 0.55714"	1152.58	1210.72	0.952	0.00	1210.72	0.000
L8	45.417 - 36.417 (8)	RPS 30" x 0.70733"	1360.07	1513.38	0.899	0.00	1513.38	0.000
L9	36.417 - 33.5 (9)	RPS 30" x 0.86188"	1429.82	1816.03	0.787	0.00	1816.03	0.000
L10	33.5 - 30 (10)	RPS 30" x 1.23648"	1514.56	2268.60	0.668	0.00	2268.60	0.000
L11	30 - 26.5 (11)	RPS 36" x 0.7835"	1603.41	2253.01	0.712	0.00	2253.01	0.000
L12	26.5 - 20.583 (12)	RPS 36" x 0.62423"	1756.78	1841.07	0.954	0.00	1841.07	0.000
L13	20.583 - 2 (13)	RPS 36" x 0.8638"	2268.96	2572.69	0.882	0.00	2572.69	0.000
L14	2 - 0 (14)	RPS 36" x 0.95358"	2326.64	2756.31	0.844	0.00	2756.31	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V <sub>u</sub> K	φV <sub>n</sub> K	Ratio $\frac{V_u}{\phi V_n}$	Actual T <sub>u</sub> kip-ft	φT <sub>n</sub> kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	120 - 90 (1)	P24x0.25	16.62	331.13	0.050	1.27	648.61	0.002
L2	90 - 80.25 (2)	P24x0.375	17.36	526.03	0.033	2.48	1019.71	0.002
L3	80.25 - 68.5 (3)	RPS 24" x 0.64677"	18.23	628.63	0.029	2.39	1191.33	0.002
L4	68.5 - 63.5 (4)	RPS 24" x 0.61306"	18.93	669.90	0.028	2.31	1273.10	0.002
L5	63.5 - 60 (5)	RPS 24" x 1.13718"	19.14	1041.65	0.018	2.28	1895.22	0.001
L6	60 - 56.5 (6)	RPS 30" x 0.90733"	20.59	1116.16	0.018	2.28	2626.72	0.001
L7	56.5 - 45.417 (7)	RPS 30" x 0.55714"	22.39	775.02	0.029	2.08	1866.93	0.001
L8	45.417 - 36.417 (8)	RPS 30" x 0.70733"	23.71	973.65	0.024	1.87	2322.06	0.001
L9	36.417 - 33.5 (9)	RPS 30" x 0.86188"	24.12	1174.45	0.021	1.82	2772.28	0.001
L10	33.5 - 30 (10)	RPS 30" x 1.23648"	24.31	1485.76	0.016	1.78	3420.83	0.001
L11	30 - 26.5 (11)	RPS 36" x 0.7835"	25.49	1205.72	0.021	1.78	3463.14	0.001
L12	26.5 - 20.583 (12)	RPS 36" x 0.62423"	26.35	980.89	0.027	1.66	2842.38	0.001
L13	20.583 - 2 (13)	RPS 36" x 0.8638"	28.73	1379.90	0.021	1.25	3945.80	0.000
L14	2 - 0 (14)	RPS 36" x 0.95358"	28.97	1482.10	0.020	1.20	4216.99	0.000

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
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### Pole Interaction Design Data

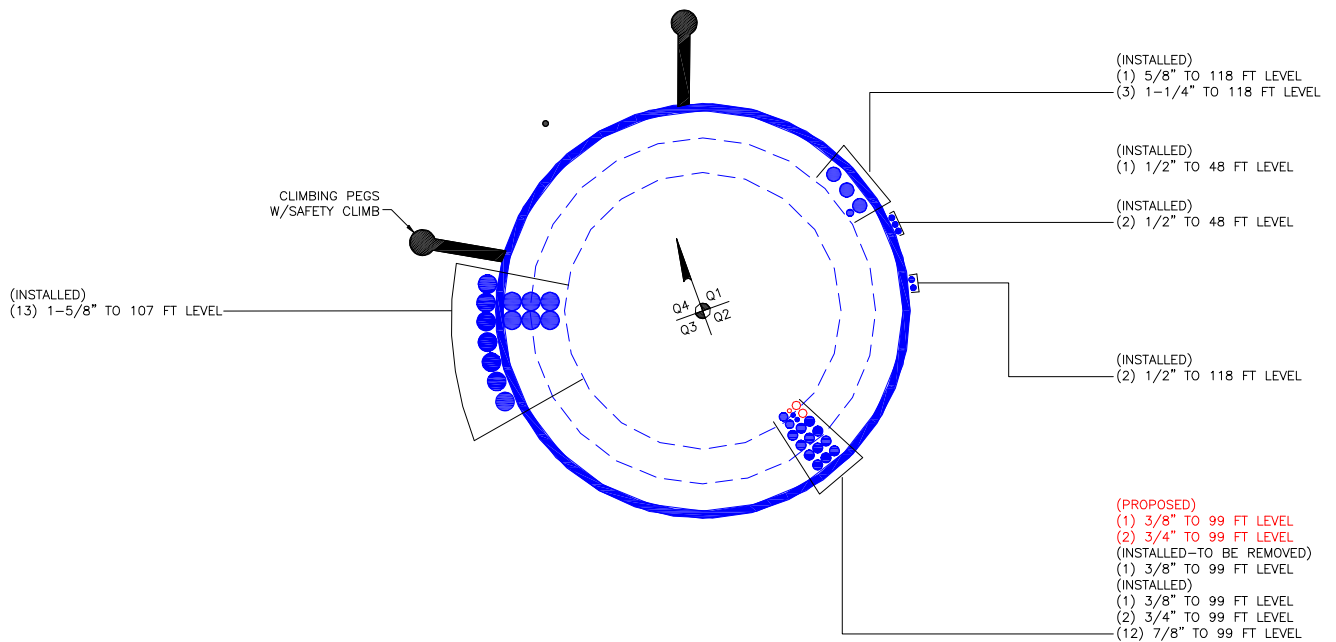
Section No.	Elevation ft	Ratio $P_u$ $\phi P_n$	Ratio $M_{ux}$ $\phi M_{nx}$	Ratio $M_{uy}$ $\phi M_{ny}$	Ratio $V_u$ $\phi V_n$	Ratio $T_u$ $\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 90 (1)	0.016	0.778	0.000	0.050	0.002	0.796	1.000	4.8.2 ✓
L2	90 - 80.25 (2)	0.011	0.760	0.000	0.033	0.002	0.773	1.000	4.8.2 ✓
L3	80.25 - 68.5 (3)	0.011	0.877	0.000	0.029	0.002	0.890	1.000	4.8.2 ✓
L4	68.5 - 63.5 (4)	0.012	0.934	0.000	0.028	0.002	0.946	1.000	4.8.2 ✓
L5	63.5 - 60 (5)	0.008	0.667	0.000	0.018	0.001	0.675	1.000	4.8.2 ✓
L6	60 - 56.5 (6)	0.008	0.531	0.000	0.018	0.001	0.539	1.000	4.8.2 ✓
L7	56.5 - 45.417 (7)	0.014	0.952	0.000	0.029	0.001	0.966	1.000	4.8.2 ✓
L8	45.417 - 36.417 (8)	0.012	0.899	0.000	0.024	0.001	0.912	1.000	4.8.2 ✓
L9	36.417 - 33.5 (9)	0.011	0.787	0.000	0.021	0.001	0.798	1.000	4.8.2 ✓
L10	33.5 - 30 (10)	0.009	0.668	0.000	0.016	0.001	0.677	1.000	4.8.2 ✓
L11	30 - 26.5 (11)	0.012	0.712	0.000	0.021	0.001	0.724	1.000	4.8.2 ✓
L12	26.5 - 20.583 (12)	0.015	0.954	0.000	0.027	0.001	0.970	1.000	4.8.2 ✓
L13	20.583 - 2 (13)	0.014	0.882	0.000	0.021	0.000	0.896	1.000	4.8.2 ✓
L14	2 - 0 (14)	0.013	0.844	0.000	0.020	0.000	0.858	1.000	4.8.2 ✓

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	120 - 90	Pole	P24x0.25	1	-10.27	662.26	79.6	Pass
L2	90 - 80.25	Pole	P24x0.375	2	-11.74	1052.07	77.3	Pass
L3	80.25 - 68.5	Pole	RPS 24" x 0.64677"	3	-14.46	1257.27	89.0	Pass
L4	68.5 - 63.5	Pole	RPS 24" x 0.61306"	4	-15.57	1339.80	94.6	Pass
L5	63.5 - 60	Pole	RPS 24" x 1.13718"	5	-16.88	2083.30	67.5	Pass
L6	60 - 56.5	Pole	RPS 30" x 0.90733"	6	-18.16	2232.33	53.9	Pass
L7	56.5 - 45.417	Pole	RPS 30" x 0.55714"	7	-20.95	1550.04	96.6	Pass
L8	45.417 - 36.417	Pole	RPS 30" x 0.70733"	8	-23.72	1947.31	91.2	Pass
L9	36.417 - 33.5	Pole	RPS 30" x 0.86188"	9	-24.78	2348.91	79.8	Pass
L10	33.5 - 30	Pole	RPS 30" x 1.23648"	10	-26.53	2971.52	67.7	Pass
L11	30 - 26.5	Pole	RPS 36" x 0.7835"	11	-27.89	2411.44	72.4	Pass
L12	26.5 - 20.583	Pole	RPS 36" x 0.62423"	12	-29.82	1961.77	97.0	Pass
L13	20.583 - 2	Pole	RPS 36" x 0.8638"	13	-37.87	2759.79	89.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L14	2 - 0	Pole	RPS 36" x 0.95358"	14	-38.82	2964.20	85.8	Pass	
							Summary		
							Pole (L12)	97.0	Pass
							<b>RATING =</b>	<b>97.0</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**





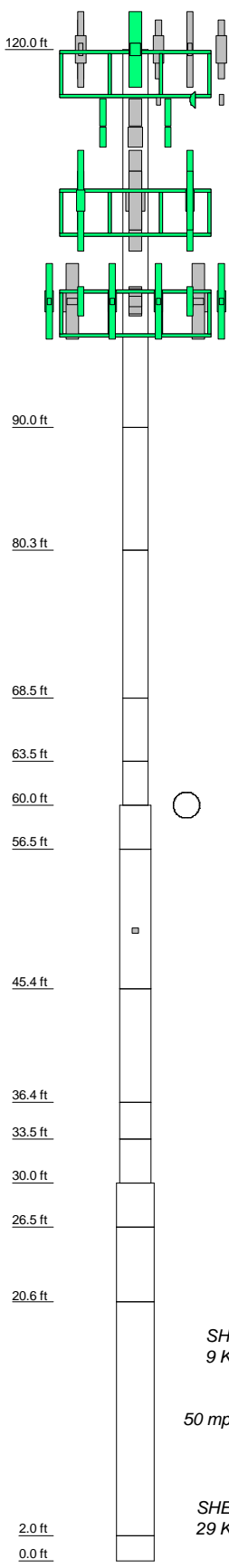
## APPENDIX C

### ADDITIONAL CALCULATIONS

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Program Version 7.0.5.1 - 2/1/2016 File:G:/TOWER/375\_Crown\_Castle/2016/37516-0115\_876329\_MTN. VIEW CEM. (FILLEY/37516-0115.006.7700\_SDD\_1269143/37516-0115.006.7700\_Mapped\_Reinforced cci.eri

