EMPIRE telecom

August 10, 2018

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

Regarding:	Notice of Exempt Modification – Antenna Modification
Property Address:	10 Sparks Street, Plainville, CT 06062
AT&T Site:	CT1054 – Plainville Center

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 136-foot monopole at the above-referenced address, latitude 41.673461°, longitude -72.854503°. Said monopole is owned by Crown Castle.

AT&T desires to modify its existing telecommunications facility by adding three (3) antennas, adding (12) twelve remote-radio heads ("RRHs"), adding (1) Surge Suppressor and replacing Diplexers inside equipment shelter at base of tower. The centerline height of the existing antennas is and will remain at 115 feet.

Please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72 (b)(2). In accordance with R.C.S.A. §16-50j-73, a copy of this letter is being sent to Robert E. Lee, as Manager for the Town of Plainville, Foster Zucchi, as Building Official for the Town of Plainville, Mark S. DeVoe, AICP, as Director of Planning and Economic Development for the Town of Plainville, Crown Castle, LLC, as owner of the Cellular Phone Tower.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72 (b)(2). Specifically:

1. The planned modification will not result in an increase in the height of the existing structure. The added antennas and accessory equipment along with equipment to be swapped will be installed at the existing height of 115 feet on the 136-foot monopole.

2. The proposed modifications will not involve any changes to ground-mounted equipment, and therefore will not require an extension of the site boundary.

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

Jennifer Iliades ⎜ Empire Telecom USA, LLC ⎜ 16 Esquire Road, Billerica, MA 01862 ⎜ 978-284-0701 ⎜ jiliades@empiretelecomm.com

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above Federal Communications Commission (FCC) safety standard. An RF emissions calculation (enclosed) for AT&T's modified facility is herein provided.

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 AT&T's proposed modifications (please see enclosed structural analysis completed by Paul J. Ford & Company, dated July 16th, 2018).

For the foregoing reasons, AT&T respectfully requests that the proposed remote-radio head installation be allowed within the exempt modifications under R.C.S.A. §16-50j-72 (b)(2).

Sincerely,

Robert C. Wilson

Robert C. Wilson
Site Acquisition Manager

Enclosures: Exhibit 1 – Field Card and GIS Map
Exhibit 2 – Construction Drawings
Exhibit 3 – Structural Analysis
Exhibit 4 – RF Emissions Analysis Report Evaluation

cc: Robert E. Lee, as Manager for the Town of Plainville, Foster Zucchi, as Building Official for the Town of Plainville, Mark S. DeVoe, AICP, as Director of Planning and Economic Development for the Town of Plainville, Crown Castle, LLC, as owner of the Cellular Phone Tower.

Plainville, CT : Assessor Database

Property Search:

Parcel ID:	Alternate ID:	Owner 1 Name:	Street Number:	Street Name:
				...

Search Reset

Property Detail:

Parcel ID:	Alternate ID/Map Block Lot:	Card:	Card:	Street Name:	Street Number:	Zoning:	LUC:	Acres:
23-O-05	R02784	1	1	SPARKS ST	10	GI	Manufacturing Warehouse Facilities	1.26

Owner Information:

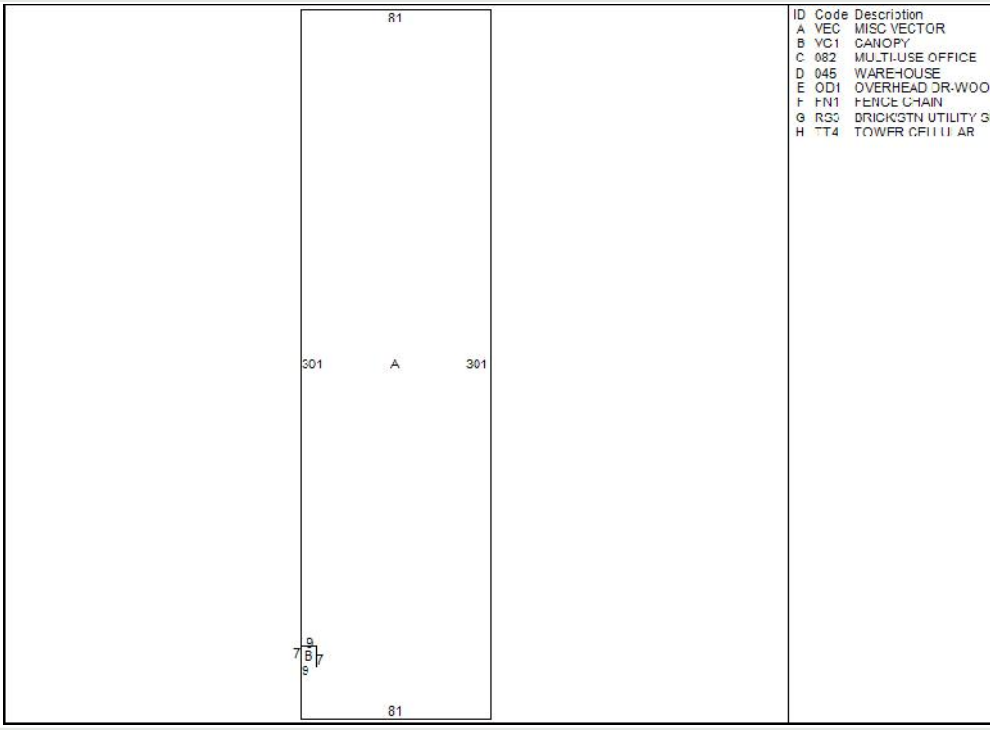
Owner 1 Name:	HEARTLAND-PLAINVILLE LLC
Owner 2 Name:	
Street 1:	P O BOX 311
Street 2:	
City:	BOUND BROOK
State:	NJ
Zip:	08805
Volume:	449
Page:	534
Deed Date:	2005-01-14

Property Images:

Picture:

There is no picture available.

Sketch:



Building Information:

Building Number:	1
Units:	1
Structure Type:	WAREHOUSE
Grade:	C
Identical Units:	1
Year Built:	1949

Valuation:

Appraised Land:	$107,000.00
Appraised Bldg:	$512,100.00
Appraised Total:	$619,100.00
Total Assessment:	$433,370.00

Sales History:

Book:	Page:	Sale Date:	Price:	Validity:	Sale Type:
449	526	01/14/2005	266,000	08	2
449	534	01/14/2005	266,000	08	2
182	1140	08/09/1971			
254	154	02/22/1988			
320	120	06/07/1995			
449	521	01/14/2005			
449	534	01/14/2005			
449	526	01/14/2005			
606	1131	01/02/2018	340,000	0	2

Out-Buildings:

Code:	Description:	Units:	Year Built:	Size1:	Size2:	Area:	Grade:	Condition:
FN1	FENCE CHAIN	1	2000	6	180	1080	C	NORMAL (Comm)
RS3	BRICK/STN UTILITY SHED	1	2000	1	120	120	C	NORMAL (Comm)
TT4	TOWER CELLULAR	1	2000	0	0	120	C	NORMAL (Comm)

Building Interior/Exterior Information:

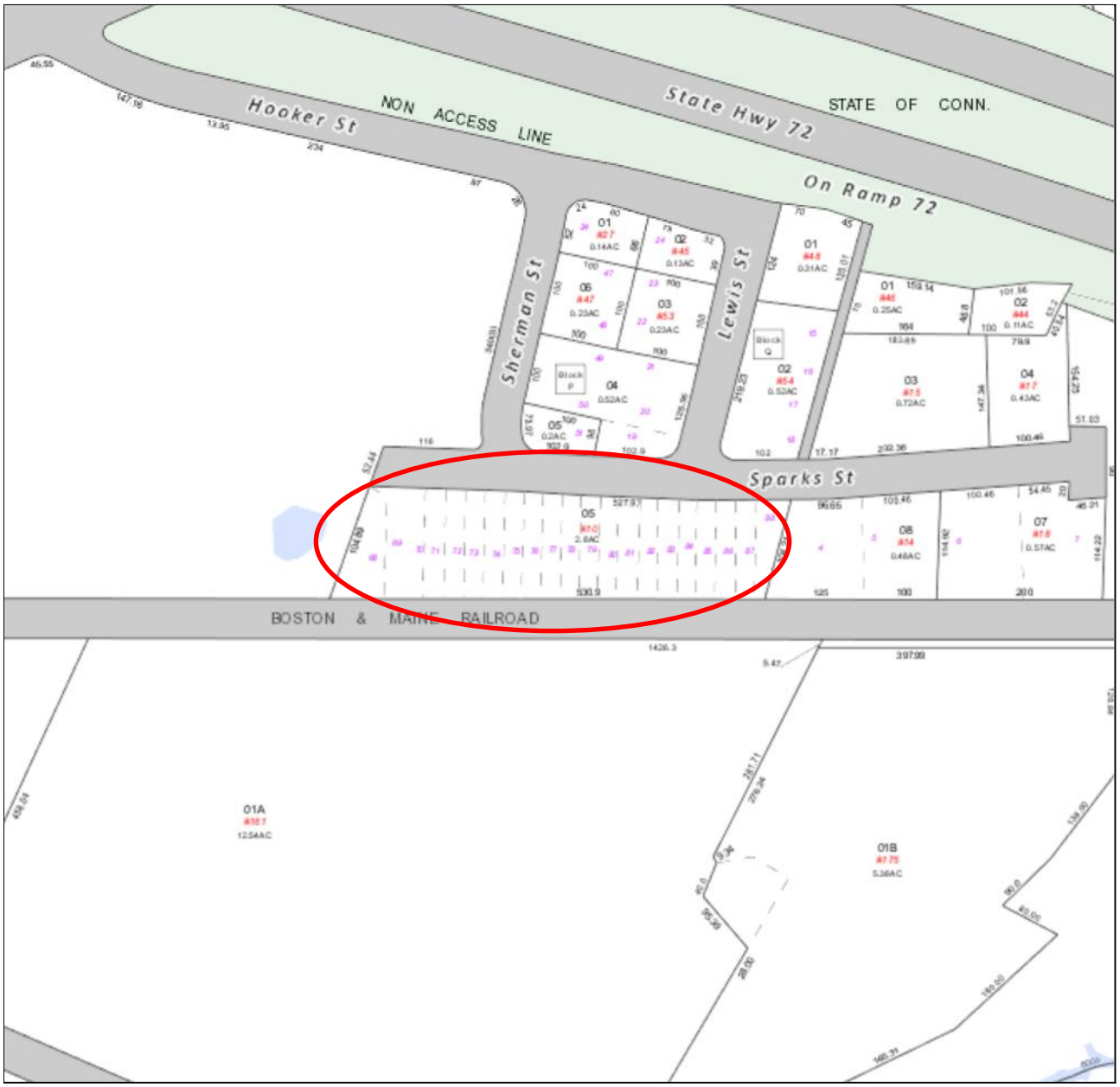
Floor From:	Floor To:	Area:	Use Type:	Exterior Walls:	Contruction Type:	Heating:	A/C:	Plumbing:	Functional U
01	01	1000	MULTI-USE OFFICE	BRICK VENEER	WOOD FRAME/JOIST/BEAM	HOT AIR	CENTRAL	NORMAL	2
01	01	23381	WAREHOUSE	BRICK VENEER	WOOD FRAME/JOIST/BEAM	HOT AIR	NONE	NORMAL	2

Fri. August 10, 2018 : 02:57 PM : 0.33s : 10mb

Town of Plainville

Geographic Information System (GIS)

Date Printed: 8/10/2018



MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Plainville and its mapping contractors assume no legal responsibility for the information contained herein.

Approximate Scale: 1 inch = 200 feet

0 200 Feet

N W E S

SITE NAME: PLAINVILLE CENTER
PROJECT: LTE - 4C/5C/6C/7C/FIRSTNET
FA NUMBER: 10035333
SITE NUMBER: CTL01054
10 SPARKS STREET
PLAINVILLE, CT 06062
HARTFORD COUNTY

PROJECT TEAM

CLIENT REPRESENTATIVE

COMPANY:	EMPIRE TELECOM
ADDRESS:	16 ESQUIRE ROAD
CITY, STATE, ZIP:	BILLERICA, MA 01862
CONTACT:	DAVID COOPER
E-MAIL:	DCOOPER@EMPIRETELCOMM.COM

ENGINEER

COMPANY:	MASER CONSULTING CONNECTICUT
ADDRESS:	331 NEWMAN SPRINGS ROAD, SUITE 203
CITY, STATE, ZIP:	RED BANK, NJ 07701
CONTACT:	MICHAEL CLEARY
PHONE:	(856) 717-0412 x4105
E-MAIL:	MCLEARY@MASERCONSULTING.COM

RF ENGINEER

COMPANY:	NEW CINGULAR WIRELESS PCS, LLC
ADDRESS:	550 COCHITUATE ROAD
CITY, STATE, ZIP:	FRAMINGHAM, MA 01701
CONTACT:	FATAH
E-MAIL:	FF5901@ATT.COM

SITE INFORMATION

APPLICANT/LESSEE

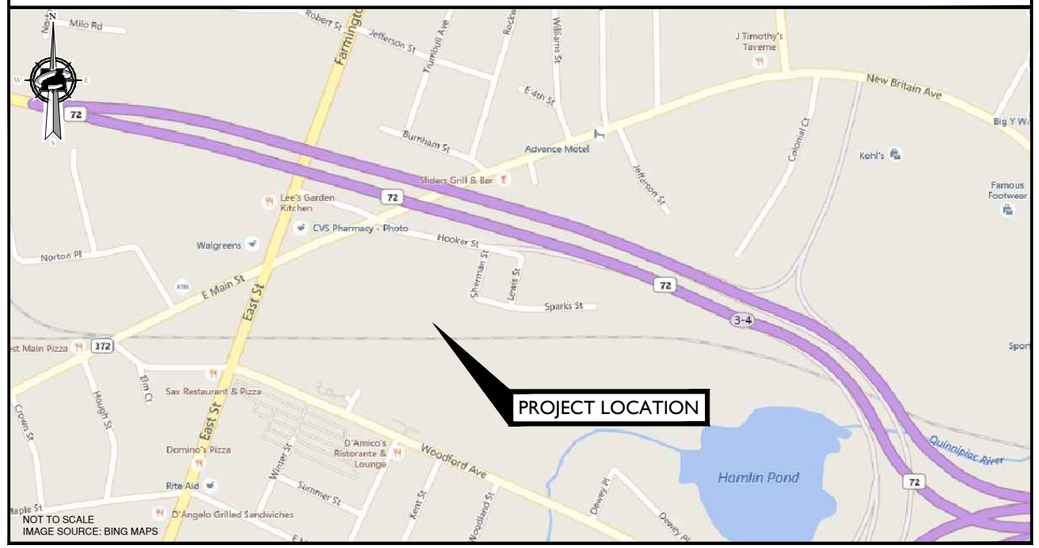
at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE RD.
FRAMINGHAM, MA 01701

TOWER OWNER:

NAME:	CROWN CASTLE
ADDRESS:	12 GILL STREET, SUITE #5800
CITY, STATE, ZIP:	WOBURN, MA 01801
CROWN BU #:	876333
LATITUDE:	41.673461° N
LONGITUDE:	72.854503° W
LAT./LONG. TYPE:	NAD 83
AREA OF CONSTRUCTION:	EXISTING EQUIPMENT SHELTER AND TOWER
ZONING/JURISDICTION:	CITY OF PLAINVILLE
CURRENT USE/PROPOSED USE:	UNMANNED TELECOMMUNICATIONS FACILITY
HANDICAP REQUIREMENTS:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS NOT REQUIRED.
CONSTRUCTION TYPE:	IIB
USE GROUP:	U

VICINITY MAP



DRIVING DIRECTIONS

DIRECTIONS FROM AT&T OFFICE AT 550 COCHITUATE ROAD, FRAMINGHAM, MA:

DEPART RT-30 WEST/COCHITUATE ROAD TOWARD BURR STREET. TURN BACK ON RT-30 EAST/COCHITUATE ROAD.TAKE RAMP RIGHT FOR I-90 WEST TOWARD SPRINGFIELD/WORCESTER. AT EXIT 9, TAKE RAMP RIGHT FOR I-84 TOWARD HARTFORD/NEW YORK CITY. AT EXIT 33, TAKE RAMP RIGHT FOR CT-72 WEST TOWARD BRISTOL. AT EXIT 2, TAKE RAMP RIGHT TOWARD NEW BRITAIN AVENUE/PLAINVILLE. TURN LEFT ONTO CT-372/NEW BRITAIN AVENUE. TURN LEFT ONTO HOOKER STREET. TURN RIGHT ONTO SHERMAN STREET. ROAD NAME CHANGES TO SPARKS STREET. ARRIVE AT SPARKS STREET.

CODE COMPLIANCE

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

1. 2016 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2012 IBC
2. 2014 NATIONAL ELECTRICAL CODE-NFPA 70
3. 2012 NFPA 101
4. LIGHTNING PROTECTION CODE 2011
5. AMERICAN CONCRETE INSTITUTE 318
6. AMERICAN INSTITUTE OF STEEL CONSTRUCTION 360-10
7. EIA/TIA-222 REVISION G
8. TIA 607 FOR GROUNDING
9. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
10. IEEE C2 LATEST EDITION
11. TELCORDIA GR-1275
12. ANSI T1.311

GENERAL CONTRACTOR NOTES

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

PROJECT DESCRIPTION/SCOPE OF WORK

THIS PROJECT WILL BE COMPRISED OF:

- INSTALL (3) NEW AT&T ANTENNAS, (1) PER SECTOR
- INSTALL (3) NEW RRUS-12, AT GRADE
- INSTALL (3) NEW RRUS-E2, AT GRADE
- INSTALL (3) NEW RRUS-B14 4478, (1) PER SECTOR
- INSTALL (3) NEW RRUS-32 B66, (1) PER SECTOR
- INSTALL (1) NEW DC-6 SURGE SUPPRESSION DOME
- REPLACE DIPLEXERS WITH LOW BAND COMBINERS, AT GRADE
- REPLACE DIPLEXERS WITH LOW BAND COMBINERS, (2) PER SECTOR
- UPGRADE DUS TO (2) 5216 AND ADD IDLe
- ADD 2ND XMU

MASER CONSULTING CONNECTICUT

Customer Loyalty *through* Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

EMPIRE telecom

16 ESQUIRE ROAD
BILLERICA, MA 01862

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

PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	17963015A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	03/16/18	FOR CONSTRUCTION	AJC	PET
1	1/24/18	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT — PETROS E. TSOULKALAS — 32577 — REGISTERED PROFESSIONAL ENGINEER

PETROS E. TSOULKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577

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

SITE NAME:

PLAINVILLE CENTER
FA#:10035333
SITE #: CTL01054

10 SPARKS STREET
PLAINVILLE, CT 06062
HARTFORD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :

TITLE SHEET

SHEET NUMBER :

T-1

GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5O HMS OR LESS.
4. THE SUBCONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
5. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
6. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
7. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE EQUIPMENT GROUND RING WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK TO BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
10. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
11. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. ALL BENDS SHALL BE MADE WITH 12" RADIUS OR LARGER.
12. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
13. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS EXCEPT FOR GROUND BAR CONNECTION FROM MGB TO OUTSIDE EXTERIOR GROUND SHALL ALL BE CADWELD CONNECTIONS.
14. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
15. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED TO THE TOWER GROUND BAR.
16. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
17. ALL EXTERIOR AND INTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
18. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
19. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF MAIN GROUND WIRES WITH 1-#2 AWG TIN-PLATED COPPER GROUND CONDUCTOR.
20. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G. NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
21. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/4" IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50.
22. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

    CONTRACTOR - EMPIRE TELECOM
    SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
    OWNER - AT&T (NEW CINGULAR WIRELESS PCS, LLC)

23. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
24. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
25. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR 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.
26. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
27. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
28. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
29. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
30. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
31. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
32. 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 THE RESPONSIBLE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. SUBCONTRACTOR 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.
33. 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, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
34. 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.
35. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
36. 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.
37. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
38. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
39. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
40. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
41. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
42. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR.
43. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
44. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
45. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS.
46. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
47. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
48. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
49. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION, ANY CONSTRUCTION WORK BY SUBCONTRACTOR 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.
50. 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 ALERT OF DANGEROUS EXPOSURE LEVELS.

MASER CONSULTING CONNECTICUT
Customer Loyalty *through* Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

EMPIRE telecom

16 ESQUIRE ROAD
BILLERICA, MA 01862

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

PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	17963015A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	03/16/18	FOR CONSTRUCTION	AJC	PET
1	1/24/18	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT
PETROS E. SOULIKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577
32577
REGISTERED PROFESSIONAL ENGINEER

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

SITE NAME:

PLAINVILLE CENTER
FA#:10035333
SITE #: CTL01054

10 SPARKS STREET
PLAINVILLE, CT 06062
HARTFORD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

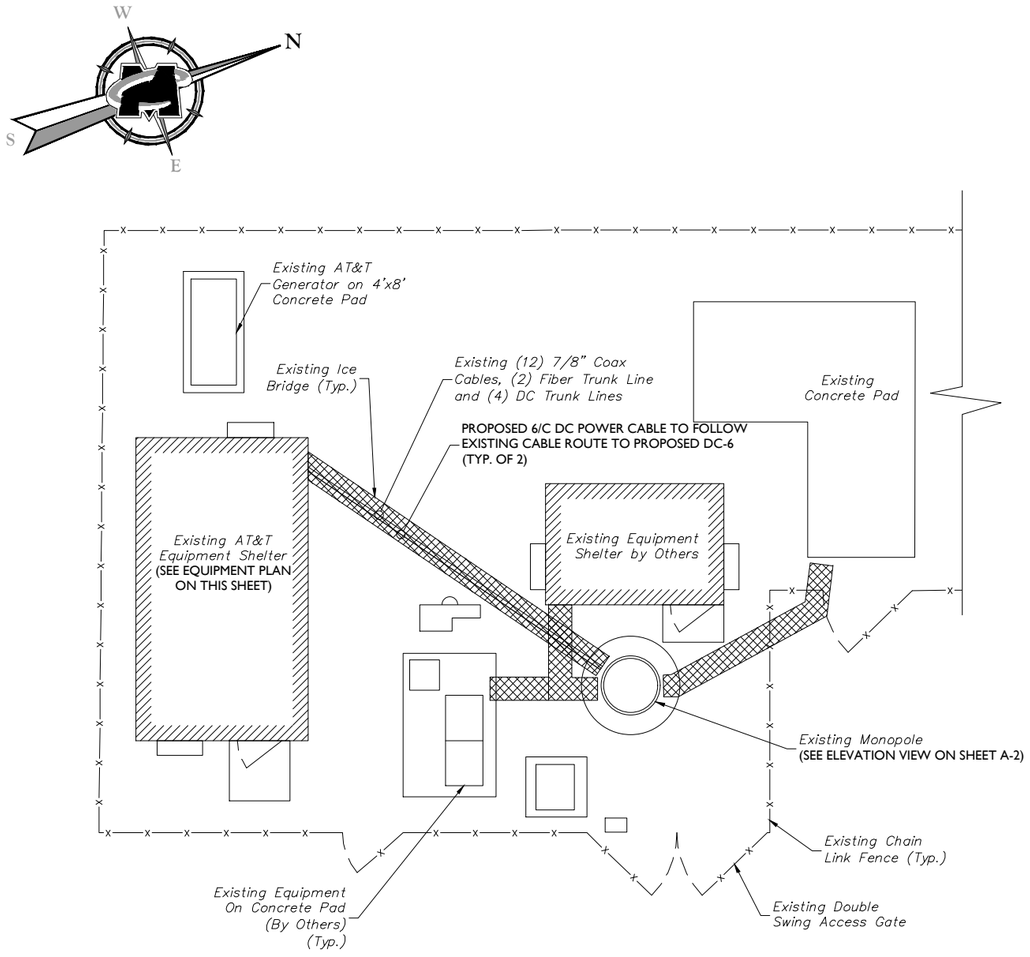
SHEET TITLE :
GENERAL NOTES

SHEET NUMBER :
GN-1

NOTE:

SITE INFORMATION OBTAINED FROM THE FOLLOWING:

A. PLAN ENTITLED "PLAINVILLE - SPARKS ST." PREPARED BY MASER CONSULTING P.A., LAST REVISED 03/24/2017.



COMPOUND PLAN

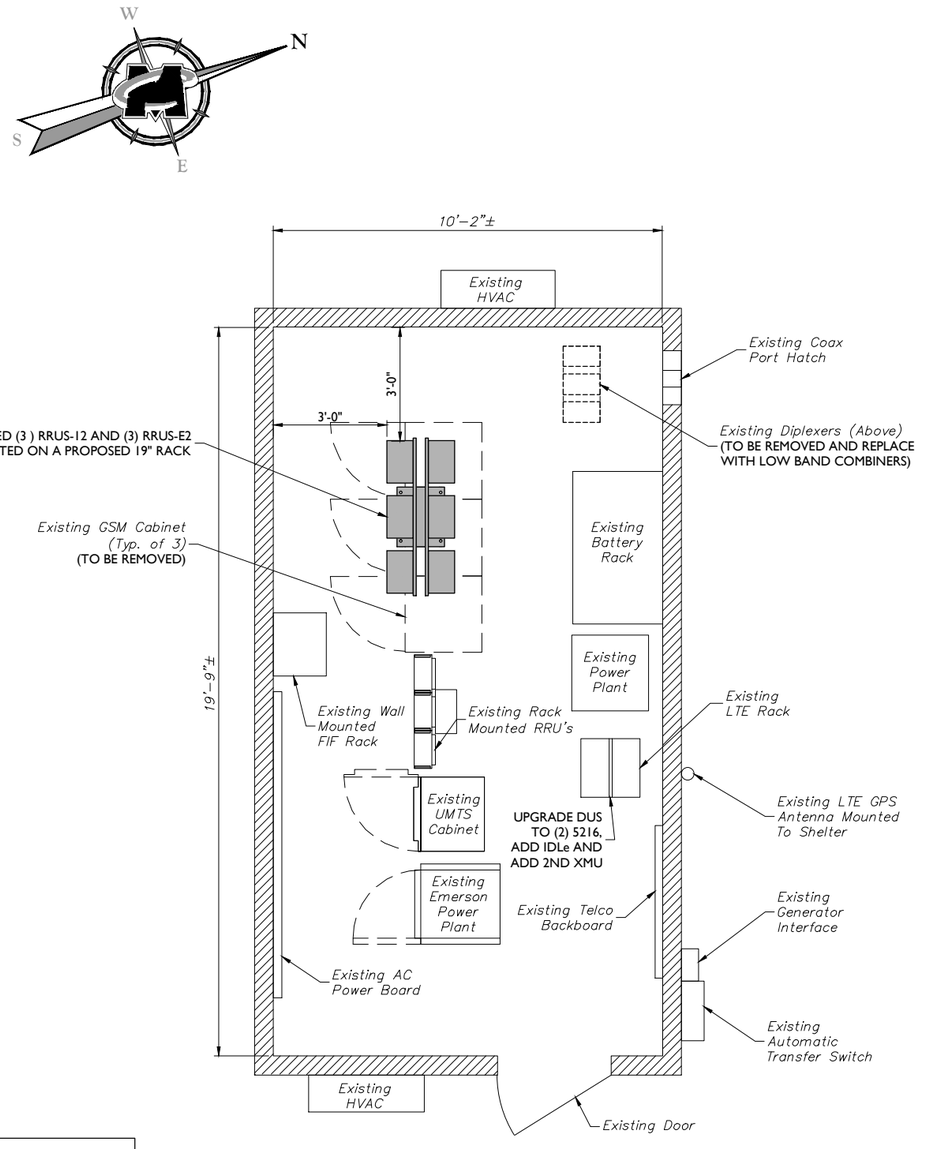
GRAPHIC SCALE

5 0 2.5 5 10

(IN FEET)

SCALE: 1" = 5' FOR 24"X36" DRAWINGS

(DO NOT SCALE 11"X17" DRAWINGS)



EQUIPMENT PLAN

GRAPHIC SCALE

2 0 1 2 4

(IN FEET)

SCALE: 1" = 2' FOR 24"X36" DRAWINGS

(DO NOT SCALE 11"X17" DRAWINGS)

NOTE:

THESE PLANS WERE DESIGNED WITH THE ASSUMPTION THAT THE PREVIOUS PLANS PREPARED BY MASER CONSULTING CONNECTICUT DATED 02/18/16 WILL BE COMPLETED PRIOR TO THE CURRENT SCOPE OF WORK BEING INSTALLED. ANY CHANGES IN PREVIOUS DESIGN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.

MASER CONSULTING CONNECTICUT

Customer Loyalty *through* Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

EMPIRE telecom

16 ESQUIRE ROAD
BILLERICA, MA 01862

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

PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	17963015A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	03/16/18	FOR CONSTRUCTION	AJC	PET
1	1/24/18	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT
PETROS T. SOLIKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577
32577
REGISTERED PROFESSIONAL ENGINEER

IT IS A VIOLATION OF LAW, IN ANY JURISDICTION, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME:

PLAINVILLE CENTER
FA#:10035333
SITE #: CTL01054

10 SPARKS STREET
PLAINVILLE, CT 06062
HARTFORD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

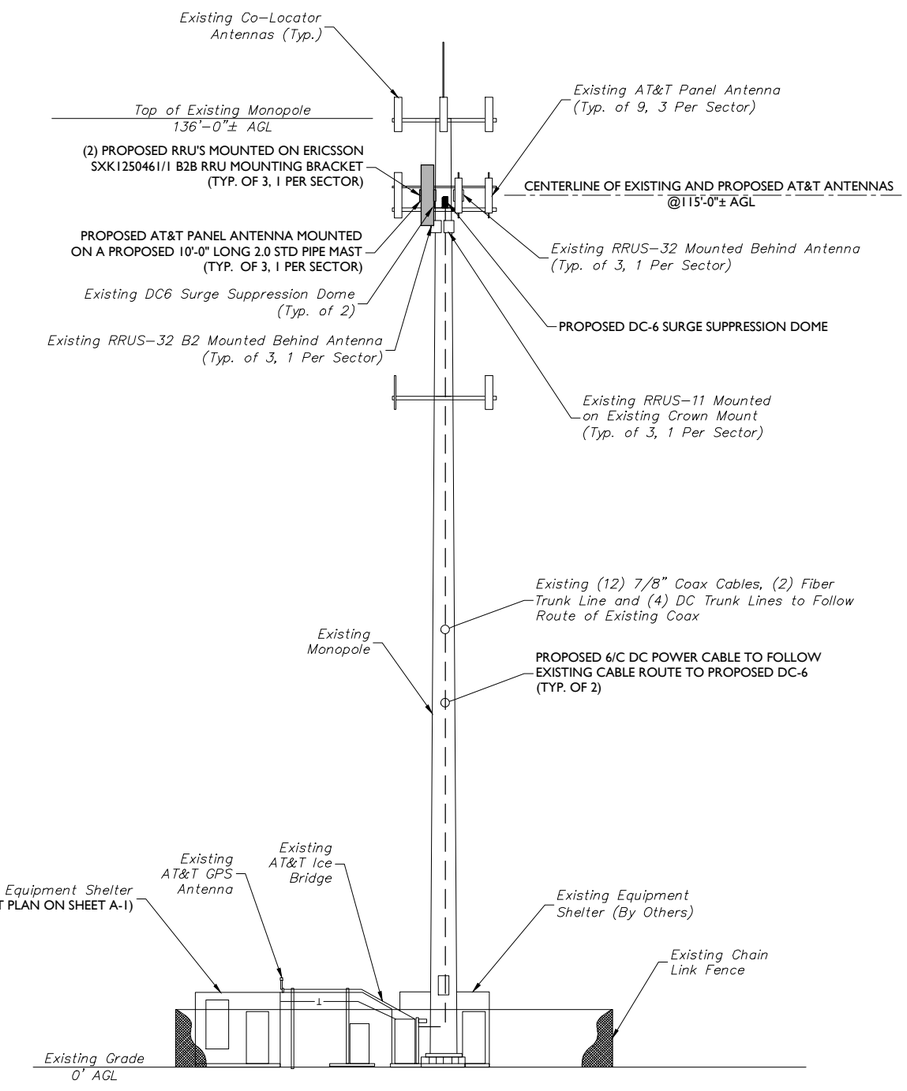
SHEET TITLE :

COMPOUND AND EQUIPMENT PLAN

SHEET NUMBER :

A-1

3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE



ELEVATION VIEW

GRAPHIC SCALE
10 0 5 10 20
(IN FEET)
SCALE: 1" = 10' FOR 24"X36" DRAWINGS
(DO NOT SCALE 11"X17" DRAWINGS)

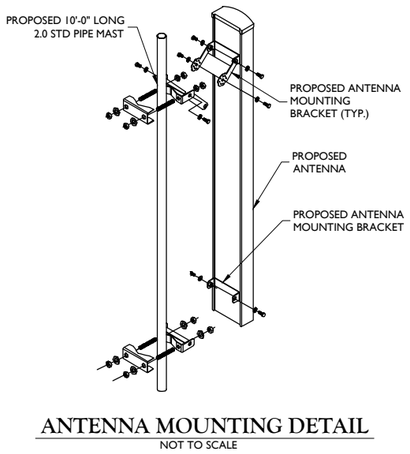
NOTE:

THESE PLANS WERE DESIGNED WITH THE ASSUMPTION THAT THE PREVIOUS PLANS PREPARED BY MASER CONSULTING CONNECTICUT DATED 02/18/16 WILL BE COMPLETED PRIOR TO THE CURRENT SCOPE OF WORK BEING INSTALLED. ANY CHANGES IN PREVIOUS DESIGN SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.

PROPOSED ANTENNA AND RRUS CONFIGURATION

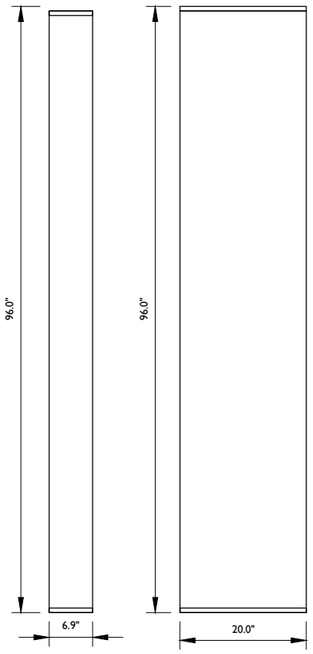
SECTOR		EXISTING ANTENNA CONFIGURATION	PROPOSED ANTENNA CONFIGURATION	TECHNOLOGY	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH	ANT. CL. ELEV (ft.)	RRUS CONFIGURATION	STATUS
ALPHA	A1	Powerwave 7770	Powerwave 7770	UMTS	REMAIN	55.00	11.00	5.00	35.00	143°	115'	-	-
	A2	CCIOPA-65R-LCUU-H8	CCIOPA-65R-LCUU-H8	LTE	REMAIN	72.00	12.00	9.60	111.00	13°	115'	(1) RRUS-32 (1) RRUS-E2 (AT GRADE) (1) RRUS-12 (AT GRADE)	REMAIN NEW NEW
	A3	-	Kathrien 800-10966	LTE	NEW	96.00	20.00	6.90	114.60	13°	115'	(1) RRUS-B14 4478 (1) RRUS-32 B66	NEW NEW
	A4	Quintel QS66512-2	Quintel QS66512-2	LTE	REMAIN	72	12	9.6	111	13°	115'	(1) RRUS-11 (1) RRUS-32 B2	REMAIN REMAIN
BETA	B1	Powerwave 7770	Powerwave 7770	UMTS	REMAIN	55.00	11.00	5.00	35.00	263°	115'	-	-
	B2	CCIOPA-65R-LCUU-H8	CCIOPA-65R-LCUU-H8	LTE	NEW	72.00	12.00	9.60	111.00	143°	115'	(1) RRUS-32 (1) RRUS-E2 (AT GRADE) (1) RRUS-12 (AT GRADE)	REMAIN NEW NEW
	B3	-	Kathrien 800-10966	LTE	NEW	96.00	20.00	6.90	114.60	143°	115'	(1) RRUS-B14 4478 (1) RRUS-32 B66	NEW NEW
	B4	Quintel QS66512-2	Quintel QS66512-2	LTE	REMAIN	72	12	9.6	111	143°	115'	(1) RRUS-11 (1) RRUS-32 B2	REMAIN REMAIN
GAMMA	C1	Powerwave 7770	Powerwave 7770	UMTS	REMAIN	55.00	11.00	5.00	35.00	13°	115'	-	-
	C2	CCIOPA-65R-LCUU-H8	CCIOPA-65R-LCUU-H8	LTE	REMAIN	92.70	14.40	7.00	88.00	263°	115'	(1) RRUS-32 (1) RRUS-E2 (AT GRADE) (1) RRUS-12 (AT GRADE)	REMAIN NEW NEW
	C3	-	Kathrien 800-10966	LTE	NEW	96.00	20.00	6.90	114.60	263°	115'	(1) RRUS-B14 4478 (1) RRUS-32 B66	NEW NEW
	C4	Quintel QS66512-2	Quintel QS66512-2	LTE	REMAIN	72	12	9.6	111	263	115	(1) RRUS-11 (1) RRUS-32 B2	REMAIN REMAIN

ANTENNA SCHEDULE



ANTENNA MOUNTING DETAIL

NOT TO SCALE



WEIGHT = 114.6 LBS
Kathrien 800-10966

ANTENNA DETAIL

NOT TO SCALE

STRUCTURAL NOTES:

1. NO CONSTRUCTION OF THE PROPOSED LOADING SHOWN SHALL PROCEED UNTIL ADEQUACY OF THE EXISTING STRUCTURE AND FOUNDATION, INCLUDING THE PROPOSED AT&T ANTENNA MOUNTING CONFIGURATION SHOWN HEREIN, HAS BEEN COMPLETED.
2. THE STRUCTURE ELEVATION IS SHOWN FOR INFORMATIONAL PURPOSES ONLY AND MAY NOT REFLECT AS-BUILT FIELD CONDITIONS FOR ALL EXISTING INVENTORY LOADING/ANTENNAS/APPURTANENCES ON STRUCTURE. REFER TO THE LATEST STRUCTURAL ANALYSIS FOR EXISTING STRUCTURE LOADING AND THE PROPOSED METHOD OF ATTACHMENT OF THE PROPOSED ANTENNAS/CABLES.
3. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, CABLES, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.

MASER CONSULTING CONNECTICUT
Customer Loyalty through Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

EMPIRE telecom

16 ESQUIRE ROAD
BILLERICA, MA 01862

811 Know what's below. Call before you dig.
PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	17963015A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	03/16/18	FOR CONSTRUCTION	AJC	PET
1	1/24/18	ISSUED FOR REVIEW	AJC	RA

PETROS L. SOLIKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577
32577

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

SITE NAME:

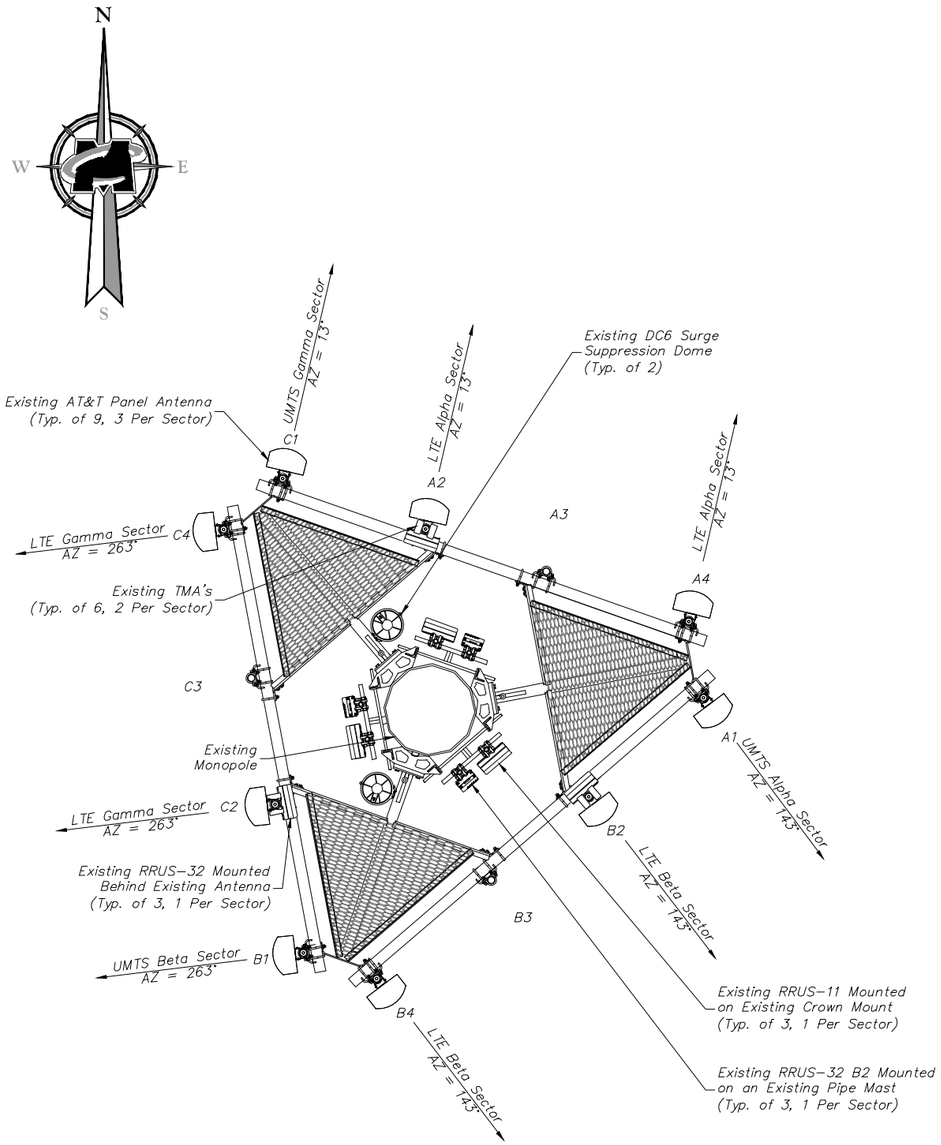
PLAINVILLE CENTER
FA#:10035333
SITE #: CTL01054

10 SPARKS STREET
PLAINVILLE, CT 06062
HARTFORD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :
ELEVATION VIEW, DETAILS AND ANTENNA SCHEDULE

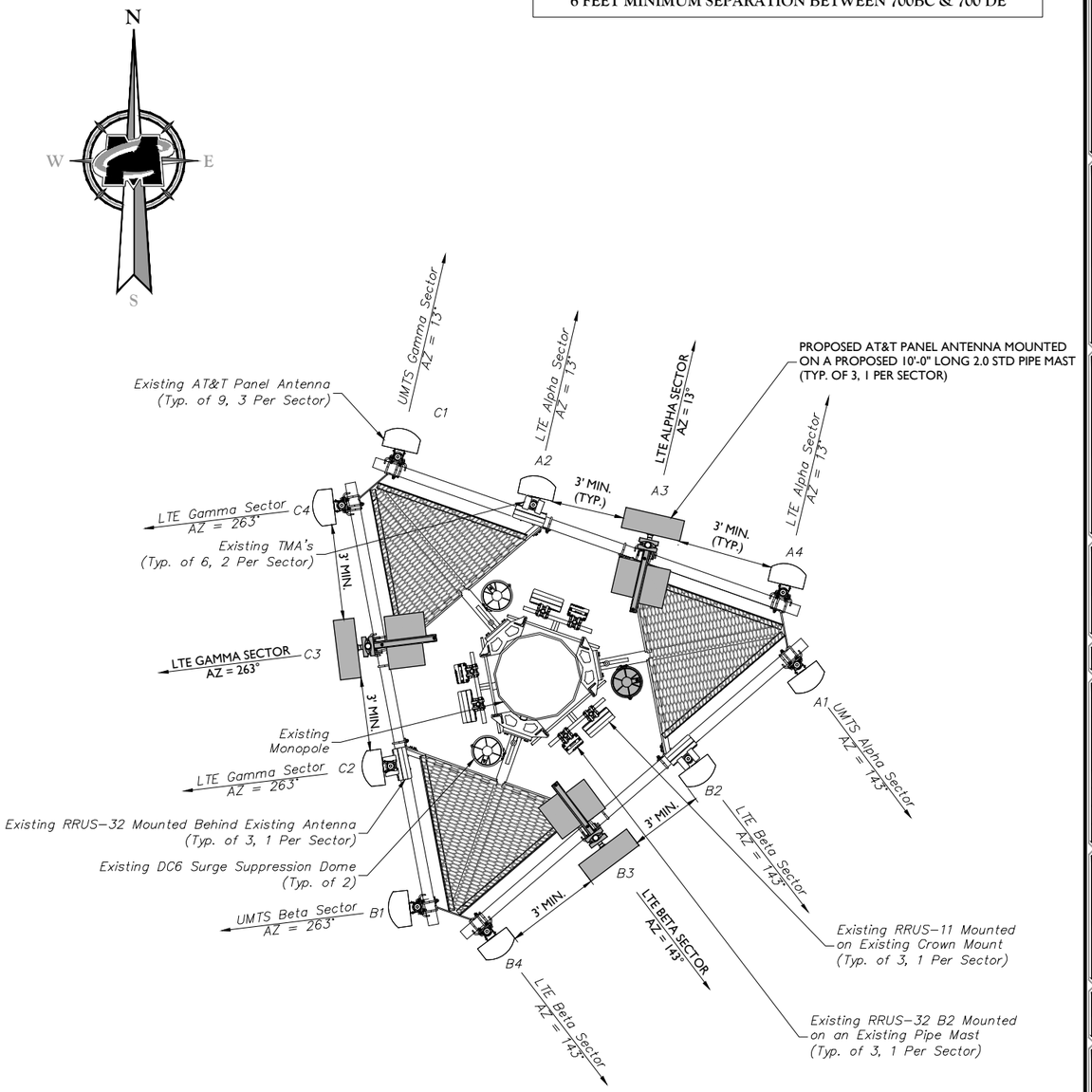
SHEET NUMBER :
A-3



EXISTING - ANTENNA LAYOUT

NOT TO SCALE

3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE



PROPOSED - ANTENNA LAYOUT

NOT TO SCALE

MASER CONSULTING
—CONNECTICUT—
Customer Loyalty *through* Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

EMPIRE telecom

16 ESQUIRE ROAD
BILLERICA, MA 01862

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

PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	17963015A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	03/16/18	FOR CONSTRUCTION	AJC	PET
1	1/24/18	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT
PETROS E. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577
32577
PROFESSIONAL ENGINEER

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

SITE NAME:

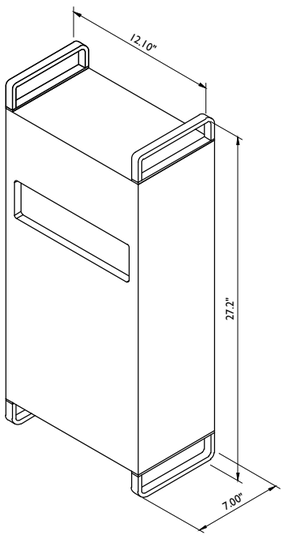
PLAINVILLE CENTER
FA#:10035333
SITE #: CTL01054

10 SPARKS STREET
PLAINVILLE, CT 06062
HARTFORD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :
ANTENNA LAYOUTS

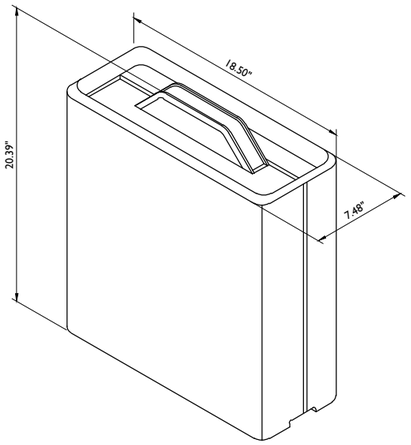
SHEET NUMBER :
A-3



RRUS-32 B66 DIMENSIONS (H X W X D): 27.2" X 12.1" X 7.0"
(INCLUDES HANDLES, FEET AND SUNSHIELD)

WEIGHT: 53 LBS

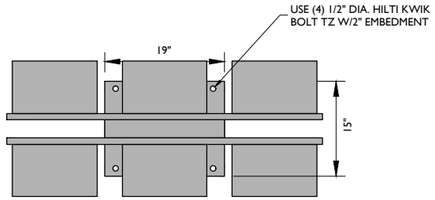
RRUS-32 B66 DETAIL
NOT TO SCALE



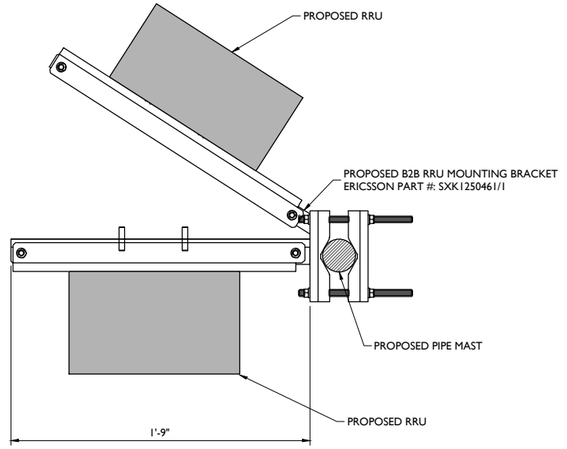
RRUS-32 B66 DIMENSIONS (H X W X D): 20.39" X 18.5" X 7.48"
(INCLUDES HANDLES)

WEIGHT: 53 LBS

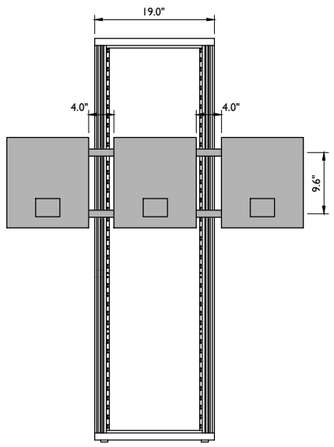
RRUS E2 DETAIL
NOT TO SCALE



PLAN VIEW
TO SCALE



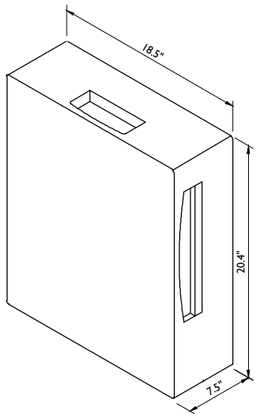
RRU MOUNTING DETAIL
NOT TO SCALE



NOTE:

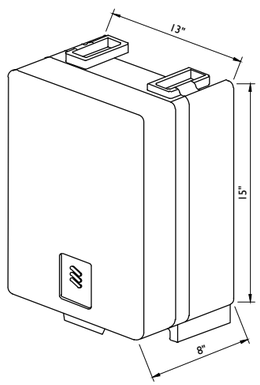
MOUNT RRU'S TO UNISTRUT WITH 3/8"Ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS THROUGH EQUIPMENT MOUNTING HOLES. SUBCONTRACTOR SHALL SUPPLY.

RRU RACK MOUNTED DETAIL
NOT TO SCALE



RRUS-12 DIMENSIONS (H X W X D): 20.4" X 18.5" X 7.5" (INCLUDES SUNSHIELD)
WEIGHT: 58 LBS

RRUS-12 DETAIL
NOT TO SCALE



DIMENSIONS (H X W X D): 15"H X 13"W X 8"D (INCLUDES SUNSHIELD)
WEIGHT: 60 LBS

RRU-4478-B14 DETAIL
NOT TO SCALE

MASER CONSULTING
—CONNECTICUT—

Customer Loyalty *through* Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

EMPIRE telecom

16 ESQUIRE ROAD
BILLERICA, MA 01862

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

PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT:
WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	17963015A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	03/16/18	FOR CONSTRUCTION	AJC	PET
1	1/24/18	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT
PETROS E. SOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577
32577
PROFESSIONAL ENGINEER

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

SITE NAME:

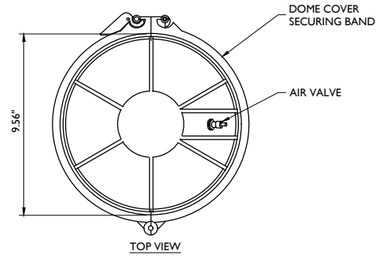
PLAINVILLE CENTER
FA#:10035333
SITE #: CTL01054

10 SPARKS STREET
PLAINVILLE, CT 06062
HARTFORD COUNTY

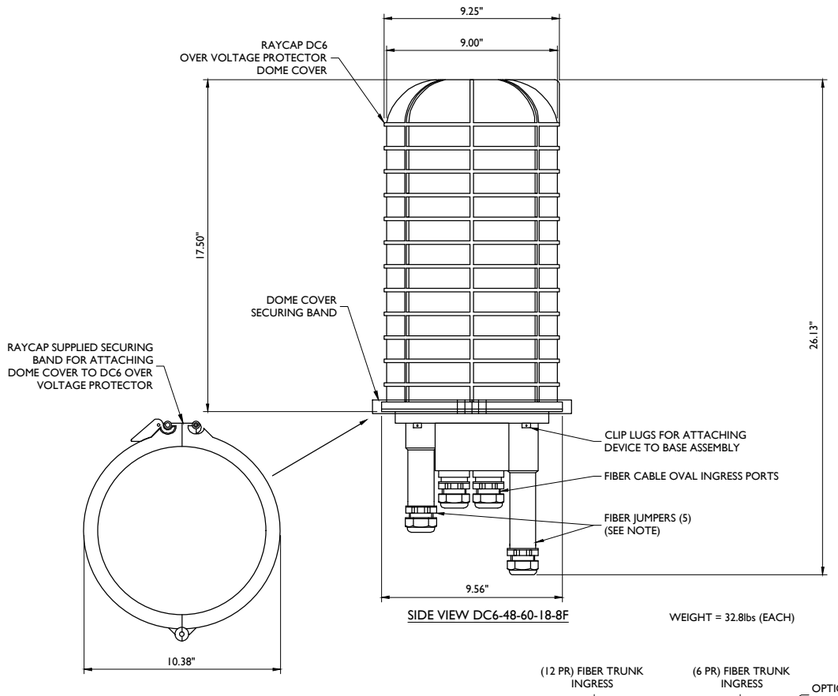
RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :
DETAILS

SHEET NUMBER :
A-4

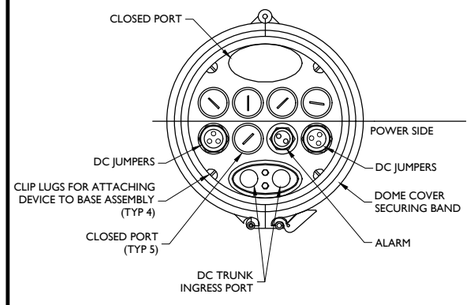


TOP VIEW

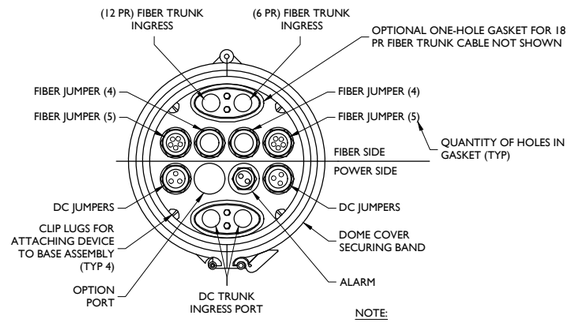


SIDE VIEW DC6-48-60-18-8F

WEIGHT = 32.8lbs (EACH)



BOTTOM VIEW
DC6-48-60-0-8F



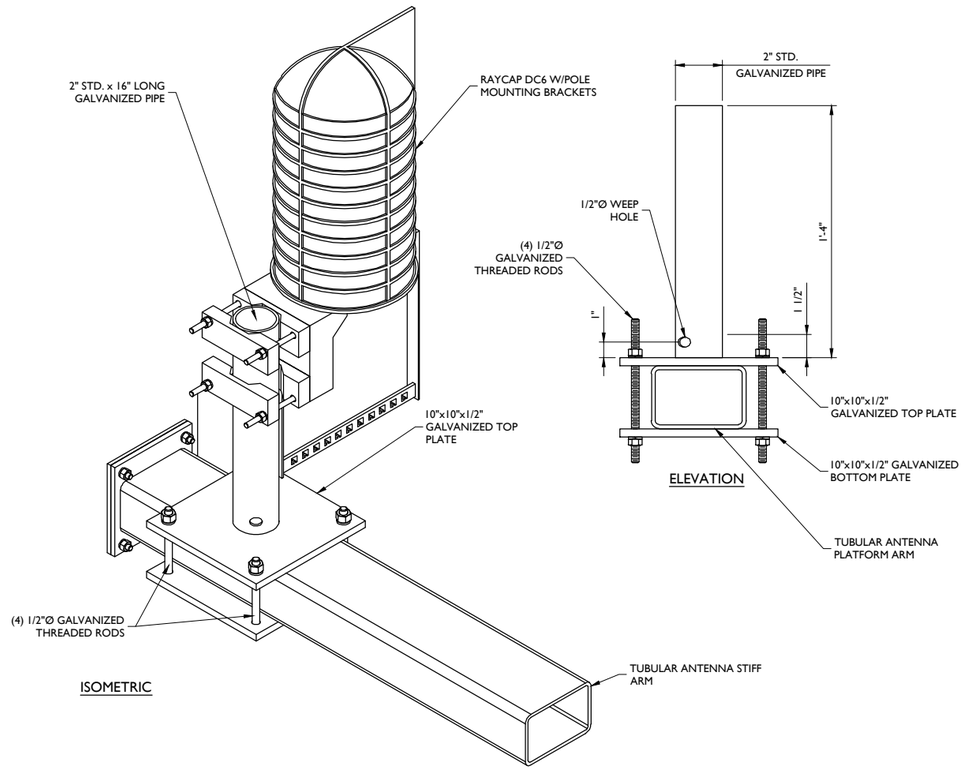
BOTTOM VIEW
DC6-48-60-18-8F

NOTE:

REMOVE CABLE SEALING GLAND AND INSTALL M32x1.5 METRIC-TO-1" NPT ADAPTER (COOPER CROUSE-HINES P/N CAP 740 994 OR EQUIVALENT MFR) WHEN CONNECTING CONDUIT TO OVP.

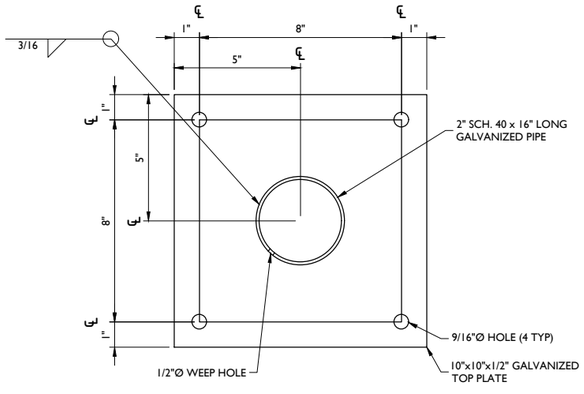
DC6 SURGE SUPPRESSION DOME DETAIL

NOT TO SCALE

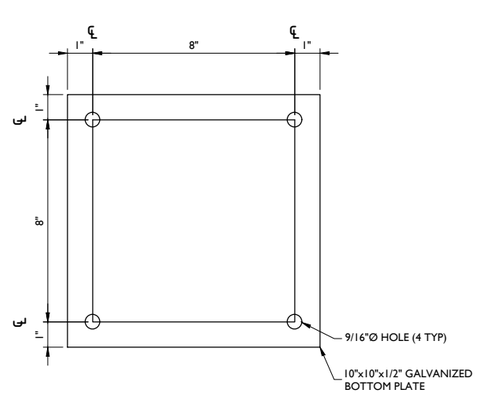


ISOMETRIC

ELEVATION



PLAN
TOP PLATE



PLAN
BOTTOM PLATE

DC6 SURGE SUPPRESSION DOME MOUNTING DETAIL (TUBE)

NOT TO SCALE

MASER CONSULTING
—CONNECTICUT—

Customer Loyalty *through* Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

EMPIRE telecom

16 ESQUIRE ROAD
BILLERICA, MA 01862

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

PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT:
WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	17963015A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	03/16/18	FOR CONSTRUCTION	AJC	PET
1	1/24/18	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT
PETROS E. SOULKALAS
32577
REGISTERED PROFESSIONAL ENGINEER

PETROS E. SOULKALAS
CONNECTICUT PROFESSIONAL
ENGINEER - LICENSE NUMBER: PEN.32577

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

SITE NAME:

PLAINVILLE CENTER
FA#:10035333
SITE #: CTL01054

10 SPARKS STREET
PLAINVILLE, CT 06062
HARTFORD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :

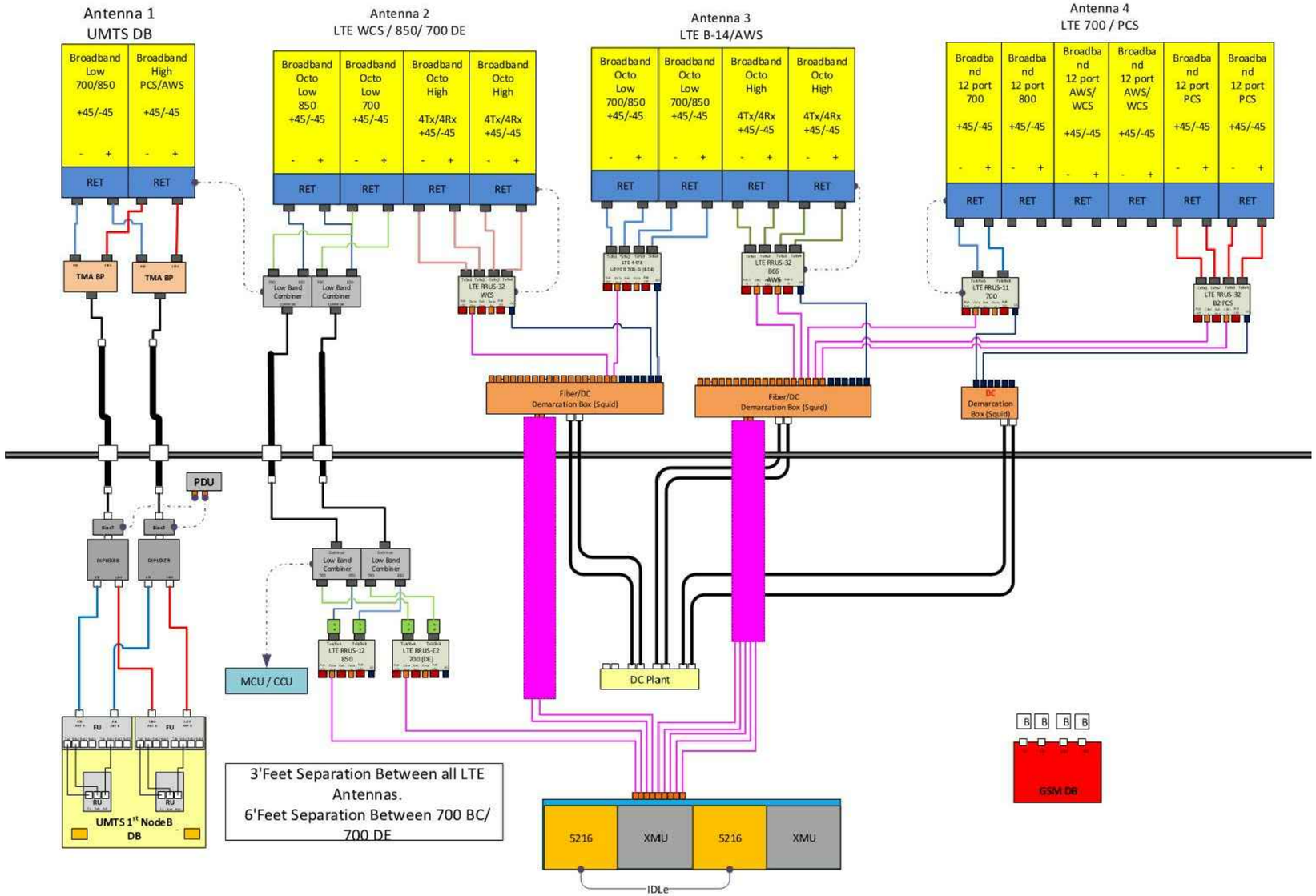
DETAILS

SHEET NUMBER :

A-5

Diagram - Sector	A	Diagram File Name - CT1054_A_B_C_LTE7C_Rev2.vsd					
Atoll Site Name -	CTV1054	Location Name -	PLAINVILLE CENTER	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND

Comments: Important Note: For detailed radio to antenna wiring refer to the latest 4T4R Antenna/ radio Port connections Field Notice (RF-HW-2016-265)



ALL SECTORS

BASED ON: "NEW-ENGLAND_CONNECTICUT_CTV1054_2018-LTE-Next-Carrier_LTE_om636a_2051A0ACL4_10035333_16334_05-30-2017_Final-Approved_v3.00" Last Updated: 11/09/2017.

RF PLUMBING DIAGRAMS

MASER CONSULTING CONNECTICUT
Customer Loyalty *through* Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

EMPIRE telecom

16 ESQUIRE ROAD
BILLERICA, MA 01862

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

PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	17963015A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	03/16/18	FOR CONSTRUCTION	AJC	PET
1	1/24/18	ISSUED FOR REVIEW	AJC	RA

PETROS E. SOULIKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577
32577

SITE NAME:

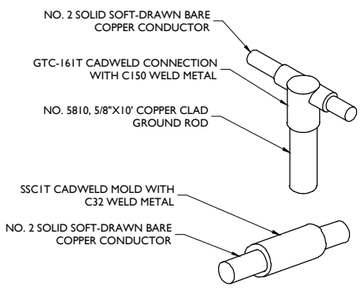
PLAINVILLE CENTER
FA#:10035333
SITE #: CTL01054

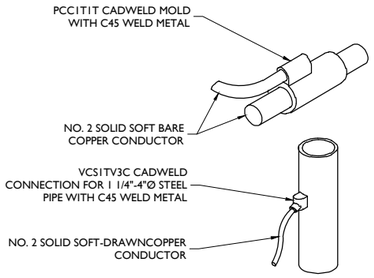
10 SPARKS STREET
PLAINVILLE, CT 06062
HARTFORD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

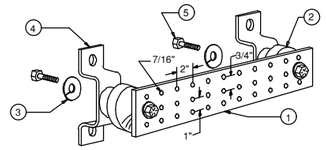
SHEET TITLE :
RF PLUMBING DIAGRAMS

SHEET NUMBER :
A-6





CADWELD DETAILS
NOT TO SCALE



LEGEND

1- TINNED COPPER GROUND BAR, 1/4"x4"x20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.

2- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4

3- 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8

4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-5056

5- 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

6- EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

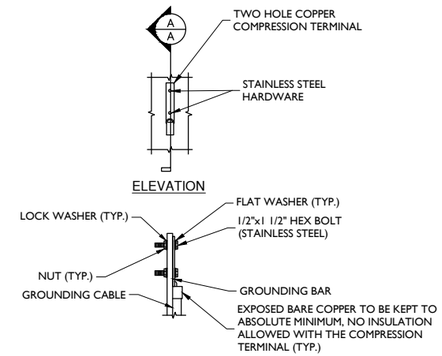
SECTION "P" - SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
+24V POWER SUPPLY RETURN BAR (#2)
-48V POWER SUPPLY RETURN BAR (#2)
RECTIFIER FRAMES.

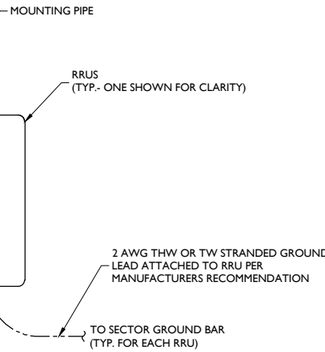
SECTION "A" - SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)

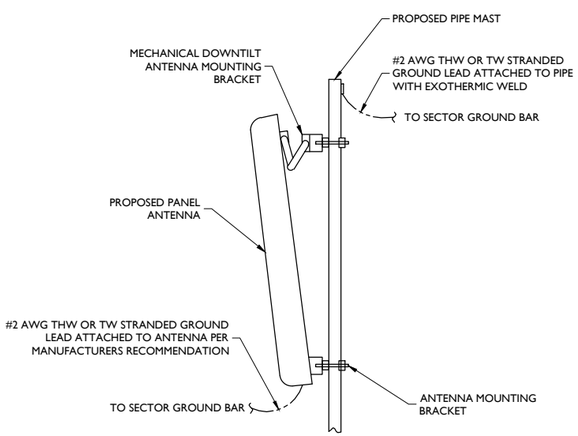
MASTER GROUND BAR
NOT TO SCALE



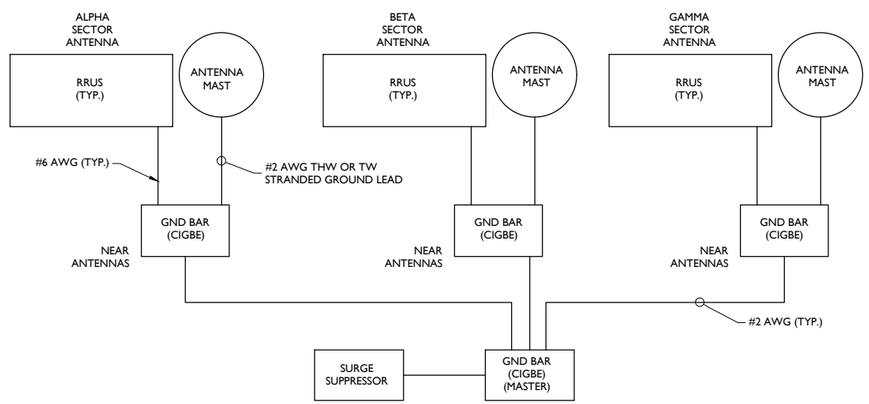
TYPICAL GROUND BAR CONNECTION DETAIL
NOT TO SCALE



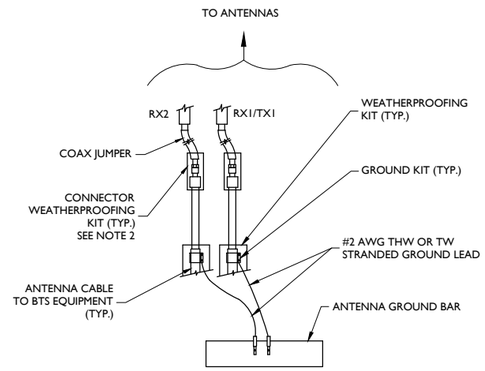
RRU GROUNDING DETAIL
NOT TO SCALE



ANTENNA GROUNDING
NOT TO SCALE



SCHEMATIC DIAGRAM GROUNDING SYSTEM



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

TYPICAL GROUND WIRE TO GROUNDING BAR
NOT TO SCALE

MASER CONSULTING CONNECTICUT
Customer Loyalty *through* Client Satisfaction
www.maserconsulting.com
Engineers ■ Planners ■ Surveyors
Landscape Architects ■ Environmental Scientists

at&t

NEW CINGULAR WIRELESS PCS, LLC
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

EMPIRE telecom

16 ESQUIRE ROAD
BILLERICA, MA 01862

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

PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE :	JOB NUMBER :
AS SHOWN	17963015A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	03/16/18	FOR CONSTRUCTION	AJC	PET
1	1/24/18	ISSUED FOR REVIEW	AJC	RA

STATE OF CONNECTICUT
PETROS T. TSOUKALAS
CONNECTICUT PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577
32577
REGISTERED PROFESSIONAL ENGINEER

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

SITE NAME:

PLAINVILLE CENTER
FA#:10035333
SITE #: CTL01054

10 SPARKS STREET
PLAINVILLE, CT 06062
HARTFORD COUNTY

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :
GROUNDING DETAILS

SHEET NUMBER :
G-1

PAUL J. FORD & COMPANY

Date: **July 16, 2018**

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

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

Subject:	**Structural Modification Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT1054
	Carrier Site Name:	10035333
Crown Castle Designation:	**Crown Castle BU Number:**	876333
	Crown Castle Site Name:	CREATIVE DIMENSIONS
	Crown Castle JDE Job Number:	478074
	Crown Castle Work Order Number:	1578501
	Crown Castle Order Number:	421157 Rev. 1
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37518-2227.001.7700
Site Data:	**10 Sparks St., PLAINVILLE, Hartford County, CT** **Latitude *41° 40' 24.52"*, Longitude *-72° 51' 16.17"*** **137 Foot - Monopole Tower**	

Dear Mr. 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 1202439, in accordance with order 421157, 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:

LC4.5: Modified Structure w/ Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the 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 per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1 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:

Shardul Kadam, P.E.
Project Engineer I

BKK

tnxTower Report - version 7.0.5.1

STATE OF CONNECTICUT
SHARDUL PACHICARAH KADAM
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

JUL 16 2018

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 137 ft Monopole tower designed by PITTSBURG MONOPOLE in April of 1997. The tower was originally designed for a wind speed of 85 mph per TIA-222-F.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the 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 per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1 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
113.0	115.0	3	ericsson	RRUS 32	2	3/4	-
		3	ericsson	RRUS 32 B2			
		3	ericsson	RRUS 32 B66			
		3	ericsson	RRUS 4478 B14			
		6	kaelus	DBC0061F1V51-2			
		3	kathrein	80010966 w/ Mount Pipe			
		6	kathrein	860 10025			
		3	powerwave technologies	1001940			
		3	quintel technology	QS66512-2 w/ Mount Pipe			
		1	raycap	DC6-48-60-0-8F			

Table 2 - Existing 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
124.0	131.0	1	andrew	VHLP1-23	6 4 2	5/16 1-1/4 1/2	1
		1	andrew	VHLP2.5-18			
		2	samsung telecommunications	WIMAX DAP HEAD			
	124.0	3	alcatel lucent	TD-RRH8x20-25			
		3	argus technologies	LLPX310R-V4 w/ Mount Pipe			
		1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe			
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		3	rfs celwave	IBC1900BB-1			
		3	rfs celwave	IBC1900HG-2A			
		3	samsung telecommunications	WIMAX DAP HEAD			
		1	tower mounts	Miscellaneous [NA 507-1]			
		1	tower mounts	Platform Mount (LP 101-1)			
122.0	125.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	-	-	1
	122.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
		1	tower mounts	Pipe Mount [PM 601-3]			
113.0	115.0	3	ericsson	RRUS 32 B30	-	-	2
		3	ericsson	RRUS-11			
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	cci antennas	OPA-65R-LCUU-H8 w/ Mount Pipe	12 2 4	7/8 3/8 3/4	1
		3	ericsson	RRUS-11			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		2	raycap	DC6-48-60-18-8F			
	113.0	1	tower mounts	Miscellaneous [NA 507-1]			
		1	tower mounts	Platform Mount [LP 712-1]			
92.0	93.0	3	andrew	HBX-6516DS-VTM w/ Mount Pipe	6 1	7/8 3/8	3
	92.0	1	tower mounts	T-Arm Mount [TA 602-3]			
50.0	50.0	1	lucent	KS24019-L112A	1	1/2	1
		1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Equipment To Be Removed
3) Abandoned Equipment considered in the analysis

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 Welt, P.E., P.C., 07/23/1996	1529723	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 25662.30277, 7/10/2015	5781873	CCISITES
4-POST-MODIFICATION INSPECTION	PJF, 67310-0038, 07/01/2010	6560711	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 25662.67617, 08/10/2017	7011614	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Hodge Design Associates, M97-0012, 08/07/1997	1616541	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Pittsburg Monopole Division, 367, 04/15/1997	1615369	CCISITES

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 modified in conformance with the referenced modification drawings.
5) Monopole will be modified in conformance with the referenced proposed modification drawings.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
137 - 132	Pole	TP12.75x12.75x0.375	Pole	0.4%	Pass
132 - 127	Pole	TP12.75x12.75x0.375	Pole	2.8%	Pass
127 - 125	Pole	TP12.75x12.75x0.375	Pole	4.0%	Pass
125 - 120	Pole	TP24x24x0.375	Pole	7.3%	Pass
120 - 115	Pole	TP24x24x0.375	Pole	14.6%	Pass
115 - 110	Pole	TP24x24x0.375	Pole	29.4%	Pass
110 - 105	Pole	TP24x24x0.375	Pole	44.8%	Pass
105 - 100	Pole	TP24x24x0.375	Pole	60.4%	Pass
100 - 95	Pole	TP24x24x0.375	Pole	76.4%	Pass
95 - 90	Pole	TP24x24x0.375	Pole	93.3%	Pass
90 - 89.25	Pole	TP24x24x0.375	Pole	95.9%	Pass
89.25 - 89	Pole + Reinf.	TP24x24x0.4938	Pole	75.9%	Pass
89 - 88.75	Pole + Reinf.	TP24x24x0.7	Pole	55.4%	Pass
88.75 - 85.66	Pole + Reinf.	TP24x24x0.7	Pole	61.7%	Pass
85.66 - 85.41	Pole + Reinf.	TP24x24x0.875	Reinf. 2 Tension Rupture	64.6%	Pass
85.41 - 81.2	Pole + Reinf.	TP24x24x0.875	Reinf. 2 Tension Rupture	73.7%	Pass
81.2 - 80.95	Pole + Reinf.	TP24x24x0.7	Pole	71.5%	Pass
80.95 - 80	Pole + Reinf.	TP24x24x0.7	Pole	73.5%	Pass
80 - 79.75	Pole	TP36x36x0.375	Pole	61.8%	Pass
79.75 - 74.75	Pole	TP36x36x0.375	Pole	71.0%	Pass
74.75 - 69.75	Pole	TP36x36x0.375	Pole	80.6%	Pass
69.75 - 65.5	Pole	TP36x36x0.375	Pole	89.1%	Pass
65.5 - 65.25	Pole + Reinf.	TP36x36x0.4625	Pole	73.9%	Pass
65.25 - 60.25	Pole + Reinf.	TP36x36x0.4625	Pole	82.5%	Pass
60.25 - 58.39	Pole + Reinf.	TP36x36x0.4625	Pole	85.8%	Pass
58.39 - 58.14	Pole + Reinf.	TP36x36x0.5625	Pole	72.8%	Pass
58.14 - 57.5	Pole + Reinf.	TP36x36x0.5625	Pole	73.8%	Pass
57.5 - 57.25	Pole + Reinf.	TP36x36x0.475	Pole	88.1%	Pass
57.25 - 54	Pole + Reinf.	TP36x36x0.475	Pole	94.1%	Pass
54 - 53.75	Pole + Reinf.	TP36x36x0.6	Pole	74.8%	Pass
53.75 - 49.5	Pole + Reinf.	TP36x36x0.6	Pole	81.2%	Pass
49.5 - 49.25	Pole + Reinf.	TP36x36x0.7	Pole	70.4%	Pass
49.25 - 44.25	Pole + Reinf.	TP36x36x0.7	Pole	77.1%	Pass
44.25 - 41.5	Pole + Reinf.	TP36x36x0.7	Pole	81.0%	Pass
41.5 - 41.25	Pole + Reinf.	TP36x36x0.6	Pole	93.0%	Pass
41.25 - 40	Pole + Reinf.	TP36x36x0.6	Pole	95.0%	Pass

40 - 39.75	Pole	TP42x42x0.5	Pole	80.4%	Pass
39.75 - 34.75	Pole	TP42x42x0.5	Pole	87.4%	Pass
34.75 - 29.75	Pole	TP42x42x0.5	Pole	94.6%	Pass
29.75 - 29.5	Pole	TP42x42x0.5	Pole	95.0%	Pass
29.5 - 29.25	Pole + Reinf.	TP42x42x0.5	Pole	95.9%	Pass
29.25 - 28.25	Pole + Reinf.	TP42x42x0.5	Pole	97.4%	Pass
28.25 - 28	Pole + Reinf.	TP42x42x0.675	Pole	73.3%	Pass
28 - 23	Pole + Reinf.	TP42x42x0.675	Pole	78.9%	Pass
23 - 19.5	Pole + Reinf.	TP42x42x0.675	Pole	82.9%	Pass
19.5 - 19.25	Pole + Reinf.	TP42x42x0.725	Pole	76.7%	Pass
19.25 - 14.25	Pole + Reinf.	TP42x42x0.725	Pole	82.1%	Pass
14.25 - 9.25	Pole + Reinf.	TP42x42x0.725	Pole	87.7%	Pass
9.25 - 4.25	Pole + Reinf.	TP42x42x0.725	Pole	93.5%	Pass
4.25 - 2.75	Pole + Reinf.	TP42x42x0.725	Pole	95.2%	Pass
2.75 - 2.5	Pole + Reinf.	TP42x42x0.9	Pole	83.4%	Pass
2.5 - 2.25	Pole + Reinf.	TP42x42x1.05	Pole	75.4%	Pass
2.25 - 1.5	Pole + Reinf.	TP42x42x1.05	Pole	76.1%	Pass
1.5 - 1.25	Pole + Reinf.	TP42x42x1	Pole	80.6%	Pass
1.25 - 0	Pole + Reinf.	TP42x42x1	Pole	81.8%	Pass
				Summary	
			Pole	97.4%	Pass
			Reinforcement	88.5%	Pass
			Overall	97.4%	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC4.5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Connection	120	26.7	Pass
1	Flange Connection	80	71.7	Pass
1	Flange Connection	40	92.5	Pass
1	Anchor Rods	0	96.1	Pass
1	Base Plate	0	93.9	Pass
1	Base Foundation Structural Steel	0	82.9	Pass
1	Base Foundation Soil Interaction	0	30.3	Pass

Structure Rating (max from all components) =	**97.4%**

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

4.1) Recommendations

The monopole and its foundation will have sufficient capacity to carry the proposed loading configuration once the proposed modifications are installed.