Section	1																			
Size	P24x0.25																			
Length (ft)	30.00																			
Grade	A36M-42																			
Weight (K)	1.9																			



**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
APXVTM14-C-120 w/ Mount Pipe	118	LNX-6515DS-A1M w/ Mount Pipe	107
(2) APXVTM14-C-120 w/ Mount Pipe	118	LNX-6515DS-A1M w/ Mount Pipe	107
TD-RRH8x20-25	118	LNX-6515DS-A1M w/ Mount Pipe	107
(2) TD-RRH8x20-25	118	RRUS 11 B12	107
APXV9ERR18-C-A20 w/ Mount Pipe	118	RRUS 11 B12	107
APXVSP18-C-A20 w/ Mount Pipe	118	RRUS 11 B12	107
APXVSP18-C-A20 w/ Mount Pipe	118	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	107
IBC1900HG-2A	118	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	107
IBC1900HG-2A	118	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	107
IBC1900HG-2A	118	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	107
IBC1900BB-1	118	DTMABP7819VG12A	99
IBC1900BB-1	118	(2) RRUS-11	99
IBC1900BB-1	118	(2) RRUS-11	99
(2) HORIZON COMPACT	118	(2) RRUS-11	99
Platform Mount [LP 501-1]	118	(2) 782-10250	99
VHLP1-23-DW1	118	(2) 782-10250	99
VHLP1-18	118	(2) 782-10250	99
PCS 1900MHz 4x45W-65MHz	114	DC6-48-60-18-8F	99
800MHz 2X50W RRH W/FILTER	114	(2) QS66512-2 w/ Mount Pipe	99
800MHz 2X50W RRH W/FILTER	114	(2) QS66512-2 w/ Mount Pipe	99
800MHz 2X50W RRH W/FILTER	114	(2) QS66512-2 w/ Mount Pipe	99
Pipe Mount [PM 601-3]	114	(2) TPX-070821	99
PCS 1900MHz 4x45W-65MHz	114	(2) TPX-070821	99
PCS 1900MHz 4x45W-65MHz	114	(2) TPX-070821	99
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	107	RRUS 32	99
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	107	RRUS 32	99
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	107	RRUS 32	99
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	107	DC6-48-60-18-8F	99
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	107	Platform Mount [LP 501-1]	99
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	107	DTMABP7819VG12A	99
KRY 112 144/1	107	(2) bridge stiffener	60
KRY 112 144/1	107	Side Arm Mount [SO 702-1]	59
KRY 112 144/1	107	Side Arm Mount [SO 702-1]	48
Platform Mount [LP 712-1]	107	GPS_A	48
		(2) bridge stiffener	30

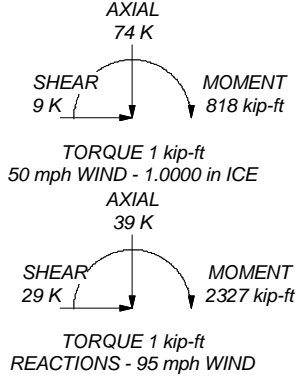
**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A36M-42	42 ksi	60 ksi	Reinf 33.08 ksi	33 ksi	42 ksi
Reinf 29.44 ksi	29 ksi	37 ksi	Reinf 29.55 ksi	30 ksi	37 ksi
Reinf 33.05 ksi	33 ksi	42 ksi	Reinf 30.91 ksi	31 ksi	39 ksi
Reinf 28.34 ksi	28 ksi	36 ksi	Reinf 31.42 ksi	31 ksi	40 ksi
Reinf 29.91 ksi	30 ksi	38 ksi	Reinf 32.16 ksi	32 ksi	41 ksi
Reinf 33.42 ksi	33 ksi	42 ksi	Reinf 31.37 ksi	31 ksi	40 ksi
Reinf 33.24 ksi	33 ksi	42 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 95 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 97%

ALL REACTIONS ARE FACTORED



**Paul J Ford and Company**  
 250 E. Broad Street Suite 600  
 Columbus, OH 43215  
 Phone: 614.221.6679  
 FAX: 614.448.4105

Job: **120 ft. Monopole / Mtn. View Cem. (Fillee Park)**  
 Project: **BU876329 / PJF# 37516-0115**  
 Client: Crown Castle USA  
 Code: TIA-222-G  
 Path:  
 Drawn by: Nick Parente, E.I.  
 Date: 08/19/16  
 Scale: NTS  
 Dwg No. E-1

# Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

## Site Data

BU#: \_\_\_\_\_  
 Site Name: \_\_\_\_\_  
 App #: \_\_\_\_\_

Reactions		
Mu	308.61	ft-kips
Axial, Pu:	10.27	kips
Shear, Vu:	16.62	kips
Elevation:	90	feet

Bolt Threads:
X-Excluded
$\phi V_n = \phi(0.55 \cdot A_b \cdot F_u)$
$\phi = 0.75, \phi \cdot V_n$ (kips):
38.88

Pole Manufacturer: **Other**

If No stiffeners, Criteria: **TIA G** <-Only Applicable to Unstiffened Cases

## Bolt Data

Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	
N/A:		<-- Disregard	
Circle (in.):	29		

## Flange Bolt Results

Bolt Tension Capacity,  $\phi \cdot T_n, B1$ : 54.54 kips  
 Adjusted  $\phi \cdot T_n$  (due to  $V_u = V_u / Q_t$ ), **B**: 54.53 kips  
 Max Bolt directly applied  $T_u$ : 25.03 Kips  
 Min. PL "tc" for **B** cap. **w/o** Pry: 1.488 in  
 Min PL "treq" for actual **T w/** Pry: 0.769 in  
 Min PL "t1" for actual **T w/o** Pry: 1.008 in  
 T allowable w/o Prying: 54.54 kips  $\alpha' < 0$  case  
 Prying Force, q: 0.00 kips  
 Total Bolt Tension =  $T_u + q$ : 25.03 kips  
 Non-Prying Bolt Stress Ratio,  $T_u / B$ : 45.9% **Pass**

Rigid
$\phi \cdot T_n$
$\phi T_n [(1 - (V_u / \phi V_n)^2)^{0.5}]$

## Plate Data

Diam:	32	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

## Exterior Flange Plate Results

Flexural Check  
 Compression Side Plate Stress: 17.7 ksi  
 Allowable Plate Stress: 32.4 ksi  
 Compression Plate Stress Ratio: 54.7% **Pass**  
**No Prying**  
 Tension Side Stress Ratio,  $(treq/t)^2$ : 26.3% **Pass**

Rigid
TIA G
$\phi \cdot F_y$
Comp. Y.L. Length:
16.28

## Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

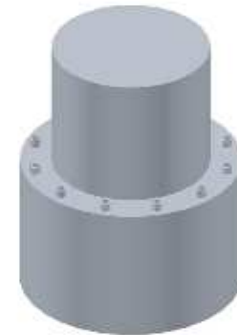
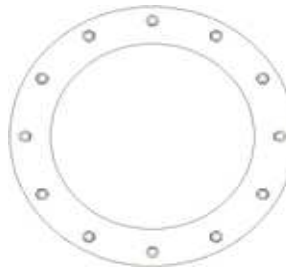
n/a

## Stiffener Results

Horizontal Weld: n/a  
 Vertical Weld: n/a  
 Plate Flex+Shear,  $f_b / F_b + (f_v / F_v)^2$ : n/a  
 Plate Tension+Shear,  $f_t / F_t + (f_v / F_v)^2$ : n/a  
 Plate Comp. (AISC Bracket): n/a

## Pole Results

Pole Punching Shear Check: n/a



\* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

\*\* Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

v4.4 - Effective 7-12-13

**Asymmetric Bolt Analysis**

Moment = 843 k-ft  
 Axial = 16.9 kips  
 Shear = 19.1 kips  
 Anchor Qty = 4

TIA Ref. = G  
 ASIF = 1.0000  
 Max Ratio = 100.0%

Location = Flange Plate  
 $\eta$  = N/A for BP, Rev. G Sect. 4.9.9  
 Threads = N-Included for FP, Rev. G

**\*\* For Flange Plates: Prying action is not considered in the bolt loads. \*\***

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in <sup>2</sup>	Area, in <sup>2</sup>	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	0.000				50.0	46.19	8.00	8.00	223.23	214.79	223.23	330.51	330.51	67.5%
2	0.000				140.0	46.19	8.00	8.00	223.23	214.79	223.23	330.51	330.51	67.5%
3	0.000				230.0	46.19	8.00	8.00	223.23	214.79	223.23	330.51	330.51	67.5%
4	0.000				320.0	46.19	8.00	8.00	223.23	214.79	223.23	330.51	330.51	67.5%

32.00

v4.4 - Effective 7-12-13

**Asymmetric Bolt Analysis**

Moment = 1515 k-ft  
 Axial = 26.5 kips  
 Shear = 24.3 kips  
 Anchor Qty = 8

TIA Ref. = G  
 ASIF = 1.0000  
 Max Ratio = 100.0%

Location = Flange Plate  
 η = N/A for BP, Rev. G Sect. 4.9.9  
 Threads = X-Excluded for FP, Rev. G

**\*\* For Flange Plates: Prying action is not considered in the bolt loads. \*\***

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in <sup>2</sup>	Area, in <sup>2</sup>	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	0.000				50.0	52.19	8.00	8.00	213.07	205.10	213.07	330.51	330.51	64.5%
2	0.000				140.0	52.19	8.00	8.00	213.07	205.10	213.07	330.51	330.51	64.5%
3	0.000				230.0	52.19	8.00	8.00	213.07	205.10	213.07	330.51	330.51	64.5%
4	0.000				320.0	52.19	8.00	8.00	213.07	205.10	213.07	330.51	330.51	64.5%
5	0.000	Other			0.0	52.25	5.31	5.31	141.66	136.36	141.66	288.05	288.05	49.2%
6	0.000	Other			90.0	52.25	5.31	5.31	141.66	136.36	141.66	288.05	288.05	49.2%
7	0.000	Other			180.0	52.25	5.31	5.31	141.66	136.36	141.66	288.05	288.05	49.2%
8	0.000	Other			270.0	52.25	5.31	5.31	141.66	136.36	141.66	288.05	288.05	49.2%

53.25

v4.4 - Effective 7-12-13

**Asymmetric Anchor Rod Analysis**

Moment = 2327 k-ft  
 Axial = 39.0 kips  
 Shear = 29.0 kips  
 Anchor Qty = 24

TIA Ref. = G  
 ASIF = 1.0000  
 Max Ratio = 100.0%

Location = Base Plate  
 η = 0.55 for BP, Rev. G Sect. 4.9.9  
 Threads = N/A for FP, Rev. G