- Install the proposed modifications per the attached 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:

Tower is located in Hartford County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 97.0 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.00 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50.0 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60.0 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Pole Size*	*Pole Grade*	*Socket Length* *ft*
L1	137.00-132.00	5.00	P12.75x0.375	A53-B-35 (35 ksi)	
L2	132.00-127.00	5.00	P12.75x0.375	A53-B-35 (35 ksi)	
L3	127.00-125.00	2.00	P12.75x0.375	A53-B-35 (35 ksi)	
L4	125.00-120.00	5.00	P24x0.375	A53-B-35 (35 ksi)	
L5	120.00-115.00	5.00	P24x0.375	A53-B-35	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L6	115.00-110.00	5.00	P24x0.375	A53-B-35 (35 ksi)	
L7	110.00-105.00	5.00	P24x0.375	A53-B-35 (35 ksi)	
L8	105.00-100.00	5.00	P24x0.375	A53-B-35 (35 ksi)	
L9	100.00-95.00	5.00	P24x0.375	A53-B-35 (35 ksi)	
L10	95.00-90.00	5.00	P24x0.375	A53-B-35 (35 ksi)	
L11	90.00-89.25	0.75	P24x0.375	A53-B-35 (35 ksi)	
L12	89.25-89.00	0.25	P24x0.49375	A53-B-35 (35 ksi)	
L13	89.00-88.75	0.25	P24x0.7	A53-B-35 (35 ksi)	
L14	88.75-85.66	3.09	P24x0.7	A53-B-35 (35 ksi)	
L15	85.66-85.41	0.25	P24x0.875	A53-B-35 (35 ksi)	
L16	85.41-81.20	4.21	P24x0.875	A53-B-35 (35 ksi)	
L17	81.20-80.95	0.25	P24x0.7	A53-B-35 (35 ksi)	
L18	80.95-80.00	0.95	P24x0.7	A53-B-35 (35 ksi)	
L19	80.00-79.75	0.25	P36x0.375	A53-B-35 (35 ksi)	
L20	79.75-74.75	5.00	P36x0.375	A53-B-35 (35 ksi)	
L21	74.75-69.75	5.00	P36x0.375	A53-B-35 (35 ksi)	
L22	69.75-65.50	4.25	P36x0.375	A53-B-35 (35 ksi)	
L23	65.50-65.25	0.25	P36x0.4625	A53-B-35 (35 ksi)	
L24	65.25-60.25	5.00	P36x0.4625	A53-B-35 (35 ksi)	
L25	60.25-58.39	1.86	P36x0.4625	A53-B-35 (35 ksi)	
L26	58.39-58.14	0.25	P36x0.5625	A53-B-35 (35 ksi)	
L27	58.14-57.50	0.64	P36x0.5625	A53-B-35 (35 ksi)	
L28	57.50-57.25	0.25	P36x0.475	A53-B-35 (35 ksi)	
L29	57.25-54.00	3.25	P36x0.475	A53-B-35 (35 ksi)	
L30	54.00-53.75	0.25	P36x0.6	A53-B-35 (35 ksi)	
L31	53.75-49.50	4.25	P36x0.6	A53-B-35 (35 ksi)	
L32	49.50-49.25	0.25	P36x0.7	A53-B-35 (35 ksi)	
L33	49.25-44.25	5.00	P36x0.7	A53-B-35 (35 ksi)	
L34	44.25-41.50	2.75	P36x0.7	A53-B-35 (35 ksi)	
L35	41.50-41.25	0.25	P36x0.6	A53-B-35 (35 ksi)	
L36	41.25-40.00	1.25	P36x0.6	A53-B-35 (35 ksi)	
L37	40.00-39.75	0.25	P42x0.5	A53-B-35 (35 ksi)	
L38	39.75-34.75	5.00	P42x0.5	A53-B-35 (35 ksi)	
L39	34.75-29.75	5.00	P42x0.5	A53-B-35 (35 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L40	29.75-29.50	0.25	P42x0.5	A53-B-35 (35 ksi)	
L41	29.50-29.25	0.25	P42x0.5	A53-B-35 (35 ksi)	
L42	29.25-28.25	1.00	P42x0.5	A53-B-35 (35 ksi)	
L43	28.25-28.00	0.25	P42x0.675	A53-B-35 (35 ksi)	
L44	28.00-23.00	5.00	P42x0.675	A53-B-35 (35 ksi)	
L45	23.00-19.50	3.50	P42x0.675	A53-B-35 (35 ksi)	
L46	19.50-19.25	0.25	P42x0.725	A53-B-35 (35 ksi)	
L47	19.25-14.25	5.00	P42x0.725	A53-B-35 (35 ksi)	
L48	14.25-9.25	5.00	P42x0.725	A53-B-35 (35 ksi)	
L49	9.25-4.25	5.00	P42x0.725	A53-B-35 (35 ksi)	
L50	4.25-2.75	1.50	P42x0.725	A53-B-35 (35 ksi)	
L51	2.75-2.50	0.25	P42x0.9	A53-B-35 (35 ksi)	
L52	2.50-2.25	0.25	P42x1.05	A53-B-35 (35 ksi)	
L53	2.25-1.50	0.75	P42x1.05	A53-B-35 (35 ksi)	
L54	1.50-1.25	0.25	P42x1	A53-B-35 (35 ksi)	
L55	1.25-0.00	1.25	P42x1	A53-B-35 (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 137.00-132.00				1	1	1			
L2 132.00-127.00				1	1	1			
L3 127.00-125.00				1	1	1			
L4 125.00-120.00				1	1	1			
L5 120.00-115.00				1	1	1			
L6 115.00-110.00				1	1	1			
L7 110.00-105.00				1	1	1			
L8 105.00-100.00				1	1	1			
L9 100.00-95.00				1	1	1			
L10 95.00-90.00				1	1	1			
L11 90.00-89.25				1	1	1			
L12 89.25-89.00				1	1	1.01016			
L13 89.00-88.75				1	1	0.982302			
L14 88.75-85.66				1	1	0.982302			
L15 85.66-				1	1	0.92452			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
85.41									
L16 85.41-81.20				1	1	0.92452			
L17 81.20-80.95				1	1	0.982302			
L18 80.95-80.00				1	1	0.982302			
L19 80.00-79.75				1	1	1			
L20 79.75-74.75				1	1	1			
L21 74.75-69.75				1	1	1			
L22 69.75-65.50				1	1	1			
L23 65.50-65.25				1	1	0.987106			
L24 65.25-60.25				1	1	0.987106			
L25 60.25-58.39				1	1	0.987106			
L26 58.39-58.14				1	1	1.04745			
L27 58.14-57.50				1	1	1.04745			
L28 57.50-57.25				1	1	1.06757			
L29 57.25-54.00				1	1	1.06757			
L30 54.00-53.75				1	1	1.05046			
L31 53.75-49.50				1	1	1.05046			
L32 49.50-49.25				1	1	1.01888			
L33 49.25-44.25				1	1	1.01888			
L34 44.25-41.50				1	1	1.01888			
L35 41.50-41.25				1	1	0.966165			
L36 41.25-40.00				1	1	0.966165			
L37 40.00-39.75				1	1	1			
L38 39.75-34.75				1	1	1			
L39 34.75-29.75				1	1	1			
L40 29.75-29.50				1	1	1			
L41 29.50-29.25				1	1	1.06903			
L42 29.25-28.25				1	1	1.06903			
L43 28.25-28.00				1	1	1.07338			
L44 28.00-23.00				1	1	1.07338			
L45 23.00-19.50				1	1	1.07338			
L46 19.50-19.25				1	1	1.0963			
L47 19.25-14.25				1	1	1.0963			
L48 14.25-9.25				1	1	1.0963			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L49 9.25-4.25				1	1	1.0963			
L50 4.25-2.75				1	1	1.0963			
L51 2.75-2.50				1	1	0.967563			
L52 2.50-2.25				1	1	0.887368			
L53 2.25-1.50				1	1	0.887368			
L54 1.50-1.25				1	1	0.860728			
L55 1.25-0.00				1	1	0.860728			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF4-50A(1/2)	C	No	Inside Pole	124.00 - 0.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
9207(5/16")	C	No	Inside Pole	124.00 - 0.00	6	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
2" Conduit	C	No	Inside Pole	124.00 - 0.00	2	No Ice	0.00	1.16
						1/2" Ice	0.00	1.16
						1" Ice	0.00	1.16
HB114-1-08U4-M5J(1 1/4")	C	No	Inside Pole	124.00 - 0.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
HB114-21U3M12-XXXF(1-1/4")	C	No	Inside Pole	124.00 - 0.00	1	No Ice	0.00	1.22
						1/2" Ice	0.00	1.22
						1" Ice	0.00	1.22
***								
LDF5-50A(7/8")	C	No	Inside Pole	113.00 - 0.00	12	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
FB-L98B-002-75000(3/8")	C	No	Inside Pole	113.00 - 0.00	2	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	113.00 - 0.00	4	No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
2" Conduit	C	No	Inside Pole	113.00 - 0.00	1	No Ice	0.00	1.16
						1/2" Ice	0.00	1.16
						1" Ice	0.00	1.16
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	113.00 - 0.00	1	No Ice	0.08	0.58
						1/2" Ice	0.18	1.38
						1" Ice	0.28	2.78
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	113.00 - 0.00	1	No Ice	0.00	0.58
						1/2" Ice	0.00	1.38
						1" Ice	0.00	2.78
***								
LDF2-50(3/8")	C	No	Inside Pole	92.00 - 0.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
FXL 780 PE(7/8)	C	No	Inside Pole	92.00 - 0.00	6	No Ice	0.00	0.25
						1/2" Ice	0.00	0.25
						1" Ice	0.00	0.25
***								
LDF4-50A(1/2")	C	No	Inside Pole	50.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
***								
WT 4x6.5 Step Ladder	C	No	CaAa (Out Of Face)	40.00 - 0.00	1	No Ice	0.67	6.50
						1/2" Ice	0.78	8.75
						1" Ice	0.89	11.34
WT 4x6.5 Step Ladder	C	No	CaAa (Out Of	80.00 - 40.00	1	No Ice	0.67	6.50

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
			Face)			1/2" Ice	0.78	8.75
						1" Ice	0.89	11.34
***								
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	59.00 - 40.25	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	86.00 - 80.25	1	No Ice	0.13	0.00
						1/2" Ice	0.24	0.00
						1" Ice	0.35	0.00
***								
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	20.50 - 0.50	1	No Ice	0.13	0.00
						1/2" Ice	0.24	0.00
						1" Ice	0.35	0.00
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	50.50 - 40.50	1	No Ice	0.13	0.00
						1/2" Ice	0.24	0.00
						1" Ice	0.35	0.00
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	66.50 - 56.50	1	No Ice	0.13	0.00
						1/2" Ice	0.24	0.00
						1" Ice	0.35	0.00
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	90.50 - 80.50	1	No Ice	0.13	0.00
						1/2" Ice	0.24	0.00
						1" Ice	0.35	0.00
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	44.25 - 35.75	1	No Ice	0.21	28.00
						1/2" Ice	0.32	29.59
						1" Ice	0.43	31.90
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	83.00 - 76.50	1	No Ice	0.17	15.00
						1/2" Ice	0.28	16.80
						1" Ice	0.39	18.60
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	31.00 - 0.00	1	No Ice	0.21	0.00
						1/2" Ice	0.32	0.00
						1" Ice	0.43	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	55.50 - 40.50	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	90.50 - 80.50	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	83.75 - 77.25	1	No Ice	0.17	15.00
						1/2" Ice	0.28	16.80
						1" Ice	0.39	18.60
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	43.25 - 37.25	1	No Ice	0.17	15.00
						1/2" Ice	0.28	16.80
						1" Ice	0.39	18.60

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	137.00-132.00	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	0.000	0.00
L2	132.00-127.00	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	0.000	0.00
L3	127.00-125.00	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	0.000	0.00
L4	125.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L5	120.00-115.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.04
L6	115.00-110.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	0.238	0.06
L7	110.00-105.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.398	0.08
L8	105.00-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.398	0.08
L9	100.00-95.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.398	0.08
L10	95.00-90.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.543	0.08
L11	90.00-89.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.278	0.01
L12	89.25-89.00	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	0.093	0.00
L13	89.00-88.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.093	0.00
L14	88.75-85.66	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.189	0.06
L15	85.66-85.41	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.124	0.00
L16	85.41-81.20	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	2.814	0.14
L17	81.20-80.95	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	0.207	0.01
L18	80.95-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.611	0.05
L19	80.00-79.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.270	0.01
L20	79.75-74.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.689	0.21
L21	74.75-69.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.731	0.12
L22	69.75-65.50	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	3.296	0.10
L23	65.50-65.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.218	0.01
L24	65.25-60.25	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	4.356	0.12
L25	60.25-58.39	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	1.722	0.05
L26	58.39-58.14	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	0.259	0.01
L27	58.14-57.50	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	0.664	0.02
L28	57.50-57.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.259	0.01
L29	57.25-54.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	3.310	0.08
L30	54.00-53.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.270	0.01
L31	53.75-49.50	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	4.713	0.10
L32	49.50-49.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.301	0.01
L33	49.25-44.25	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	6.023	0.12
L34	44.25-41.50	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	4.177	0.17
L35	41.50-41.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.395	0.02
L36	41.25-40.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.787	0.08
L37	40.00-39.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.280	0.02
L38	39.75-34.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.981	0.27
L39	34.75-29.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.991	0.12
L40	29.75-29.50	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	0.239	0.01
L41	29.50-29.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.239	0.01
L42	29.25-28.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.955	0.02
L43	28.25-28.00	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	0.239	0.01
L44	28.00-23.00	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	4.773	0.12
L45	23.00-19.50	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	3.466	0.09
L46	19.50-19.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.270	0.01
L47	19.25-14.25	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	5.398	0.12
L48	14.25-9.25	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	5.398	0.12
L49	9.25-4.25	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	5.398	0.12
L50	4.25-2.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.619	0.04
L51	2.75-2.50	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	0.270	0.01
L52	2.50-2.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	0.270	0.01
L53	2.25-1.50	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	0.810	0.02
L54	1.50-1.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.270	0.01
L55	1.25-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.287	0.03

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	137.00-132.00	A	2.302	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	0.000	0.00
L2	132.00-127.00	A	2.293	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	0.000	0.00
L3	127.00-125.00	A	2.287	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	0.000	0.00
L4	125.00-120.00	A	2.280	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	0.000	0.03
L5	120.00-115.00	A	2.271	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.04
L6	115.00-110.00	A	2.261	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.595	0.12
L7	110.00-105.00	A	2.251	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.648	0.17
L8	105.00-100.00	A	2.240	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.638	0.17
L9	100.00-95.00	A	2.229	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.626	0.17
L10	95.00-90.00	A	2.217	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.253	0.17
L11	90.00-89.25	A	2.210	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	1.347	0.03
L12	89.25-89.00	A	2.209	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	0.449	0.01
L13	89.00-88.75	A	2.208	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	0.449	0.01
L14	88.75-85.66	A	2.204	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.745	0.11
L15	85.66-85.41	A	2.200	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	0.601	0.01
L16	85.41-81.20	A	2.194	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	12.940	0.25
L17	81.20-80.95	A	2.188	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	0.000	0.925	0.02
L18	80.95-80.00	A	2.186	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	2.727	0.08
L19	80.00-79.75	A	2.185	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.743	0.03
L20	79.75-74.75	A	2.178	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	12.069	0.41
L21	74.75-69.75	A	2.163	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	8.297	0.27
L22	69.75-65.50	A	2.149	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	7.630	0.22
L23	65.50-65.25	A	2.142	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	0.563	0.01
L24	65.25-60.25	A	2.133	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	11.228	0.26
L25	60.25-58.39	A	2.121	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	4.552	0.10
L26	58.39-58.14	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	0.718	0.01
L27	58.14-57.50	A	2.115	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	1.838	0.03
L28	57.50-57.25	A	2.114	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	0.717	0.01
L29	57.25-54.00	A	2.107	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	8.777	0.17
L30	54.00-53.75	A	2.100	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	0.725	0.01
L31	53.75-49.50	A	2.092	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	12.881	0.22
L32	49.50-49.25	A	2.082	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	0.868	0.01
L33	49.25-44.25	A	2.071	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	17.297	0.25
L34	44.25-41.50	A	2.053	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	12.378	0.29
L35	41.50-41.25	A	2.046	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	1.179	0.03
L36	41.25-40.00	A	2.042	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.134	0.14
L37	40.00-39.75	A	2.038	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	0.722	0.03
L38	39.75-34.75	A	2.024	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	12.179	0.46
L39	34.75-29.75	A	1.995	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	8.758	0.25
L40	29.75-29.50	A	1.979	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	0.000	0.557	0.01
L41	29.50-29.25	A	1.977	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.557	0.01
L42	29.25-28.25	A	1.973	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	2.226	0.05
L43	28.25-28.00	A	1.968	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	0.556	0.01
L44	28.00-23.00	A	1.949	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	11.053	0.24
L45	23.00-19.50	A	1.914	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	8.208	0.17
L46	19.50-19.25	A	1.896	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	0.681	0.01
L47	19.25-14.25	A	1.869	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	13.496	0.24
L48	14.25-9.25	A	1.804	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	13.214	0.23
L49	9.25-4.25	A	1.707	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	12.792	0.22
L50	4.25-2.75	A	1.598	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	3.697	0.06
L51	2.75-2.50	A	1.553	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	0.606	0.01
L52	2.50-2.25	A	1.537	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	0.603	0.01
L53	2.25-1.50	A	1.501	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.785	0.03
L54	1.50-1.25	A	1.455	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	0.585	0.01
L55	1.25-0.00	A	1.345	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	2.595	0.05

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	137.00-132.00	0.00	0.00	0.00	0.00
L2	132.00-127.00	0.00	0.00	0.00	0.00
L3	127.00-125.00	0.00	0.00	0.00	0.00
L4	125.00-120.00	0.00	0.00	0.00	0.00
L5	120.00-115.00	0.00	0.00	0.00	0.00
L6	115.00-110.00	-0.06	0.03	-0.31	0.18
L7	110.00-105.00	-0.10	0.06	-0.47	0.27
L8	105.00-100.00	-0.10	0.06	-0.47	0.27
L9	100.00-95.00	-0.10	0.06	-0.47	0.27
L10	95.00-90.00	-0.13	0.08	-0.56	0.32
L11	90.00-89.25	-0.41	0.23	-1.12	0.65
L12	89.25-89.00	-0.41	0.23	-1.12	0.65
L13	89.00-88.75	-0.41	0.23	-1.12	0.65

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L14	88.75-85.66	-0.42	0.24	-1.14	0.66
L15	85.66-85.41	-0.52	0.30	-1.31	0.76
L16	85.41-81.20	-0.65	0.38	-1.47	0.85
L17	81.20-80.95	-0.76	0.44	-1.58	0.91
L18	80.95-80.00	-0.63	0.36	-1.42	0.82
L19	80.00-79.75	-1.03	0.60	-1.83	1.06
L20	79.75-74.75	-0.93	0.54	-1.63	0.94
L21	74.75-69.75	-0.78	0.45	-1.29	0.74
L22	69.75-65.50	-0.80	0.46	-1.36	0.78
L23	65.50-65.25	-0.88	0.51	-1.56	0.90
L24	65.25-60.25	-0.88	0.51	-1.56	0.90
L25	60.25-58.39	-0.92	0.53	-1.64	0.95
L26	58.39-58.14	-1.00	0.58	-1.80	1.04
L27	58.14-57.50	-1.00	0.58	-1.80	1.04
L28	57.50-57.25	-1.00	0.58	-1.80	1.04
L29	57.25-54.00	-0.99	0.57	-1.74	1.00
L30	54.00-53.75	-1.03	0.60	-1.81	1.04
L31	53.75-49.50	-1.05	0.61	-1.85	1.07
L32	49.50-49.25	-1.12	0.64	-1.98	1.15
L33	49.25-44.25	-1.12	0.64	-1.98	1.14
L34	44.25-41.50	-1.31	0.76	-2.24	1.29
L35	41.50-41.25	-1.34	0.78	-2.28	1.32
L36	41.25-40.00	-1.26	0.73	-2.15	1.24
L37	40.00-39.75	-1.10	0.64	-1.95	1.13
L38	39.75-34.75	-1.01	0.58	-1.77	1.02
L39	34.75-29.75	-0.84	0.49	-1.43	0.82
L40	29.75-29.50	-0.97	0.56	-1.67	0.97
L41	29.50-29.25	-0.97	0.56	-1.67	0.97
L42	29.25-28.25	-0.97	0.56	-1.67	0.96
L43	28.25-28.00	-0.97	0.56	-1.67	0.96
L44	28.00-23.00	-0.97	0.56	-1.67	0.96
L45	23.00-19.50	-1.00	0.58	-1.73	1.00
L46	19.50-19.25	-1.07	0.62	-1.89	1.09
L47	19.25-14.25	-1.07	0.62	-1.88	1.09
L48	14.25-9.25	-1.07	0.62	-1.86	1.08
L49	9.25-4.25	-1.07	0.62	-1.83	1.06
L50	4.25-2.75	-1.07	0.62	-1.80	1.04
L51	2.75-2.50	-1.07	0.62	-1.78	1.03
L52	2.50-2.25	-1.07	0.62	-1.78	1.03
L53	2.25-1.50	-1.07	0.62	-1.77	1.02
L54	1.50-1.25	-1.07	0.62	-1.75	1.01
L55	1.25-0.00	-1.03	0.60	-1.63	0.94

Shielding Factor Ka

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	K
***									
LLPX310R-V4 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice	4.44 4.77 5.10	2.85 3.37 3.90	0.04 0.08 0.12

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
LLPX310R-V4 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	4.44 4.77 5.10	2.85 3.37 3.90	0.04 0.08 0.12
LLPX310R-V4 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	4.44 4.77 5.10	2.85 3.37 3.90	0.04 0.08 0.12
WIMAX DAP HEAD	A	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	1.55 1.70 1.87	0.68 0.80 0.92	0.03 0.04 0.06
WIMAX DAP HEAD	B	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	1.55 1.70 1.87	0.68 0.80 0.92	0.03 0.04 0.06
WIMAX DAP HEAD	C	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	1.55 1.70 1.87	0.68 0.80 0.92	0.03 0.04 0.06
WIMAX DAP HEAD	B	From Leg	4.00 0.00 7.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	1.55 1.70 1.87	0.68 0.80 0.92	0.03 0.04 0.06
WIMAX DAP HEAD	C	From Leg	4.00 0.00 7.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	1.55 1.70 1.87	0.68 0.80 0.92	0.03 0.04 0.06
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXV9ERR18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	7.47 8.66 9.56	0.09 0.16 0.24
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
IBC1900BB-1	A	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900BB-1	B	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900BB-1	C	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900HG-2A	A	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900HG-2A	B	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04
IBC1900HG-2A	C	From Leg	4.00 0.00 0.00	0.000	124.00	1" Ice No Ice 1/2" Ice 1" Ice	0.97 1.09 1.22	0.46 0.56 0.66	0.02 0.03 0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
TD-RRH8x20-25	A	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8x20-25	B	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8x20-25	C	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
Platform Mount (LP 101-1)	C	None		0.000	124.00	No Ice 1/2" Ice 1" Ice	36.21 42.82 49.43	36.21 42.82 49.43	1.50 2.30 3.10
Miscellaneous [NA 507-1]	C	None		0.000	124.00	No Ice 1/2" Ice 1" Ice	4.80 6.70 8.60	4.80 6.70 8.60	0.25 0.29 0.34
****									
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.00 0.00 3.00	0.000	122.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.00 0.00 3.00	0.000	122.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.00 0.00 3.00	0.000	122.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
800MHz 2X50W RRH W/FILTER	A	From Leg	1.00 0.00 0.00	0.000	122.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
800MHz 2X50W RRH W/FILTER	B	From Leg	1.00 0.00 0.00	0.000	122.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
800MHz 2X50W RRH W/FILTER	C	From Leg	1.00 0.00 0.00	0.000	122.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
Pipe Mount [PM 601-3]	C	None		0.000	122.00	No Ice 1/2" Ice 1" Ice	4.39 5.48 6.57	4.39 5.48 6.57	0.20 0.24 0.28
***									
80010966 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice	17.60 18.33 19.07	9.64 11.15 12.70	0.15 0.26 0.39

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* K
						1" Ice			
80010966 w/ Mount Pipe	B	From Leg	4.00	0.000	113.00	No Ice	17.60	9.64	0.15
			0.00			1/2"	18.33	11.15	0.26
			2.00			Ice	19.07	12.70	0.39
						1" Ice			
80010966 w/ Mount Pipe	C	From Leg	4.00	0.000	113.00	No Ice	17.60	9.64	0.15
			0.00			1/2"	18.33	11.15	0.26
			2.00			Ice	19.07	12.70	0.39
						1" Ice			
QS66512-2 w/ Mount Pipe	A	From Leg	4.00	0.000	113.00	No Ice	3.83	6.22	0.14
			0.00			1/2"	9.29	9.66	0.21
			2.00			Ice	9.91	10.62	0.30
						1" Ice			
QS66512-2 w/ Mount Pipe	B	From Leg	4.00	0.000	113.00	No Ice	3.83	6.22	0.14
			0.00			1/2"	9.29	9.66	0.21
			2.00			Ice	9.91	10.62	0.30
						1" Ice			
QS66512-2 w/ Mount Pipe	C	From Leg	4.00	0.000	113.00	No Ice	3.83	6.22	0.14
			0.00			1/2"	9.29	9.66	0.21
			2.00			Ice	9.91	10.62	0.30
						1" Ice			
RRUS 32	A	From Leg	4.00	0.000	113.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			2.00			Ice	3.32	2.17	0.10
						1" Ice			
RRUS 32	B	From Leg	4.00	0.000	113.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			2.00			Ice	3.32	2.17	0.10
						1" Ice			
RRUS 32	C	From Leg	4.00	0.000	113.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			2.00			Ice	3.32	2.17	0.10
						1" Ice			
1001940	A	From Leg	4.00	0.000	113.00	No Ice	0.18	0.08	0.00
			0.00			1/2"	0.23	0.13	0.00
			2.00			Ice	0.30	0.18	0.01
						1" Ice			
1001940	B	From Leg	4.00	0.000	113.00	No Ice	0.18	0.08	0.00
			0.00			1/2"	0.23	0.13	0.00
			2.00			Ice	0.30	0.18	0.01
						1" Ice			
1001940	C	From Leg	4.00	0.000	113.00	No Ice	0.18	0.08	0.00
			0.00			1/2"	0.23	0.13	0.00
			2.00			Ice	0.30	0.18	0.01
						1" Ice			
(2) DBC0061F1V51-2	A	From Leg	4.00	0.000	113.00	No Ice	0.21	0.41	0.01
			0.00			1/2"	0.28	0.50	0.02
			2.00			Ice	0.35	0.59	0.02
						1" Ice			
(2) DBC0061F1V51-2	B	From Leg	4.00	0.000	113.00	No Ice	0.21	0.41	0.01
			0.00			1/2"	0.28	0.50	0.02
			2.00			Ice	0.35	0.59	0.02
						1" Ice			
(2) DBC0061F1V51-2	C	From Leg	4.00	0.000	113.00	No Ice	0.21	0.41	0.01
			0.00			1/2"	0.28	0.50	0.02
			2.00			Ice	0.35	0.59	0.02
						1" Ice			
RRUS 4478 B14	A	From Leg	4.00	0.000	113.00	No Ice	1.84	1.06	0.06
			0.00			1/2"	2.01	1.20	0.08
			2.00			Ice	2.19	1.34	0.09
						1" Ice			
RRUS 4478 B14	B	From Leg	4.00	0.000	113.00	No Ice	1.84	1.06	0.06
			0.00			1/2"	2.01	1.20	0.08
			2.00			Ice	2.19	1.34	0.09
						1" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS 4478 B14	C	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	1.84 2.01 2.19	1.06 1.20 1.34	0.06 0.08 0.09
RRUS 32 B66	A	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B66	B	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B66	C	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.05 0.07 0.10
DC6-48-60-0-8F	A	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06
RRUS 32 B2	A	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B2	B	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
RRUS 32 B2	C	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	2.73 2.95 3.18	1.67 1.86 2.05	0.05 0.07 0.10
(2) 860 10025	A	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	0.14 0.19 0.25	0.12 0.17 0.23	0.00 0.00 0.01
(2) 860 10025	B	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	0.14 0.19 0.25	0.12 0.17 0.23	0.00 0.00 0.01
(2) 860 10025	C	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	0.14 0.19 0.25	0.12 0.17 0.23	0.00 0.00 0.01
OPA-65R-LCUU-H8 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	12.98 13.67 14.36	9.32 10.79 12.24	0.12 0.21 0.32
OPA-65R-LCUU-H8 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	12.98 13.67 14.36	9.32 10.79 12.24	0.12 0.21 0.32
OPA-65R-LCUU-H8 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	12.98 13.67 14.36	9.32 10.79 12.24	0.12 0.21 0.32
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.000	113.00	No Ice	5.75	4.25	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	6.18	5.01	0.10
			2.00			1" Ice	6.61	5.71	0.16
RRUS-11	A	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.09
RRUS-11	B	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.09
RRUS-11	C	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.09
(2) LGP21401	A	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.35 0.44 0.54	0.01 0.02 0.03
(2) LGP21401	B	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.35 0.44 0.54	0.01 0.02 0.03
(2) LGP21401	C	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.35 0.44 0.54	0.01 0.02 0.03
DC6-48-60-18-8F	A	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06
DC6-48-60-18-8F	A	From Leg	4.00 0.00 2.00	0.000	113.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.02 0.04 0.06
Platform Mount [LP 712-1]	C	None		0.000	113.00	No Ice 1/2" Ice 1" Ice	24.53 29.94 35.35	24.53 29.94 35.35	1.34 1.65 1.96
Miscellaneous [NA 507-1]	C	None		0.000	113.00	No Ice 1/2" Ice 1" Ice	4.80 6.70 8.60	4.80 6.70 8.60	0.25 0.29 0.34
****									
HBX-6516DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.000	92.00	No Ice 1/2" Ice 1" Ice	3.60 4.00 4.39	3.24 3.91 4.56	0.03 0.06 0.10
HBX-6516DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.000	92.00	No Ice 1/2" Ice 1" Ice	3.60 4.00 4.39	3.24 3.91 4.56	0.03 0.06 0.10
HBX-6516DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.000	92.00	No Ice 1/2" Ice 1" Ice	3.60 4.00 4.39	3.24 3.91 4.56	0.03 0.06 0.10
5' x 2' Pipe Mount	A	None		0.000	92.00	No Ice 1/2" Ice 1" Ice	1.00 1.39 1.70	1.00 1.39 1.70	0.03 0.04 0.05
5' x 2' Pipe Mount	B	None		0.000	92.00	No Ice 1/2" Ice 1" Ice	1.00 1.39 1.70	1.00 1.39 1.70	0.03 0.04 0.05
5' x 2' Pipe Mount	C	None		0.000	92.00	No Ice	1.00	1.00	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1/2" Ice	1.39	1.39	0.04
						1" Ice	1.70	1.70	0.05
T-Arm Mount [TA 602-3]	C	None		0.000	92.00	No Ice	11.59	11.59	0.77
						1/2" Ice	15.44	15.44	0.99
						1" Ice	19.29	19.29	1.21
****									
KS24019-L112A	C	From Leg	1.00 0.00 0.00	0.000	50.00	No Ice	0.14	0.14	0.01
						1/2" Ice	0.20	0.20	0.01
						1" Ice	0.26	0.26	0.01
Side Arm Mount [SO 701-1]	C	None		0.000	50.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
***									
Bridge Stiffener (53" x 9" x 1")	A	None		0.000	40.00	No Ice	4.47	0.74	0.11
						1/2" Ice	4.81	1.24	0.13
						1" Ice	5.16	1.71	0.15
Bridge Stiffener (53" x 9" x 1")	B	None		0.000	40.00	No Ice	0.00	0.00	0.11
						1/2" Ice	0.00	0.00	0.13
						1" Ice	0.00	0.00	0.15
Bridge Stiffener (53" x 9" x 1")	C	None		0.000	40.00	No Ice	0.00	0.00	0.11
						1/2" Ice	0.00	0.00	0.13
						1" Ice	0.00	0.00	0.15
Bridge Stiffener (43" x 9.5" x 1")	A	None		0.000	80.00	No Ice	3.66	0.60	0.12
						1/2" Ice	3.95	1.01	0.13
						1" Ice	4.24	1.29	0.15
Bridge Stiffener (43" x 9.5" x 1")	B	None		0.000	80.00	No Ice	0.00	0.00	0.12
						1/2" Ice	0.00	0.00	0.13
						1" Ice	0.00	0.00	0.15
Bridge Stiffener (43" x 9.5" x 1")	C	None		0.000	80.00	No Ice	0.00	0.00	0.12
						1/2" Ice	0.00	0.00	0.13
						1" Ice	0.00	0.00	0.15
****									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP2.5-18	B	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 7.00	0.000		124.00	2.92	No Ice 1/2" Ice 1" Ice	6.68 7.07 7.46	0.05 0.08 0.12
VHLP1-23	C	Paraboloid w/o Radome	From Leg	4.00 0.00 7.00	0.000		124.00	1.27	No Ice 1/2" Ice 1" Ice	1.28 1.45 1.62	0.01 0.02 0.03

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 137.00-132.00	134.50	1.347	31	5.313	A	0.000	5.313	5.313	100.00	0.000	0.000
					B	0.000	5.313		100.00	0.000	0.000
					C	0.000	5.313		100.00	0.000	0.000
L2 132.00-127.00	129.50	1.336	31	5.313	A	0.000	5.313	5.313	100.00	0.000	0.000
					B	0.000	5.313		100.00	0.000	0.000
					C	0.000	5.313		100.00	0.000	0.000
L3 127.00-125.00	126.00	1.329	30	2.125	A	0.000	2.125	2.125	100.00	0.000	0.000
					B	0.000	2.125		100.00	0.000	0.000
					C	0.000	2.125		100.00	0.000	0.000
L4 125.00-120.00	122.50	1.321	30	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	0.000
L5 120.00-115.00	117.50	1.309	30	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	0.000
L6 115.00-110.00	112.50	1.297	30	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	0.238
L7 110.00-105.00	107.50	1.285	29	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	0.398
L8 105.00-100.00	102.50	1.272	29	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	0.398
L9 100.00-95.00	97.50	1.259	29	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	0.398
L10 95.00-90.00	92.50	1.245	28	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	0.543
L11 90.00-89.25	89.63	1.237	28	1.500	A	0.000	1.500	1.500	100.00	0.000	0.000
					B	0.000	1.500		100.00	0.000	0.000
					C	0.000	1.500		100.00	0.000	0.278
L12 89.25-89.00	89.13	1.235	28	0.500	A	0.000	0.500	0.500	100.00	0.000	0.000
					B	0.000	0.500		100.00	0.000	0.000
					C	0.000	0.500		100.00	0.000	0.093
L13 89.00-88.75	88.88	1.235	28	0.500	A	0.000	0.500	0.500	100.00	0.000	0.000
					B	0.000	0.500		100.00	0.000	0.000
					C	0.000	0.500		100.00	0.000	0.093
L14 88.75-85.66	87.21	1.23	28	6.180	A	0.000	6.180	6.180	100.00	0.000	0.000
					B	0.000	6.180		100.00	0.000	0.000
					C	0.000	6.180		100.00	0.000	1.189
L15 85.66-85.41	85.54	1.225	28	0.500	A	0.000	0.500	0.500	100.00	0.000	0.000
					B	0.000	0.500		100.00	0.000	0.000
					C	0.000	0.500		100.00	0.000	0.124
L16 85.41-81.20	83.31	1.218	28	8.420	A	0.000	8.420	8.420	100.00	0.000	0.000
					B	0.000	8.420		100.00	0.000	0.000
					C	0.000	8.420		100.00	0.000	2.814
L17 81.20-80.95	81.08	1.211	28	0.500	A	0.000	0.500	0.500	100.00	0.000	0.000
					B	0.000	0.500		100.00	0.000	0.000
					C	0.000	0.500		100.00	0.000	0.207
L18 80.95-80.00	80.48	1.209	28	1.900	A	0.000	1.900	1.900	100.00	0.000	0.000
					B	0.000	1.900		100.00	0.000	0.000
					C	0.000	1.900		100.00	0.000	0.611
L19 80.00-79.75	79.88	1.207	28	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.270
L20 79.75-74.75	77.25	1.199	27	15.000	A	0.000	15.000	15.000	100.00	0.000	0.000
					B	0.000	15.000		100.00	0.000	0.000
					C	0.000	15.000		100.00	0.000	4.689
L21 74.75-69.75	72.25	1.182	27	15.000	A	0.000	15.000	15.000	100.00	0.000	0.000
					B	0.000	15.000		100.00	0.000	0.000
					C	0.000	15.000		100.00	0.000	3.731

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L22 69.75-65.50	67.63	1.166	27	12.750	A	0.000	12.750	12.750	100.00	0.000	0.000
					B	0.000	12.750		100.00	0.000	0.000
					C	0.000	12.750		100.00	0.000	3.296
L23 65.50-65.25	65.38	1.157	26	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.218
L24 65.25-60.25	62.75	1.147	26	15.000	A	0.000	15.000	15.000	100.00	0.000	0.000
					B	0.000	15.000		100.00	0.000	0.000
					C	0.000	15.000		100.00	0.000	4.356
L25 60.25-58.39	59.32	1.134	26	5.580	A	0.000	5.580	5.580	100.00	0.000	0.000
					B	0.000	5.580		100.00	0.000	0.000
					C	0.000	5.580		100.00	0.000	1.722
L26 58.39-58.14	58.27	1.13	26	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.259
L27 58.14-57.50	57.82	1.128	26	1.920	A	0.000	1.920	1.920	100.00	0.000	0.000
					B	0.000	1.920		100.00	0.000	0.000
					C	0.000	1.920		100.00	0.000	0.664
L28 57.50-57.25	57.38	1.126	26	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.259
L29 57.25-54.00	55.63	1.119	26	9.750	A	0.000	9.750	9.750	100.00	0.000	0.000
					B	0.000	9.750		100.00	0.000	0.000
					C	0.000	9.750		100.00	0.000	3.310
L30 54.00-53.75	53.88	1.111	25	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.270
L31 53.75-49.50	51.63	1.101	25	12.750	A	0.000	12.750	12.750	100.00	0.000	0.000
					B	0.000	12.750		100.00	0.000	0.000
					C	0.000	12.750		100.00	0.000	4.713
L32 49.50-49.25	49.38	1.091	25	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.301
L33 49.25-44.25	46.75	1.078	25	15.000	A	0.000	15.000	15.000	100.00	0.000	0.000
					B	0.000	15.000		100.00	0.000	0.000
					C	0.000	15.000		100.00	0.000	6.023
L34 44.25-41.50	42.88	1.059	24	8.250	A	0.000	8.250	8.250	100.00	0.000	0.000
					B	0.000	8.250		100.00	0.000	0.000
					C	0.000	8.250		100.00	0.000	4.177
L35 41.50-41.25	41.38	1.051	24	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.395
L36 41.25-40.00	40.63	1.047	24	3.750	A	0.000	3.750	3.750	100.00	0.000	0.000
					B	0.000	3.750		100.00	0.000	0.000
					C	0.000	3.750		100.00	0.000	1.787
L37 40.00-39.75	39.88	1.043	24	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.280
L38 39.75-34.75	37.25	1.028	24	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500		100.00	0.000	0.000
					C	0.000	17.500		100.00	0.000	4.981
L39 34.75-29.75	32.25	0.997	23	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500		100.00	0.000	0.000
					C	0.000	17.500		100.00	0.000	3.991
L40 29.75-29.50	29.63	0.98	22	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.239
L41 29.50-29.25	29.38	0.978	22	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.239
L42 29.25-28.25	28.75	0.973	22	3.500	A	0.000	3.500	3.500	100.00	0.000	0.000
					B	0.000	3.500		100.00	0.000	0.000
					C	0.000	3.500		100.00	0.000	0.955
L43 28.25-28.00	28.13	0.969	22	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.239
L44 28.00-23.00	25.50	0.949	22	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	17.500		100.00	0.000	4.773
L45 23.00-19.50	21.25	0.913	21	12.250	A	0.000	12.250	12.250	100.00	0.000	0.000
					B	0.000	12.250		100.00	0.000	0.000
					C	0.000	12.250		100.00	0.000	3.466
L46 19.50-19.25	19.38	0.896	21	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.270
L47 19.25-14.25	16.75	0.869	20	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500		100.00	0.000	0.000
					C	0.000	17.500		100.00	0.000	5.398
L48 14.25-9.25	11.75	0.85	19	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500		100.00	0.000	0.000
					C	0.000	17.500		100.00	0.000	5.398
L49 9.25-4.25	6.75	0.85	19	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500		100.00	0.000	0.000
					C	0.000	17.500		100.00	0.000	5.398
L50 4.25-2.75	3.50	0.85	19	5.250	A	0.000	5.250	5.250	100.00	0.000	0.000
					B	0.000	5.250		100.00	0.000	0.000
					C	0.000	5.250		100.00	0.000	1.619
L51 2.75-2.50	2.63	0.85	19	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.270
L52 2.50-2.25	2.38	0.85	19	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.270
L53 2.25-1.50	1.88	0.85	19	2.625	A	0.000	2.625	2.625	100.00	0.000	0.000
					B	0.000	2.625		100.00	0.000	0.000
					C	0.000	2.625		100.00	0.000	0.810
L54 1.50-1.25	1.38	0.85	19	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.270
L55 1.25-0.00	0.63	0.85	19	4.375	A	0.000	4.375	4.375	100.00	0.000	0.000
					B	0.000	4.375		100.00	0.000	0.000
					C	0.000	4.375		100.00	0.000	1.287

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 137.00-132.00	134.50	1.347	8	2.30	7.231	A	0.000	7.231	7.231	100.00	0.000	0.000
						B	0.000	7.231		100.00	0.000	0.000
						C	0.000	7.231		100.00	0.000	0.000
L2 132.00-127.00	129.50	1.336	8	2.29	7.223	A	0.000	7.223	7.223	100.00	0.000	0.000
						B	0.000	7.223		100.00	0.000	0.000
						C	0.000	7.223		100.00	0.000	0.000
L3 127.00-125.00	126.00	1.329	8	2.29	2.887	A	0.000	2.887	2.887	100.00	0.000	0.000
						B	0.000	2.887		100.00	0.000	0.000
						C	0.000	2.887		100.00	0.000	0.000
L4 125.00-120.00	122.50	1.321	8	2.28	11.900	A	0.000	11.900	11.900	100.00	0.000	0.000
						B	0.000	11.900		100.00	0.000	0.000
						C	0.000	11.900		100.00	0.000	0.000
L5 120.00-115.00	117.50	1.309	8	2.27	11.892	A	0.000	11.892	11.892	100.00	0.000	0.000
						B	0.000	11.892		100.00	0.000	0.000
						C	0.000	11.892		100.00	0.000	0.000
L6 115.00-110.00	112.50	1.297	8	2.26	11.884	A	0.000	11.884	11.884	100.00	0.000	0.000
						B	0.000	11.884		100.00	0.000	0.000
						C	0.000	11.884		100.00	0.000	1.595
L7 110.00-105.00	107.50	1.285	8	2.25	11.876	A	0.000	11.876	11.876	100.00	0.000	0.000
						B	0.000	11.876		100.00	0.000	0.000
						C	0.000	11.876		100.00	0.000	2.648
L8 105.00-	102.50	1.272	8	2.24	11.867	A	0.000	11.867	11.867	100.00	0.000	0.000

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
100.00						B	0.000	11.867		100.00	0.000	0.000
						C	0.000	11.867		100.00	0.000	2.638
L9 100.00-95.00	97.50	1.259	8	2.23	11.857	A	0.000	11.857	11.857	100.00	0.000	0.000
						B	0.000	11.857		100.00	0.000	0.000
						C	0.000	11.857		100.00	0.000	2.626
L10 95.00-90.00	92.50	1.245	8	2.22	11.848	A	0.000	11.848	11.848	100.00	0.000	0.000
						B	0.000	11.848		100.00	0.000	0.000
						C	0.000	11.848		100.00	0.000	3.253
L11 90.00-89.25	89.63	1.237	8	2.21	1.776	A	0.000	1.776	1.776	100.00	0.000	0.000
						B	0.000	1.776		100.00	0.000	0.000
						C	0.000	1.776		100.00	0.000	1.347
L12 89.25-89.00	89.13	1.235	8	2.21	0.592	A	0.000	0.592	0.592	100.00	0.000	0.000
						B	0.000	0.592		100.00	0.000	0.000
						C	0.000	0.592		100.00	0.000	0.449
L13 89.00-88.75	88.88	1.235	8	2.21	0.592	A	0.000	0.592	0.592	100.00	0.000	0.000
						B	0.000	0.592		100.00	0.000	0.000
						C	0.000	0.592		100.00	0.000	0.449
L14 88.75-85.66	87.21	1.23	7	2.20	7.315	A	0.000	7.315	7.315	100.00	0.000	0.000
						B	0.000	7.315		100.00	0.000	0.000
						C	0.000	7.315		100.00	0.000	5.745
L15 85.66-85.41	85.54	1.225	7	2.20	0.592	A	0.000	0.592	0.592	100.00	0.000	0.000
						B	0.000	0.592		100.00	0.000	0.000
						C	0.000	0.592		100.00	0.000	0.601
L16 85.41-81.20	83.31	1.218	7	2.19	9.959	A	0.000	9.959	9.959	100.00	0.000	0.000
						B	0.000	9.959		100.00	0.000	0.000
						C	0.000	9.959		100.00	0.000	12.940
L17 81.20-80.95	81.08	1.211	7	2.19	0.591	A	0.000	0.591	0.591	100.00	0.000	0.000
						B	0.000	0.591		100.00	0.000	0.000
						C	0.000	0.591		100.00	0.000	0.925
L18 80.95-80.00	80.48	1.209	7	2.19	2.246	A	0.000	2.246	2.246	100.00	0.000	0.000
						B	0.000	2.246		100.00	0.000	0.000
						C	0.000	2.246		100.00	0.000	2.727
L19 80.00-79.75	79.88	1.207	7	2.18	0.841	A	0.000	0.841	0.841	100.00	0.000	0.000
						B	0.000	0.841		100.00	0.000	0.000
						C	0.000	0.841		100.00	0.000	0.743
L20 79.75-74.75	77.25	1.199	7	2.18	16.815	A	0.000	16.815	16.815	100.00	0.000	0.000
						B	0.000	16.815		100.00	0.000	0.000
						C	0.000	16.815		100.00	0.000	12.069
L21 74.75-69.75	72.25	1.182	7	2.16	16.803	A	0.000	16.803	16.803	100.00	0.000	0.000
						B	0.000	16.803		100.00	0.000	0.000
						C	0.000	16.803		100.00	0.000	8.297
L22 69.75-65.50	67.63	1.166	7	2.15	14.272	A	0.000	14.272	14.272	100.00	0.000	0.000
						B	0.000	14.272		100.00	0.000	0.000
						C	0.000	14.272		100.00	0.000	7.630
L23 65.50-65.25	65.38	1.157	7	2.14	0.839	A	0.000	0.839	0.839	100.00	0.000	0.000
						B	0.000	0.839		100.00	0.000	0.000
						C	0.000	0.839		100.00	0.000	0.563
L24 65.25-60.25	62.75	1.147	7	2.13	16.777	A	0.000	16.777	16.777	100.00	0.000	0.000
						B	0.000	16.777		100.00	0.000	0.000
						C	0.000	16.777		100.00	0.000	11.228
L25 60.25-58.39	59.32	1.134	7	2.12	6.237	A	0.000	6.237	6.237	100.00	0.000	0.000
						B	0.000	6.237		100.00	0.000	0.000
						C	0.000	6.237		100.00	0.000	4.552
L26 58.39-58.14	58.27	1.13	7	2.12	0.838	A	0.000	0.838	0.838	100.00	0.000	0.000
						B	0.000	0.838		100.00	0.000	0.000
						C	0.000	0.838		100.00	0.000	0.718
L27 58.14-57.50	57.82	1.128	7	2.12	2.146	A	0.000	2.146	2.146	100.00	0.000	0.000
						B	0.000	2.146		100.00	0.000	0.000
						C	0.000	2.146		100.00	0.000	1.838
L28 57.50-57.25	57.38	1.126	7	2.11	0.838	A	0.000	0.838	0.838	100.00	0.000	0.000
						B	0.000	0.838		100.00	0.000	0.000
						C	0.000	0.838		100.00	0.000	0.717
L29 57.25-54.00	55.63	1.119	7	2.11	10.891	A	0.000	10.891	10.891	100.00	0.000	0.000
						B	0.000	10.891		100.00	0.000	0.000
						C	0.000	10.891		100.00	0.000	8.777
L30 54.00-53.75	53.88	1.111	7	2.10	0.838	A	0.000	0.838	0.838	100.00	0.000	0.000
						B	0.000	0.838		100.00	0.000	0.000
						C	0.000	0.838		100.00	0.000	0.725

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L31 53.75-49.50	51.63	1.101	7	2.09	14.232	A	0.000	14.232	14.232	100.00	0.000	0.000
						B	0.000	14.232		100.00	0.000	0.000
						C	0.000	14.232		100.00	0.000	12.881
L32 49.50-49.25	49.38	1.091	7	2.08	0.837	A	0.000	0.837	0.837	100.00	0.000	0.000
						B	0.000	0.837		100.00	0.000	0.000
						C	0.000	0.837		100.00	0.000	0.868
L33 49.25-44.25	46.75	1.078	7	2.07	16.726	A	0.000	16.726	16.726	100.00	0.000	0.000
						B	0.000	16.726		100.00	0.000	0.000
						C	0.000	16.726		100.00	0.000	17.297
L34 44.25-41.50	42.88	1.059	6	2.05	9.191	A	0.000	9.191	9.191	100.00	0.000	0.000
						B	0.000	9.191		100.00	0.000	0.000
						C	0.000	9.191		100.00	0.000	12.378
L35 41.50-41.25	41.38	1.051	6	2.05	0.835	A	0.000	0.835	0.835	100.00	0.000	0.000
						B	0.000	0.835		100.00	0.000	0.000
						C	0.000	0.835		100.00	0.000	1.179
L36 41.25-40.00	40.63	1.047	6	2.04	4.175	A	0.000	4.175	4.175	100.00	0.000	0.000
						B	0.000	4.175		100.00	0.000	0.000
						C	0.000	4.175		100.00	0.000	5.134
L37 40.00-39.75	39.88	1.043	6	2.04	0.960	A	0.000	0.960	0.960	100.00	0.000	0.000
						B	0.000	0.960		100.00	0.000	0.000
						C	0.000	0.960		100.00	0.000	0.722
L38 39.75-34.75	37.25	1.028	6	2.02	19.187	A	0.000	19.187	19.187	100.00	0.000	0.000
						B	0.000	19.187		100.00	0.000	0.000
						C	0.000	19.187		100.00	0.000	12.179
L39 34.75-29.75	32.25	0.997	6	2.00	19.163	A	0.000	19.163	19.163	100.00	0.000	0.000
						B	0.000	19.163		100.00	0.000	0.000
						C	0.000	19.163		100.00	0.000	8.758
L40 29.75-29.50	29.63	0.98	6	1.98	0.957	A	0.000	0.957	0.957	100.00	0.000	0.000
						B	0.000	0.957		100.00	0.000	0.000
						C	0.000	0.957		100.00	0.000	0.557
L41 29.50-29.25	29.38	0.978	6	1.98	0.957	A	0.000	0.957	0.957	100.00	0.000	0.000
						B	0.000	0.957		100.00	0.000	0.000
						C	0.000	0.957		100.00	0.000	0.557
L42 29.25-28.25	28.75	0.973	6	1.97	3.829	A	0.000	3.829	3.829	100.00	0.000	0.000
						B	0.000	3.829		100.00	0.000	0.000
						C	0.000	3.829		100.00	0.000	2.226
L43 28.25-28.00	28.13	0.969	6	1.97	0.957	A	0.000	0.957	0.957	100.00	0.000	0.000
						B	0.000	0.957		100.00	0.000	0.000
						C	0.000	0.957		100.00	0.000	0.556
L44 28.00-23.00	25.50	0.949	6	1.95	19.124	A	0.000	19.124	19.124	100.00	0.000	0.000
						B	0.000	19.124		100.00	0.000	0.000
						C	0.000	19.124		100.00	0.000	11.053
L45 23.00-19.50	21.25	0.913	6	1.91	13.366	A	0.000	13.366	13.366	100.00	0.000	0.000
						B	0.000	13.366		100.00	0.000	0.000
						C	0.000	13.366		100.00	0.000	8.208
L46 19.50-19.25	19.38	0.896	5	1.90	0.954	A	0.000	0.954	0.954	100.00	0.000	0.000
						B	0.000	0.954		100.00	0.000	0.000
						C	0.000	0.954		100.00	0.000	0.681
L47 19.25-14.25	16.75	0.869	5	1.87	19.057	A	0.000	19.057	19.057	100.00	0.000	0.000
						B	0.000	19.057		100.00	0.000	0.000
						C	0.000	19.057		100.00	0.000	13.496
L48 14.25-9.25	11.75	0.85	5	1.80	19.003	A	0.000	19.003	19.003	100.00	0.000	0.000
						B	0.000	19.003		100.00	0.000	0.000
						C	0.000	19.003		100.00	0.000	13.214
L49 9.25-4.25	6.75	0.85	5	1.71	18.922	A	0.000	18.922	18.922	100.00	0.000	0.000
						B	0.000	18.922		100.00	0.000	0.000
						C	0.000	18.922		100.00	0.000	12.792
L50 4.25-2.75	3.50	0.85	5	1.60	5.650	A	0.000	5.650	5.650	100.00	0.000	0.000
						B	0.000	5.650		100.00	0.000	0.000
						C	0.000	5.650		100.00	0.000	3.697
L51 2.75-2.50	2.63	0.85	5	1.55	0.940	A	0.000	0.940	0.940	100.00	0.000	0.000
						B	0.000	0.940		100.00	0.000	0.000
						C	0.000	0.940		100.00	0.000	0.606
L52 2.50-2.25	2.38	0.85	5	1.54	0.939	A	0.000	0.939	0.939	100.00	0.000	0.000
						B	0.000	0.939		100.00	0.000	0.000
						C	0.000	0.939		100.00	0.000	0.603
L53 2.25-1.50	1.88	0.85	5	1.50	2.813	A	0.000	2.813	2.813	100.00	0.000	0.000
						B	0.000	2.813		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	0.000	2.813		100.00	0.000	1.785
L54 1.50-1.25	1.38	0.85	5	1.46	0.936	A	0.000	0.936	0.936	100.00	0.000	0.000
						B	0.000	0.936		100.00	0.000	0.000
						C	0.000	0.936		100.00	0.000	0.585
L55 1.25-0.00	0.63	0.85	5	1.35	4.655	A	0.000	4.655	4.655	100.00	0.000	0.000
						B	0.000	4.655		100.00	0.000	0.000
						C	0.000	4.655		100.00	0.000	2.595

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 137.00-132.00	134.50	1.347	11	5.313	A	0.000	5.313	5.313	100.00	0.000	0.000
					B	0.000	5.313		100.00	0.000	0.000
					C	0.000	5.313		100.00	0.000	0.000
L2 132.00-127.00	129.50	1.336	10	5.313	A	0.000	5.313	5.313	100.00	0.000	0.000
					B	0.000	5.313		100.00	0.000	0.000
					C	0.000	5.313		100.00	0.000	0.000
L3 127.00-125.00	126.00	1.329	10	2.125	A	0.000	2.125	2.125	100.00	0.000	0.000
					B	0.000	2.125		100.00	0.000	0.000
					C	0.000	2.125		100.00	0.000	0.000
L4 125.00-120.00	122.50	1.321	10	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	0.000
L5 120.00-115.00	117.50	1.309	10	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	0.000
L6 115.00-110.00	112.50	1.297	10	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	0.238
L7 110.00-105.00	107.50	1.285	10	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	0.398
L8 105.00-100.00	102.50	1.272	10	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	0.398
L9 100.00-95.00	97.50	1.259	10	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	0.398
L10 95.00-90.00	92.50	1.245	10	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	0.543
L11 90.00-89.25	89.63	1.237	10	1.500	A	0.000	1.500	1.500	100.00	0.000	0.000
					B	0.000	1.500		100.00	0.000	0.000
					C	0.000	1.500		100.00	0.000	0.278
L12 89.25-89.00	89.13	1.235	10	0.500	A	0.000	0.500	0.500	100.00	0.000	0.000
					B	0.000	0.500		100.00	0.000	0.000
					C	0.000	0.500		100.00	0.000	0.093
L13 89.00-88.75	88.88	1.235	10	0.500	A	0.000	0.500	0.500	100.00	0.000	0.000
					B	0.000	0.500		100.00	0.000	0.000
					C	0.000	0.500		100.00	0.000	0.093
L14 88.75-85.66	87.21	1.23	10	6.180	A	0.000	6.180	6.180	100.00	0.000	0.000
					B	0.000	6.180		100.00	0.000	0.000
					C	0.000	6.180		100.00	0.000	1.189
L15 85.66-85.41	85.54	1.225	10	0.500	A	0.000	0.500	0.500	100.00	0.000	0.000
					B	0.000	0.500		100.00	0.000	0.000
					C	0.000	0.500		100.00	0.000	0.124
L16 85.41-81.20	83.31	1.218	10	8.420	A	0.000	8.420	8.420	100.00	0.000	0.000
					B	0.000	8.420		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	8.420		100.00	0.000	2.814
L17 81.20-80.95	81.08	1.211	9	0.500	A	0.000	0.500	0.500	100.00	0.000	0.000
					B	0.000	0.500		100.00	0.000	0.000
					C	0.000	0.500		100.00	0.000	0.207
L18 80.95-80.00	80.48	1.209	9	1.900	A	0.000	1.900	1.900	100.00	0.000	0.000
					B	0.000	1.900		100.00	0.000	0.000
					C	0.000	1.900		100.00	0.000	0.611
L19 80.00-79.75	79.88	1.207	9	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.270
L20 79.75-74.75	77.25	1.199	9	15.000	A	0.000	15.000	15.000	100.00	0.000	0.000
					B	0.000	15.000		100.00	0.000	0.000
					C	0.000	15.000		100.00	0.000	4.689
L21 74.75-69.75	72.25	1.182	9	15.000	A	0.000	15.000	15.000	100.00	0.000	0.000
					B	0.000	15.000		100.00	0.000	0.000
					C	0.000	15.000		100.00	0.000	3.731
L22 69.75-65.50	67.63	1.166	9	12.750	A	0.000	12.750	12.750	100.00	0.000	0.000
					B	0.000	12.750		100.00	0.000	0.000
					C	0.000	12.750		100.00	0.000	3.296
L23 65.50-65.25	65.38	1.157	9	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.218
L24 65.25-60.25	62.75	1.147	9	15.000	A	0.000	15.000	15.000	100.00	0.000	0.000
					B	0.000	15.000		100.00	0.000	0.000
					C	0.000	15.000		100.00	0.000	4.356
L25 60.25-58.39	59.32	1.134	9	5.580	A	0.000	5.580	5.580	100.00	0.000	0.000
					B	0.000	5.580		100.00	0.000	0.000
					C	0.000	5.580		100.00	0.000	1.722
L26 58.39-58.14	58.27	1.13	9	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.259
L27 58.14-57.50	57.82	1.128	9	1.920	A	0.000	1.920	1.920	100.00	0.000	0.000
					B	0.000	1.920		100.00	0.000	0.000
					C	0.000	1.920		100.00	0.000	0.664
L28 57.50-57.25	57.38	1.126	9	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.259
L29 57.25-54.00	55.63	1.119	9	9.750	A	0.000	9.750	9.750	100.00	0.000	0.000
					B	0.000	9.750		100.00	0.000	0.000
					C	0.000	9.750		100.00	0.000	3.310
L30 54.00-53.75	53.88	1.111	9	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.270
L31 53.75-49.50	51.63	1.101	9	12.750	A	0.000	12.750	12.750	100.00	0.000	0.000
					B	0.000	12.750		100.00	0.000	0.000
					C	0.000	12.750		100.00	0.000	4.713
L32 49.50-49.25	49.38	1.091	9	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.301
L33 49.25-44.25	46.75	1.078	8	15.000	A	0.000	15.000	15.000	100.00	0.000	0.000
					B	0.000	15.000		100.00	0.000	0.000
					C	0.000	15.000		100.00	0.000	6.023
L34 44.25-41.50	42.88	1.059	8	8.250	A	0.000	8.250	8.250	100.00	0.000	0.000
					B	0.000	8.250		100.00	0.000	0.000
					C	0.000	8.250		100.00	0.000	4.177
L35 41.50-41.25	41.38	1.051	8	0.750	A	0.000	0.750	0.750	100.00	0.000	0.000
					B	0.000	0.750		100.00	0.000	0.000
					C	0.000	0.750		100.00	0.000	0.395
L36 41.25-40.00	40.63	1.047	8	3.750	A	0.000	3.750	3.750	100.00	0.000	0.000
					B	0.000	3.750		100.00	0.000	0.000
					C	0.000	3.750		100.00	0.000	1.787
L37 40.00-39.75	39.88	1.043	8	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.280
L38 39.75-34.75	37.25	1.028	8	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500		100.00	0.000	0.000
					C	0.000	17.500		100.00	0.000	4.981
L39 34.75-	32.25	0.997	8	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
29.75					B	0.000	17.500		100.00	0.000	0.000
					C	0.000	17.500		100.00	0.000	3.991
L40 29.75-29.50	29.63	0.98	8	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.239
L41 29.50-29.25	29.38	0.978	8	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.239
L42 29.25-28.25	28.75	0.973	8	3.500	A	0.000	3.500	3.500	100.00	0.000	0.000
					B	0.000	3.500		100.00	0.000	0.000
					C	0.000	3.500		100.00	0.000	0.955
L43 28.25-28.00	28.13	0.969	8	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.239
L44 28.00-23.00	25.50	0.949	7	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500		100.00	0.000	0.000
					C	0.000	17.500		100.00	0.000	4.773
L45 23.00-19.50	21.25	0.913	7	12.250	A	0.000	12.250	12.250	100.00	0.000	0.000
					B	0.000	12.250		100.00	0.000	0.000
					C	0.000	12.250		100.00	0.000	3.466
L46 19.50-19.25	19.38	0.896	7	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.270
L47 19.25-14.25	16.75	0.869	7	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500		100.00	0.000	0.000
					C	0.000	17.500		100.00	0.000	5.398
L48 14.25-9.25	11.75	0.85	7	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500		100.00	0.000	0.000
					C	0.000	17.500		100.00	0.000	5.398
L49 9.25-4.25	6.75	0.85	7	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500		100.00	0.000	0.000
					C	0.000	17.500		100.00	0.000	5.398
L50 4.25-2.75	3.50	0.85	7	5.250	A	0.000	5.250	5.250	100.00	0.000	0.000
					B	0.000	5.250		100.00	0.000	0.000
					C	0.000	5.250		100.00	0.000	1.619
L51 2.75-2.50	2.63	0.85	7	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.270
L52 2.50-2.25	2.38	0.85	7	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.270
L53 2.25-1.50	1.88	0.85	7	2.625	A	0.000	2.625	2.625	100.00	0.000	0.000
					B	0.000	2.625		100.00	0.000	0.000
					C	0.000	2.625		100.00	0.000	0.810
L54 1.50-1.25	1.38	0.85	7	0.875	A	0.000	0.875	0.875	100.00	0.000	0.000
					B	0.000	0.875		100.00	0.000	0.000
					C	0.000	0.875		100.00	0.000	0.270
L55 1.25-0.00	0.63	0.85	7	4.375	A	0.000	4.375	4.375	100.00	0.000	0.000
					B	0.000	4.375		100.00	0.000	0.000
					C	0.000	4.375		100.00	0.000	1.287

Load Combinations

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	137 - 132	Pole	Max Tension	48	0.00	0	0
			Max. Compression	26	-0.51	0	0
			Max. Mx	20	-0.28	0	0
			Max. My	2	-0.28	0	0
			Max. Vy	20	-0.20	0	0
			Max. Vx	2	-0.20	0	0
L2	132 - 127	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-1.29	-1	-1
			Max. Mx	8	-0.61	-4	0
			Max. My	14	-0.62	-1	-3
			Max. Vy	20	-0.87	4	0
			Max. Vx	2	-0.75	0	3
			Max. Torque	4			-1
L3	127 - 125	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-1.49	-1	-1
			Max. Mx	8	-0.72	-6	-1
			Max. My	14	-0.73	-1	-5
			Max. Vy	20	-0.95	6	1
			Max. Vx	2	-0.83	1	5
			Max. Torque	4			-1
L4	125 - 120	Pole	Max Tension	1	0.00	0	0

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-15.45	-1	-1
			Max. Mx	20	-4.89	36	1
			Max. My	14	-4.92	-2	-34
			Max. Vy	20	-7.56	36	1
			Max. Vx	2	-7.41	1	34
			Max. Torque	4			-1
L5	120 - 115	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-16.43	-1	-1
			Max. Mx	20	-5.49	75	2
			Max. My	2	-5.50	2	72
			Max. Vy	20	-7.92	75	2
			Max. Vx	2	-7.77	2	72
			Max. Torque	4			-1
L6	115 - 110	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-32.28	-1	1
			Max. Mx	20	-10.32	151	3
			Max. My	2	-10.34	3	148
			Max. Vy	20	-16.25	151	3
			Max. Vx	2	-16.09	3	148
			Max. Torque	4			-1
L7	110 - 105	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-33.39	-1	1
			Max. Mx	20	-11.00	234	4
			Max. My	2	-11.02	3	230
			Max. Vy	20	-16.60	234	4
			Max. Vx	2	-16.44	3	230
			Max. Torque	4			-1
L8	105 - 100	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-34.51	-1	1
			Max. Mx	20	-11.70	317	4
			Max. My	2	-11.72	4	313
			Max. Vy	20	-16.94	317	4
			Max. Vx	2	-16.78	4	313
			Max. Torque	4			-1
L9	100 - 95	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-35.62	0	0
			Max. Mx	20	-12.41	403	5
			Max. My	2	-12.44	5	397
			Max. Vy	20	-17.25	403	5
			Max. Vx	2	-17.09	5	397
			Max. Torque	4			-1
L10	95 - 90	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-39.63	0	0
			Max. Mx	20	-14.24	493	6
			Max. My	2	-14.25	5	486
			Max. Vy	20	-18.76	493	6
			Max. Vx	2	-18.60	5	486
			Max. Torque	4			-1
L11	90 - 89.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-39.79	0	0
			Max. Mx	20	-14.35	507	6
			Max. My	2	-14.37	6	500
			Max. Vy	20	-18.81	507	6
			Max. Vx	2	-18.66	6	500
			Max. Torque	4			-1
L12	89.25 - 89	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-39.86	0	0
			Max. Mx	20	-14.41	511	6
			Max. My	2	-14.43	6	505
			Max. Vy	20	-18.83	511	6
			Max. Vx	2	-18.67	6	505
			Max. Torque	4			-1
L13	89 - 88.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-39.94	0	0
			Max. Mx	20	-14.47	516	6
			Max. My	2	-14.48	6	510
			Max. Vy	20	-18.85	516	6
			Max. Vx	2	-18.70	6	510
			Max. Torque	4			-1

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L14	88.75 - 85.66	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-40.91	0	0
			Max. Mx	20	-15.19	575	6
			Max. My	2	-15.21	6	568
			Max. Vy	20	-19.14	575	6
			Max. Vx	2	-18.98	6	568
			Max. Torque	4			-1
L15	85.66 - 85.41	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-41.00	0	0
			Max. Mx	20	-15.26	580	6
			Max. My	2	-15.28	6	573
			Max. Vy	20	-19.17	580	6
			Max. Vx	2	-19.01	6	573
			Max. Torque	4			-1
L16	85.41 - 81.2	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-42.59	0	0
			Max. Mx	20	-16.46	662	7
			Max. My	2	-16.48	7	654
			Max. Vy	20	-19.82	662	7
			Max. Vx	2	-19.66	7	654
			Max. Torque	4			-1
L17	81.2 - 80.95	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-42.68	0	0
			Max. Mx	20	-16.53	667	7
			Max. My	2	-16.55	7	659
			Max. Vy	20	-19.86	667	7
			Max. Vx	2	-19.70	7	659
			Max. Torque	4			-1
L18	80.95 - 80	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-43.03	0	0
			Max. Mx	20	-16.79	686	7
			Max. My	2	-16.80	7	678
			Max. Vy	20	-20.00	686	7
			Max. Vx	2	-19.84	7	678
			Max. Torque	4			-1
L19	80 - 79.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-43.86	0	0
			Max. Mx	20	-17.28	691	7
			Max. My	2	-17.29	7	683
			Max. Vy	20	-20.25	691	7
			Max. Vx	2	-20.09	7	683
			Max. Torque	4			-1
L20	79.75 - 74.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-45.67	0	0
			Max. Mx	20	-18.38	795	8
			Max. My	2	-18.40	8	786
			Max. Vy	20	-21.35	795	8
			Max. Vx	2	-21.19	8	786
			Max. Torque	4			-1
L21	74.75 - 69.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-47.32	1	0
			Max. Mx	20	-19.40	904	8
			Max. My	2	-19.42	9	894
			Max. Vy	20	-22.37	904	8
			Max. Vx	2	-22.21	9	894
			Max. Torque	4			-1
L22	69.75 - 65.5	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-48.72	1	0
			Max. Mx	20	-20.28	1001	9
			Max. My	2	-20.30	9	990
			Max. Vy	20	-23.22	1001	9
			Max. Vx	2	-23.07	9	990
			Max. Torque	23			1
L23	65.5 - 65.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-48.81	1	0