**\*\* For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. \*\***

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in <sup>2</sup>	Area, in <sup>2</sup>	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.500	A354 Gr BC	109	125	0.0	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
2	1.500	A354 Gr BC	109	125	22.5	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
3	1.500	A354 Gr BC	109	125	45.0	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
4	1.500	A354 Gr BC	109	125	67.5	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
5	1.500	A354 Gr BC	109	125	90.0	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
6	1.500	A354 Gr BC	109	125	112.5	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
7	1.500	A354 Gr BC	109	125	135.0	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
8	1.500	A354 Gr BC	109	125	157.5	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
9	1.500	A354 Gr BC	109	125	180.0	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
10	1.500	A354 Gr BC	109	125	202.5	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
11	1.500	A354 Gr BC	109	125	225.0	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
12	1.500	A354 Gr BC	109	125	247.5	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
13	1.500	A354 Gr BC	109	125	270.0	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
14	1.500	A354 Gr BC	109	125	292.5	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
15	1.500	A354 Gr BC	109	125	315.0	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
16	1.500	A354 Gr BC	109	125	337.5	41.00	0.00	1.77	98.39	95.09	100.63	0.00	141.00	71.4%
17	1.375	Williams R71	127.7	150	33.8	51.88	0.00	1.68	117.80	114.66	119.92	180.02	180.02	66.6%
18	1.375	Williams R71	127.7	150	56.3	51.88	0.00	1.68	117.80	114.66	119.92	180.02	180.02	66.6%
19	1.375	Williams R71	127.7	150	123.8	51.88	0.00	1.68	117.80	114.66	119.92	180.02	180.02	66.6%
20	1.375	Williams R71	127.7	150	146.3	51.88	0.00	1.68	117.80	114.66	119.92	180.02	180.02	66.6%
21	1.375	Williams R71	127.7	150	213.8	51.88	0.00	1.68	117.80	114.66	119.92	180.02	180.02	66.6%
22	1.375	Williams R71	127.7	150	236.3	51.88	0.00	1.68	117.80	114.66	119.92	180.02	180.02	66.6%
23	1.375	Williams R71	127.7	150	303.8	51.88	0.00	1.68	117.80	114.66	119.92	180.02	180.02	66.6%
24	1.375	Williams R71	127.7	150	326.3	51.88	0.00	1.68	117.80	114.66	119.92	180.02	180.02	66.6%

41.70

## Stiffened or Unstiffened, Ungerouted, Circular Base Plate - Any Rod Material

**TIA Rev G**

Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)\*(Rod Diameter)

Site Data	
BU#:	
Site Name:	
App #:	
Pole Manufacturer:	<i>Other</i>

Reactions			Reactions adjusted to account for additional anchor rods.
Mu:	1322.1	ft-kips	
Axial, Pu:	26.4	kips	
Shear, Vu:	19.7	kips	
Eta Factor, η	0.55	TIA G (Fig. 4-4)	

Anchor Rod Data		
Qty:	16	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	41	in

If No stiffeners, Criteria: **AISC LRFD** <-Only Applicable to Unstiffened Cases

**Anchor Rod Results**  
 Max Rod (Cu+ Vu/rj): 100.6 Kips  
 Allowable Axial, Φ\*Fu\*Anet: 141.0 Kips  
 Anchor Rod Stress Ratio: 71.4% **Pass**

Stiffened
AISC LRFD
φ*Tn

Plate Data		
Diam:	47	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.07	in

**Base Plate Results**  
 Base Plate Stress: 20.6 ksi  
 Allowable Plate Stress: 32.4 ksi  
 Base Plate Stress Ratio: 63.7% **Pass**

Flexural Check  
 20.6 ksi  
 32.4 ksi  
 63.7% **Pass**

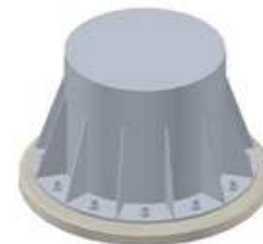
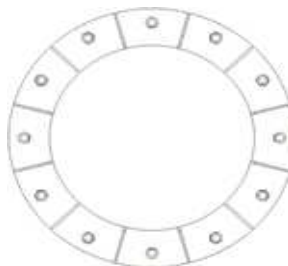
Stiffened
AISC LRFD
φ*Fy
Y.L. Length: N/A, Roark

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.75	in
Fillet V. Weld:	0.375	in
Width:	5.5	in
Height:	20.5	in
Thick:	0.75	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

**Stiffener Results**  
 Horizontal Weld : 40.3% **Pass**  
 Vertical Weld: 20.7% **Pass**  
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: 6.6% **Pass**  
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: 41.1% **Pass**  
 Plate Comp. (AISC Bracket): 37.9% **Pass**

**Pole Results**  
 Pole Punching Shear Check: 8.2% **Pass**

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None



\* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

\*\* Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

**DRILLED PIER SOIL AND STEEL ANALYSIS - TIA-222-G**

**Factored Base Reactions from RISA**

	Comp. (+)	Tension (-)	
Moment, Mu =	2327.0		k-ft
Shear, Vu =	29.0		kips
Axial Load, Pu1 =	39.0		kips (from 1.2D + 1.6W)*
Axial Load, Pu2 =	29.3	0.0	kips (from 0.9D + 1.6W)**
OTMu =	2341.5	0.0	k-ft @ Ground

\*Axial Load, Pu1 will be used for Soil Compression Analysis.

\*\*Axial Load, Pu2 will be used for Steel Analysis.

**Drilled Pier Parameters**

Diameter =	6	ft
Height Above Grade =	0.5	ft
Depth Below Grade =	25	ft
fc' =	3	ksi
εc =	0.003	in/in
L / D Ratio =	4.25	

Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

**Steel Parameters**

Number of Bars =	24	
Rebar Size =	#9	
Rebar Fy =	60	ksi
Rebar MOE =	29000	ksi
Tie Size =	#5	
Side Clear Cover to Ties =	3	in

**Direct Embed Pole Shaft Parameters**

Dia @ Grade =		in
Dia @ Depth Below Grade =		in
Number of Sides =		
Thickness =		in
Fy =		ksi
Backfill Condition =		

**Define Soil Layers**

Note: Cohesion = Undrained Shear Strength = Unconfined Compressive Strength / 2

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	15	135		36	Sand	8000			15
2	15	137.4		36	Sand	8000			30
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

**Soil Results: Overturning**

Depth to COR =	17.66	ft, from Grade
Bending Moment, Mu =	2853.55	k-ft, from COR
Resisting Moment, ΦMn =	9569.31	k-ft, from COR

**MOMENT RATIO = 29.8% OK**

Shear, Vu =	29.00	kips
Resisting Shear, ΦVn =	97.25	kips

**SHEAR RATIO = 29.8% OK**

**Soil Results: Uplift**

Uplift, Tu =	0.00	kips
Uplift Capacity, ΦTn =	81.46	kips

**UPLIFT RATIO = 0.0% OK**

**Soil Results: Compression**

Compression, Cu =	39.00	kips
Comp. Capacity, ΦCn =	155.19	kips

**COMPRESSION RATIO = 25.1% OK**

**Steel Results (ACI 318-08):**

Minimum Steel Area =	13.57	sq in
Actual Steel Area =	24.00	sq in

Axial, ΦPn (min) =	-1296.00	kips, Where ΦMn = 0 k-ft
Axial, ΦPn (max) =	6115.79	kips, Where ΦMn = 0 k-ft

Axial Load, Pu =	52.15	kips @ 5.50 ft Below Grade
Moment, Mu =	2475.92	k-ft @ 5.50 ft Below Grade
Moment, ΦMn =	3294.70	k-ft

**MOMENT RATIO = 75.1% OK**

**Safety Factors / Load Factors / Φ Factors**

Tower Type =	Monopole DP
ACI Code =	ACI 318-08
Seismic Design Category =	D
Reference Standard =	TIA-222-G
Use 1.3 Load Factor?	No
Load Factor =	1.00

	Safety Factor	Φ Factor
Soil Lateral Resistance =	2.00	0.75
Skin Friction =	2.00	0.75
End Bearing =	2.00	0.75
Concrete Wt. Resist Uplift =	1.25	

**Load Combinations Checked per TIA-222-G**

- (0.75) Ult. Skin Friction + (0.75) Ult. End Bearing + (1.2) Effective Soil Wt. - (1.2) Buoyant Conc. Wt. ≥ Comp.
- (0.75) Ult. Skin Friction + (0.9) Buoyant Conc. Wt. ≥ Uplift

**Soil Parameters**

Water Table Depth =	15.00	ft
Depth to Ignore Soil =	3.00	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?*	Ground	

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)  
 Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

**Maximum Capacity Ratios**

Maximum Soil Ratio =	100.0%
Maximum Steel Ratio =	100.0%

\*Note: The drilled pier foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the drilled pier is based on the recommendations of the site specific geotechnical report. In the absence of any recommendations, the frost depth at the site or one half of the drilled pier diameter (whichever is greater) shall be ignored.



# Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

**Note:** Shaft assumed to have ties, not spiral, transverse reinforcing

## Site Data

BU#: 876329  
 Site Name: MTN. View CEM. (Filley Park)  
 App #:

Loads Already Factored		
For M (WL)	1	<----Disregard
For P (DL)	1	<----Disregard

Pier Properties	
<b>Concrete:</b>	
Pier Diameter =	6.0 ft
Concrete Area =	4071.5 in <sup>2</sup>
<b>Reinforcement:</b>	
Clear Cover to Tie=	3.00 in
Horiz. Tie Bar Size=	5
Vert. Cage Diameter =	5.30 ft
Vert. Cage Diameter =	63.62 in
<b>Vertical Bar Size =</b>	<b>9</b>
Bar Diameter =	1.13 in
Bar Area =	1 in <sup>2</sup>
Number of Bars =	24
As Total=	24 in <sup>2</sup>
A s/ Aconc, Rho:	0.0059 0.59%

ACI 10.5 , ACI 21.10.4, and IBC 1810.

Min As for Flexural, Tension Controlled, Shafts:

$$(3) * (\text{Sqrt}(f'c) / F_y) = 0.0027$$

$$200 / F_y = 0.0033$$

Minimum Rho Check:

Actual Req'd Min. Rho: 0.33% Flexural  
 Provided Rho: 0.59% **OK**

Ref. Shaft Max Axial Capacities, $\phi$ Max(Pn or Tn):		
Max Pu = ( $\phi=0.65$ ) Pn.		
Pn per ACI 318 (10-2)	6115.79	kips
at Mu=( $\phi=0.65$ )Mn=	3187.43	ft-kips
Max Tu, ( $\phi=0.9$ ) Tn =	1296	kips
at Mu= $\phi=(0.90)$ Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces		
TIA Revision:	G	
Max. Factored Shaft Mu:	2475.92	ft-kips (* Note)
Max. Factored Shaft Pu:	52.15	kips
Max Axial Force Type:	Comp.	

(\* Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

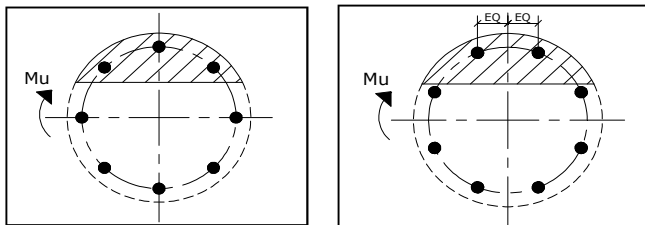
Load Factor	Shaft Factored Loads	
1.00	Mu:	2475.92 ft-kips
1.00	Pu:	52.15 kips

Material Properties	
Concrete Comp. strength, f'c =	3000 psi
Reinforcement yield strength, Fy =	60 ksi
Reinforcing Modulus of Elasticity, E =	29000 ksi
Reinforcement yield strain =	0.00207
Limiting compressive strain =	0.003
ACI 318 Code	
Select Analysis ACI Code=	2008
Seismic Properties	
Seismic Design Category =	D
Seismic Risk =	High

Solve (Run) <-- Press Upon Completing All Input

## Results:

Governing Orientation Case: 2



Case 1

Case 2

Dist. From Edge to Neutral Axis: 11.94 in

Extreme Steel Strain,  $\epsilon_t$ : 0.0140

$\epsilon_t > 0.0050$ , Tension Controlled

Reduction Factor,  $\phi$ : 0.900

Output Note: Negative Pu=Tension  
 For Axial Compression,  $\phi$  Pn = Pu: 52.15 kips  
 Drilled Shaft Moment Capacity,  $\phi$ Mn: 3294.69 ft-kips  
 Drilled Shaft Superimposed Mu: 2475.92 ft-kips

(Mu/ $\phi$ Mn, Drilled Shaft Flexure CSR: 75.1%

# MODIFICATION OF AN EXISTING 120'-0" MONOPOLE UNR-ROHN A963248 AND A963207,1-3 BU #876329; MTN. VIEW CEM. (Filley Park)

28 BREWER DRIVE  
BLOOMFIELD, CT. 06002  
HARTFORD COUNTY  
LAT: 41° 50' 6.57"; LONG: -72° 44' 28.20"  
APP: 345613 REV. 1; WO: 1269143

### PROJECT CONTACTS

STRUCTURE OWNER:  
CROWN CASTLE  
MOD PM: DAN VADNEY AT DAN.VADNEY@CROWNCastle.COM  
PH: (518) 373-3510  
MOD CM: ERIC BARON AT ERIC.BARON@CROWNCastle.COM  
PH: (518) 373-3504  
ENGINEER OF RECORD:  
PJFMOD@PJFWEB.COM

### THIS PROJECT INCLUDES THE FOLLOWING ITEMS

WELDED FLANGE BRIDGE STIFFENERS  
RESTACK COAX INTO A SINGLE ROW FLAT TO POLE FACE  
EXISTING SHAFT REINFORCING BOLT REMOVAL

### SHEET INDEX

SHEET NUMBER	DESCRIPTION
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S-2	MONOPOLE PROFILE
S-3	WELDED BRIDGE STIFFENER DETAILS

### WIND DESIGN DATA

REFERENCE STANDARD	ANSI/TIA-222-G-2-2009
LOCAL CODE	2009 IBC
NOMINAL WIND SPEED (3-SECOND GUST)	95 MPH
ICE THICKNESS	1.0
ICE WIND SPEED	50
SERVICE WIND SPEED	60 MPH
RISK CATEGORY	II
EXPOSURE CATEGORY	C
Kzt	1.0

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 RIGGING@PJFWEB.COM.

THE ASSOCIATED FAILING SA WO NUMBER FOR THIS PROJECT IS 1256923

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.

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MODIFICATION OF AN EXISTING  
120'-0" MONOPOLE  
BU #876329; MTN. VIEW CEM. (Filley Park)  
BLOOMFIELD, CT.

PROJECT No: 37516-0115.006.7700  
DRAWN BY: FE  
DESIGNED BY: NZP  
CHECKED BY:  
DATE: 8-18-2016

TITLE SHEET

T-1

**MODIFICATION INSPECTION NOTES:**

- 1. GENERAL**
  - 1.1. THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE EOR.
  - 1.2. THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.
  - 1.3. ALL MI'S SHALL BE CONDUCTED BY A CROWN CASTLE ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN CASTLE.
  - 1.4. 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 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, CONTACT YOUR CROWN CASTLE POINT OF CONTACT (POC).
  - 1.5. REFER TO ENG-SOW-10007: MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.
- 2. MI INSPECTOR**
  - 2.1. THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:
    - 2.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
    - 2.1.2. WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
    - 2.1.3. THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GC INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN CASTLE.
- 3. GENERAL CONTRACTOR**
  - 3.1. THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:
    - 3.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
    - 3.1.2. WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
    - 3.1.3. BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.
    - 3.1.4. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.
- 4. RECOMMENDATIONS**
  - 4.1. THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:
    - 4.1.1. IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
    - 4.1.2. THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
    - 4.1.3. WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
    - 4.1.4. IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
    - 4.1.5. WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY 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.
- 5. CANCELLATION OR DELAYS IN SCHEDULED MI**
  - 5.1. IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN CASTLE SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CASTLE CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.
- 6. CORRECTION OF FAILING MI'S**
  - 6.1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN CASTLE TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
    - 6.1.1. CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
    - 6.1.2. OR, WITH CROWN CASTLE'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.
- 7. MI VERIFICATION INSPECTIONS**
  - 7.1. CROWN CASTLE RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.
  - 7.2. ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.
  - 7.3. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.
- 8. PHOTOGRAPHS**
  - 8.1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
    - 8.1.1. PRECONSTRUCTION GENERAL SITE CONDITION
    - 8.1.2. PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
    - 8.1.3. RAW MATERIALS
    - 8.1.4. PHOTOS OF ALL CRITICAL DETAILS
    - 8.1.5. FOUNDATION MODIFICATIONS
    - 8.1.6. WELD PREPARATION
    - 8.1.7. BOLT INSTALLATION AND TORQUE
    - 8.1.8. FINAL INSTALLED CONDITION
    - 8.1.9. SURFACE COATING REPAIR
    - 8.1.10. POST CONSTRUCTION PHOTOGRAPHS
    - 8.1.11. FINAL INFIELD CONDITION
    - 8.1.12. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.
    - 8.1.13. THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

**9. INSPECTION AND TESTING**

- 9.1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY CROWN CASTLE'S REPRESENTATIVE AND CROWN CASTLE'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY.
- 9.2. INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS ARE STILL REQUIRED WHEN THE EOR PERFORMS SUPPORT SERVICES DURING CONSTRUCTION.
- 9.3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- 9.4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED AND RETAINED FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
  - 9.4.1. ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
  - 9.4.2. THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
- 9.5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES AND INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
- 9.6. **GENERAL**
  - 9.6.1. PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY CROWN CASTLE AND THE EOR IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
- 9.7. FOUNDATIONS AND SOIL PREPARATION - (NOT REQUIRED)
- 9.8. CONCRETE TESTING PER ACI - (NOT REQUIRED)
- 9.9. STRUCTURAL STEEL
  - 9.9.1. CHECK STEEL ON THE JOB WITH THE PLANS.
  - 9.9.2. CHECK MILL CERTIFICATIONS. CALL FOR LABORATORY TEST REPORTS WHEN MILL CERTIFICATION IS IN QUESTION.
  - 9.9.3. CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
  - 9.9.4. INSPECT ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
  - 9.9.5. INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
  - 9.9.6. CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
  - 9.9.7. CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
  - 9.9.8. CHECK THAT BOLTS HAVE BEEN TIGHTENED PROPERLY.
  - 9.9.9. PRIOR TO ANY FIELD CUTTING THE CONTRACTOR SHALL MARK THE CUTOFF LINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
- 9.10. WELDING:
  - 9.10.1. VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
  - 9.10.2. INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND WITH AWS D1.1.
  - 9.10.3. APPROVE FIELD WELDING SEQUENCE.
  - 9.10.4. A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO CROWN CASTLE BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM CROWN CASTLE.
  - 9.10.5. INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
    - 9.10.5.1. INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE, AND WORKING CONDITIONS.
    - 9.10.5.2. VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
    - 9.10.5.3. INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
    - 9.10.5.4. VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT.
    - 9.10.5.5. SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE.
    - 9.10.5.6. INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED DRAWINGS.
    - 9.10.5.7. VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
    - 9.10.5.8. REVIEW THE REPORTS BY TESTING LABS.
    - 9.10.5.9. CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
    - 9.10.5.10. INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
    - 9.10.5.11. CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
- 9.11. **REPORTS:**
  - 9.11.1. COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO CROWN CASTLE.
  - 9.11.2. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES OR PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO CROWN CASTLE'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT CROWN CASTLE'S REVIEW AND SPECIFIC WRITTEN CONSENT. CROWN CASTLE RESERVES THE RIGHT TO DETERMINE WHETHER OR NOT A RESOLUTION IS ACCEPTABLE.
  - 9.11.3. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO CROWN CASTLE. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
  - 9.11.4. THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

MI CHECKLIST	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
<b>PRE-CONSTRUCTION</b>	
X	MI CHECKLIST DRAWINGS
X	EOR REVIEW
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS: _____	
<b>CONSTRUCTION</b>	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: PROVIDE PHOTO DOCUMENTATION OF EXCAVATION QUALITY AND COMPACTION
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS: _____	
<b>POST-CONSTRUCTION</b>	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD TARGET TENSION LOAD TESTING
NA	REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS: _____	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT  
 NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

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**MODIFICATION OF AN EXISTING  
 120'-0" MONOPOLE  
 BU #876329; MTN. VIEW CEM. (Filley Park)  
 BLOOMFIELD, CT.**

PROJECT No: 37516-0115.006.7700  
 DRAWN BY: FE  
 DESIGNED BY: NZP  
 CHECKED BY:  
 DATE: 8-18-2016

MI CHECKLIST

T-2

**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. 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. 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 ANSITIA-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSITIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.
- 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 EOR.
- 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, MORAIN, 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 # ENGL-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. BASE PLATE GROUT - (NOT REQUIRED)**

**4. FOUNDATION WORK - (NOT REQUIRED)**

**5. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**

**6. EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)**

**7. TOUCH UP OF GALVANIZING**

- 7.1. 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.
- 7.2. 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.
- 7.3. 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.