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	20	-20.35	1007	9
			Max. My	2	-20.37	9	996
			Max. Vy	20	-23.27	1007	9
			Max. Vx	2	-23.11	9	996
			Max. Torque	23			1
L24	65.25 - 60.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-50.64	1	0
			Max. Mx	20	-21.57	1126	9
			Max. My	2	-21.58	10	1114
			Max. Vy	20	-24.28	1126	9
			Max. Vx	2	-24.13	10	1114
			Max. Torque	23			1
L25	60.25 - 58.39	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-51.31	1	0
			Max. Mx	20	-22.02	1171	10
			Max. My	2	-22.03	10	1159
			Max. Vy	20	-24.66	1171	10
			Max. Vx	2	-24.51	10	1159
			Max. Torque	23			1
L26	58.39 - 58.14	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-51.42	1	0
			Max. Mx	20	-22.11	1178	10
			Max. My	2	-22.12	10	1166
			Max. Vy	20	-24.71	1178	10
			Max. Vx	2	-24.55	10	1166
			Max. Torque	23			1
L27	58.14 - 57.5	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-51.69	1	0
			Max. Mx	20	-22.30	1193	10
			Max. My	2	-22.31	10	1181
			Max. Vy	20	-24.84	1193	10
			Max. Vx	2	-24.68	10	1181
			Max. Torque	23			1
L28	57.5 - 57.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-51.79	1	-1
			Max. Mx	20	-22.37	1200	10
			Max. My	2	-22.38	10	1187
			Max. Vy	20	-24.89	1200	10
			Max. Vx	2	-24.73	10	1187
			Max. Torque	23			1
L29	57.25 - 54	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-53.04	1	-1
			Max. Mx	20	-23.24	1282	10
			Max. My	2	-23.25	11	1269
			Max. Vy	20	-25.55	1282	10
			Max. Vx	2	-25.39	11	1269
			Max. Torque	23			1
L30	54 - 53.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-53.15	1	-1
			Max. Mx	20	-23.33	1288	10
			Max. My	2	-23.34	11	1275
			Max. Vy	20	-25.59	1288	10
			Max. Vx	2	-25.44	11	1275
			Max. Torque	23			1
L31	53.75 - 49.5	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-55.18	2	-1
			Max. Mx	20	-24.79	1399	11
			Max. My	2	-24.80	12	1385
			Max. Vy	20	-26.54	1399	11
			Max. Vx	2	-26.39	12	1385
			Max. Torque	25			2
L32	49.5 - 49.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-55.29	2	-1
			Max. Mx	20	-24.89	1405	11
			Max. My	2	-24.90	12	1392
			Max. Vy	20	-26.59	1405	11

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-26.43	12	1392
			Max. Torque	25			2
L33	49.25 - 44.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-57.67	2	-1
			Max. Mx	20	-26.69	1541	12
			Max. My	2	-26.70	12	1526
			Max. Vy	20	-27.61	1541	12
			Max. Vx	2	-27.46	12	1526
			Max. Torque	25			2
L34	44.25 - 41.5	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-59.14	2	-1
			Max. Mx	20	-27.81	1618	12
			Max. My	2	-27.82	13	1603
			Max. Vy	20	-28.20	1618	12
			Max. Vx	2	-28.04	13	1603
			Max. Torque	25			2
L35	41.5 - 41.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-59.26	2	-1
			Max. Mx	20	-27.91	1625	12
			Max. My	2	-27.92	13	1610
			Max. Vy	20	-28.24	1625	12
			Max. Vx	2	-28.08	13	1610
			Max. Torque	25			3
L36	41.25 - 40	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-59.87	2	-1
			Max. Mx	20	-28.35	1660	12
			Max. My	2	-28.36	13	1645
			Max. Vy	20	-28.50	1660	12
			Max. Vx	2	-28.34	13	1645
			Max. Torque	25			3
L37	40 - 39.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-60.70	3	-1
			Max. Mx	20	-28.85	1668	12
			Max. My	2	-28.86	13	1652
			Max. Vy	20	-28.74	1668	12
			Max. Vx	2	-28.58	13	1652
			Max. Torque	25			3
L38	39.75 - 34.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-63.09	3	-2
			Max. Mx	20	-30.56	1814	12
			Max. My	2	-30.57	14	1797
			Max. Vy	20	-29.77	1814	12
			Max. Vx	2	-29.61	14	1797
			Max. Torque	25			3
L39	34.75 - 29.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-65.23	3	-2
			Max. Mx	20	-32.12	1965	13
			Max. My	2	-32.13	15	1947
			Max. Vy	20	-30.39	1965	13
			Max. Vx	2	-30.23	15	1947
			Max. Torque	25			3
L40	29.75 - 29.5	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-65.33	3	-2
			Max. Mx	20	-32.21	1972	13
			Max. My	2	-32.22	15	1954
			Max. Vy	20	-30.43	1972	13
			Max. Vx	2	-30.27	15	1954
			Max. Torque	25			3
L41	29.5 - 29.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-65.45	3	-2
			Max. Mx	20	-32.29	1980	13
			Max. My	2	-32.30	15	1962
			Max. Vy	20	-30.48	1980	13
			Max. Vx	2	-30.32	15	1962
			Max. Torque	25			3
L42	29.25 -	Pole	Max Tension	1	0.00	0	0

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
	28.25						
			Max. Compression	26	-65.89	3	-2
			Max. Mx	20	-32.62	2010	13
			Max. My	2	-32.62	15	1992
			Max. Vy	20	-30.67	2010	13
			Max. Vx	2	-30.51	15	1992
			Max. Torque	25			3
L43	28.25 - 28	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-66.03	3	-2
			Max. Mx	20	-32.73	2018	13
			Max. My	2	-32.74	15	2000
			Max. Vy	20	-30.71	2018	13
			Max. Vx	2	-30.55	15	2000
			Max. Torque	25			3
L44	28 - 23	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-68.74	4	-2
			Max. Mx	20	-34.86	2174	14
			Max. My	2	-34.87	16	2155
			Max. Vy	20	-31.64	2174	14
			Max. Vx	2	-31.48	16	2155
			Max. Torque	25			4
L45	23 - 19.5	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-70.62	4	-2
			Max. Mx	20	-36.36	2286	14
			Max. My	2	-36.37	16	2266
			Max. Vy	20	-32.25	2286	14
			Max. Vx	2	-32.10	16	2266
			Max. Torque	25			4
L46	19.5 - 19.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-70.77	4	-2
			Max. Mx	20	-36.49	2294	14
			Max. My	2	-36.50	16	2274
			Max. Vy	20	-32.29	2294	14
			Max. Vx	2	-32.13	16	2274
			Max. Torque	25			4
L47	19.25 - 14.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-73.63	4	-2
			Max. Mx	20	-38.82	2458	15
			Max. My	2	-38.82	17	2437
			Max. Vy	20	-33.13	2458	15
			Max. Vx	2	-32.98	17	2437
			Max. Torque	25			4
L48	14.25 - 9.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-76.47	4	-2
			Max. Mx	20	-41.17	2625	16
			Max. My	2	-41.17	18	2604
			Max. Vy	20	-33.93	2625	16
			Max. Vx	2	-33.78	18	2604
			Max. Torque	25			5
L49	9.25 - 4.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-79.28	5	-2
			Max. Mx	20	-43.53	2797	16
			Max. My	2	-43.53	19	2774
			Max. Vy	20	-34.70	2797	16
			Max. Vx	2	-34.55	19	2774
			Max. Torque	25			5
L50	4.25 - 2.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-80.11	5	-2
			Max. Mx	20	-44.24	2849	17
			Max. My	2	-44.24	19	2826
			Max. Vy	20	-34.93	2849	17
			Max. Vx	2	-34.78	19	2826
			Max. Torque	25			5
L51	2.75 - 2.5	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-80.26	5	-2
			Max. Mx	20	-44.38	2858	17
			Max. My	2	-44.38	19	2835
			Max. Vy	20	-34.95	2858	17

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-34.80	19	2835
			Max. Torque	25			5
L52	2.5 - 2.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-80.41	5	-2
			Max. Mx	20	-44.51	2866	17
			Max. My	2	-44.51	19	2844
			Max. Vy	20	-34.99	2866	17
			Max. Vx	2	-34.84	19	2844
			Max. Torque	25			5
L53	2.25 - 1.5	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-80.88	5	-3
			Max. Mx	20	-44.91	2893	17
			Max. My	2	-44.91	19	2870
			Max. Vy	20	-35.12	2893	17
			Max. Vx	2	-34.97	19	2870
			Max. Torque	25			5
L54	1.5 - 1.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-81.02	5	-3
			Max. Mx	20	-45.04	2902	17
			Max. My	2	-45.04	19	2879
			Max. Vy	20	-35.15	2902	17
			Max. Vx	2	-35.00	19	2879
			Max. Torque	25			5
L55	1.25 - 0	Pole	Max Tension	1	0.00	0	0
			Max. Compression	26	-81.73	5	-3
			Max. Mx	20	-45.66	2946	17
			Max. My	2	-45.66	19	2922
			Max. Vy	20	-35.36	2946	17
			Max. Vx	2	-35.21	19	2922
			Max. Torque	25			5

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	81.73	0.00	0.00
	Max. H_x	21	34.25	35.34	0.13
	Max. H_z	3	34.25	0.13	35.19
	Max. M_x	2	2922	0.13	35.19
	Max. M_z	8	2934	-35.28	-0.05
	Max. Torsion	25	5	17.77	30.48
	Min. Vert	21	34.25	35.34	0.13
	Min. H_x	8	45.67	-35.28	-0.05
	Min. H_z	15	34.25	-0.12	-35.14
	Min. M_x	14	-2918	-0.12	-35.14
	Min. M_z	20	-2946	35.34	0.13
	Min. Torsion	13	-5	-17.70	-30.41

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	38.06	-0.00	0.00	1	1	0
1.2 Dead+1.6 Wind 0 deg - No Ice	45.67	-0.13	-35.19	-2922	19	-4
0.9 Dead+1.6 Wind 0 deg - No Ice	34.25	-0.13	-35.19	-2901	19	-4
1.2 Dead+1.6 Wind 30 deg - No Ice	45.67	17.68	-30.40	-2520	-1472	-2

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 30 deg - No Ice	34.25	17.68	-30.40	-2502	-1461	-2
1.2 Dead+1.6 Wind 60 deg - No Ice	45.67	30.59	-17.49	-1446	-2546	1
0.9 Dead+1.6 Wind 60 deg - No Ice	34.25	30.59	-17.49	-1436	-2527	1
1.2 Dead+1.6 Wind 90 deg - No Ice	45.67	35.28	0.05	8	-2934	3
0.9 Dead+1.6 Wind 90 deg - No Ice	34.25	35.28	0.05	8	-2913	3
1.2 Dead+1.6 Wind 120 deg - No Ice	45.67	30.61	17.55	1457	-2548	5
0.9 Dead+1.6 Wind 120 deg - No Ice	34.25	30.61	17.55	1446	-2530	5
1.2 Dead+1.6 Wind 150 deg - No Ice	45.67	17.70	30.41	2524	-1474	5
0.9 Dead+1.6 Wind 150 deg - No Ice	34.25	17.70	30.41	2505	-1464	5
1.2 Dead+1.6 Wind 180 deg - No Ice	45.67	0.12	35.14	2918	-15	4
0.9 Dead+1.6 Wind 180 deg - No Ice	34.25	0.12	35.14	2896	-15	4
1.2 Dead+1.6 Wind 210 deg - No Ice	45.67	-17.55	30.44	2528	1457	2
0.9 Dead+1.6 Wind 210 deg - No Ice	34.25	-17.55	30.44	2509	1446	2
1.2 Dead+1.6 Wind 240 deg - No Ice	45.67	-30.62	17.41	1437	2553	0
0.9 Dead+1.6 Wind 240 deg - No Ice	34.25	-30.62	17.41	1426	2534	0
1.2 Dead+1.6 Wind 270 deg - No Ice	45.67	-35.34	-0.13	-17	2946	-3
0.9 Dead+1.6 Wind 270 deg - No Ice	34.25	-35.34	-0.13	-17	2923	-3
1.2 Dead+1.6 Wind 300 deg - No Ice	45.67	-30.62	-17.65	-1468	2554	-5
0.9 Dead+1.6 Wind 300 deg - No Ice	34.25	-30.62	-17.65	-1457	2534	-5
1.2 Dead+1.6 Wind 330 deg - No Ice	45.67	-17.77	-30.48	-2531	1487	-5
0.9 Dead+1.6 Wind 330 deg - No Ice	34.25	-17.77	-30.48	-2512	1476	-5
1.2 Dead+1.0 Ice+1.0 Temp	81.73	-0.00	-0.00	3	5	0
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	81.73	-0.02	-9.72	-885	8	-2
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	81.73	4.88	-8.40	-764	-442	-1
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	81.73	8.45	-4.84	-438	-768	0
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	81.73	9.74	0.01	4	-886	1
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	81.73	8.45	4.85	445	-768	2
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	81.73	4.88	8.40	769	-442	2
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	81.73	0.03	9.71	889	1	2
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	81.73	-4.85	8.41	770	448	1
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	81.73	-8.45	4.82	441	778	0
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	81.73	-9.75	-0.03	-1	897	-1
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	81.73	-8.45	-4.87	-443	778	-2
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	81.73	-4.90	-8.42	-766	454	-2
Dead+Wind 0 deg - Service	38.06	-0.03	-7.53	-622	5	0
Dead+Wind 30 deg - Service	38.06	3.78	-6.50	-536	-312	0

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 60 deg - Service	38.06	6.54	-3.74	-307	-541	0
Dead+Wind 90 deg - Service	38.06	7.55	0.01	2	-624	0
Dead+Wind 120 deg - Service	38.06	6.55	3.76	311	-542	0
Dead+Wind 150 deg - Service	38.06	3.79	6.51	538	-313	0
Dead+Wind 180 deg - Service	38.06	0.03	7.52	622	-2	0
Dead+Wind 210 deg - Service	38.06	-3.75	6.51	539	312	0
Dead+Wind 240 deg - Service	38.06	-6.55	3.72	307	545	0
Dead+Wind 270 deg - Service	38.06	-7.56	-0.03	-3	629	0
Dead+Wind 300 deg - Service	38.06	-6.55	-3.78	-312	545	0
Dead+Wind 330 deg - Service	38.06	-3.80	-6.52	-538	318	0

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-38.06	0.00	0.00	38.06	-0.00	0.000%
2	-0.13	-45.67	-35.19	0.13	45.67	35.19	0.000%
3	-0.13	-34.25	-35.19	0.13	34.25	35.19	0.000%
4	17.68	-45.67	-30.40	-17.68	45.67	30.40	0.000%
5	17.68	-34.25	-30.40	-17.68	34.25	30.40	0.000%
6	30.59	-45.67	-17.49	-30.59	45.67	17.49	0.000%
7	30.59	-34.25	-17.49	-30.59	34.25	17.49	0.000%
8	35.29	-45.67	0.05	-35.28	45.67	-0.05	0.000%
9	35.29	-34.25	0.05	-35.28	34.25	-0.05	0.001%
10	30.61	-45.67	17.55	-30.61	45.67	-17.55	0.000%
11	30.61	-34.25	17.55	-30.61	34.25	-17.55	0.000%
12	17.70	-45.67	30.41	-17.70	45.67	-30.41	0.000%
13	17.70	-34.25	30.41	-17.70	34.25	-30.41	0.000%
14	0.12	-45.67	35.14	-0.12	45.67	-35.14	0.001%
15	0.12	-34.25	35.14	-0.12	34.25	-35.14	0.001%
16	-17.55	-45.67	30.44	17.55	45.67	-30.44	0.000%
17	-17.55	-34.25	30.44	17.55	34.25	-30.44	0.000%
18	-30.62	-45.67	17.41	30.62	45.67	-17.41	0.000%
19	-30.62	-34.25	17.41	30.62	34.25	-17.41	0.000%
20	-35.34	-45.67	-0.13	35.34	45.67	0.13	0.001%
21	-35.34	-34.25	-0.13	35.34	34.25	0.13	0.001%
22	-30.62	-45.67	-17.65	30.62	45.67	17.65	0.000%
23	-30.62	-34.25	-17.65	30.62	34.25	17.65	0.000%
24	-17.77	-45.67	-30.48	17.77	45.67	30.48	0.000%
25	-17.77	-34.25	-30.48	17.77	34.25	30.48	0.000%
26	0.00	-81.73	0.00	0.00	81.73	0.00	0.000%
27	-0.02	-81.73	-9.72	0.02	81.73	9.72	0.000%
28	4.88	-81.73	-8.40	-4.88	81.73	8.40	0.000%
29	8.45	-81.73	-4.84	-8.45	81.73	4.84	0.000%
30	9.74	-81.73	0.01	-9.74	81.73	-0.01	0.000%
31	8.45	-81.73	4.85	-8.45	81.73	-4.85	0.000%
32	4.88	-81.73	8.40	-4.88	81.73	-8.40	0.000%
33	0.03	-81.73	9.71	-0.03	81.73	-9.71	0.000%
34	-4.85	-81.73	8.41	4.85	81.73	-8.41	0.000%
35	-8.45	-81.73	4.82	8.45	81.73	-4.82	0.000%
36	-9.75	-81.73	-0.03	9.75	81.73	0.03	0.000%
37	-8.45	-81.73	-4.87	8.45	81.73	4.87	0.000%
38	-4.90	-81.73	-8.42	4.90	81.73	8.42	0.000%
39	-0.03	-38.06	-7.53	0.03	38.06	7.53	0.003%
40	3.78	-38.06	-6.50	-3.78	38.06	6.50	0.001%
41	6.55	-38.06	-3.74	-6.54	38.06	3.74	0.001%
42	7.55	-38.06	0.01	-7.55	38.06	-0.01	0.003%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
43	6.55	-38.06	3.76	-6.55	38.06	-3.76	0.001%
44	3.79	-38.06	6.51	-3.79	38.06	-6.51	0.001%
45	0.03	-38.06	7.52	-0.03	38.06	-7.52	0.003%
46	-3.76	-38.06	6.51	3.75	38.06	-6.51	0.001%
47	-6.55	-38.06	3.72	6.55	38.06	-3.72	0.001%
48	-7.56	-38.06	-0.03	7.56	38.06	0.03	0.003%
49	-6.55	-38.06	-3.78	6.55	38.06	3.78	0.001%
50	-3.80	-38.06	-6.52	3.80	38.06	6.52	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	18	0.00000001	0.00010334
3	Yes	18	0.00000001	0.00008001
4	Yes	21	0.00000001	0.00009812
5	Yes	21	0.00000001	0.00007193
6	Yes	21	0.00000001	0.00009686
7	Yes	21	0.00000001	0.00007098
8	Yes	18	0.00000001	0.00007418
9	Yes	17	0.00000001	0.00012402
10	Yes	21	0.00000001	0.00010388
11	Yes	21	0.00000001	0.00007622
12	Yes	21	0.00000001	0.00009518
13	Yes	21	0.00000001	0.00006967
14	Yes	17	0.00000001	0.00014832
15	Yes	17	0.00000001	0.00011602
16	Yes	21	0.00000001	0.00009858
17	Yes	21	0.00000001	0.00007228
18	Yes	21	0.00000001	0.00009848
19	Yes	21	0.00000001	0.00007216
20	Yes	17	0.00000001	0.00012443
21	Yes	17	0.00000001	0.00009631
22	Yes	21	0.00000001	0.00009654
23	Yes	21	0.00000001	0.00007059
24	Yes	21	0.00000001	0.00010547
25	Yes	21	0.00000001	0.00007738
26	Yes	6	0.00000001	0.00000001
27	Yes	20	0.00000001	0.00011114
28	Yes	20	0.00000001	0.00012613
29	Yes	20	0.00000001	0.00012645
30	Yes	20	0.00000001	0.00011108
31	Yes	20	0.00000001	0.00012825
32	Yes	20	0.00000001	0.00012643
33	Yes	20	0.00000001	0.00011111
34	Yes	20	0.00000001	0.00012759
35	Yes	20	0.00000001	0.00012742
36	Yes	20	0.00000001	0.00011208
37	Yes	20	0.00000001	0.00012780
38	Yes	20	0.00000001	0.00012927
39	Yes	14	0.00000001	0.00008613
40	Yes	16	0.00000001	0.00008271
41	Yes	15	0.00000001	0.00014898
42	Yes	14	0.00000001	0.00008204
43	Yes	16	0.00000001	0.00007573
44	Yes	16	0.00000001	0.00007990
45	Yes	14	0.00000001	0.00009201
46	Yes	15	0.00000001	0.00014715
47	Yes	16	0.00000001	0.00007825
48	Yes	14	0.00000001	0.00008256
49	Yes	16	0.00000001	0.00007947
50	Yes	16	0.00000001	0.00007619

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	137 - 132	15.33	48	0.946	0.004
L2	132 - 127	14.34	48	0.946	0.004
L3	127 - 125	13.35	48	0.944	0.003
L4	125 - 120	12.96	48	0.943	0.002
L5	120 - 115	11.97	48	0.940	0.002
L6	115 - 110	10.99	48	0.931	0.002
L7	110 - 105	10.02	48	0.915	0.002
L8	105 - 100	9.08	48	0.885	0.001
L9	100 - 95	8.17	48	0.842	0.001
L10	95 - 90	7.32	48	0.786	0.001
L11	90 - 89.25	6.53	48	0.717	0.001
L12	89.25 - 89	6.42	48	0.705	0.001
L13	89 - 88.75	6.38	48	0.702	0.001
L14	88.75 - 85.66	6.35	48	0.700	0.001
L15	85.66 - 85.41	5.90	48	0.670	0.001
L16	85.41 - 81.2	5.87	48	0.668	0.001
L17	81.2 - 80.95	5.30	48	0.631	0.001
L18	80.95 - 80	5.26	48	0.628	0.001
L19	80 - 79.75	5.14	48	0.617	0.001
L20	79.75 - 74.75	5.11	48	0.616	0.001
L21	74.75 - 69.75	4.48	48	0.582	0.001
L22	69.75 - 65.5	3.89	48	0.543	0.000
L23	65.5 - 65.25	3.42	48	0.507	0.000
L24	65.25 - 60.25	3.40	48	0.505	0.000
L25	60.25 - 58.39	2.89	48	0.465	0.000
L26	58.39 - 58.14	2.71	48	0.449	0.000
L27	58.14 - 57.5	2.69	48	0.447	0.000
L28	57.5 - 57.25	2.63	48	0.443	0.000
L29	57.25 - 54	2.60	48	0.441	0.000
L30	54 - 53.75	2.31	48	0.411	0.000
L31	53.75 - 49.5	2.29	48	0.410	0.000
L32	49.5 - 49.25	1.94	48	0.376	0.000
L33	49.25 - 44.25	1.92	48	0.375	0.000
L34	44.25 - 41.5	1.55	48	0.338	0.000
L35	41.5 - 41.25	1.36	48	0.316	0.000
L36	41.25 - 40	1.34	48	0.314	0.000
L37	40 - 39.75	1.26	48	0.302	0.000
L38	39.75 - 34.75	1.25	48	0.300	0.000
L39	34.75 - 29.75	0.95	48	0.262	0.000
L40	29.75 - 29.5	0.70	48	0.222	0.000
L41	29.5 - 29.25	0.69	48	0.220	0.000
L42	29.25 - 28.25	0.68	48	0.217	0.000
L43	28.25 - 28	0.63	48	0.209	0.000
L44	28 - 23	0.62	48	0.207	0.000
L45	23 - 19.5	0.42	48	0.173	0.000
L46	19.5 - 19.25	0.30	48	0.148	0.000
L47	19.25 - 14.25	0.30	48	0.146	0.000
L48	14.25 - 9.25	0.16	48	0.110	0.000
L49	9.25 - 4.25	0.07	48	0.072	0.000
L50	4.25 - 2.75	0.01	48	0.031	0.000
L51	2.75 - 2.5	0.01	48	0.018	0.000
L52	2.5 - 2.25	0.00	48	0.016	0.000
L53	2.25 - 1.5	0.00	48	0.014	0.000
L54	1.5 - 1.25	0.00	48	0.010	0.000
L55	1.25 - 0	0.00	48	0.008	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
131.00	VHLP2.5-18	48	14.14	0.946	0.004	157701
124.00	LLPX310R-V4 w/ Mount Pipe	48	12.76	0.942	0.002	76338
122.00	PCS 1900MHz 4x45W-65MHz	48	12.37	0.941	0.002	65989
113.00	80010966 w/ Mount Pipe	48	10.60	0.926	0.002	17497
92.00	HBX-6516DS-VTM w/ Mount Pipe	48	6.84	0.747	0.001	4231
80.00	Bridge Stiffener (43" x 9.5" x 1")	48	5.14	0.617	0.001	6859
50.00	KS24019-L112A	48	1.98	0.380	0.000	7533
40.00	Bridge Stiffener (53" x 9" x 1")	48	1.26	0.302	0.000	7109

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	137 - 132	71.99	20	4.453	0.016
L2	132 - 127	67.33	20	4.452	0.016
L3	127 - 125	62.68	20	4.443	0.010
L4	125 - 120	60.82	20	4.433	0.007
L5	120 - 115	56.19	20	4.420	0.006
L6	115 - 110	51.58	20	4.380	0.005
L7	110 - 105	47.04	20	4.299	0.004
L8	105 - 100	42.61	20	4.158	0.004
L9	100 - 95	38.36	20	3.957	0.004
L10	95 - 90	34.35	20	3.693	0.004
L11	90 - 89.25	30.65	20	3.366	0.005
L12	89.25 - 89	30.13	20	3.311	0.005
L13	89 - 88.75	29.95	20	3.296	0.005
L14	88.75 - 85.66	29.78	20	3.286	0.005
L15	85.66 - 85.41	27.70	20	3.148	0.005
L16	85.41 - 81.2	27.54	20	3.138	0.005
L17	81.2 - 80.95	24.85	20	2.964	0.005
L18	80.95 - 80	24.69	20	2.950	0.005
L19	80 - 79.75	24.11	20	2.898	0.005
L20	79.75 - 74.75	23.96	20	2.890	0.005
L21	74.75 - 69.75	21.01	20	2.732	0.005
L22	69.75 - 65.5	18.25	20	2.550	0.005
L23	65.5 - 65.25	16.05	20	2.377	0.005
L24	65.25 - 60.25	15.93	20	2.369	0.005
L25	60.25 - 58.39	13.55	20	2.182	0.004
L26	58.39 - 58.14	12.71	20	2.108	0.004
L27	58.14 - 57.5	12.60	20	2.099	0.004
L28	57.5 - 57.25	12.32	20	2.077	0.004
L29	57.25 - 54	12.21	20	2.067	0.004
L30	54 - 53.75	10.85	20	1.930	0.004
L31	53.75 - 49.5	10.75	20	1.921	0.004
L32	49.5 - 49.25	9.11	20	1.766	0.004
L33	49.25 - 44.25	9.02	20	1.758	0.004
L34	44.25 - 41.5	7.26	20	1.585	0.003
L35	41.5 - 41.25	6.38	20	1.483	0.003
L36	41.25 - 40	6.30	20	1.471	0.003
L37	40 - 39.75	5.93	20	1.416	0.003
L38	39.75 - 34.75	5.85	20	1.407	0.003
L39	34.75 - 29.75	4.47	20	1.231	0.003
L40	29.75 - 29.5	3.28	20	1.039	0.002
L41	29.5 - 29.25	3.23	20	1.029	0.002
L42	29.25 - 28.25	3.17	20	1.019	0.002
L43	28.25 - 28	2.96	20	0.979	0.002
L44	28 - 23	2.91	20	0.971	0.002
L45	23 - 19.5	1.98	20	0.812	0.002

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L46	19.5 - 19.25	1.42	20	0.693	0.002
L47	19.25 - 14.25	1.39	20	0.685	0.002
L48	14.25 - 9.25	0.76	20	0.516	0.001
L49	9.25 - 4.25	0.31	20	0.336	0.001
L50	4.25 - 2.75	0.06	20	0.143	0.000
L51	2.75 - 2.5	0.02	20	0.083	0.000
L52	2.5 - 2.25	0.02	20	0.075	0.000
L53	2.25 - 1.5	0.02	20	0.068	0.000
L54	1.5 - 1.25	0.01	20	0.046	0.000
L55	1.25 - 0	0.01	20	0.038	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
131.00	VHLP2.5-18	20	66.40	4.451	0.016	42265
124.00	LLPX310R-V4 w/ Mount Pipe	20	59.89	4.430	0.007	18282
122.00	PCS 1900MHz 4x45W-65MHz	20	58.04	4.426	0.006	15002
113.00	80010966 w/ Mount Pipe	20	49.76	4.353	0.005	3776
92.00	HBX-6516DS-VTM w/ Mount Pipe	20	32.09	3.508	0.005	905
80.00	Bridge Stiffener (43" x 9.5" x 1")	20	24.11	2.898	0.005	1465
50.00	KS24019-L112A	20	9.29	1.783	0.004	1606
40.00	Bridge Stiffener (53" x 9" x 1")	20	5.93	1.416	0.003	1516

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K
L1	137 - 132 (1)	P12.75x0.375	5.00	0.00	0.0	14.58	-0.28
L2	132 - 127 (2)	P12.75x0.375	5.00	0.00	0.0	14.58	-0.60
L3	127 - 125 (3)	P12.75x0.375	2.00	0.00	0.0	14.58	-0.72
L4	125 - 120 (4)	P24x0.375	5.00	0.00	0.0	27.83	-4.90
L5	120 - 115 (5)	P24x0.375	5.00	0.00	0.0	27.83	-5.49
L6	115 - 110 (6)	P24x0.375	5.00	0.00	0.0	27.83	-10.32
L7	110 - 105 (7)	P24x0.375	5.00	0.00	0.0	27.83	-11.00
L8	105 - 100 (8)	P24x0.375	5.00	0.00	0.0	27.83	-11.70
L9	100 - 95 (9)	P24x0.375	5.00	0.00	0.0	27.83	-12.41
L10	95 - 90 (10)	P24x0.375	5.00	0.00	0.0	27.83	-14.23
L11	90 - 89.25 (11)	P24x0.375	0.75	0.00	0.0	27.83	-14.35
L12	89.25 - 89 (12)	P24x0.49375	0.25	0.00	0.0	36.46	-14.41
L13	89 - 88.75 (13)	P24x0.7	0.25	0.00	0.0	51.24	-14.47
L14	88.75 - 85.66 (14)	P24x0.7	3.09	0.00	0.0	51.24	-15.19
L15	85.66 - 85.41 (15)	P24x0.875	0.25	0.00	0.0	63.57	-15.26
L16	85.41 - 81.2 (16)	P24x0.875	4.21	0.00	0.0	63.57	-16.46
L17	81.2 - 80.95 (17)	P24x0.7	0.25	0.00	0.0	51.24	-16.53
L18	80.95 - 80 (18)	P24x0.7	0.95	0.00	0.0	51.24	-16.79

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u
	ft		ft	ft		in^2	K
L19	80 - 79.75 (19)	P36x0.375	0.25	0.00	0.0	41.97	-17.28
L20	79.75 - 74.75 (20)	P36x0.375	5.00	0.00	0.0	41.97	-18.38
L21	74.75 - 69.75 (21)	P36x0.375	5.00	0.00	0.0	41.97	-19.40
L22	69.75 - 65.5 (22)	P36x0.375	4.25	0.00	0.0	41.97	-20.28
L23	65.5 - 65.25 (23)	P36x0.4625	0.25	0.00	0.0	51.64	-20.35
L24	65.25 - 60.25 (24)	P36x0.4625	5.00	0.00	0.0	51.64	-21.57
L25	60.25 - 58.39 (25)	P36x0.4625	1.86	0.00	0.0	51.64	-22.02
L26	58.39 - 58.14 (26)	P36x0.5625	0.25	0.00	0.0	62.62	-22.11
L27	58.14 - 57.5 (27)	P36x0.5625	0.64	0.00	0.0	62.62	-22.30
L28	57.5 - 57.25 (28)	P36x0.475	0.25	0.00	0.0	53.01	-22.37
L29	57.25 - 54 (29)	P36x0.475	3.25	0.00	0.0	53.01	-23.24
L30	54 - 53.75 (30)	P36x0.6	0.25	0.00	0.0	66.73	-23.33
L31	53.75 - 49.5 (31)	P36x0.6	4.25	0.00	0.0	66.73	-24.79
L32	49.5 - 49.25 (32)	P36x0.7	0.25	0.00	0.0	77.63	-24.89
L33	49.25 - 44.25 (33)	P36x0.7	5.00	0.00	0.0	77.63	-26.69
L34	44.25 - 41.5 (34)	P36x0.7	2.75	0.00	0.0	77.63	-27.81
L35	41.5 - 41.25 (35)	P36x0.6	0.25	0.00	0.0	66.73	-27.91
L36	41.25 - 40 (36)	P36x0.6	1.25	0.00	0.0	66.73	-28.35
L37	40 - 39.75 (37)	P42x0.5	0.25	0.00	0.0	65.19	-28.85
L38	39.75 - 34.75 (38)	P42x0.5	5.00	0.00	0.0	65.19	-30.56
L39	34.75 - 29.75 (39)	P42x0.5	5.00	0.00	0.0	65.19	-32.12
L40	29.75 - 29.5 (40)	P42x0.5	0.25	0.00	0.0	65.19	-32.21
L41	29.5 - 29.25 (41)	P42x0.5	0.25	0.00	0.0	65.19	-32.29
L42	29.25 - 28.25 (42)	P42x0.5	1.00	0.00	0.0	65.19	-32.62
L43	28.25 - 28 (43)	P42x0.675	0.25	0.00	0.0	87.63	-32.73
L44	28 - 23 (44)	P42x0.675	5.00	0.00	0.0	87.63	-34.86
L45	23 - 19.5 (45)	P42x0.675	3.50	0.00	0.0	87.63	-36.36
L46	19.5 - 19.25 (46)	P42x0.725	0.25	0.00	0.0	94.01	-36.49
L47	19.25 - 14.25 (47)	P42x0.725	5.00	0.00	0.0	94.01	-38.82
L48	14.25 - 9.25 (48)	P42x0.725	5.00	0.00	0.0	94.01	-41.17
L49	9.25 - 4.25 (49)	P42x0.725	5.00	0.00	0.0	94.01	-43.53
L50	4.25 - 2.75 (50)	P42x0.725	1.50	0.00	0.0	94.01	-44.24
L51	2.75 - 2.5 (51)	P42x0.9	0.25	0.00	0.0	116.21	-44.38
L52	2.5 - 2.25 (52)	P42x1.05	0.25	0.00	0.0	135.08	-44.51
L53	2.25 - 1.5 (53)	P42x1.05	0.75	0.00	0.0	135.08	-44.91
L54	1.5 - 1.25 (54)	P42x1	0.25	0.00	0.0	128.80	-45.04
L55	1.25 - 0 (55)	P42x1	1.25	0.00	0.0	128.80	-45.66

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	M_{uy}
	ft		kip-ft	kip-ft
L1	137 - 132 (1)	P12.75x0.375	0	0
L2	132 - 127 (2)	P12.75x0.375	4	0
L3	127 - 125 (3)	P12.75x0.375	6	0
L4	125 - 120 (4)	P24x0.375	36	0
L5	120 - 115 (5)	P24x0.375	75	0
L6	115 - 110 (6)	P24x0.375	152	0
L7	110 - 105 (7)	P24x0.375	234	0
L8	105 - 100 (8)	P24x0.375	318	0
L9	100 - 95 (9)	P24x0.375	403	0
L10	95 - 90 (10)	P24x0.375	493	0
L11	90 - 89.25 (11)	P24x0.375	507	0
L12	89.25 - 89 (12)	P24x0.49375	512	0
L13	89 - 88.75 (13)	P24x0.7	516	0
L14	88.75 - 85.66 (14)	P24x0.7	575	0
L15	85.66 - 85.41 (15)	P24x0.875	580	0
L16	85.41 - 81.2 (16)	P24x0.875	662	0
L17	81.2 - 80.95 (17)	P24x0.7	667	0
L18	80.95 - 80 (18)	P24x0.7	686	0
L19	80 - 79.75 (19)	P36x0.375	691	0
L20	79.75 - 74.75 (20)	P36x0.375	795	0
L21	74.75 - 69.75 (21)	P36x0.375	904	0
L22	69.75 - 65.5 (22)	P36x0.375	1001	0
L23	65.5 - 65.25 (23)	P36x0.4625	1007	0
L24	65.25 - 60.25 (24)	P36x0.4625	1126	0
L25	60.25 - 58.39 (25)	P36x0.4625	1172	0
L26	58.39 - 58.14 (26)	P36x0.5625	1178	0
L27	58.14 - 57.5 (27)	P36x0.5625	1194	0
L28	57.5 - 57.25 (28)	P36x0.475	1200	0
L29	57.25 - 54 (29)	P36x0.475	1282	0
L30	54 - 53.75 (30)	P36x0.6	1288	0
L31	53.75 - 49.5 (31)	P36x0.6	1399	0
L32	49.5 - 49.25 (32)	P36x0.7	1405	0
L33	49.25 - 44.25 (33)	P36x0.7	1541	0
L34	44.25 - 41.5 (34)	P36x0.7	1618	0
L35	41.5 - 41.25 (35)	P36x0.6	1625	0
L36	41.25 - 40 (36)	P36x0.6	1661	0
L37	40 - 39.75 (37)	P42x0.5	1668	0
L38	39.75 - 34.75 (38)	P42x0.5	1814	0

Section No.	Elevation ft	Size	M_{ux} kip-ft	M_{uy} kip-ft
L39	34.75 - 29.75 (39)	P42x0.5	1965	0
L40	29.75 - 29.5 (40)	P42x0.5	1972	0
L41	29.5 - 29.25 (41)	P42x0.5	1980	0
L42	29.25 - 28.25 (42)	P42x0.5	2011	0
L43	28.25 - 28 (43)	P42x0.675	2018	0
L44	28 - 23 (44)	P42x0.675	2174	0
L45	23 - 19.5 (45)	P42x0.675	2286	0
L46	19.5 - 19.25 (46)	P42x0.725	2294	0
L47	19.25 - 14.25 (47)	P42x0.725	2458	0
L48	14.25 - 9.25 (48)	P42x0.725	2625	0
L49	9.25 - 4.25 (49)	P42x0.725	2797	0
L50	4.25 - 2.75 (50)	P42x0.725	2849	0
L51	2.75 - 2.5 (51)	P42x0.9	2858	0
L52	2.5 - 2.25 (52)	P42x1.05	2867	0
L53	2.25 - 1.5 (53)	P42x1.05	2893	0
L54	1.5 - 1.25 (54)	P42x1	2902	0
L55	1.25 - 0 (55)	P42x1	2946	0