**8. HOT-DIP GALVANIZING**

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

**9. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER**

- 9.1. 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.
- 9.2. 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.
- 9.3. CROWN CASTLE SHALL REFER TO ANSITIA-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 ANSITIA-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".

**10. FIELD NDE MINIMUM REQUIREMENTS - (NOT REQUIRED)**

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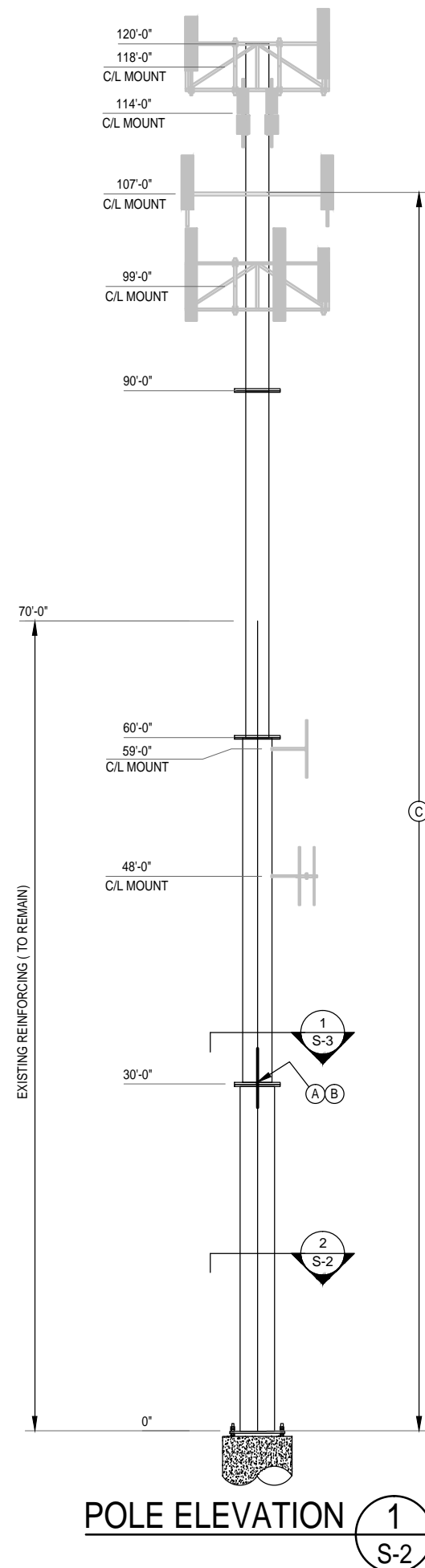
**CROWN CASTLE**  
3530 TORINGDON WAY, SUITE 300 CHARLOTTE, NC 28277  
PH: (980) 209-9242

**MODIFICATION OF AN EXISTING  
120'-0" MONOPOLE**  
BU #876329; MTN. VIEW CEM. (Filley Park)  
BLOOMFIELD, CT.

PROJECT No:	37516-0115.006.7700
DRAWN BY:	FE
DESIGNED BY:	NZP
CHECKED BY:	
DATE:	8-18-2016

GENERAL NOTES

S-1

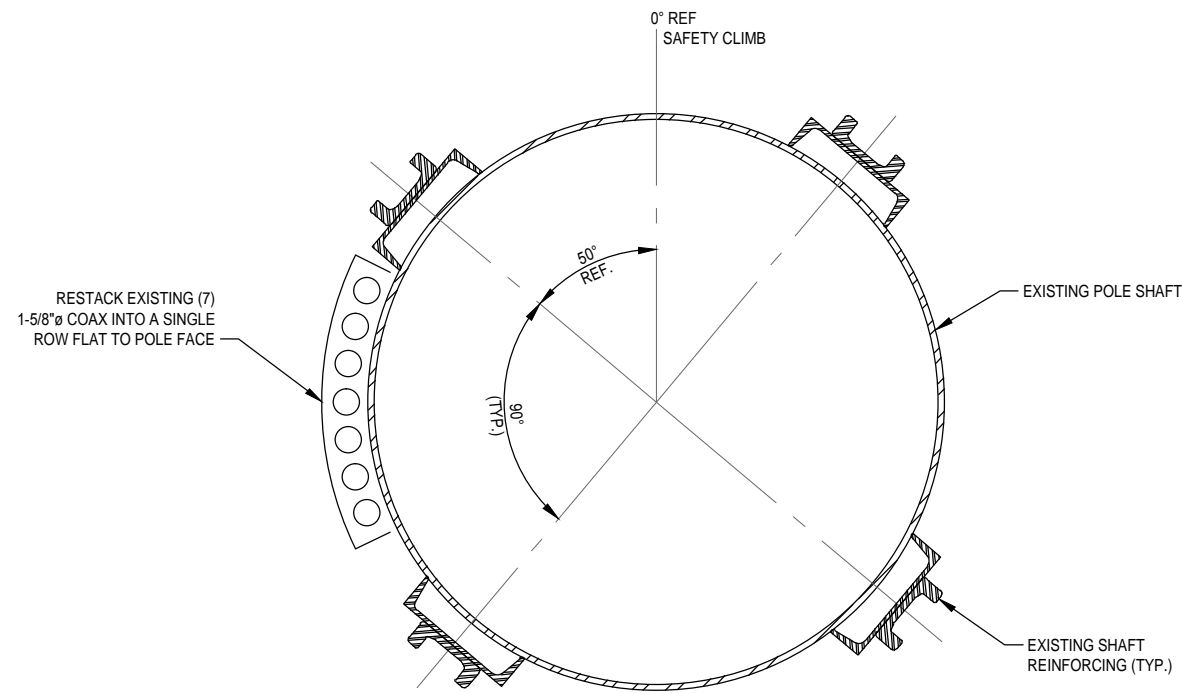


POLE ELEVATION 1  
S-2

SHAFT SECTION DATA							
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER (IN)		POLE GRADE (ksi)	POLE SHAPE
				@ TOP	@ BOTTOM		
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

TOWER MODIFICATION SCHEDULE			
	ELEVATION	TOWER MODIFICATION DESCRIPTION	REFERENCE SHEETS
(A)	30'	REMOVE BOTTOM TERMINATION BOLTS IN PREPARATION OF PROPOSED WELDED BRIDGE STIFFENERS	S-3
(B)	30'	INSTALL NEW WELDED BRIDGE STIFFENERS	S-3
(C)	0' - 107'	RESTACK COAX INTO A SINGLE ROW FLAT TO POLE FACE	S-2



SECTION 2  
S-2

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MODIFICATION OF AN EXISTING  
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PROJECT No:	37516-0115.006.7700
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MONOPOLE  
PROFILE

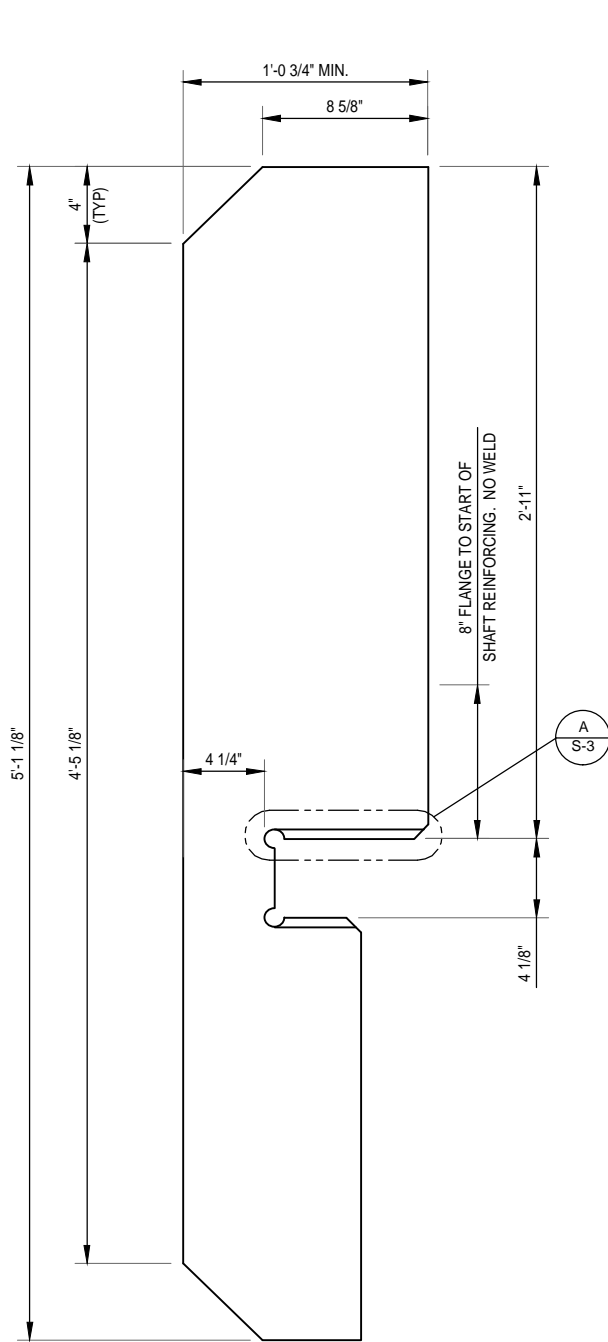
S-2

**MODIFICATION OF AN EXISTING  
 120'-0" MONOPOLE**  
 BU #876329; MTN. VIEW CEM. (Filley Park)  
 BLOOMFIELD, CT.

PROJECT No:	37516-0115.006.7700
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MONOPOLE  
 PROFILE

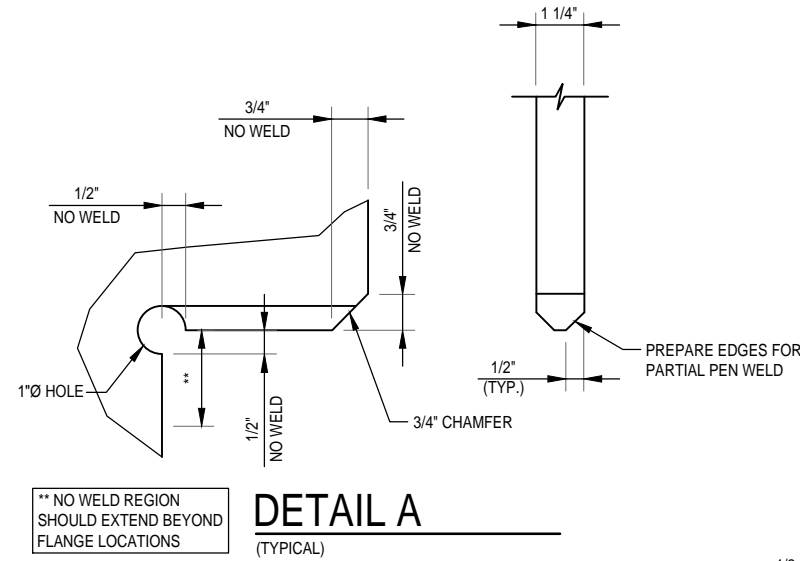
S-3



**BRIDGE STIFFENER MK~BS1**

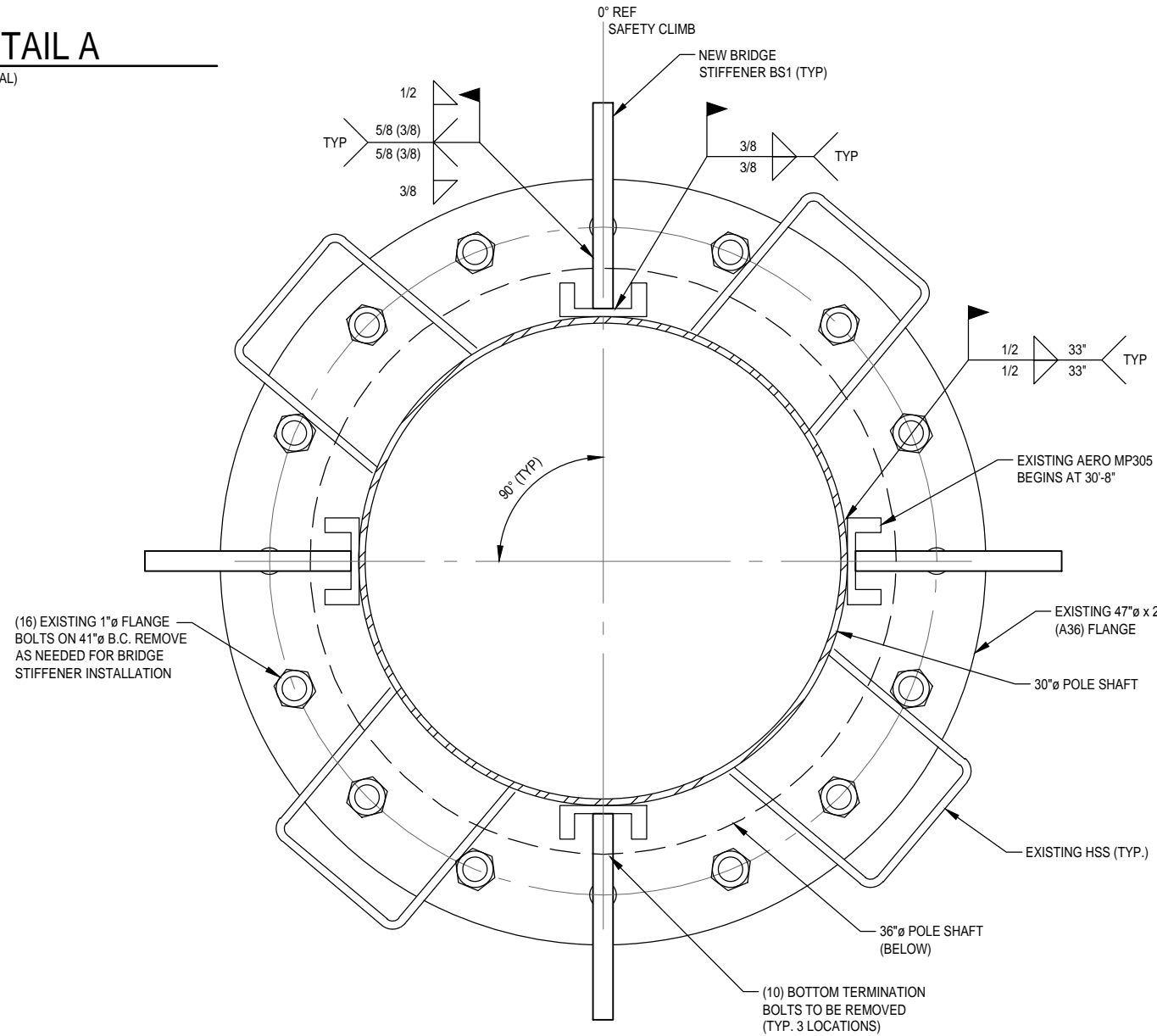
(4 REQUIRED) (Fy = 65 KSI)

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.



\*\* NO WELD REGION SHOULD EXTEND BEYOND FLANGE LOCATIONS

**DETAIL A**  
 (TYPICAL)



**SHAFT PLAN** 1  
 EL. 30' S-3

# MODIFICATION OF AN EXISTING 120'-0" MONOPOLE UNR-ROHN A963248 AND A963207,1-3 BU #876329; MTN. VIEW CEM. (Filley Park)

28 BREWER DRIVE  
BLOOMFIELD, CT. 06002  
HARTFORD COUNTY  
LAT: 41° 50' 6.57"; LONG: -72° 44' 28.20"  
APP: 345613 REV. 1; WO: 1269143

### PROJECT CONTACTS

STRUCTURE OWNER:  
CROWN CASTLE  
MOD PM: DAN VADNEY AT DAN.VADNEY@CROWNCastle.COM  
PH: (518) 373-3510  
MOD CM: ERIC BARON AT ERIC.BARON@CROWNCastle.COM  
PH: (518) 373-3504  
ENGINEER OF RECORD:  
PJFMOD@PJFWEB.COM

### THIS PROJECT INCLUDES THE FOLLOWING ITEMS

WELDED FLANGE BRIDGE STIFFENERS
RESTACK COAX INTO A SINGLE ROW FLAT TO POLE FACE
EXISTING SHAFT REINFORCING BOLT REMOVAL

### SHEET INDEX

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
T-2	MI CHECKLIST
S-1	GENERAL NOTES
S-2	MONOPOLE PROFILE
S-3	WELDED BRIDGE STIFFENER DETAILS

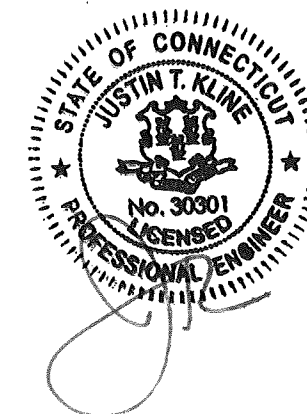
### WIND DESIGN DATA

REFERENCE STANDARD	ANSI/TIA-222-G-2-2009
LOCAL CODE	2009 IBC
NOMINAL WIND SPEED (3-SECOND GUST)	95 MPH
ICE THICKNESS	1.0
ICE WIND SPEED	50
SERVICE WIND SPEED	60 MPH
RISK CATEGORY	II
EXPOSURE CATEGORY	C
Kzt	1.0

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 RIGGING@PJFWEB.COM.

THE ASSOCIATED FAILING SA WO NUMBER FOR THIS PROJECT IS 1256923

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.



AUG 19 2016

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DRAWN BY: FE  
DESIGNED BY: NZP  
CHECKED BY: *AKT*  
DATE: 8-18-2016

TITLE SHEET

T-1



**MODIFICATION INSPECTION NOTES:**

**1. GENERAL**

- 1.1. THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE EOR.
- 1.2. THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.
- 1.3. ALL MIs SHALL BE CONDUCTED BY A CROWN CASTLE ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN CASTLE.
- 1.4. 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 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, CONTACT YOUR CROWN CASTLE POINT OF CONTACT (POC).
- 1.5. REFER TO ENG-SOW-10007: MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

**2. MI INSPECTOR**

- 2.1. THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:
  - 2.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
  - 2.1.2. WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
  - 2.1.3. THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GC INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN CASTLE.

**3. GENERAL CONTRACTOR**

- 3.1. THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:
  - 3.1.1. REVIEW THE REQUIREMENTS OF THE MI CHECKLIST.
  - 3.1.2. WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
  - 3.1.3. BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS.
  - 3.1.4. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

**4. RECOMMENDATIONS**

- 4.1. THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:
  - 4.1.1. IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
  - 4.1.2. THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
  - 4.1.3. WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
  - 4.1.4. IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTIONS(S) TO COMMENCE WITH ONE SITE VISIT.
  - 4.1.5. WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY 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.

**5. CANCELLATION OR DELAYS IN SCHEDULED MI**

- 5.1. IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN CASTLE SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CASTLE CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

**6. CORRECTION OF FAILING MI'S**

- 6.1. IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN CASTLE TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:
  - 6.1.1. CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
  - 6.1.2. OR, WITH CROWN CASTLE'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

**7. MI VERIFICATION INSPECTIONS**

- 7.1. CROWN CASTLE RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.
- 7.2. ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.
- 7.3. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEA/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

**8. PHOTOGRAPHS**

- 8.1. BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:
  - 8.1.1. PRECONSTRUCTION GENERAL SITE CONDITION
  - 8.1.2. PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - 8.1.3. RAW MATERIALS
  - 8.1.4. PHOTOS OF ALL CRITICAL DETAILS
  - 8.1.5. FOUNDATION MODIFICATIONS
  - 8.1.6. WELD PREPARATION
  - 8.1.7. BOLT INSTALLATION AND TORQUE
  - 8.1.8. FINAL INSTALLED CONDITION
  - 8.1.9. SURFACE COATING REPAIR
  - 8.1.10. POST CONSTRUCTION PHOTOGRAPHS
  - 8.1.11. FINAL INFIELD CONDITION
  - 8.1.12. PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.
  - 8.1.13. THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

**9. INSPECTION AND TESTING**

- 9.1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY CROWN CASTLE'S REPRESENTATIVE AND CROWN CASTLE'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY.
- 9.2. INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS ARE STILL REQUIRED WHEN THE EOR PERFORMS SUPPORT SERVICES DURING CONSTRUCTION.
- 9.3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- 9.4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED AND RETAINED FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
  - 9.4.1. ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
  - 9.4.2. THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
- 9.5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES AND INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
- 9.6. **GENERAL**
  - 9.6.1. PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY CROWN CASTLE AND THE EOR IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
- 9.7. **FOUNDATIONS AND SOIL PREPARATION - (NOT REQUIRED)**
- 9.8. **CONCRETE TESTING PER ACI - (NOT REQUIRED)**
- 9.9. **STRUCTURAL STEEL**
  - 9.9.1. CHECK STEEL ON THE JOB WITH THE PLANS.
  - 9.9.2. CHECK MILL CERTIFICATIONS. CALL FOR LABORATORY TEST REPORTS WHEN MILL CERTIFICATION IS IN QUESTION.
  - 9.9.3. CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
  - 9.9.4. INSPECT ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISI 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
  - 9.9.5. INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
  - 9.9.6. CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
  - 9.9.7. CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
  - 9.9.8. CHECK THAT BOLTS HAVE BEEN TIGHTENED PROPERLY.
  - 9.9.9. PRIOR TO ANY FIELD CUTTING THE CONTRACTOR SHALL MARK THE CUTOFF LINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
- 9.10. **WELDING:**
  - 9.10.1. VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
  - 9.10.2. INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND WITH AWS D1.1.
  - 9.10.3. APPROVE FIELD WELDING SEQUENCE.
  - 9.10.4. A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO CROWN CASTLE BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM CROWN CASTLE.
  - 9.10.5. INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
    - 9.10.5.1. INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE, AND WORKING CONDITIONS.
    - 9.10.5.2. VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
    - 9.10.5.3. INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
    - 9.10.5.4. VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT.
    - 9.10.5.5. SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE.
    - 9.10.5.6. INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED DRAWINGS.
    - 9.10.5.7. VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
    - 9.10.5.8. REVIEW THE REPORTS BY TESTING LABS.
    - 9.10.5.9. CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
    - 9.10.5.10. INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
    - 9.10.5.11. CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
- 9.11. **REPORTS:**
  - 9.11.1. COMPILER AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO CROWN CASTLE.
  - 9.11.2. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES OR PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO CROWN CASTLE'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT CROWN CASTLE'S REVIEW AND SPECIFIC WRITTEN CONSENT. CROWN CASTLE RESERVES THE RIGHT TO DETERMINE WHETHER OR NOT A RESOLUTION IS ACCEPTABLE.
  - 9.11.3. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO CROWN CASTLE. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
  - 9.11.4. THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