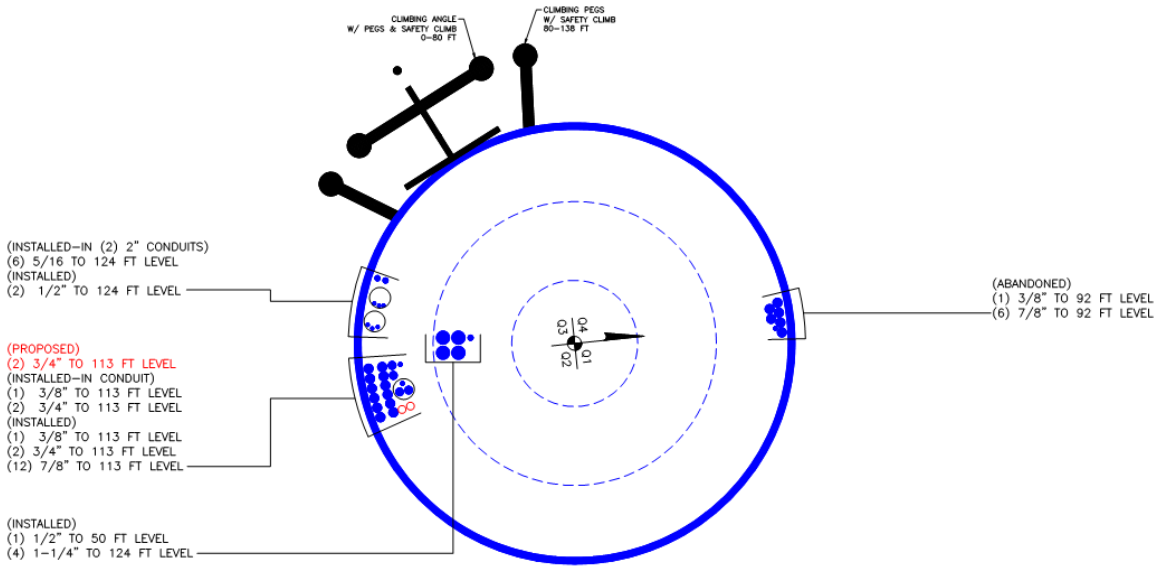
Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	Actual T_u kip-ft
L1	137 - 132 (1)	P12.75x0.375	0.20	0
L2	132 - 127 (2)	P12.75x0.375	0.84	0
L3	127 - 125 (3)	P12.75x0.375	0.91	0
L4	125 - 120 (4)	P24x0.375	7.50	0
L5	120 - 115 (5)	P24x0.375	7.92	1
L6	115 - 110 (6)	P24x0.375	16.25	0
L7	110 - 105 (7)	P24x0.375	16.61	0
L8	105 - 100 (8)	P24x0.375	16.94	0
L9	100 - 95 (9)	P24x0.375	17.26	0
L10	95 - 90 (10)	P24x0.375	18.76	0
L11	90 - 89.25 (11)	P24x0.375	18.82	0
L12	89.25 - 89 (12)	P24x0.49375	18.84	0
L13	89 - 88.75 (13)	P24x0.7	18.86	0
L14	88.75 - 85.66 (14)	P24x0.7	19.14	0
L15	85.66 - 85.41 (15)	P24x0.875	19.18	0
L16	85.41 - 81.2 (16)	P24x0.875	19.82	0
L17	81.2 - 80.95 (17)	P24x0.7	19.86	0
L18	80.95 - 80 (18)	P24x0.7	20.00	0
L19	80 - 79.75 (19)	P36x0.375	20.26	0
L20	79.75 - 74.75 (20)	P36x0.375	21.36	0
L21	74.75 - 69.75 (21)	P36x0.375	22.38	1

Section No.	Elevation ft	Size	Actual V_u K	Actual T_u kip-ft
L22	69.75 - 65.5 (22)	P36x0.375	23.23	1
L23	65.5 - 65.25 (23)	P36x0.4625	23.28	1
L24	65.25 - 60.25 (24)	P36x0.4625	24.29	1
L25	60.25 - 58.39 (25)	P36x0.4625	24.67	1
L26	58.39 - 58.14 (26)	P36x0.5625	24.71	1
L27	58.14 - 57.5 (27)	P36x0.5625	24.84	1
L28	57.5 - 57.25 (28)	P36x0.475	24.90	1
L29	57.25 - 54 (29)	P36x0.475	25.55	1
L30	54 - 53.75 (30)	P36x0.6	25.60	1
L31	53.75 - 49.5 (31)	P36x0.6	26.55	2
L32	49.5 - 49.25 (32)	P36x0.7	26.60	2
L33	49.25 - 44.25 (33)	P36x0.7	27.62	2
L34	44.25 - 41.5 (34)	P36x0.7	28.20	2
L35	41.5 - 41.25 (35)	P36x0.6	28.24	2
L36	41.25 - 40 (36)	P36x0.6	28.50	2
L37	40 - 39.75 (37)	P42x0.5	28.74	2
L38	39.75 - 34.75 (38)	P42x0.5	29.77	2
L39	34.75 - 29.75 (39)	P42x0.5	30.39	2
L40	29.75 - 29.5 (40)	P42x0.5	30.43	2
L41	29.5 - 29.25 (41)	P42x0.5	30.48	2
L42	29.25 - 28.25 (42)	P42x0.5	30.67	2
L43	28.25 - 28 (43)	P42x0.675	30.71	2
L44	28 - 23 (44)	P42x0.675	31.64	2
L45	23 - 19.5 (45)	P42x0.675	32.25	2
L46	19.5 - 19.25 (46)	P42x0.725	32.29	2
L47	19.25 - 14.25 (47)	P42x0.725	33.13	2
L48	14.25 - 9.25 (48)	P42x0.725	33.93	3
L49	9.25 - 4.25 (49)	P42x0.725	34.70	3
L50	4.25 - 2.75 (50)	P42x0.725	34.94	3
L51	2.75 - 2.5 (51)	P42x0.9	34.95	3
L52	2.5 - 2.25 (52)	P42x1.05	34.99	3
L53	2.25 - 1.5 (53)	P42x1.05	35.12	3
L54	1.5 - 1.25 (54)	P42x1	35.15	3
L55	1.25 - 0 (55)	P42x1	35.36	3

APPENDIX B

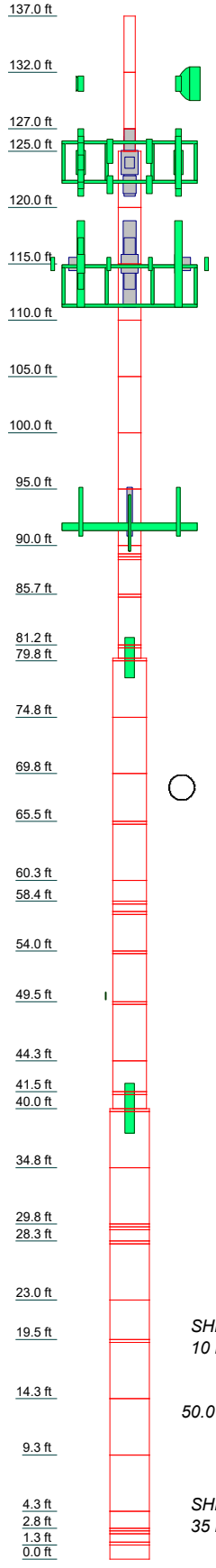
BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Section	Size	Length (ft)	Grade	Weight (K)
1	P42x0.375	5.00	A53-B-35	0.2
2	P42x0.375	5.00		0.2
3	P42x0.375	2.00		0.1
4	P42x0.375	5.00		0.5
5	P42x0.375	5.00		0.5
6	P42x0.375	5.00		0.5
7	P42x0.375	5.00		0.5
8	P42x0.375	5.00		0.5
9	P42x0.375	5.00		0.5
10	P42x0.375	5.00		0.5
14	P36x0.375	5.00		0.5
15	P36x0.375	5.00		0.5
16	P36x0.375	5.00		0.8
20	P36x0.375	5.00		0.7
21	P36x0.375	5.00		0.7
22	P36x0.375	5.00		0.6
24	P36x0.375	5.00		0.9
30	P36x0.375	5.00		1.0
32	P36x0.375	5.00		1.3
38	P42x0.375	5.00		1.1
39	P42x0.5	5.00		1.1
44	P42x0.5	5.00		1.6
45	P42x0.5	3.50		1.1
47	P42x0.5	5.00		1.8
48	P42x0.625	5.00		1.8
49	P42x0.625	5.00		1.8



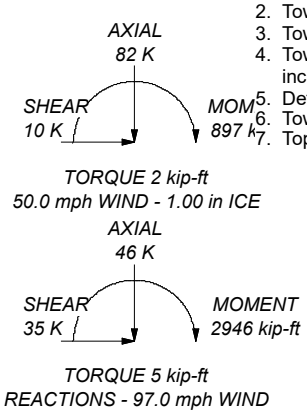
DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LLPX310R-V4 w/ Mount Pipe	124	RRUS 4478 B14	113
LLPX310R-V4 w/ Mount Pipe	124	RRUS 4478 B14	113
LLPX310R-V4 w/ Mount Pipe	124	RRUS 4478 B14	113
WIMAX DAP HEAD	124	RRUS 32 B66	113
WIMAX DAP HEAD	124	RRUS 32 B66	113
WIMAX DAP HEAD	124	RRUS 32 B66	113
WIMAX DAP HEAD	124	DC6-48-60-0-8F	113
WIMAX DAP HEAD	124	RRUS 32 B2	113
APXVSPP18-C-A20 w/ Mount Pipe	124	RRUS 32 B2	113
APXV9ERR18-C-A20 w/ Mount Pipe	124	RRUS 32 B2	113
APXVSPP18-C-A20 w/ Mount Pipe	124	(2) 860 10025	113
IBC1900BB-1	124	(2) 860 10025	113
IBC1900BB-1	124	(2) 860 10025	113
IBC1900BB-1	124	OPA-65R-LCUU-H8 w/ Mount Pipe	113
IBC1900HG-2A	124	OPA-65R-LCUU-H8 w/ Mount Pipe	113
IBC1900HG-2A	124	OPA-65R-LCUU-H8 w/ Mount Pipe	113
IBC1900HG-2A	124	7770.00 w/ Mount Pipe	113
APXVTM14-C-120 w/ Mount Pipe	124	7770.00 w/ Mount Pipe	113
APXVTM14-C-120 w/ Mount Pipe	124	7770.00 w/ Mount Pipe	113
APXVTM14-C-120 w/ Mount Pipe	124	RRUS-11	113
TD-RRH8x20-25	124	RRUS-11	113
TD-RRH8x20-25	124	RRUS-11	113
TD-RRH8x20-25	124	(2) LGP21401	113
Platform Mount (LP 101-1)	124	(2) LGP21401	113
Miscellaneous [NA 507-1]	124	(2) LGP21401	113
VHLP2.5-18	124	DC6-48-60-18-8F	113
VHLP1-23	124	DC6-48-60-18-8F	113
PCS 1900MHz 4x45W-65MHz	122	Platform Mount [LP 712-1]	113
800MHz 2X50W RRH W/FILTER	122	Miscellaneous [NA 507-1]	113
800MHz 2X50W RRH W/FILTER	122	80010966 w/ Mount Pipe	113
800MHz 2X50W RRH W/FILTER	122	80010966 w/ Mount Pipe	113
Pipe Mount [PM 601-3]	122	HBX-6516DS-VTM w/ Mount Pipe	92
PCS 1900MHz 4x45W-65MHz	122	5' x 2' Pipe Mount	92
PCS 1900MHz 4x45W-65MHz	122	5' x 2' Pipe Mount	92
80010966 w/ Mount Pipe	113	5' x 2' Pipe Mount	92
QS66512-2 w/ Mount Pipe	113	T-Arm Mount [TA 602-3]	92
QS66512-2 w/ Mount Pipe	113	HBX-6516DS-VTM w/ Mount Pipe	92
QS66512-2 w/ Mount Pipe	113	HBX-6516DS-VTM w/ Mount Pipe	92
RRUS 32	113	Bridge Stiffener (43" x 9.5" x 1")	80
RRUS 32	113	Bridge Stiffener (43" x 9.5" x 1")	80
RRUS 32	113	Bridge Stiffener (43" x 9.5" x 1")	80
1001940	113	KS24019-L112A	50
1001940	113	Side Arm Mount [SO 701-1]	50
1001940	113	Bridge Stiffener (53" x 9" x 1")	40
(2) DBC0061F1V51-2	113	Bridge Stiffener (53" x 9" x 1")	40
(2) DBC0061F1V51-2	113	Bridge Stiffener (53" x 9" x 1")	40
(2) DBC0061F1V51-2	113		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi			

ALL REACTIONS ARE FACTORED



TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97.0 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.0 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

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

Job: 138 ft Monopole / Creative Dimensions		
Project: PJF 37518-2227.001.7700 / BU 876333		
Client: CCI	Drawn by: skadam	App'd:
Code: TIA-222-G	Date: 07/16/18	Scale: NTS
Path:		Dwg No. E-1

CCIpole

per TIA-222- G

Site BU: 876333

Work Order:

CROWN CASTLE

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	137	12		0	12.75	12.75	0.375	n/a	A53-B-35
2	125	5		0	24.00	24	0.375	n/a	A53-B-35
3	120	40		0	24.00	24	0.375	n/a	A53-B-35
4	80	40		0	36.00	36	0.375	n/a	A53-B-35
5	40	40		0	42.00	42	0.5	n/a	A53-B-35

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	41.5	58.39	plate	4.875 x 1; (1) (1.1875)	3	84	174	293															
2	81.2	85.66	plate	3.75 x 0.75; (1) (1.1875	3				79	207	323												
3	0	2.5	solid round	Diameter Threaded Rou	3							152	222	350									
4	1.5	19.5	plate	CCI-SFP-040075	3										110	197	324						
5	40	49.5	plate	CCI-SFP-040075	3													23.5	135	248			
6	57.5	65.5	plate	CCI-SFP-040075	3																67.6	192	306
7	80	89.25	plate	CCI-SFP-040075	3	19.7	128	265															
8	2.75	28.25	plate	CCI-SFP-065125	3				80	172	296												
9	2.5	29.5	plate	CCI-SFP-045100	1							340											
10	0	2.75	plate	FP 1.25 x 6.75_1	4								80	172	296	245							
11	40	54	plate	CCI-SFP-045100	3												110	220	340				
12	80	89	plate	CCI-SFP-045100	3															100	230	345	
13																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	4.875	1	4.875	0.5	18.000	18.000	18.000	3.625	1.1875	A572-50
2	3.75	0.75	2.8125	0.375	9.000	12.000	18.000	1.875	1.1875	A572-50
3	-	-	3.976078202	6.25	n/a	n/a	0.000	3.976	0.0000	A193 Gr B7
4	4	0.75	3	0.375	12.000	12.000	16.000	2.063	1.1875	A572-65
5	4	0.75	3	0.375	12.000	12.000	16.000	2.063	1.1875	A572-65
6	4	0.75	3	0.375	12.000	12.000	16.000	2.063	1.1875	A572-65
7	4	0.75	3	0.375	12.000	12.000	16.000	2.063	1.1875	A572-65
8	6.5	1.25	8.125	0.625	33.000	33.000	19.000	6.563	1.1875	A572-65
9	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
10	1.25	6.75	8.4375	3.375	n/a	n/a	0.000	8.438	0.0000	A572-65
11	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
12	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	137 - 132	5		0	12.750	12.750	0.375	A53-B-35	1.000
2	132 - 127	5		0	12.750	12.750	0.375	A53-B-35	1.000
3	127 - 125	2	0	0	12.750	12.750	0.375	A53-B-35	1.000
4	125 - 120	5	0	0	24.000	24.000	0.375	A53-B-35	1.000
5	120 - 115	5		0	24.000	24.000	0.375	A53-B-35	1.000
6	115 - 110	5		0	24.000	24.000	0.375	A53-B-35	1.000
7	110 - 105	5		0	24.000	24.000	0.375	A53-B-35	1.000
8	105 - 100	5		0	24.000	24.000	0.375	A53-B-35	1.000
9	100 - 95	5		0	24.000	24.000	0.375	A53-B-35	1.000
10	95 - 90	5		0	24.000	24.000	0.375	A53-B-35	1.000
11	90 - 89.25	0.75		0	24.000	24.000	0.375	A53-B-35	1.000
12	89.25 - 89	0.25		0	24.000	24.000	0.49375	A53-B-35	1.010
13	89 - 88.75	0.25		0	24.000	24.000	0.7	A53-B-35	0.982
14	88.75 - 85.66	3.09		0	24.000	24.000	0.7	A53-B-35	0.982
15	85.66 - 85.41	0.25		0	24.000	24.000	0.875	A53-B-35	0.925
16	85.41 - 81.2	4.21		0	24.000	24.000	0.875	A53-B-35	0.925
17	81.2 - 80.95	0.25		0	24.000	24.000	0.7	A53-B-35	0.982
18	80.95 - 80	0.95	0	0	24.000	24.000	0.7	A53-B-35	0.982
19	80 - 79.75	0.25		0	36.000	36.000	0.375	A53-B-35	1.000
20	79.75 - 74.75	5		0	36.000	36.000	0.375	A53-B-35	1.000
21	74.75 - 69.75	5		0	36.000	36.000	0.375	A53-B-35	1.000
22	69.75 - 65.5	4.25		0	36.000	36.000	0.375	A53-B-35	1.000
23	65.5 - 65.25	0.25		0	36.000	36.000	0.4625	A53-B-35	0.987
24	65.25 - 60.25	5		0	36.000	36.000	0.4625	A53-B-35	0.987
25	60.25 - 58.39	1.86		0	36.000	36.000	0.4625	A53-B-35	0.987
26	58.39 - 58.14	0.25		0	36.000	36.000	0.5625	A53-B-35	1.047
27	58.14 - 57.5	0.64		0	36.000	36.000	0.5625	A53-B-35	1.047
28	57.5 - 57.25	0.25		0	36.000	36.000	0.475	A53-B-35	1.068
29	57.25 - 54	3.25		0	36.000	36.000	0.475	A53-B-35	1.068
30	54 - 53.75	0.25		0	36.000	36.000	0.6	A53-B-35	1.050
31	53.75 - 49.5	4.25		0	36.000	36.000	0.6	A53-B-35	1.050
32	49.5 - 49.25	0.25		0	36.000	36.000	0.7	A53-B-35	1.019
33	49.25 - 44.25	5		0	36.000	36.000	0.7	A53-B-35	1.019
34	44.25 - 41.5	2.75		0	36.000	36.000	0.7	A53-B-35	1.019
35	41.5 - 41.25	0.25		0	36.000	36.000	0.6	A53-B-35	0.966
36	41.25 - 40	1.25	0	0	36.000	36.000	0.6	A53-B-35	0.966
37	40 - 39.75	0.25		0	42.000	42.000	0.5	A53-B-35	1.000
38	39.75 - 34.75	5		0	42.000	42.000	0.5	A53-B-35	1.000
39	34.75 - 29.75	5		0	42.000	42.000	0.5	A53-B-35	1.000
40	29.75 - 29.5	0.25		0	42.000	42.000	0.5	A53-B-35	1.000
41	29.5 - 29.25	0.25		0	42.000	42.000	0.5	A53-B-35	1.069
42	29.25 - 28.25	1		0	42.000	42.000	0.5	A53-B-35	1.069
43	28.25 - 28	0.25		0	42.000	42.000	0.675	A53-B-35	1.073
44	28 - 23	5		0	42.000	42.000	0.675	A53-B-35	1.073
45	23 - 19.5	3.5		0	42.000	42.000	0.675	A53-B-35	1.073
46	19.5 - 19.25	0.25		0	42.000	42.000	0.725	A53-B-35	1.096
47	19.25 - 14.25	5		0	42.000	42.000	0.725	A53-B-35	1.096
48	14.25 - 9.25	5		0	42.000	42.000	0.725	A53-B-35	1.096
49	9.25 - 4.25	5		0	42.000	42.000	0.725	A53-B-35	1.096
50	4.25 - 2.75	1.5		0	42.000	42.000	0.725	A53-B-35	1.096
51	2.75 - 2.5	0.25		0	42.000	42.000	0.9	A53-B-35	0.968
52	2.5 - 2.25	0.25		0	42.000	42.000	1.05	A53-B-35	0.887
53	2.25 - 1.5	0.75		0	42.000	42.000	1.05	A53-B-35	0.887
54	1.5 - 1.25	0.25		0	42.000	42.000	1	A53-B-35	0.861
55	1.25 - 0	1.25		0	42.000	42.000	1	A53-B-35	0.861

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	137 - 132	0.28	0.49	0.20
2	132 - 127	0.60	3.98	0.84
3	127 - 125	0.72	5.72	0.91
4	125 - 120	4.90	36.19	7.50
5	120 - 115	5.49	74.86	7.92
6	115 - 110	10.32	151.55	16.25
7	110 - 105	11.00	233.69	16.61
8	105 - 100	11.70	317.55	16.94
9	100 - 95	12.41	403.02	17.26
10	95 - 90	14.23	492.85	18.76
11	90 - 89.25	14.35	506.93	18.82
12	89.25 - 89	14.41	511.64	18.84
13	89 - 88.75	14.47	516.35	18.86
14	88.75 - 85.66	15.19	575.04	19.14
15	85.66 - 85.41	15.26	579.83	19.18
16	85.41 - 81.2	16.46	661.94	19.82
17	81.2 - 80.95	16.53	666.91	19.86
18	80.95 - 80	16.79	685.85	20.00
19	80 - 79.75	17.28	690.92	20.26
20	79.75 - 74.75	18.38	795.03	21.36
21	74.75 - 69.75	19.40	904.37	22.38
22	69.75 - 65.5	20.28	1001.27	23.23
23	65.5 - 65.25	20.35	1007.09	23.28
24	65.25 - 60.25	21.57	1126.00	24.29
25	60.25 - 58.39	22.02	1171.52	24.67
26	58.39 - 58.14	22.11	1177.69	24.71
27	58.14 - 57.5	22.30	1193.55	24.84
28	57.5 - 57.25	22.37	1199.77	24.90
29	57.25 - 54	23.24	1281.74	25.55
30	54 - 53.75	23.33	1288.13	25.60
31	53.75 - 49.5	24.79	1398.81	26.55
32	49.5 - 49.25	24.89	1405.46	26.60
33	49.25 - 44.25	26.69	1540.99	27.62
34	44.25 - 41.5	27.81	1617.88	28.20
35	41.5 - 41.25	27.91	1624.96	28.24
36	41.25 - 40	28.35	1660.50	28.50
37	40 - 39.75	28.85	1667.71	28.74
38	39.75 - 34.75	30.56	1814.29	29.77
39	34.75 - 29.75	32.12	1964.70	30.39
40	29.75 - 29.5	32.21	1972.31	30.43
41	29.5 - 29.25	32.29	1979.92	30.48
42	29.25 - 28.25	32.62	2010.50	30.67
43	28.25 - 28	32.73	2018.17	30.71
44	28 - 23	34.86	2174.08	31.64
45	23 - 19.5	36.36	2285.89	32.25
46	19.5 - 19.25	36.49	2293.96	32.29
47	19.25 - 14.25	38.82	2457.55	33.13
48	14.25 - 9.25	41.17	2625.22	33.93
49	9.25 - 4.25	43.53	2796.80	34.70
50	4.25 - 2.75	44.24	2849.02	34.94
51	2.75 - 2.5	44.38	2857.75	34.95
52	2.5 - 2.25	44.51	2866.50	34.99
53	2.25 - 1.5	44.91	2892.80	35.12
54	1.5 - 1.25	45.04	2901.58	35.15
55	1.25 - 0	45.66	2945.66	35.36

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
137 - 132	Pole	TP12.75x12.75x0.375	Pole	0.4%	Pass
132 - 127	Pole	TP12.75x12.75x0.375	Pole	2.8%	Pass
127 - 125	Pole	TP12.75x12.75x0.375	Pole	4.0%	Pass
125 - 120	Pole	TP24x24x0.375	Pole	7.3%	Pass
120 - 115	Pole	TP24x24x0.375	Pole	14.6%	Pass
115 - 110	Pole	TP24x24x0.375	Pole	29.4%	Pass
110 - 105	Pole	TP24x24x0.375	Pole	44.8%	Pass
105 - 100	Pole	TP24x24x0.375	Pole	60.4%	Pass
100 - 95	Pole	TP24x24x0.375	Pole	76.4%	Pass
95 - 90	Pole	TP24x24x0.375	Pole	93.3%	Pass
90 - 89.25	Pole	TP24x24x0.375	Pole	95.9%	Pass
89.25 - 89	Pole + Reinf.	TP24x24x0.4938	Pole	75.9%	Pass
89 - 88.75	Pole + Reinf.	TP24x24x0.7	Pole	55.4%	Pass
88.75 - 85.66	Pole + Reinf.	TP24x24x0.7	Pole	61.7%	Pass
85.66 - 85.41	Pole + Reinf.	TP24x24x0.875	Reinf. 2 Tension Rupture	64.6%	Pass
85.41 - 81.2	Pole + Reinf.	TP24x24x0.875	Reinf. 2 Tension Rupture	73.7%	Pass
81.2 - 80.95	Pole + Reinf.	TP24x24x0.7	Pole	71.5%	Pass
80.95 - 80	Pole + Reinf.	TP24x24x0.7	Pole	73.5%	Pass
80 - 79.75	Pole	TP36x36x0.375	Pole	61.8%	Pass
79.75 - 74.75	Pole	TP36x36x0.375	Pole	71.0%	Pass
74.75 - 69.75	Pole	TP36x36x0.375	Pole	80.6%	Pass
69.75 - 65.5	Pole	TP36x36x0.375	Pole	89.1%	Pass
65.5 - 65.25	Pole + Reinf.	TP36x36x0.4625	Pole	73.9%	Pass
65.25 - 60.25	Pole + Reinf.	TP36x36x0.4625	Pole	82.5%	Pass
60.25 - 58.39	Pole + Reinf.	TP36x36x0.4625	Pole	85.8%	Pass
58.39 - 58.14	Pole + Reinf.	TP36x36x0.5625	Pole	72.8%	Pass
58.14 - 57.5	Pole + Reinf.	TP36x36x0.5625	Pole	73.8%	Pass
57.5 - 57.25	Pole + Reinf.	TP36x36x0.475	Pole	88.1%	Pass
57.25 - 54	Pole + Reinf.	TP36x36x0.475	Pole	94.1%	Pass
54 - 53.75	Pole + Reinf.	TP36x36x0.6	Pole	74.8%	Pass
53.75 - 49.5	Pole + Reinf.	TP36x36x0.6	Pole	81.2%	Pass
49.5 - 49.25	Pole + Reinf.	TP36x36x0.7	Pole	70.4%	Pass
49.25 - 44.25	Pole + Reinf.	TP36x36x0.7	Pole	77.1%	Pass
44.25 - 41.5	Pole + Reinf.	TP36x36x0.7	Pole	81.0%	Pass
41.5 - 41.25	Pole + Reinf.	TP36x36x0.6	Pole	93.0%	Pass
41.25 - 40	Pole + Reinf.	TP36x36x0.6	Pole	95.0%	Pass
40 - 39.75	Pole	TP42x42x0.5	Pole	80.4%	Pass
39.75 - 34.75	Pole	TP42x42x0.5	Pole	87.4%	Pass
34.75 - 29.75	Pole	TP42x42x0.5	Pole	94.6%	Pass
29.75 - 29.5	Pole	TP42x42x0.5	Pole	95.0%	Pass
29.5 - 29.25	Pole + Reinf.	TP42x42x0.5	Pole	95.9%	Pass
29.25 - 28.25	Pole + Reinf.	TP42x42x0.5	Pole	97.4%	Pass
28.25 - 28	Pole + Reinf.	TP42x42x0.675	Pole	73.3%	Pass
28 - 23	Pole + Reinf.	TP42x42x0.675	Pole	78.9%	Pass
23 - 19.5	Pole + Reinf.	TP42x42x0.675	Pole	82.9%	Pass
19.5 - 19.25	Pole + Reinf.	TP42x42x0.725	Pole	76.7%	Pass
19.25 - 14.25	Pole + Reinf.	TP42x42x0.725	Pole	82.1%	Pass
14.25 - 9.25	Pole + Reinf.	TP42x42x0.725	Pole	87.7%	Pass
9.25 - 4.25	Pole + Reinf.	TP42x42x0.725	Pole	93.5%	Pass
4.25 - 2.75	Pole + Reinf.	TP42x42x0.725	Pole	95.2%	Pass
2.75 - 2.5	Pole + Reinf.	TP42x42x0.9	Pole	83.4%	Pass
2.5 - 2.25	Pole + Reinf.	TP42x42x1.05	Pole	75.4%	Pass
2.25 - 1.5	Pole + Reinf.	TP42x42x1.05	Pole	76.1%	Pass
1.5 - 1.25	Pole + Reinf.	TP42x42x1	Pole	80.6%	Pass
1.25 - 0	Pole + Reinf.	TP42x42x1	Pole	81.8%	Pass
				Summary	
			Pole	97.4%	Pass
			Reinforcement	88.5%	Pass
			Overall	97.4%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity											
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
137 - 132	279	n/a	279	14.58	n/a	14.58	0.4%												
132 - 127	279	n/a	279	14.58	n/a	14.58	2.8%												
127 - 125	279	n/a	279	14.58	n/a	14.58	4.0%												
125 - 120	1942	n/a	1942	27.83	n/a	27.83	7.3%												
120 - 115	1942	n/a	1942	27.83	n/a	27.83	14.6%												
115 - 110	1942	n/a	1942	27.83	n/a	27.83	29.4%												
110 - 105	1942	n/a	1942	27.83	n/a	27.83	44.8%												
105 - 100	1942	n/a	1942	27.83	n/a	27.83	60.4%												
100 - 95	1942	n/a	1942	27.83	n/a	27.83	76.4%												
95 - 90	1942	n/a	1942	27.83	n/a	27.83	93.3%												
90 - 89.25	1942	n/a	1942	27.83	n/a	27.83	95.9%												
89.25 - 89	1944	579	2523	27.83	9.00	36.83	75.9%							72.4%					
89 - 88.75	1946	1561	3506	27.83	22.50	50.33	55.4%							51.7%					50.2%
88.75 - 85.66	1946	1561	3506	27.83	22.50	50.33	61.7%							57.5%					55.9%
85.66 - 85.41	1945	2285	4231	27.83	30.94	58.77	51.5%		64.6%					50.0%					47.9%
85.41 - 81.2	1945	2285	4231	27.83	30.94	58.77	58.8%		73.7%					57.0%					54.6%
81.2 - 80.95	1946	1561	3506	27.83	22.50	50.33	71.5%							66.6%					64.7%
80.95 - 80	1946	1561	3506	27.83	22.50	50.33	73.5%							68.5%					66.5%
80 - 79.75	6659	n/a	6659	41.97	n/a	41.97	61.8%												
79.75 - 74.75	6659	n/a	6659	41.97	n/a	41.97	71.0%												
74.75 - 69.75	6659	n/a	6659	41.97	n/a	41.97	80.6%												
69.75 - 65.5	6659	n/a	6659	41.97	n/a	41.97	89.1%												
65.5 - 65.25	6659	1433	8092	41.97	9.00	50.97	73.9%						67.2%						
65.25 - 60.25	6659	1433	8092	41.97	9.00	50.97	82.5%						75.1%						
60.25 - 58.39	6659	1433	8092	41.97	9.00	50.97	85.8%						78.1%						
58.39 - 58.14	6675	3198	9873	41.97	23.63	65.59	72.8%	69.8%					62.5%						
58.14 - 57.5	6675	3198	9873	41.97	23.63	65.59	73.8%	70.7%					63.4%						
57.5 - 57.25	6677	1651	8328	41.97	14.63	56.59	88.1%	82.9%											
57.25 - 54	6677	1651	8328	41.97	14.63	56.59	94.1%	88.5%											
54 - 53.75	6679	3868	10547	41.97	28.13	70.09	74.8%	69.2%										61.5%	
53.75 - 49.5	6679	3868	10547	41.97	28.13	70.09	81.2%	75.1%										66.8%	
49.5 - 49.25	6680	5556	12237	41.97	37.13	79.09	70.4%	66.2%				64.6%						59.4%	
49.25 - 44.25	6680	5556	12237	41.97	37.13	79.09	77.1%	72.5%				70.8%						65.1%	
44.25 - 41.5	6680	5556	12237	41.97	37.13	79.09	81.0%	76.1%				74.3%						68.3%	
41.5 - 41.25	6661	3765	10426	41.97	22.50	64.47	93.0%					84.7%						81.4%	
41.25 - 40	6661	3765	10426	41.97	22.50	64.47	95.0%					86.6%						83.2%	
40 - 39.75	14036	n/a	14036	65.19	n/a	65.19	80.4%												
39.75 - 34.75	14036	n/a	14036	65.19	n/a	65.19	87.4%												
34.75 - 29.75	14036	n/a	14036	65.19	n/a	65.19	94.6%												
29.75 - 29.5	14036	n/a	14036	65.19	n/a	65.19	95.0%												
29.5 - 29.25	14044	129	14173	65.19	4.50	69.69	95.9%									70.5%			
29.25 - 28.25	14044	129	14173	65.19	4.50	69.69	97.4%									71.6%			
28.25 - 28	14040	4725	18765	65.19	28.88	94.06	73.3%								54.4%	56.1%			
28 - 23	14040	4725	18765	65.19	28.88	94.06	78.9%								58.6%	60.5%			
23 - 19.5	14040	4725	18765	65.19	28.88	94.06	82.9%								61.6%	63.6%			
19.5 - 19.25	14036	6116	20152	65.19	37.88	103.06	76.7%				69.0%				57.9%	57.8%			
19.25 - 14.25	14036	6116	20152	65.19	37.88	103.06	82.1%				73.9%				62.0%	61.9%			
14.25 - 9.25	14036	6116	20152	65.19	37.88	103.06	87.7%				79.0%				66.2%	66.2%			
9.25 - 4.25	14036	6116	20152	65.19	37.88	103.06	93.5%				84.1%				70.6%	70.5%			
4.25 - 2.75	14036	6116	20152	65.19	37.88	103.06	95.2%				85.7%				71.9%	71.8%			
2.75 - 2.5	14179	10510	24689	65.19	47.25	112.44	83.4%				68.8%					68.4%	68.0%		
2.5 - 2.25	14496	14292	28788	65.19	54.68	119.87	75.4%			42.3%	61.6%						64.0%		
2.25 - 1.5	14496	14292	28788	65.19	54.68	119.87	76.1%			42.7%	62.2%						64.6%		
1.5 - 1.25	14477	12735	27212	65.19	45.68	110.87	80.6%			46.2%							68.3%		
1.25 - 0	14477	12735	27212	65.19	45.68	110.87	81.8%			46.9%							69.4%		

Note: Section capacity checked in 5 degree increments.