MI CHECKLIST	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
<b>PRE-CONSTRUCTION</b>	
X	MI CHECKLIST DRAWINGS
X	EOB REVIEW
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
<b>CONSTRUCTION</b>	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: PROVIDE PHOTO DOCUMENTATION OF EXCAVATION QUALITY AND COMPACTION
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
NA	MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
<b>POST-CONSTRUCTION</b>	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD TARGET TENSION LOAD TESTING
NA	REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT  
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

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MODIFICATION OF AN EXISTING  
120'-0" MONOPOLE  
BU #876329; MTN. VIEW CEM. (Filey Park)  
BLOOMFIELD, CT.



AUG 19 2016

PROJECT No: 37516-0115.006.7700  
DRAWN BY: FE  
DESIGNED BY: NZP  
CHECKED BY: [Signature]  
DATE: 8-18-2016

MI CHECKLIST

T-2



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. 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. 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 ANSII/A-1019 (LATEST EDITION), OSHA AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSII/A-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.
- 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 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 EOR.
- 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, MORAINNE, 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 1 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. BASE PLATE GROUT - (NOT REQUIRED)

4. FOUNDATION WORK - (NOT REQUIRED)

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

6. EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)

7. TOUCH UP OF GALVANIZING

- 7.1. 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.
- 7.2. 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.
- 7.3. 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.

8. HOT-DIP GALVANIZING

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

9. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

- 9.1. 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.
- 9.2. 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.
- 9.3. CROWN CASTLE SHALL REFER TO ANSII/A-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 ANSII/A-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".

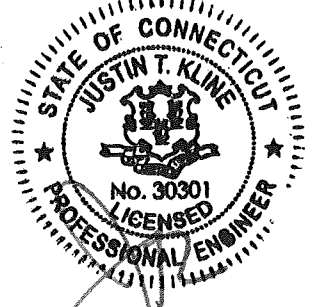
10. FIELD NDE MINIMUM REQUIREMENTS - (NOT REQUIRED)

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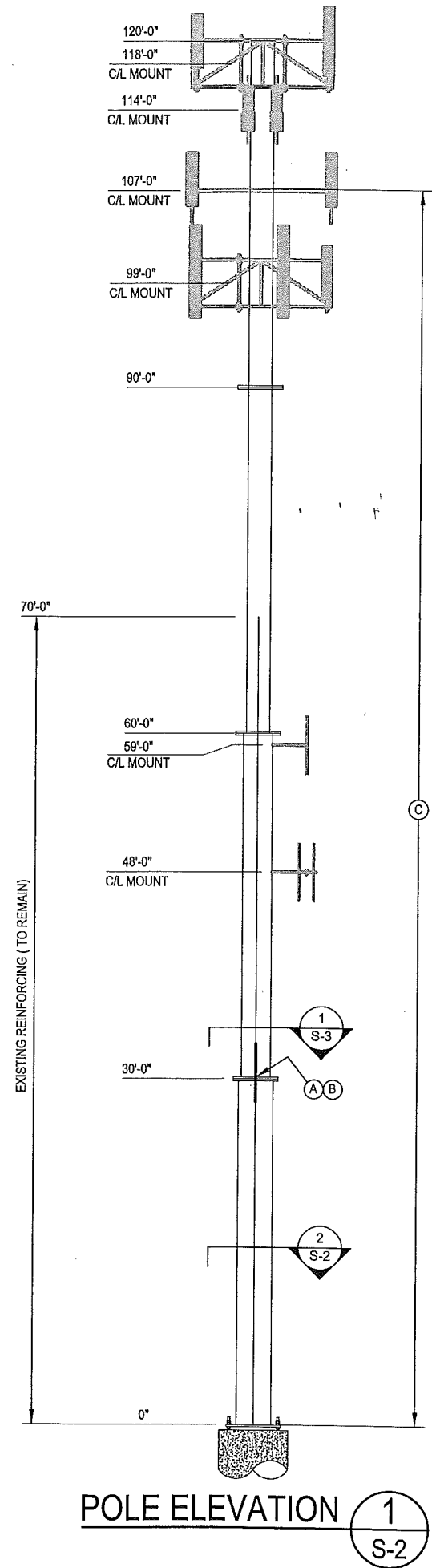
**MODIFICATION OF AN EXISTING 120'-0" MONOPOLE**  
 BU #876329; MTN. VIEW CEM. (Filley Park) BLOOMFIELD, CT.



AUG 19 2016

PROJECT No:	37516-0115.006.7700
DRAWN BY:	FE
DESIGNED BY:	NZP
CHECKED BY:	KAK
DATE:	8-18-2016

GENERAL NOTES

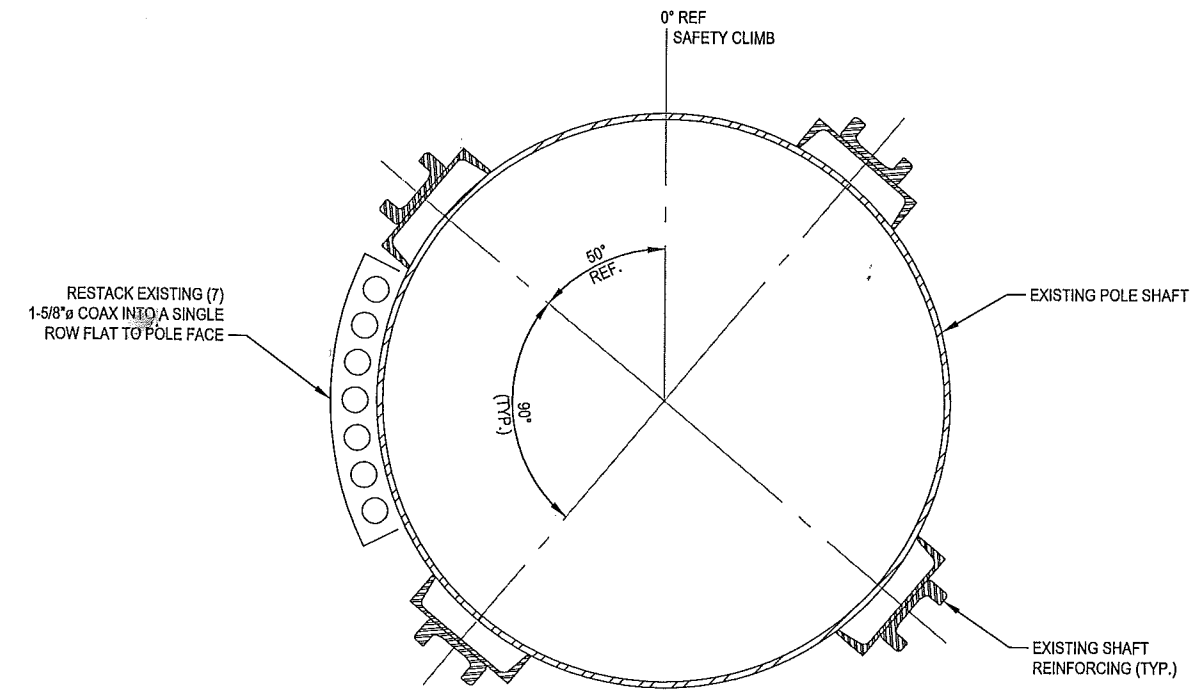


POLE ELEVATION 1  
S-2

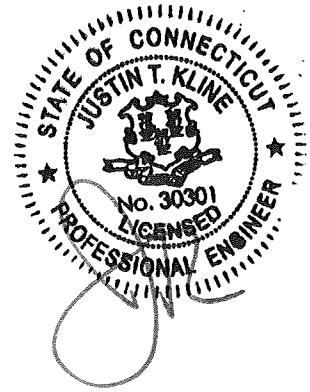
SHAFT SECTION DATA							
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER (IN)		POLE GRADE (ksi)	POLE SHAPE
				@ TOP	@ BOTTOM		
1	30.00	0.2500		24.000	24.000	42	ROUND
2	30.00	0.3750		24.000	24.000	42	ROUND
3	30.00	0.3750		30.000	30.000	42	ROUND
4	30.00	0.3750		36.000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

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

TOWER MODIFICATION SCHEDULE			
	ELEVATION	TOWER MODIFICATION DESCRIPTION	REFERENCE SHEETS
(A)	30'	REMOVE BOTTOM TERMINATION BOLTS IN PREPARATION OF PROPOSED WELDED BRIDGE STIFFENERS	S-3
(B)	30'	INSTALL NEW WELDED BRIDGE STIFFENERS	S-3
(C)	0' - 107'	RESTACK COAX INTO A SINGLE ROW FLAT TO POLE FACE	S-2



SECTION 2  
S-2



AUG 19 2016

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3530 TORINGDON WAY, SUITE 300 CHARLOTTE, NC 28277  
PH: (800) 209-8242

MODIFICATION OF AN EXISTING  
120'-0" MONOPOLE  
BU #876329; MTN. VIEW CEM. (Filley Park)  
BLOOMFIELD, CT.