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

Site Data

BU#: *876333*
Site Name: *Creative Dimensions*
App #:

Reactions		
Mu	36	ft-kips
Axial, Pu:	4.9	kips
Shear, Vu:	7.5	kips
Elevation:	120	feet

Bolt Threads:
N-Included
Vn=φ(0.45*Ab*Fu)
φ=0.75, φ*Vn (kips):
17.89

Pole Manufacturer:	Other

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

Bolt Data			
Qty:	8		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	25		

Plate Data		
Diam:	32	in
Thick, t:	0.75	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	2.75	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	24	in
Thick:	0.375	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Non-Rigid
Bolt Tension Capacity, φ*Tn, **B1**:	30.06	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	30.02	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	8.03	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	0.323	in	
Min PL "treq" for actual **T w/ Pry**:	0.128	in	
Min PL "t1" for actual **T w/o Pry**:	0.167	in	
T allowable w/o Prying:	30.06	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	8.03	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	26.7%	**Pass**	

Exterior Flange Plate Results

	Flexural Check		Non-Rigid
Compression Side Plate Stress:	4.7	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	14.5%	**Pass**	Comp. Y.L. Length:
No Prying			7.00
Tension Side Stress Ratio, (treq/t)^2:	2.9%	**Pass**	

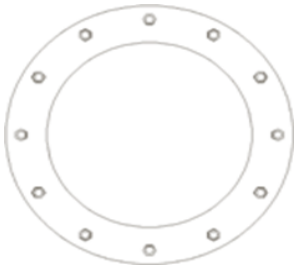
n/a

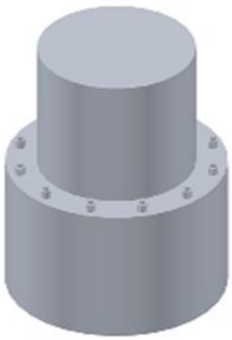
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^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

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com
Effective Date: 01/08/2018 Verison 1.6

DATE:	7/16/2018
PROJECT NO:	37518-2227.001.7700
SITE NAME:	CREATIVE DIMENSIONS
SITE NUMBER/BUN:	876333.00
DESCRIPTION:	80FT FLANGE
OWNER:	CCI
ENGINEER:	SSK

BOLTED FLANGE JUMP ANALYSIS PER TIA-222-G & AISC 13TH ED. (BLACK)

General Parameters & Loading

Flange Elevation:	80.00	ft
TIA Reference Standard:	TIA-222-G	
AISC Manual:	13th Ed. (Black)	
Method:	LRFD	
ASD Stress Increase, ASIF:	1.00	
Moment, Muf:	686.00	k-ft
Axial, Puf:	16.80	kips
Shear, Vf:	20.00	kips

Pole Parameters

	Upper Pole	Lower Pole	
Number of Sides	Round	Round	
Pole Diameter, Dp:	24.00	36.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	35	35	ksi
Pole Fu:	60	60	ksi
Flange Diameter, Df:	35.00	36.00	in
Flange Thickness, tf:	1.88	1.88	in

Flange Parameters

Number of Bolt Circles: (1) Bolt Circle

	Bolt Circle 1	Bolt Circle 2	
Qty. Bolts:	24		
Bolt Diameter:	0.75		in
Bolt Circle:	28.63		in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0.00		degrees
Bolt Area, Ag:	0.4418	0.0000	in^2

	Bolt Circle 1	Bolt Circle 2	
Max. Tension:	10.88	0.00	kips
Max. Net Tension:	10.69	0.00	kips
Max. Net Compression:	11.08	0.00	kips
Moment to Bolt Circle:	155.78	0.00	k-ft
Axial to Bolt Circle:	4.74	0.00	kips
Shear to Bolt Circle:	20.00	0.00	kips
Equivalent Bolt Circle:	28.63	0.00	in

	Thickness	Width	Height
Top Flange Stiffener Parameters			
Bot. Flange Stiffener Parameters			

Shaft Reinforcing Parameters

	Generation 1	Generation 2	Generation 3	Generation 4	
Top Condition	Existing	Design			
Top Shaft Reinf. Designation	CCI-040075	CCI-045100			
Top Shaft Reinf. Thickness					in
Top Shaft Reinf. Width					in
Top Shaft Reinf. Term. Bolts	10	12			
Top Shaft Reinf. Bolt Spacing	3.00	3.00			in
Top Shaft Reinf. End Spacing	3.00	3.00			in
Top Shaft Reinf. Start Elevation		80.50			ft
Bottom Condition					
Bottom Shaft Reinf. Designation					
Bottom Shaft Reinf. Thickness					in
Bottom Shaft Reinf. Width					in
Bottom Shaft Reinf. Term. Bolts					
Bottom Shaft Reinf. Bolt Spacing					in
Bottom Shaft Reinf. End Spacing					in
Bottom Shaft Reinf. End Elevation					ft

Bridge Stiffener Parameters

	Generation 1	Generation 2	Generation 3	Generation 4	
Reference Document	PMI 5781873				
Analysis, Design, New, Ignore	Analysis	Design			
Jump Plate Designation	CCI-045100	CCI-045100			
Jump Plate Width Override					in
Jump Plate Thickness Override					in
Clear Distance from Flange	0.00	0.00			in
Jump Plate Fy	65	65			ksi
Jump Plate Fu	80	80			ksi
Bolt Type	EXISTING AJAX	APPROVED BLIND BOLT			
Bolt Tension Method	Case 1	Case 1			
Top Bolt Quantity	10	12			
Top Bolt Spacing	3.00	3.00			in
Top Bolt Edge Distance	3.00	3.00			in
Bottom Bolt Quantity	10	8			
Bottom Bolt Spacing	3.00	3.00			in
Bottom Bolt Edge Distance	3.00	3.00			in
Unbraced Length	18.00	18.00			in
Unbraced Length Override	18.00	18.00			in
K	0.80	0.80			
Stiffener Circle	37.00	37.00			in
Clearance Check	OK	OK			
Qty. Jump Plates	3	3			in
Location 1	20	100			deg
Location 2	128	230			deg
Location 3	265	340			deg
Location 4					deg
Location 5					deg
Location 6					deg

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com
Effective Date: 01/08/2018 Verison 1.6

DATE:	7/16/2018
PROJECT NO:	37518-2227.001.7700
SITE NAME:	CREATIVE DIMENSIONS
SITE NUMBER/BUN:	876333.00
DESCRIPTION:	80FT FLANGE
OWNER:	CCI
ENGINEER:	SSK

BOLTED FLANGE JUMP ANALYSIS PER TIA-222-G & AISC 13TH ED. (BLACK)

Jump Plate Analysis

	Generation 1	Generation 2	Generation 3	Generation 4	
Applied Axial Load (Pu)	130.59	129.50			kips
Hole Diameter	1.19	1.19			in
Gross Area (Ag)	4.50	4.50			in^2
Net Area (An)	3.31	3.31			in^2
b/t Ratio	4.50	4.50			
Radius of Gyration (r)	0.29	0.29			in
K L / r	49.88	49.88			
Q (Where Qa = 1.0)	1.00	1.00			
ASIF Value	1.00	1.00			
Critical Stress (Fa or Fcr)	51.31	51.31			ksi
Nominal Compressive Capacity	207.80	207.80			kips
Nominal Tensile Capacity	198.75	198.75			kips
Controlling Stress Ratio	65.7%	65.2%			

Bolt Analysis

	Generation 1	Generation 2	Generation 3	Generation 4	
Top Bolt Shear Load (Vu)	13.059	16.563			kips
Top Bolt Tension Load (Tu)	8.961	9.708			kips
Top Eccentricity (e)	6.500	6.500			in
Top Bolt Bearing Capacity (Rn)	45.315	45.315			kips
Top Bolt Shear Capacity (Vn)	37.000	37.000			kips
Top Bolt Tension Capacity (Tn)	30.000	13.500			kips
Top Connection Length Reduction	N/a	N/a			
Top Bolt Combined Stress Ratio	21.4%	71.7%			

Bottom Bolt Shear Load (Vu)	13.059	24.844			kips
Bottom Bolt Tension Load (Tu)	0.689	1.579			kips
Bottom Eccentricity (e)	0.500	0.500			in
Bottom Bolt Bearing Capacity (Rn)	45.315	45.315			kips
Bottom Bolt Shear Capacity (Vn)	37.000	37.000			kips
Bottom Bolt Tension Capacity (Tn)	30.000	13.500			kips
Bottom Connection Length Reduction	N/a	N/a			
Bottom Bolt Combined Stress Ratio	12.5%	46.5%			

Analysis Summary

	Generation 1	Generation 2	Generation 3	Generation 4
JUMP PLATE COMBINED STRESS RATIO	65.7%	65.2%		
TOP BOLT COMBINED STRESS RATIO	21.4%	71.7%		
BOTTOM BOLT COMBINED STRESS RATIO	12.5%	46.5%		

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

Site Data

BU#: *876333*
Site Name: *Creative Dimensions*
App #:

Reactions		
Mu	155.78	ft-kips
Axial, Pu:	4.74	kips
Shear, Vu:	20	kips
Elevation:	80	feet

Bolt Threads:
N-Included
Vn=φ(0.45*Ab*Fu)
φ=0.75, φ*Vn (kips):
17.89

Pole Manufacturer:	Other

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

Bolt Data			
Qty:	24		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	28.625		

Plate Data		
Diam:	35	in
Thick, t:	1.875	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.14	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	24	in
Thick:	0.375	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn, **B1**:	30.06	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	30.03	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	10.69	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.191	in	
Min PL "treq" for actual **T w/ Pry**:	0.538	in	
Min PL "t1" for actual **T w/o Pry**:	0.710	in	
T allowable w/o Prying:	30.06	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	10.69	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	35.6%	**Pass**	

Exterior Flange Plate Results

	Flexural Check		Rigid
Compression Side Plate Stress:	5.3	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	16.5%	**Pass**	Comp. Y.L. Length:
No Prying			15.60
Tension Side Stress Ratio, (treq/t)^2:	8.2%	**Pass**	

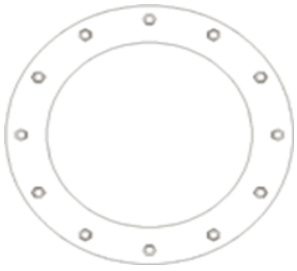
n/a

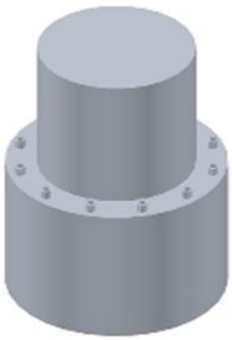
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^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

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

Site Data

BU#: *876333*
Site Name: *Creative Dimensions*
App #:

Manufacturer:	Other

Reactions		
Moment:	155.78	ft-kips
Axial:	4.74	kips
Shear:	20	kips
Exterior Flange Run, T+q:	10.69	kips

Bolt Threads:
N-Included
Vn=φ(0.45*Ab*Fu)
φ=0.75, φ*Vn (kips):
17.89

Elevation: 80 feet

Bolt Data			
Qty:	24		
Diam:	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle:	28.625	in	

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	10.7	Kips, Ext. Flange Tu+q
Adjusted φ*Tn (due to Vu=Vu/Qty), I	30.0	Kips
Bolt Stress Ratio:	35.6%	**Pass**

Plate Data		
Plate Outer Diam:	35.25	in
Plate Inner Diam:	24.25	in (Hole @ Ctr)
Thick:	1.875	in
Grade:	36	ksi
Effective Width:	4.61	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	11.1	Kips, Ext. Cu=Interior Cu
Plate Stress:	9.1	ksi
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	27.9%	**Pass**

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

n/a

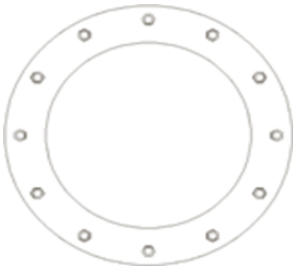
Stiffener Results

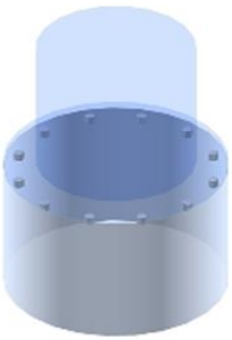
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Pole OuterDiam:	36	in
Thick:	0.375	in
Pole Inner Diam:	35.25	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi





* 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

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com
Effective Date: 01/08/2018 Verison 1.6

DATE:	7/16/2018
PROJECT NO:	37518-2227.001.7700
SITE NAME:	CREATIVE DIMENSIONS
SITE NUMBER/BUN:	876333.00
DESCRIPTION:	40FT FLANGE
OWNER:	CCI
ENGINEER:	SSK

BOLTED FLANGE JUMP ANALYSIS PER TIA-222-G & AISC 13TH ED. (BLACK)

General Parameters & Loading

Flange Elevation:	40.00	ft
TIA Reference Standard:	TIA-222-G	
AISC Manual:	13th Ed. (Black)	
Method:	LRFD	
ASD Stress Increase, ASIF:	1.00	
Moment, Muf:	1661.00	k-ft
Axial, Puf:	28.35	kips
Shear, Vf:	28.50	kips

Pole Parameters

	Upper Pole	Lower Pole	
Number of Sides	Round	Round	
Pole Diameter, Dp:	36.00	42.00	in
Pole Thickness, tp:	0.3750	0.5000	in
Pole Fy:	35	35	ksi
Pole Fu:	60	60	ksi
Flange Diameter, Df:	40.75	42.00	in
Flange Thickness, tf:	1.75	1.75	in

Flange Parameters

Number of Bolt Circles: (1) Bolt Circle

	Bolt Circle 1	Bolt Circle 2	
Qty. Bolts:	32		
Bolt Diameter:	0.75		in
Bolt Circle:	38.50		in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0.00		degrees
Bolt Area, Ag:	0.4418	0.0000	in^2

	Bolt Circle 1	Bolt Circle 2	
Max. Tension:	16.36	0.00	kips
Max. Net Tension:	16.12	0.00	kips
Max. Net Compression:	16.60	0.00	kips
Moment to Bolt Circle:	419.81	0.00	k-ft
Axial to Bolt Circle:	7.71	0.00	kips
Shear to Bolt Circle:	28.50	0.00	kips
Equivalent Bolt Circle:	38.50	0.00	in

	Thickness	Width	Height
Top Flange Stiffener Parameters			
Bot. Flange Stiffener Parameters			

Shaft Reinforcing Parameters

	Generation 1	Generation 2	Generation 3	Generation 4	
Top Condition	Existing	Design			
Top Shaft Reinf. Designation	CCI-040075	CCI-045100			
Top Shaft Reinf. Thickness					in
Top Shaft Reinf. Width					in
Top Shaft Reinf. Term. Bolts	14	10			
Top Shaft Reinf. Bolt Spacing	3.00	3.00			in
Top Shaft Reinf. End Spacing	3.00	3.00			in
Top Shaft Reinf. Start Elevation		40.50			ft
Bottom Condition					
Bottom Shaft Reinf. Designation					
Bottom Shaft Reinf. Thickness					in
Bottom Shaft Reinf. Width					in
Bottom Shaft Reinf. Term. Bolts					
Bottom Shaft Reinf. Bolt Spacing					in
Bottom Shaft Reinf. End Spacing					in
Bottom Shaft Reinf. End Elevation					ft

Bridge Stiffener Parameters

	Generation 1	Generation 2	Generation 3	Generation 4	
Reference Document	PMI 5781873				
Analysis, Design, New, Ignore	Analysis	Design			
Jump Plate Designation	CCI-065125	CCI-045100			
Jump Plate Width Override					in
Jump Plate Thickness Override					in
Clear Distance from Flange	0.00	0.00			in
Jump Plate Fy	65	65			ksi
Jump Plate Fu	80	80			ksi
Bolt Type	EXISTING AJAX	APPROVED BLIND BOLT			
Bolt Tension Method	Case 1	Case 1			
Top Bolt Quantity	14	10			
Top Bolt Spacing	3.00	3.00			in
Top Bolt Edge Distance	3.00	3.00			in
Bottom Bolt Quantity	14	8			
Bottom Bolt Spacing	3.00	3.00			in
Bottom Bolt Edge Distance	3.00	3.00			in
Unbraced Length	18.00	18.00			in
Unbraced Length Override	18.00	18.00			in
K	0.80	0.80			
Stiffener Circle	43.25	43.00			in
Clearance Check	OK	OK			
Qty. Jump Plates	3	3			in
Location 1	24	110			deg
Location 2	135	220			deg
Location 3	248	340			deg
Location 4					deg
Location 5					deg
Location 6					deg

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com
Effective Date: 01/08/2018 Verison 1.6

DATE:	7/16/2018
PROJECT NO:	37518-2227.001.7700
SITE NAME:	CREATIVE DIMENSIONS
SITE NUMBER/BUN:	876333.00
DESCRIPTION:	40FT FLANGE
OWNER:	CCI
ENGINEER:	SSK

BOLTED FLANGE JUMP ANALYSIS PER TIA-222-G & AISC 13TH ED. (BLACK)

Jump Plate Analysis

	Generation 1	Generation 2	Generation 3	Generation 4	
Applied Axial Load (Pu)	311.46	183.93			kips
Hole Diameter	1.19	1.19			in
Gross Area (Ag)	8.13	4.50			in^2
Net Area (An)	6.64	3.31			in^2
b/t Ratio	5.20	4.50			
Radius of Gyration (r)	0.36	0.29			in
K L / r	39.91	49.88			
Q (Where Qa = 1.0)	1.00	1.00			
ASIF Value	1.00	1.00			
Critical Stress (Fa or Fcr)	55.87	51.31			ksi
Nominal Compressive Capacity	408.54	207.80			kips
Nominal Tensile Capacity	398.44	198.75			kips
Controlling Stress Ratio	78.2%	92.5%			

Bolt Analysis

	Generation 1	Generation 2	Generation 3	Generation 4	
Top Bolt Shear Load (Vu)	22.247	19.875			kips
Top Bolt Tension Load (Tu)	6.347	7.344			kips
Top Eccentricity (e)	3.625	3.500			in
Top Bolt Bearing Capacity (Rn)	45.315	45.315			kips
Top Bolt Shear Capacity (Vn)	37.000	37.000			kips
Top Bolt Tension Capacity (Tn)	30.000	13.500			kips
Top Connection Length Reduction	N/a	N/a			
Top Bolt Combined Stress Ratio	40.6%	58.4%			

Bottom Bolt Shear Load (Vu)	22.247	24.844			kips
Bottom Bolt Tension Load (Tu)	1.068	1.542			kips
Bottom Eccentricity (e)	0.625	0.500			in
Bottom Bolt Bearing Capacity (Rn)	60.420	60.420			kips
Bottom Bolt Shear Capacity (Vn)	37.000	37.000			kips
Bottom Bolt Tension Capacity (Tn)	30.000	18.000			kips
Bottom Connection Length Reduction	N/a	N/a			
Bottom Bolt Combined Stress Ratio	36.3%	45.8%			

Analysis Summary

	Generation 1	Generation 2	Generation 3	Generation 4
JUMP PLATE COMBINED STRESS RATIO	78.2%	92.5%		
TOP BOLT COMBINED STRESS RATIO	40.6%	58.4%		
BOTTOM BOLT COMBINED STRESS RATIO	36.3%	45.8%		

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

Site Data

BU#: *876333*
Site Name: *Creative Dimensions*
App #:

Reactions		
Mu	419.81	ft-kips
Axial, Pu:	7.71	kips
Shear, Vu:	28.5	kips
Elevation:	40	feet

Bolt Threads:
N-Included
Vn=φ(0.45*Ab*Fu)
φ=0.75, φ*Vn (kips):
17.89

Pole Manufacturer:	Other

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

Bolt Data			
Qty:	32		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	38.5		

Plate Data		
Diam:	40.75	in
Thick, t:	1.75	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.53	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn, **B1**:	30.06	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	30.02	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	16.12	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	0.754	in	
Min PL "treq" for actual **T w/ Pry**:	0.415	in	
Min PL "t1" for actual **T w/o Pry**:	0.553	in	
T allowable w/o Prying:	30.06	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	16.12	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	53.7%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	4.9	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	15.2%	**Pass**	Comp. Y.L. Length:
No Prying			13.65
Tension Side Stress Ratio, (treq/t)^2:	5.6%	**Pass**	

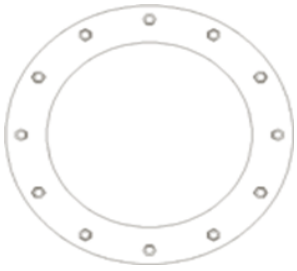
n/a

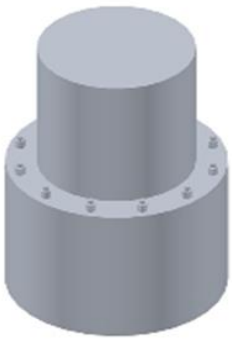
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^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

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

Site Data

BU#: *876333*
Site Name: *Creative Dimensions*
App #:

Manufacturer:	Other

Reactions		
Moment:	419.81	ft-kips
Axial:	7.71	kips
Shear:	28.5	kips
Exterior Flange Run, T+q:	16.12	kips

Bolt Threads:
N-Included
Vn=φ(0.45*Ab*Fu)
φ=0.75, φ*Vn (kips):
17.89

Elevation: 40 feet

Bolt Data

Qty:	32		
Diam:	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle:	38.5	in	

Plate Data

Plate Outer Diam:	41	in
Plate Inner Diam:	36.25	in (Hole @ Ctr)
Thick:	1.75	in
Grade:	36	ksi
Effective Width:	4.03	in

Stiffener Data (Welding at Both Sides)

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

Pole Data

Pole OuterDiam:	42	in
Thick:	0.5	in
Pole Inner Diam:	41	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	16.1	Kips, Ext. Flange Tu+q
Adjusted φ*Tn (due to Vu=Vu/Qty), I	30.0	Kips
Bolt Stress Ratio:	53.7%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	16.6	Kips, Ext. Cu=Interior Cu
Plate Stress:	6.7	ksi
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	20.8%	**Pass**

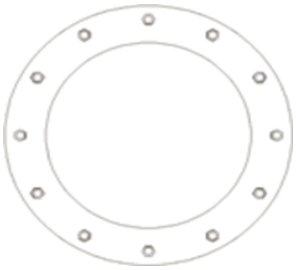
n/a

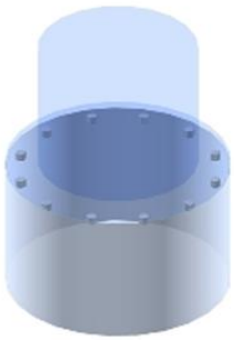
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^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

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com
v4.4 - Effective 7-12-13

Date: 7/16/2018
PJF Project: 37518-2227.001.7700
Client Ref. # 876333
Site Name: Creative Dimensions
Description: 138ft Monopole
Owner: CCI
Engineer: SSK

Asymmetric Anchor Rod Analysis

Moment =	2946	k-ft	TIA Ref.	G	Location =	Base Plate		
Axial =	46.0	kips	ASIF =	1.0000	η =	0.55	for BP, Rev. G Sect. 4.9.9	
Shear =	35.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	28							

**** 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^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.000	Other	36	58	0.0	48.00	0.00	3.14	97.43	94.12	99.72	0.00	116.00	86.0%
2	2.000	Other	36	58	18.0	48.00	0.00	3.14	100.65	97.34	102.94	0.00	116.00	88.7%
3	2.000	Other	36	58	36.0	48.00	0.00	3.14	104.49	101.18	106.78	0.00	116.00	92.0%
4	2.000	Other	36	58	54.0	48.00	0.00	3.14	107.67	104.36	109.96	0.00	116.00	94.8%
5	2.000	Other	36	58	72.0	48.00	0.00	3.14	109.19	105.88	111.48	0.00	116.00	96.1%
6	2.000	Other	36	58	90.0	48.00	0.00	3.14	108.55	105.24	110.83	0.00	116.00	95.5%
7	2.000	Other	36	58	108.0	48.00	0.00	3.14	105.85	102.54	108.14	0.00	116.00	93.2%
8	2.000	Other	36	58	126.0	48.00	0.00	3.14	101.83	98.52	104.12	0.00	116.00	89.8%
9	2.000	Other	36	58	144.0	48.00	0.00	3.14	97.69	94.38	99.98	0.00	116.00	86.2%
10	2.000	Other	36	58	162.0	48.00	0.00	3.14	94.74	91.43	97.03	0.00	116.00	83.6%
11	2.000	Other	36	58	180.0	48.00	0.00	3.14	93.88	90.57	96.17	0.00	116.00	82.9%
12	2.000	Other	36	58	198.0	48.00	0.00	3.14	95.16	91.85	97.45	0.00	116.00	84.0%
13	2.000	Other	36	58	216.0	48.00	0.00	3.14	97.73	94.42	100.02	0.00	116.00	86.2%
14	2.000	Other	36	58	234.0	48.00	0.00	3.14	100.35	97.04	102.64	0.00	116.00	88.5%
15	2.000	Other	36	58	252.0	48.00	0.00	3.14	101.94	98.63	104.23	0.00	116.00	89.9%
16	2.000	Other	36	58	270.0	48.00	0.00	3.14	101.95	98.64	104.24	0.00	116.00	89.9%
17	2.000	Other	36	58	288.0	48.00	0.00	3.14	100.46	97.15	102.75	0.00	116.00	88.6%
18	2.000	Other	36	58	306.0	48.00	0.00	3.14	98.20	94.89	100.49	0.00	116.00	86.6%
19	2.000	Other	36	58	324.0	48.00	0.00	3.14	96.31	93.00	98.60	0.00	116.00	85.0%
20	2.000	Other	36	58	342.0	48.00	0.00	3.14	95.87	92.56	98.16	0.00	116.00	84.6%
21							0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0%
22	2.000	A193 Gr B7	105	125	10.0	54.00	0.00	3.14	110.95	107.64	113.24	249.00	249.00	45.5%
23	2.000	A193 Gr B7	105	125	100.0	54.00	0.00	3.14	120.09	116.78	122.38	249.00	249.00	49.1%
24	2.000	A193 Gr B7	105	125	190.0	54.00	0.00	3.14	106.24	102.93	108.53	249.00	249.00	43.6%
25	2.000	A193 Gr B7	105	125	280.0	54.00	0.00	3.14	114.09	110.78	116.38	249.00	249.00	46.7%
26	2.250	A193 Gr B7	105	125	152.0	54.50	0.00	3.98	137.85	133.66	140.75	0.00	325.00	43.3%
27	2.250	A193 Gr B7	105	125	244.0	54.50	0.00	3.98	146.08	141.89	148.98	0.00	325.00	45.8%
28	2.250	A193 Gr B7	105	125	350.0	54.50	0.00	3.98	137.91	133.72	140.81	0.00	325.00	43.3%
								87.33						

Stiffened or Unstiffened, Ungrouted, 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#:	*876333*
Site Name:	*Creative Dimensions*
App #:	
Pole Manufacturer:	*Other*

Reactions			Reactions adjusted to account for aditional anchor rods
Mu:	2150.8	ft-kips	
Axial, Pu:	33.1	kips	
Shear, Vu:	25.2	kips	
Eta Factor, η	0.55	TIA G (Fig. 4-4)	

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

Anchor Rod Data		
Qty:	20	
Diam:	2	in
Rod Material:	Other	
Strength (Fu):	58	ksi
Yield (Fy):	36	ksi
Bolt Circle:	48	in

Anchor Rod Results

Max Rod (Cu+ Vu/ή):	111.5	Kips	Rigid
Allowable Axial, Φ*Fu*Anet:	116.0	Kips	AISC LRFD
Anchor Rod Stress Ratio:	96.1%	**Pass**	φ*Tn

Plate Data		
Diam:	54	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	6.60	in

Base Plate Results Flexural Check

Base Plate Stress:	30.4	ksi	Rigid
Allowable Plate Stress:	32.4	ksi	AISC LRFD
Base Plate Stress Ratio:	93.9%	**Pass**	φ*Fy
			Y.L. Length: 23.24

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

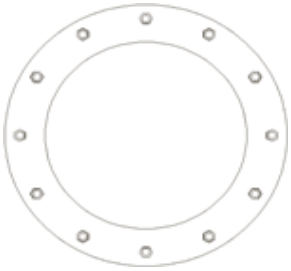
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Diam:	42	in
Thick:	0.5	in
Grade:	35	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 Foundation

BU # :	876333
Site Name:	Creative Dimensions
App. Number:	

TIA-222 Revison:	G
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	2946	
Axial Force (kips)	46	
Shear Force (kips)	35	

Material Properties		
Concrete Strength, f'c:	4	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	30	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 30' below grade		
Pier Diameter	6.5	ft
Rebar Quantity	16	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	7.18	-
Soil Safety Factor	4.39	-
Max Moment (kip-ft)	3192.71	-
Rating	*30.3%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	278.08	-
End Bearing (kips)	1459.64	-
Weight of Concrete (kips)	127.51	-
Total Capacity (kips)	1737.72	-
Axial (kips)	173.51	-
Rating	*10.0%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.63	-
Critical Moment (kip-ft)	3190.79	-
Critical Moment Capacity	3849.36	-
Rating	*82.9%*	-

Soil Interaction Rating	**30.3%**
Structural Foundation Rating	**82.9%**

Soil Profile

Groundwater Depth	8	ft	# of Layers: 11

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	2	2	113	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	2	3.33	1.33	112	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
3	3.33	4	0.67	112	150	0	34	0.000	0.000	0.16	0.16			Cohesionless
4	4	6	2	113	150	0	39	0.000	0.000	0.31	0.31			Cohesionless
5	6	8	2	113	150	0	37	0.000	0.000	0.41	0.41			Cohesionless
6	8	10	2	50.6	87.6	0	37	0.000	0.000	0.50	0.50			Cohesionless
7	10	12	2	49.6	87.6	0	35	0.00	0.00	0.51	0.51			Cohesionless
8	12	14	2	49.6	87.6	0	34	0.00	0.00	0.54	0.54			Cohesionless
9	14	20	6	50.6	87.6	0	35	0.00	0.00	0.66	0.66			Cohesionless
10	20	25	5	51.6	87.6	0	41	0.00	0.00	0.96	0.96			Cohesionless
11	25	30	5	50.6	87.6	0	36	0.00	0.00	0.95	0.95	58.65		Cohesionless

APPENDIX D

MODIFICATION DRAWINGS

MODIFIED 137'-0" MONOPOLE

BU #876333; CREATIVE DIMENSIONS

10 SPARKS ST.
PLAINVILLE, CONNECTICUT 06062
HARTFORD COUNTY
LAT: 41° 40' 24.52"; LONG: -72° 51' 16.17"
ORDER: 421157 REV. 1; WO: 1578501

PROJECT CONTACTS

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

ENGINEER OF RECORD:
PJFMOD@PAULJFORD.COM

THIS PROJECT INCLUDES THE FOLLOWING ITEMS
REMOVE EXISTING SHAFT REINFORCING AS REQUIRED
SHAFT REINFORCING
FIELD WELDED STIFFENERS
BOLTED FLANGE JUMPS
OBSTRUCTION SIGNAGE
REMOVAL OF EXISTING BASE PLATE GROUT
INSTALLATION OF NEW BASE PLATE GROUT

SHEET INDEX	
SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
MI-1	MI CHECKLIST
N-1	GENERAL NOTES
B-1	FORGBolt® DETAILS
B-2	NEXGEN2™ BOLT DETAIL
B-3	AJAX ONESIDE™ BOLT DETAIL
S-1	MONOPOLE PROFILE
S-2	BOLTED FLANGE JUMP DETAILS
S-3	BOLTED FLANGE JUMP DETAILS
S-4	BASE PLATE DETAILS
S-5	TRANSITION STIFFENER DETAILS

WIND DESIGN DATA	
REFERENCE STANDARD	ANSI/TIA-222-G-2-2009
LOCAL CODE	2016 CSBC
ULTIMATE WIND SPEED (3-SECOND GUST)	125 MPH
CONVERTED NOMINAL WIND SPEED (3-SECOND GUST)	97 MPH
ICE THICKNESS	1.0 IN
ICE WIND SPEED	50 MPH
SERVICE WIND SPEED	60 MPH
RISK CATEGORY	II
EXPOSURE CATEGORY	C
Kzt	1.0

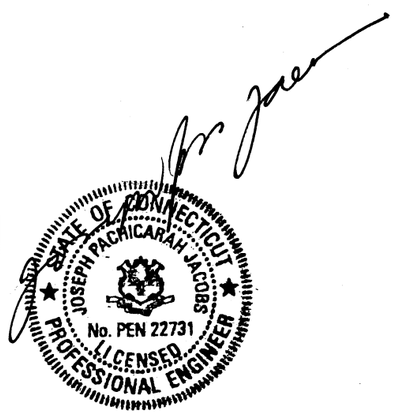
TOWER MANUFACTURER: PITTSBURGH MONOPOLE DIVISION
TOWER MANUFACTURER #: 367

THE ASSOCIATED FAILING SA WO NUMBER FOR THIS PROJECT IS 1519272

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@PAULJFORD.COM.

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

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.



JUL 16 2018

REV	DATE	DESCRIPTION

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

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

BU #876333; CREATIVE DIMENSIONS
PLAINVILLE, CONNECTICUT
MODIFIED 137'-0" MONOPOLE

PROJECT No:	37518-2227.001.7700
DRAWN BY:	IM
DESIGNED BY:	SK
CHECKED BY:	BKK
DATE:	7-16-2018

TITLE SHEET

T-1

V1.0 37518-2227.001.DWG

MI CHECKLIST

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

MODIFICATION INSPECTION NOTES

GENERAL

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

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

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

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

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

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

SERVICE LEVEL COMMITMENT

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

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

REQUIRED PHOTOS

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

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

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

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

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

JUL 16 2018

REV	DATE	DESCRIPTION

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

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

BU #876333; CREATIVE DIMENSIONS
PLAINVILLE, CONNECTICUT
MODIFIED 137'-0" MONOPOLE

PROJECT No:	37518-2227.001.7700
DRAWN BY:	IM
DESIGNED BY:	SK
CHECKED BY:	BKK
DATE:	7-16-2018

MI CHECKLIST

MI-1

V1.0 37518-2227.001.DWG

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

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

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

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

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

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

7. FOUNDATION WORK - (NOT REQUIRED)

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

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

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

11. BASE PLATE GROUT
    - 11.1. NEW GROUT FOR THE POLE BASE SHALL BE NON-SHRINK, NON-METALLIC, GROUT (NS GROUT BY EUCLID, OR APPROVED EQUAL) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH. CONTRACTOR SHALL SUBMIT PROPOSED GROUT SPECIFICATION INFORMATION TO CROWN CASTLE FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION. CONTRACTOR SHALL FOLLOW GROUT MANUFACTURER'S SPECIFICATIONS FOR COLD WEATHER GROUTING PROCEDURES (IF NECESSARY) AND THE TESTING AGENCY SHALL PREPARE GROUT SAMPLE SPECIMENS FOR COMPRESSIVE STRENGTH TESTING AND VERIFICATION.
    - 11.2. GROUT SHALL BE INSTALLED TIGHT UNDER THE BASE PLATE AND BEARING PLATE REGION WITH NO VOIDS REMAINING BETWEEN THE TOP OF THE EXISTING CONCRETE AND THE UNDERSIDE OF THE EXISTING BASE PLATE AND BEARING PLATE.
    - 11.3. CAULK AROUND ANCHOR RODS WHEN GROUTING.

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

JUL 16 2018

REV	DATE	DESCRIPTION

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

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

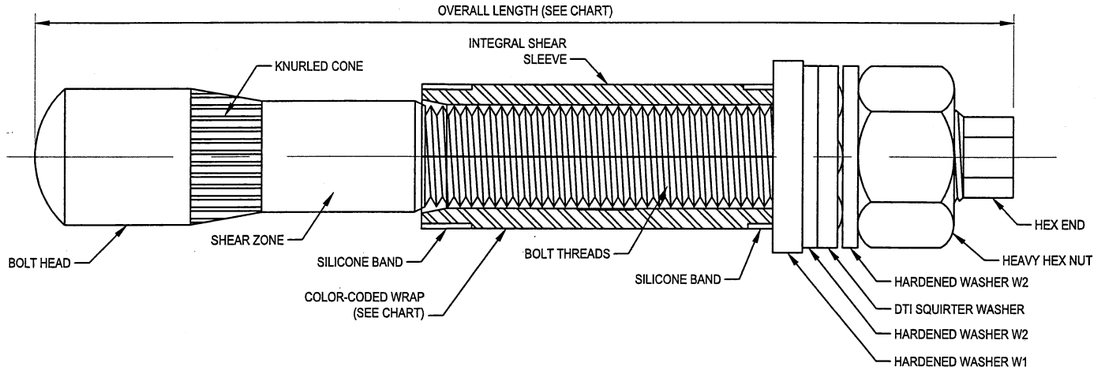
BU #876333; CREATIVE DIMENSIONS
PLAINVILLE, CONNECTICUT
MODIFIED 137'-0" MONOPOLE

PROJECT No:	37518-2227.001.7700
DRAWN BY:	IM
DESIGNED BY:	SK
CHECKED BY:	BKK
DATE:	7-16-2018

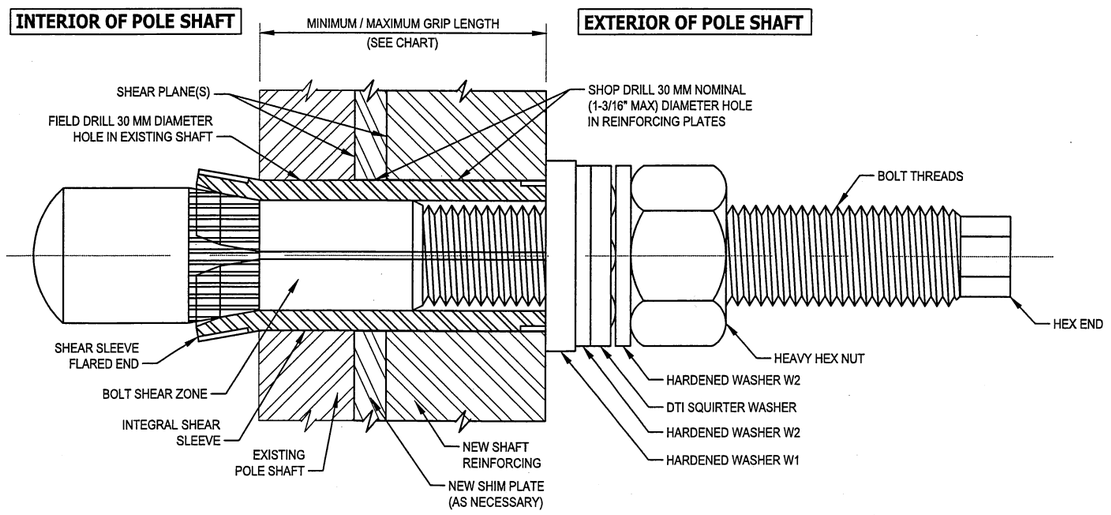
GENERAL NOTES

N-1

V1.0 37518-2227.001.DWG



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



INSTALLED FORGBolt® ASSEMBLY DETAIL 2 / B-1

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

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

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

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

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

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

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

DISTRIBUTOR CONTACT:
PRECISION TOWER PRODUCTS
PHONE: 888-926-4857
EMAIL: info@precisiontowerproducts.com
WEB: www.precisiontowerproducts.com

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

JUL 16 2018

REV	DATE	DESCRIPTION

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

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

BU #876333; CREATIVE DIMENSIONS
PLAINVILLE, CONNECTICUT
MODIFIED 137'-0" MONOPOLE

PROJECT No:	37518-2227.001.7700
DRAWN BY:	IM
DESIGNED BY:	SK
CHECKED BY:	BKK
DATE:	7-16-2018

FORGBolt® DETAILS

B-1

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

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

BU #876333; CREATIVE DIMENSIONS
PLAINVILLE, CONNECTICUT
MODIFIED 137'-0" MONOPOLE

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

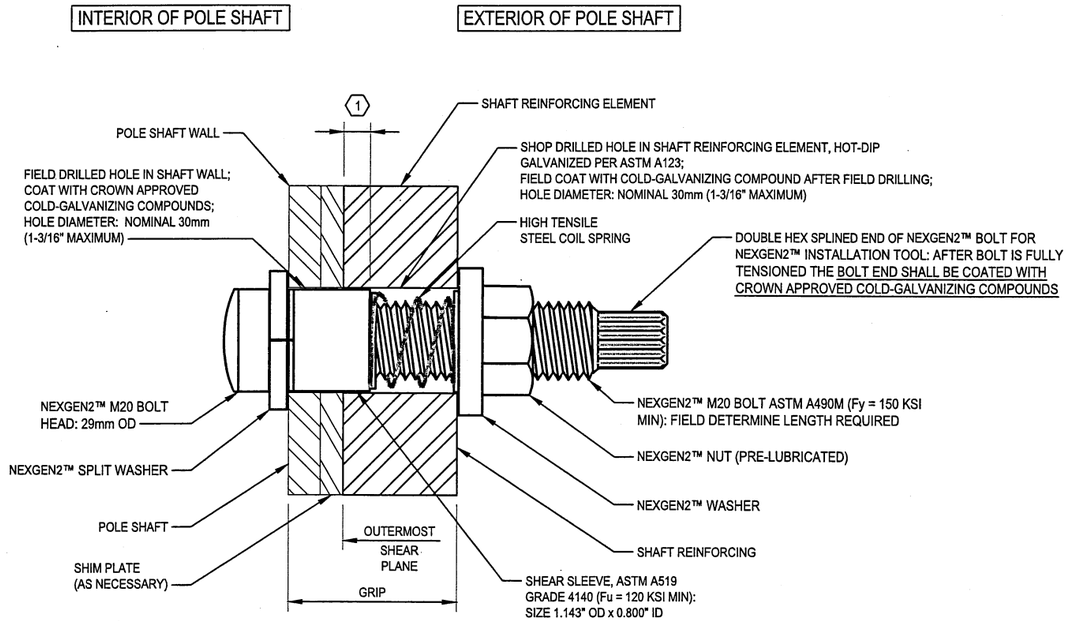
BOLT HOLE NOTES:

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

BOLT TIGHTENING AND INSPECTION NOTES:

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

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



TYPICAL NEXGEN2™ BOLT DETAIL ① B-2

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

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

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

DISTRIBUTOR CONTACT DETAILS:
ALLFASTENERS
959 LAKE ROAD
MEDINA, OHIO, USA 44256
PHONE: 440-232-6060
FAX 440-232-6062
WEBSITES: WWW.ALLFASTENERS.COM
WWW.AFTOWER.COM

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

JUL 16 2018

REV	DATE	DESCRIPTION

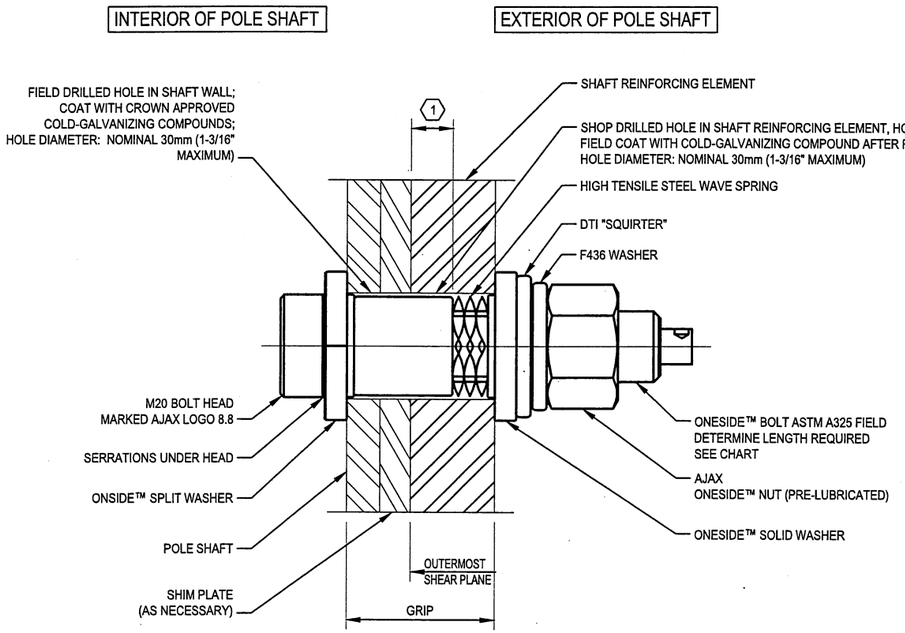
PROJECT No:	37518-2227.001.7700
DRAWN BY:	IM
DESIGNED BY:	SK
CHECKED BY:	BKK
DATE:	7-16-2018

NEXGEN2™ BOLT DETAIL

B-2

V1.0 37518-2227.001.DWG

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



TYPICAL AJAX ONESIDE™ BOLT DETAIL 1 / B-3

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

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

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

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

AJAX ONESIDE™ BOLT DETAIL

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

DISTRIBUTOR
IRA SVENSGAARD AND ASSOCIATES
PETER SVENDSGAARD - PETERS@IRASVENS.COM
JOHN KILLAM - JOHN@IRASVENS.COM
PHONE: (530) 647-8225
FAX: (530) 647-8229

MANUFACTURER
AJAX FASTENERS
SALES + TECH: ONESIDE@AJAXFAST.COM.AU

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

JUL 16 2018

REV	DATE	DESCRIPTION

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

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

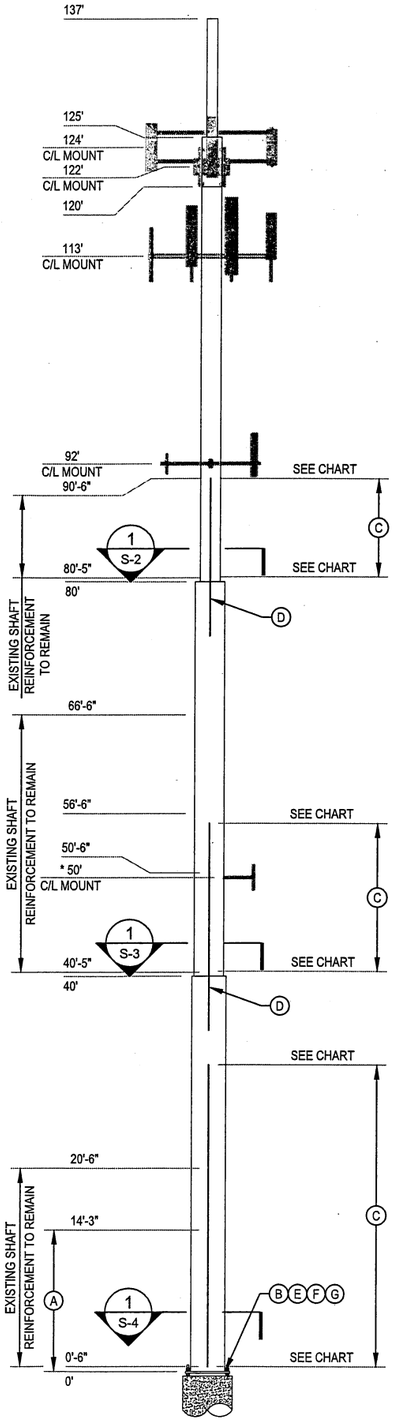
BU #876333; CREATIVE DIMENSIONS
PLAINVILLE, CONNECTICUT
MODIFIED 137'-0" MONOPOLE

PROJECT No:	37518-2227.001.7700
DRAWN BY:	IM
DESIGNED BY:	SK
CHECKED BY:	BKK
DATE:	7-16-2018

AJAX ONESIDE™ BOLT DETAIL

B-3

V1.0 37518-2227.001.DWG



POLE ELEVATION 1 / S-1

TOWER MODIFICATION SCHEDULE

	ELEVATION	TOWER MODIFICATION DESCRIPTION	REFERENCE SHEETS
A	6" TO 14'-3"	REMOVE EXISTING SHAFT REINFORCING ANGLES 80°, 172°, 294°	S-1 & S-4
B	0'	INSTALL NEW TRANSITION STIFFENERS w/ BEARING PLATE AT BASE PLATE	S-4 TO S-5
C	1'-0" TO 31'-0", 40'-6" TO 55'-6", 80'-6" TO 90'-6"	INSTALL NEW SHAFT REINFORCING	S-1
D	40' & 80'	INSTALL NEW BOLTED FLANGE JUMP	S-1 TO S-3
E	0'	REMOVE EXISTING BASE PLATE GROUT. SEE BASE PLATE GROUT REMOVAL NOTES	S-1 & N-1
F	0'	RE-INSTALL NEW GROUT, AFTER ALL BASE PLATE WORK & WELDING, PER ENG-PRC-10012 "BASE PLATE GROUT REPAIR"	S-1 & N-1
G	-	** CONTRACTOR TO POST SIGNAGE INDICATING OBSTRUCTED CLIMBING FACILITIES	S-1

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

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

MANUFACTURER POLE SPECIFICATIONS

TAPER	NA
BASE PLATE STEEL	ASTM A36 GRADE 36 (36 KSI)
ANCHOR RODS	2"ø ASTM A36 GRADE 36
FLANGE PLATE STEEL	ASTM A36 GRADE 36 (36 KSI)
FLANGE BOLTS	3/4"ø A325

SHAFT SECTION DATA

SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (FT)	DIAMETER ACROSS FLATS (IN) @ TOP	DIAMETER ACROSS FLATS (IN) @ BOTTOM	POLE GRADE (ksi)	POLE SHAPE
1	12.00	0.3750		12.800	12.800	35	ROUND
2	5.00	0.3750		24.000	24.000	35	ROUND
3	40.00	0.3750		24.000	24.000	35	ROUND
4	40.00	0.3750		36.000	36.000	35	ROUND
5	40.00	0.5000		42.000	42.000	35	ROUND

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

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

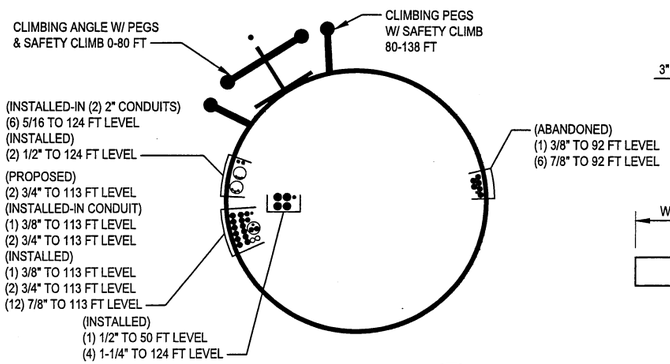
NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE

BOTTOM ELEVATION	TOP ELEVATION	ELEMENT	FLAT # / DEGREE SEPARATION	ELEMENT LENGTH	ELEMENT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	APPROXIMATE BOLTS PER ELEMENT	STEEL WEIGHT PER PLATE	APPROXIMATE TOTAL BOLT QUANTITY	ESTIMATED TOTAL STEEL WEIGHT	NOTES
1'-0"	31'-0"	CFP-06512530#1	80, 172, 296	30'-0"	3	WELD	11	19"	26	829 LBS.	78	2486 LBS.	SHAFT REINFORCING
1'-0"	31'-0"	CCI-SFP-04510030	340	30'-0"	1	6	6	20"	28	459 LBS.	84	459 LBS.	SHAFT REINFORCING
40'-6"	55'-6"	CFP-04510030#2	110, 220, 340	15'-0"	3	10	6	20"	22	230 LBS.	66	690 LBS.	SHAFT REINFORCING
80'-6"	90'-6"	CFP-04510030#3	100, 230, 340	10'-0"	3	12	6	20"	21	153 LBS.	63	459 LBS.	SHAFT REINFORCING
37'-3"	43' - 3"	CCI-CFP-0451006 #4	110, 220, 340	6' - 0"	3	8	10*	18"	8	92 LBS.	24	276 LBS.	JUMP PLATE
77'-3"	83' - 9"	CCI-CFP-0451006.5 #5	100, 230, 345	6' - 6"	3	8	12*	18"	8	100 LBS.	24	300 LBS.	JUMP PLATE
											339	4670 LBS.	

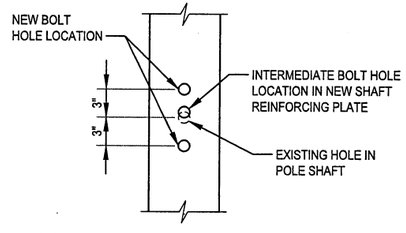
NOTES:

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

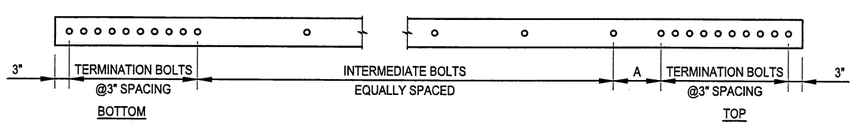
* FOR JUMP PLATES, TERMINATION BOLTS LISTED ARE INCLUDED IN TERMINATION BOLTS FOR SHAFT REINFORCING



COAX LAYOUT 2 / S-1

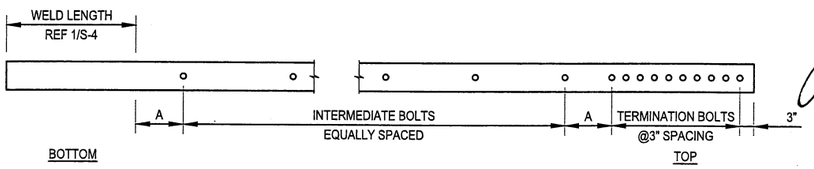


INTERMEDIATE BOLT HOLE FIX



CUSTOM BOLTED FLAT PLATE DETAIL

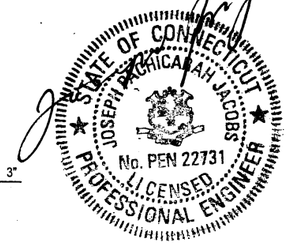
NOTE: "A" DIMENSION MAY VARY, NOT TO EXCEED MAXIMUM INTERMEDIATE BOLT SPACING



CUSTOM WELDED FLAT PLATE DETAIL

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

CUSTOM FLAT PLATE PART NUMBER BREAKDOWN



JUL 16 2018

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

REV	DATE	DESCRIPTION

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

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

BU #876333; CREATIVE DIMENSIONS
PLAINVILLE, CONNECTICUT
MODIFIED 137'-0" MONOPOLE

PROJECT No:	37518-2227.001.7700
DRAWN BY:	IM
DESIGNED BY:	SK
CHECKED BY:	BKK
DATE:	7-16-2018

MONOPOLE PROFILE

S-1

V1.0 37518-2227.001.DWG

FILLER PLATE SCHEDULE							
BOTTOM ELEVATION	TOP ELEVATION	FILLER PLATE DIMENSIONS	FLAT # / DEGREE SEPARATION	QUANTITY OF BOLT HOLES PER PLATE	STEEL WEIGHT PER PLATE (BLACK)	TOTAL BOLT HOLE QUANTITY	TOTAL STEEL WEIGHT (BLACK)
80' - 6"	83' - 9"	39" x 5" x 5.5"	100, 230, 345	12	305	36	915
					TOTAL	36	915

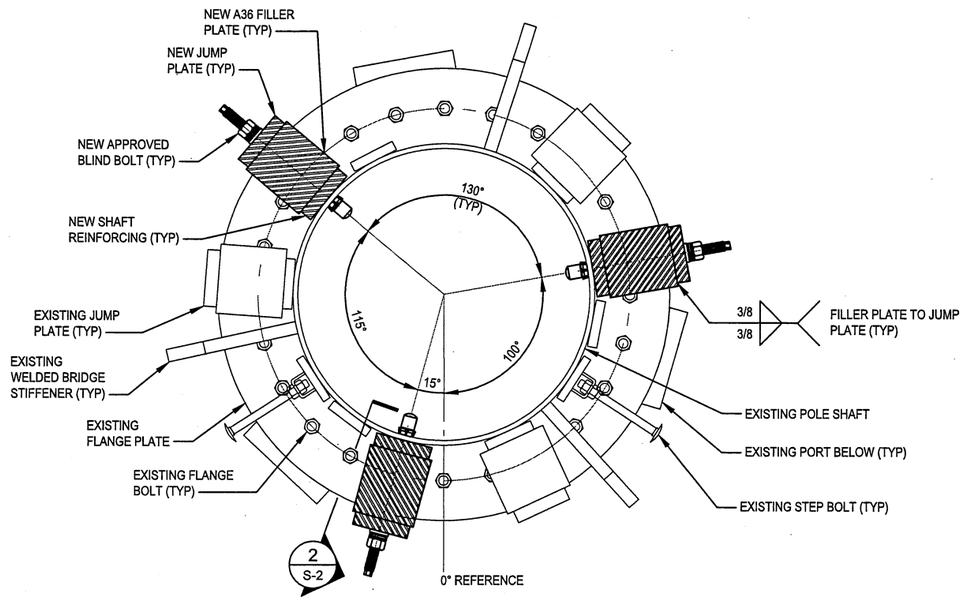
NOTES:

1 ALL NEW FILLER PLATE STEEL REINFORCING SHALL BE COLD GALVANIZED AS FOLLOWS:
APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.

2 ALL FILLER PLATES SHALL BE ASTM A36 GR. 36

3 HOLES FOR THE BOLTS ARE 30mm UNLESS NOTED OTHERWISE.

4 DEGREE SEPARATION ARE MEASURED FROM 0 DEGREE REFERENCE, AND ARE COUNTER-CLOCKWISE.

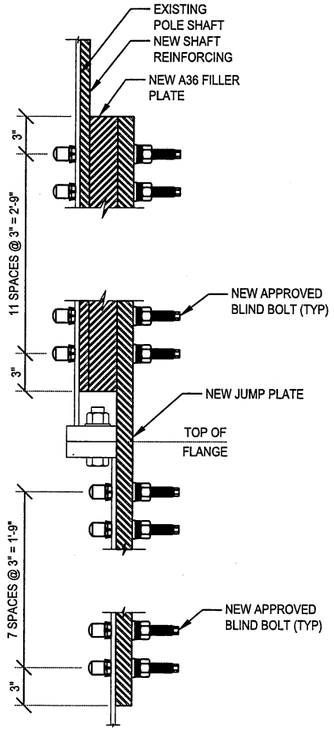


SECTION 1 / S-2

EL. 81'

SEE CHART ON SHEET S-1 FOR NEW SHAFT REINFORCING LOCATIONS.

CONTRACTOR TO SEE ORIGINAL MANUFACTURER DOCUMENTS FOR EXISTING POLE INFORMATION, EXISTING FLANGE PLATE INFORMATION, AND FLANGE BOLT INFORMATION. SEE CHART ON SHEET S-1 FOR SHAFT REINFORCING SIZES, INCLUDING APPROVED BLIND BOLT QUANTITIES. EXISTING CONDITIONS TO BE FIELD VERIFIED PRIOR TO FABRICATION.



SECTION 2 / S-2

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

JUL 16 2018

REV	DATE	DESCRIPTION

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

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

BU #876333; CREATIVE DIMENSIONS
PLAINVILLE, CONNECTICUT
MODIFIED 137'-0" MONOPOLE

PROJECT No:	37518-2227.001.7700
DRAWN BY:	IM
DESIGNED BY:	SK
CHECKED BY:	BKK
DATE:	7-16-2018

BOLTED FLANGE JUMP DETAILS

S-2

V1.0 37518-2227.001.DWG

FILLER PLATE SCHEDULE							
BOTTOM ELEVATION	TOP ELEVATION	FILLER PLATE DIMENSIONS	FLAT # / DEGREE SEPARATION	QUANTITY OF BOLT HOLES PER PLATE	STEEL WEIGHT PER PLATE (BLACK)	TOTAL BOLT HOLE QUANTITY	TOTAL STEEL WEIGHT (BLACK)
40' - 6"	43' - 3"	33" x 2" x 5.5"	110, 220, 340	10	103	30	309
					TOTAL	30	309

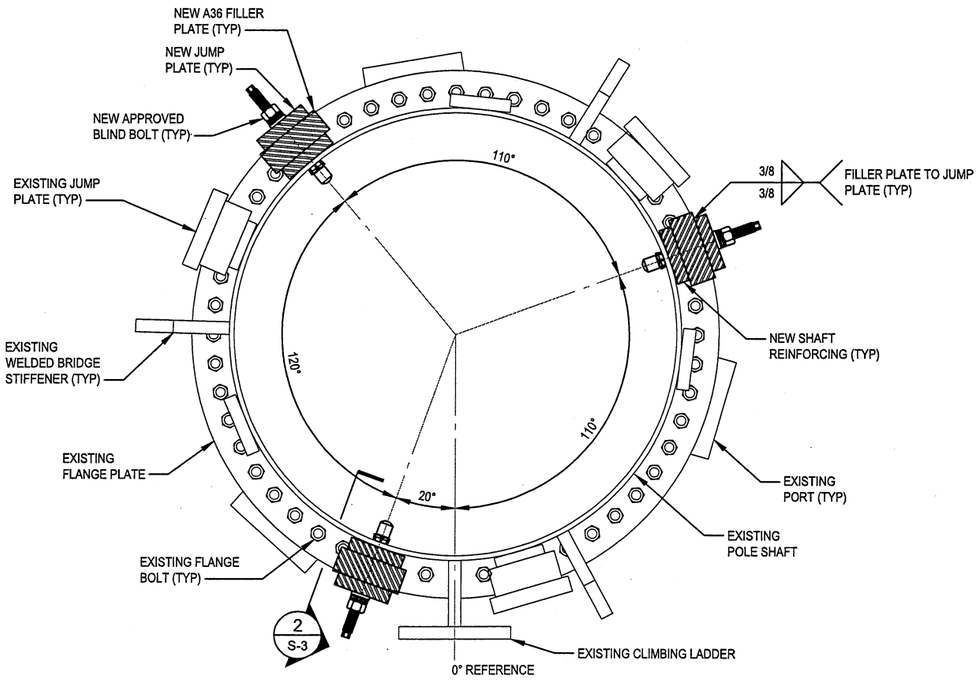
NOTES:

1 ALL NEW FILLER PLATE STEEL REINFORCING SHALL BE COLD GALVANIZED AS FOLLOWS:
APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC -RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.

2 ALL FILLER PLATES SHALL BE ASTM A36 GR. 36

3 HOLES FOR THE BOLTS ARE 30mm UNLESS NOTED OTHERWISE.

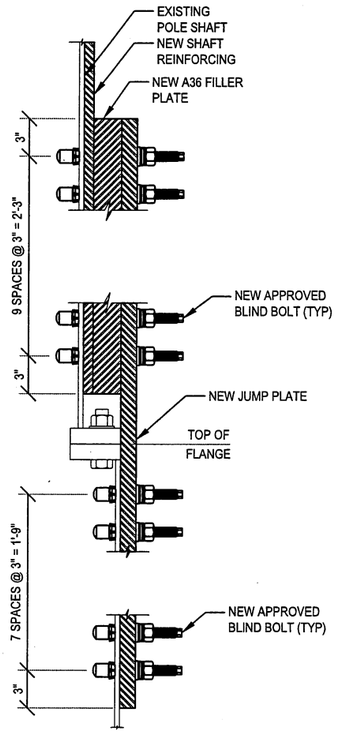
4 DEGREE SEPARATION ARE MEASURED FROM 0 DEGREE REFERENCE, AND ARE COUNTER-CLOCKWISE.



SECTION 1 / S-3
EL. 40'

SEE CHART ON SHEET S-1 FOR NEW SHAFT REINFORCING LOCATIONS.

CONTRACTOR TO SEE ORIGINAL MANUFACTURER DOCUMENTS FOR EXISTING POLE INFORMATION, EXISTING FLANGE PLATE INFORMATION, AND FLANGE BOLT INFORMATION. SEE CHART ON SHEET S-1 FOR SHAFT REINFORCING SIZES, INCLUDING APPROVED BLIND BOLT QUANTITIES. EXISTING CONDITIONS TO BE FIELD VERIFIED PRIOR TO FABRICATION.



SECTION 2 / S-3

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

JUL 16 2018

REV	DATE	DESCRIPTION

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

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

BU #876333; CREATIVE DIMENSIONS
PLAINVILLE, CONNECTICUT
MODIFIED 137'-0" MONOPOLE

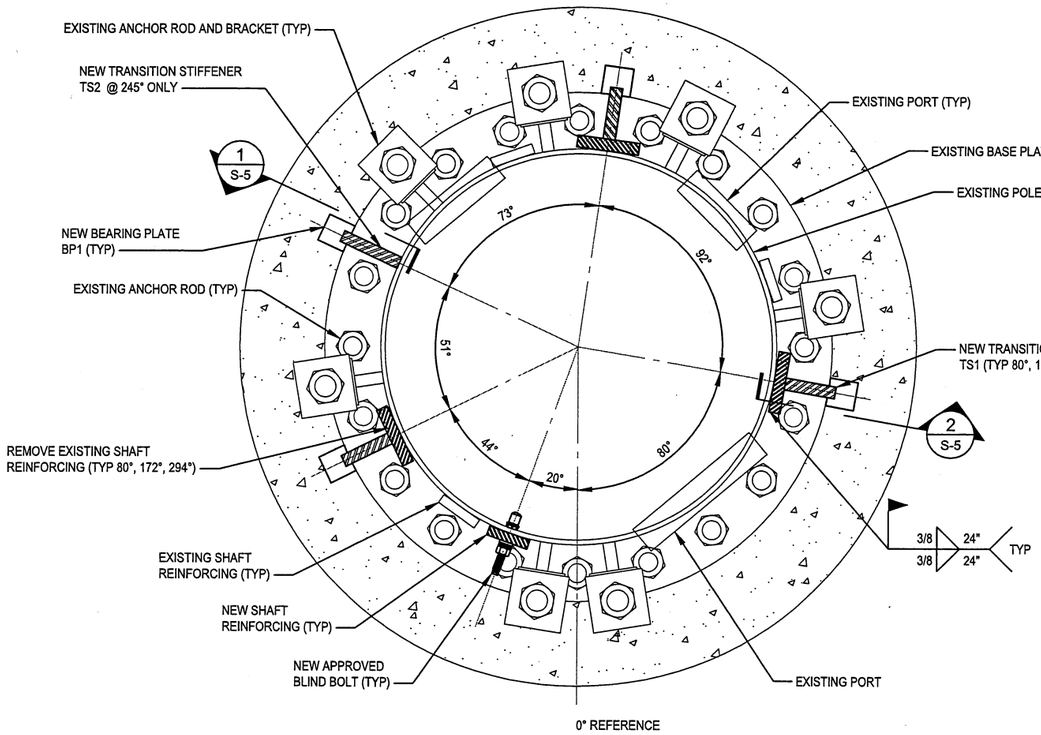
PROJECT No:	37518-2227.001.7700
DRAWN BY:	IM
DESIGNED BY:	SK
CHECKED BY:	BKK
DATE:	7-16-2018

BOLTED FLANGE JUMP DETAILS

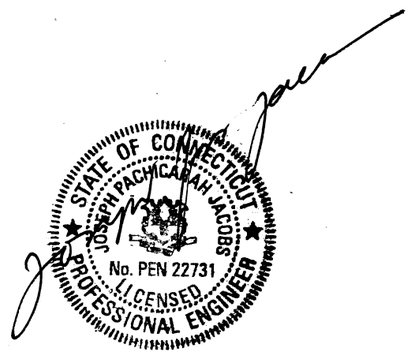
S-3

V1.0 37518-2227.001.DWG

SEE CHART ON SHEET S-1 FOR NEW SHAFT REINFORCING LOCATIONS (IN DEGREES FROM 0° REFERENCE)



BASE PLATE 1 / S-4



JUL 16 2018

REV	DATE	DESCRIPTION

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

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

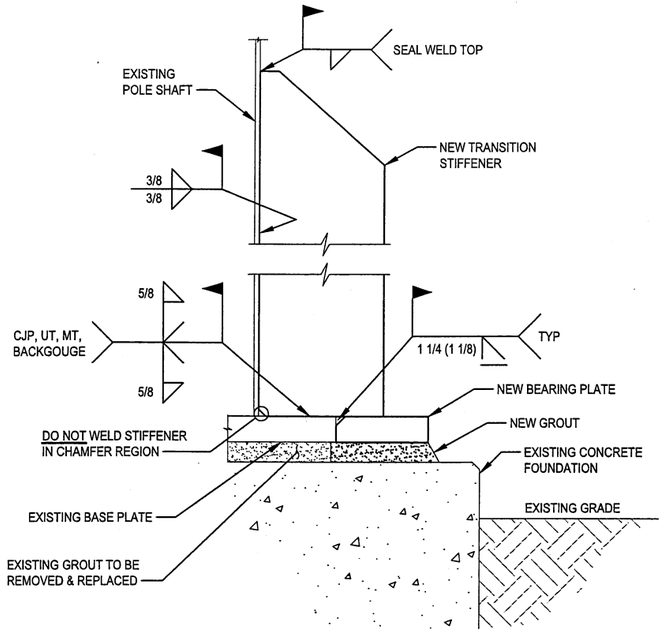
BU #876333; CREATIVE DIMENSIONS
PLAINVILLE, CONNECTICUT
MODIFIED 137'-0" MONOPOLE

PROJECT No:	37518-2227.001.7700
DRAWN BY:	IM
DESIGNED BY:	SK
CHECKED BY:	BKK
DATE:	7-16-2018

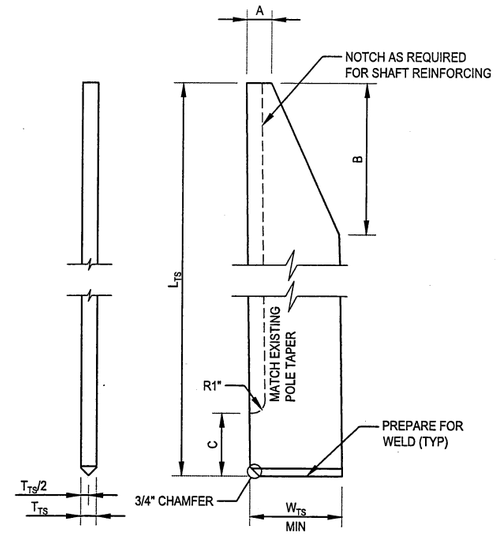
BASE PLATE DETAILS

S-4

V1.0 37518-2227.001.DWG

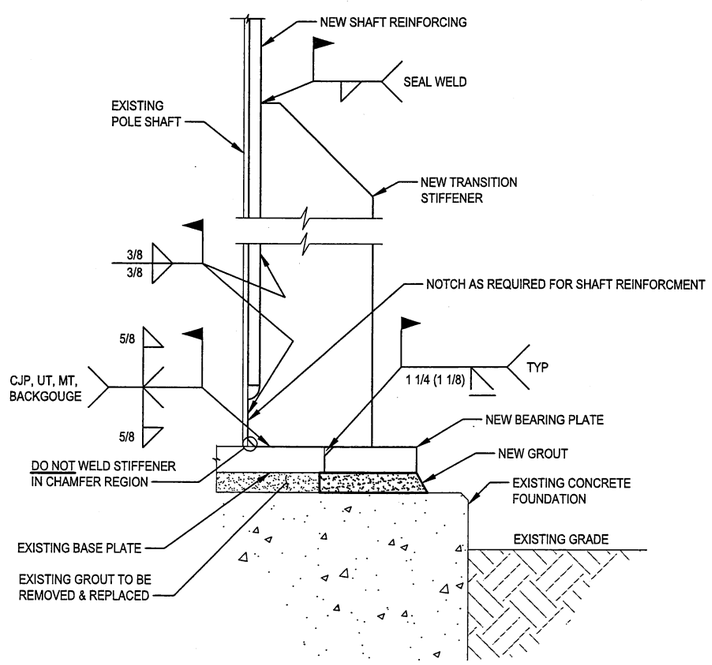


TRANSITION STIFFENER DETAIL 1 / S-5

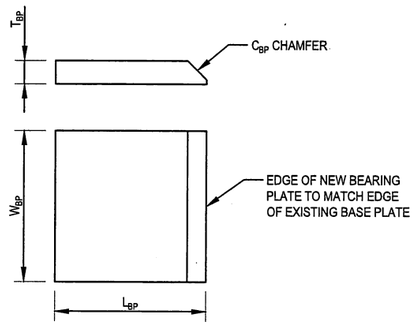


TRANSITION STIFFENER

TRANSITION STIFFENER										
PART #	ANGLE	QTY	MAT'L SPEC	T_{TS} (IN)	W_{TS} (IN)	L_{TS} (IN)	A (IN)	B (IN)	NOTCH	
									REQ'D	C (IN)
TS1	80°, 172°, 296°	3	ASTM A572 GR 65KSI	1 1/4	6 3/4	36	3	12	YES	11
TS2	245°	1	ASTM A572 GR 65KSI	1 1/4	6 3/4	64	3	12	-	-



TRANSITION STIFFENER DETAIL 2 / S-5



BEARING PLATE

BEARING PLATE							
PART #	FLAT # / ANGLE	QTY	MAT'L SPEC	T_{BP} (IN)	W_{BP} (IN)	L_{BP} (IN)	C_{BP} (IN)
BP1	80°, 172°, 245° 296°	4	ASTM A572 GR 50KSI	1 1/2	3	3	1 3/8

JUL 16 2018

REV	DATE	DESCRIPTION

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

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

BU #876333; CREATIVE DIMENSIONS
PLAINVILLE, CONNECTICUT
MODIFIED 137'-0" MONOPOLE

PROJECT No:	37518-2227.001.7700
DRAWN BY:	IM
DESIGNED BY:	SK
CHECKED BY:	BKK
DATE:	7-16-2018

TRANSITION STIFFENER DETAILS

S-5

V1.0.37518-2227.001.DWG

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT1054

FA#: 10035333

Plainville Center
10 Sparks Street
Plainville, CT 6062

June 8, 2018

Centerline Communications Project Number: 950006-127

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**11.49 %**

June 8, 2018

AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT1054 – Plainville Center**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **10 Sparks Street, Plainville, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed AT&T Wireless antenna facility located at **10 Sparks Street, Plainville, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T 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.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
UMTS	1900 MHz (PCS)	2	30
LTE	700 MHz	4	40
LTE	850 MHz	2	40
LTE	2300 MHz (WCS)	4	30
LTE	700 MHz (Band 14)	4	40
LTE	2100 MHz (AWS)	4	30
LTE	1900 MHz (PCS)	4	40

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7770	115
A	2	CCI OPA-65R-LCUU-H8	115
A	3	Kathrein 800-10966	115
A	4	Quintel QS66512-2	115
B	1	Powerwave 7770	115
B	2	CCI OPA-65R-LCUU-H8	115
B	3	Kathrein 800-10966	115
B	4	Quintel QS66512-2	115
C	1	Powerwave 7770	115
C	2	CCI OPA-65R-LCUU-H8	115
C	3	Kathrein 800-10966	115
C	4	Quintel QS66512-2	115

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.84
Antenna A2	CCI OPA-65R-LCUU-H8	700 MHz / 850 MHz / 2300 MHz (WCS)	12.55 / 13.35 / 14.95	8	280	6,920.57	2.99
Antenna A3	Kathrein 800-10966	700 MHz (Band 14) / 2100 MHz (AWS)	13.55 / 16.15	8	280	8,568.60	3.84
Antenna A4	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	6	240	4,855.52	1.81
						Sector A Composite MPE%	**9.48**
Antenna B1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.84
Antenna B2	CCI OPA-65R-LCUU-H8	700 MHz / 850 MHz / 2300 MHz (WCS)	12.55 / 13.35 / 14.95	8	280	6,920.57	2.99
Antenna B3	Kathrein 800-10966	700 MHz (Band 14) / 2100 MHz (AWS)	13.55 / 16.15	8	280	8,568.60	3.84
Antenna B4	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	6	240	4,855.52	1.81
						Sector B Composite MPE%	**9.48**
Antenna C1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.84
Antenna C2	CCI OPA-65R-LCUU-H8	700 MHz / 850 MHz / 2300 MHz (WCS)	12.55 / 13.35 / 14.95	8	280	6,920.57	2.99
Antenna C3	Kathrein 800-10966	700 MHz (Band 14) / 2100 MHz (AWS)	13.55 / 16.15	8	280	8,568.60	3.84
Antenna C4	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	6	240	4,855.52	1.81
						Sector C Composite MPE%	**9.48**

Table 3: AT&T Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Sector Value	**9.48 %**
MetroPCS	1.64 %
Clearwire	0.14 %
Sprint	0.23 %
Site Total MPE %:	**11.49 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	9.48 %
AT&T Sector B Total:	9.48 %
AT&T Sector C Total:	9.48 %
Site Total:	11.49 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS – Antenna 1	2	414.12	115	2.51	850 MHz	567	0.44%
AT&T 1900 MHz (PCS) UMTS – Antenna 1	2	656.33	115	3.97	1900 MHz (PCS)	1000	0.40%
AT&T 700 MHz LTE – Antenna 2	2	719.55	115	4.35	700 MHz	467	0.93%
AT&T 850 MHz LTE – Antenna 2	2	865.09	115	5.24	850 MHz	567	0.92%
AT&T 2300 MHz (WCS) LTE – Antenna 2	4	937.82	115	11.35	2300 MHz (WCS)	1000	1.14%
AT&T 700 MHz LTE (Band 14) – Antenna 3	4	905.86	115	10.96	700 MHz	467	2.35%
AT&T 2100 MHz (AWS) LTE – Antenna 3	4	1,236.29	115	14.96	2100 MHz (AWS)	1000	1.50%
AT&T 700 MHz LTE – Antenna 4	2	486.47	115	2.94	700 MHz	467	0.63%
AT&T 1900 MHz (PCS) LTE – Antenna 4	4	970.64	115	11.75	1900 MHz (PCS)	1000	1.17%
						Total:	**9.48%**

Table 6: AT&T Maximum Sector MPE Power Values

Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	9.48 %
Sector B:	9.48 %
Sector C:	9.48 %
AT&T Maximum Total (per sector):	9.48 %
Site Total:	11.49 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.49 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767

ENDER: COMPLETE THIS SECTION

Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.

Article Addressed to:

own Castle
ul Pedicone, Project Manager
Corporate Drive, Suite 101
ifton Park, NY 12065

9590 9402 3845 8032 6732 10

Article Number *(Transfer from service label)*

7015 0640 0007 2962 5631

COMPLETE THIS SECTION ON DELIVERY

A. Signature

x

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

8/27

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mark S. DeVoe, AICP
Director of Planning &
Economic Development
One Central Square, Room 100
Plainville, CT 06062

9590 9402 3770 8032 0832 90

2. Article Number *(Transfer from service label)*

7014 2120 0001 6938 3500

COMPLETE THIS SECTION ON DELIVERY

A. Signature

x

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

Chris Hadi

C. Date of Delivery

8/16/18

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

ENDER: COMPLETE THIS SECTION

Complete items 1, 2, and 3.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.

Article Addressed to:

Foster Zucchi
Building Official
Plainville Municipal Center
One Central Square, Room 100
Plainville, CT 06062

9590 9402 3770 8032 0833 06

Article Number *(Transfer from service label)*

7014 2120 0001 6938 3494

COMPLETE THIS SECTION ON DELIVERY

A. Signature

x

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

Chris Hadi

C. Date of Delivery

8/16/18

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Robert E. Lee, Town Manager
Plainville Municipal Center
One Central Square, Room 100
Plainville, CT 06062

9590 9402 3770 8032 0833 13

2. Article Number *(Transfer from service label)*

7014 2120 0001 6938 3487

COMPLETE THIS SECTION ON DELIVERY

A. Signature

x

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

Chris Hadi

C. Date of Delivery

8/16/18

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☑ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation
☐ Signature Confirmation Restricted Delivery