PROJECT No:	37516-0115.008.7700
DRAWN BY:	FE
DESIGNED BY:	NZP
CHECKED BY:	<i>[Signature]</i>
DATE:	8-18-2016

MONOPOLE  
PROFILE

S-2

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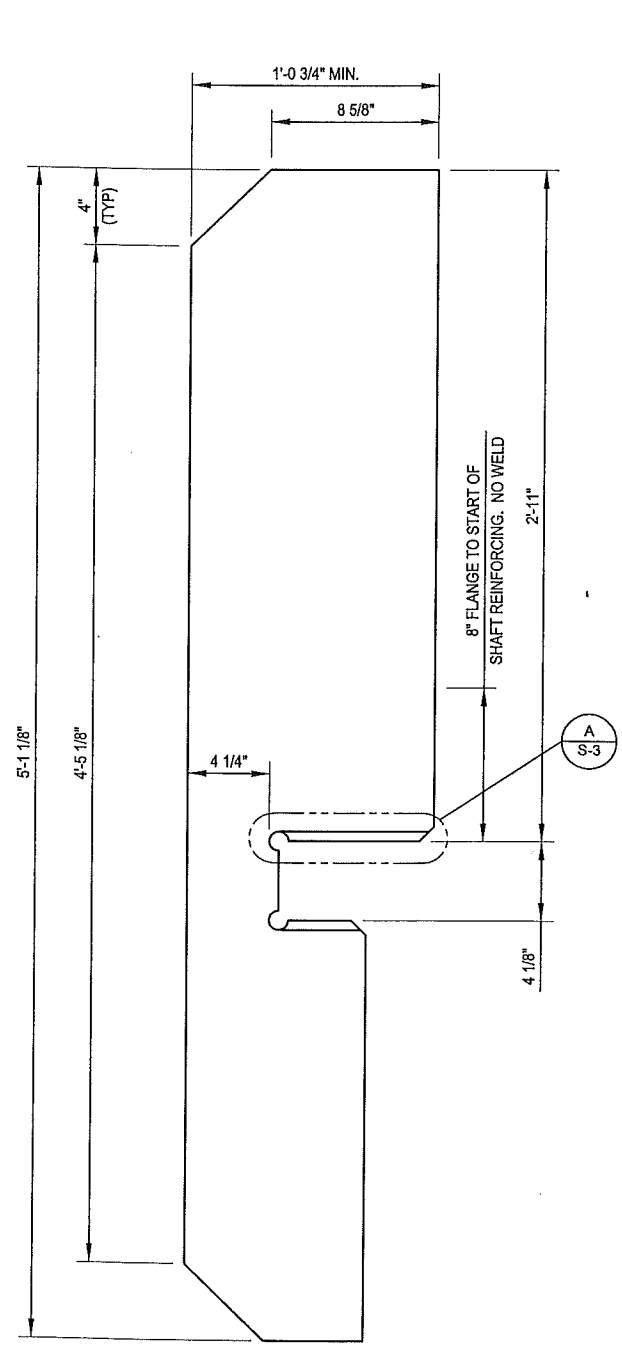
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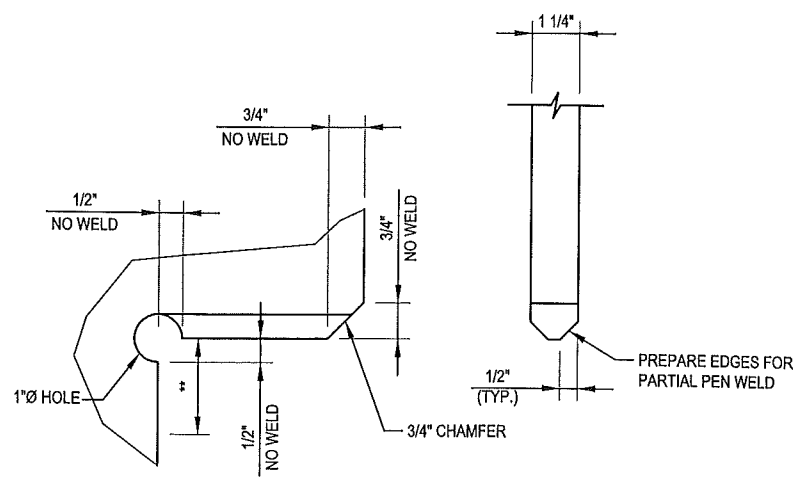
MONOPOLE PROFILE

S-3



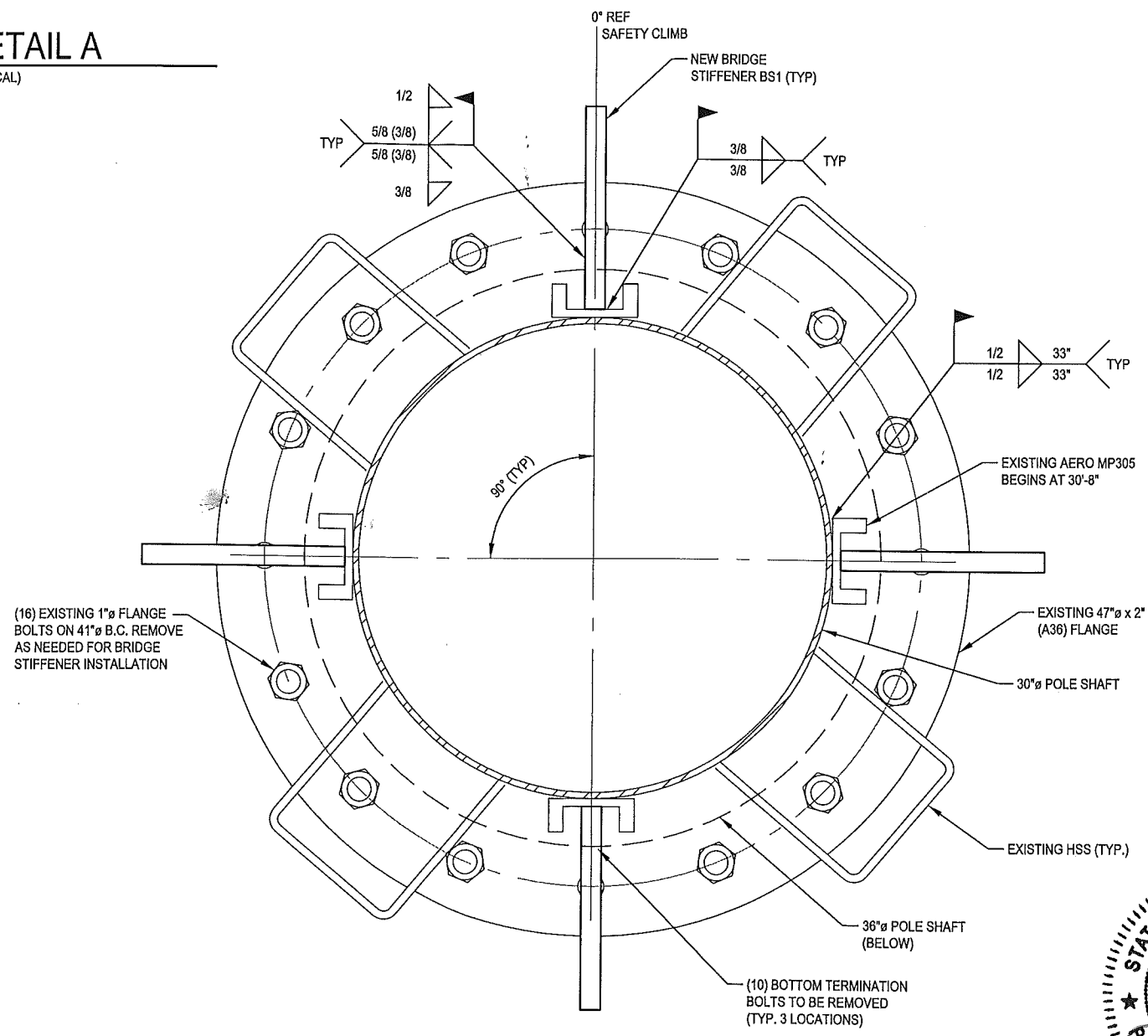
**BRIDGE STIFFENER MK~BS1**  
 (4 REQUIRED) (Fy = 65 KSI)

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.

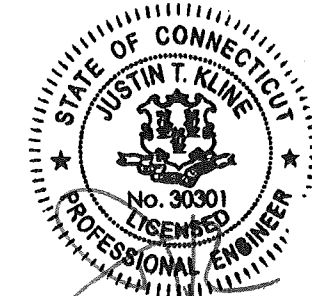


\*\* NO WELD REGION SHOULD EXTEND BEYOND FLANGE LOCATIONS

**DETAIL A**  
 (TYPICAL)



**SHAFT PLAN** 1  
 EL. 30' S-3



AUG 19 2016

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

T-Mobile Existing Facility

Site ID: CT11278A

Mtn. View Cem. (Filley Park)  
28 Brewer Drive  
Bloomfield, CT 06002

**September 8, 2016**

**EBI Project Number: 6216004017**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>10.14 %</b>

September 8, 2016

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

Emissions Analysis for Site: **CT11278A – Mtn. View Cem. (Filley Park)**

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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  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 public 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 public 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 ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limit for the 700 MHz Band is approximately 467  $\mu\text{W}/\text{cm}^2$ , and the general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is 1000  $\mu\text{W}/\text{cm}^2$ . 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, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 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) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

- 6) Since the 2100 MHz UMTS radios are ground mounted there are additional cabling losses accounted for. For each 2100 MHz UMTS ground mounted RF path an additional 1.38 dB of cable loss was factored into the calculations. This is based on manufacturers Specifications for 130 feet of 1-5/8" coax cable on each of these paths.
- 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 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 AIR21 B4A/B2P & Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, 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 public threshold limits.



### T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	108	Height (AGL):	108	Height (AGL):	108
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):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A1 MPE%	1.61	Antenna B1 MPE%	1.61	Antenna C1 MPE%	1.61
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	Height (AGL):	108	Height (AGL):	108
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	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	6,367.38	ERP (W):	6,367.38	ERP (W):	6,367.38
Antenna A2 MPE%	2.20	Antenna B2 MPE%	2.20	Antenna C2 MPE%	2.20
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	108	Height (AGL):	108	Height (AGL):	108
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.64	Antenna B3 MPE%	0.64	Antenna C3 MPE%	0.64

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	4.45 %
Verizon	3.31 %
AT&T	1.74 %
Clearwire	0.15 %
Sprint	0.07 %
Town of Bloomfield	0.42 %
<b>Site Total MPE %:</b>	<b>10.14 %</b>

T-Mobile Sector A Total:	4.45 %
T-Mobile Sector B Total:	4.45 %
T-Mobile Sector C Total:	4.45 %
<b>Site Total:</b>	<b>10.14 %</b>

T-Mobile _ per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	108	16.13	AWS - 2100 MHz	1000	1.61%
T-Mobile AWS - 2100 MHz UMTS	2	849.42	108	5.87	AWS - 2100 MHz	1000	0.59%
T-Mobile PCS - 1950 MHz UMTS	2	1,167.14	108	8.07	PCS - 1950 MHz	1000	0.81%
T-Mobile PCS - 1950 MHz GSM	2	1,167.14	108	8.07	PCS - 1950 MHz	1000	0.81%
T-Mobile 700 MHz LTE	1	865.21	108	2.99	700 MHz	467	0.64%
						<b>Total*:</b>	<b>4.45%</b>

\*NOTE: Totals may vary by .01% due to summing of remainders



## Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public 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 public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	4.45 %
Sector B:	4.45 %
Sector C:	4.45 %
T-Mobile Per Sector Maximum:	4.45 %
Site Total:	10.14 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **10.14%** of the allowable FCC established general public 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.