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

January 13, 2017

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

RE: **Notice of Exempt Modification for Sprint / Crown Site BU: 806382**
Sprint Site ID: CT03XC166
Located at: 74 Goodrich Lane, Portland, CT 06480
Latitude: 41° 36' 29.9" / Longitude: -72° 35' 29.56"

Dear Ms. Bachman,

Sprint currently maintains six (6) antennas at the 152-foot level of the existing 160-foot monopole at 74 Goodrich Lane, Portland, CT. The tower is owned by Crown Castle. The property is owned by Joan Hale. Sprint now intends to remove and replace the six (6) existing antennas with six (6) new antennas; remove installed coaxial cables with three (3) Hybriflex cables; adding four (4) Belden fiber lines, one (1) Ethernet line, and one (1) Southwire Power Line; and, adding three (3) Nokia Mini-Macros, three (3) 800 RRHs, and three (3) 1900 RHHs. The antennas would be installed at the same 152-foot level of the tower.

This facility was approved by the Connecticut Siting Council, Docket Number 58 on July 11, 1986. This approval included the condition(s) that:

1. The tower shall be a monopole.
2. The tower shall be no taller than necessary to provide the proposed service, and in no event shall exceed total heights, including antennas, of 173'.
3. The certificate holder shall submit a development and management (D&M) plan pursuant to Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies (RSA), except that irrelevant items in Section 16-50j-76 need only be identified as such. The D&M plan shall include a proposal for painting the approved monopole structures to blend with the sky. The

D&M plan must be approved prior to facility construction. Any changes to specification in the D&M plan must be approved by the Council prior to facility operation.

4. All certified facilities shall be constructed, operated, and maintained as specified in the Council's records and in the site plan required by order number 7.
5. The certificate holder shall comply with any future radiofrequency (RF) standard promulgated by state or federal regulatory agencies. Upon the establishment of any new governmental RF standard, the facilities granted in this decision shall continue to be in compliance with such standards.
6. The certificate holder shall permit public or private entities to share space on the towers approved herein, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. In addition to complying with Section 16-50j-73 of the RSA, the certificate holder shall notify the Council of the addition of any equipment to any approved tower.
7. A fence not lower than 8' shall surround each tower and associated equipment.
8. Unless necessary to comply with order 12, no lights shall be installed on any of these towers.
9. The facilities' construction and any future tower sharing shall be in accordance with all applicable federal, state, and municipal laws and regulations. Share uses by entities not subject to jurisdiction pursuant to Section 16-50k of the CGS shall be subject to all applicable federal, state, and municipal laws and regulations.
10. Construction activities shall take place during daylight working hours.
11. This decision and order shall be void and the towers and associate equipment shall be dismantled and removed, or reapplication for any new use shall be made to the Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction.
12. This decision and order shall be void if all construction authorized herein is not completed within three years of the completion of any appeal if appeal of this decision is taken, unless otherwise approved by the council.

This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72(b)(2). In

accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Susan Bransfield, First Selectman for the Town of Portland, as well as the property owner and the tower owner.

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

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

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

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

Sincerely,

Amanda Goodall
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
339-205-7017
Amanda.Goodall@crowncastle.com

Attachments:

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

cc: First Selectman Susan S. Bransfield
Town of Portland
33 East Main Street
P.O. Box 71
Portland, CT 06480

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

Joan Hale (Property Owner)
3060 N. Atlantic Avenue Apt. 301
Cocoa Beach, FL 32931

DOCKET NO. 58

AN APPLICATION OF HARTFORD CELLULAR COPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN HARTFORD, TOLLAND AND MIDDLESEX COUNTIES.	CONNECTICUT SITING COUNCIL
	July 11, 1986.

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

Pursuant to the foregoing opinion, the Connecticut Siting Council (Council) hereby directs that a Certificate of Environmental Compatibility and Public Need as provided by Section 16-50k of the General Statutes of Connecticut (CGS) be issued to the Hartford Cellular Company for the construction, maintenance, and operation of cellular mobile phone telecommunication towers and associated equipment in the towns of Glastonbury, Haddam, Hartford, Portland, Rocky Hill, Somers, Vernon, Windsor, and Willington subject to the conditions below.

1) The proposed Bloomfield and Middlefield sites are rejected without prejudice.

2) The antennas on the Glastonbury tower shall be mounted no higher than the 180' level of this existing tower.

3) The Portland and Rocky Hill towers shall be monopoles.

4) The towers shall be no taller than necessary to provide the proposed service, and in no event shall exceed total heights, including antennas, of

a) 193' at the Haddam site;

b) 173' at the Portland site;

c) 153' at the Rocky Hill site;

d) 173' at the Somers site;

e) 173' at the Vernon site;

f) 153' at the Willington site;

g) 173' at the Windsor site.

5) The Hartford site receive antennas shall be mounted below the top of the high point of the building to preclude visibility.

6) Any future actions requiring the removal of the existing Glastonbury tower to be shared by the certificate holder shall also apply to the equipment mounted on that tower by the certificate holder, regardless of that equipment's status under Chapter 277a of the CGS.

7) The certificate holder shall submit a development and management (D&M) plan for the Haddam, Portland, Rocky Hill, Somers, Vernon and Windsor sites pursuant to Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies (RSA), except that irrelevant items in Section 16-50j-76 need only be identified as such. In addition to the requirements of Section 16-50j-76, the D&M plan shall provide plans for evergreen screening around the fenced perimeter at the Haddam, Somers, Vernon, and Windsor sites. The D&M plan shall include a proposal for painting the approved monopole structures to blend with the sky. The D&M plan must be approved prior to facility construction. Any changes to specifications in the D&M plan must be approved by the Council prior to facility operation.

8) All certified facilities shall be constructed, operated, and maintained as specified in the Council's record and in the

site plan required by order number 7.

9) The certificate holder shall comply with any future radiofrequency (RF) standards promulgated by state or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facilities granted in this decison shall continue to be in compliance with such standards.

10) The certificate holder shall permit public or private entities to share space on the towers approved herein, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. In addition to complying with Section 16-50j-73 of the RSA, the certificate holder shall notify the Council of the addition of any equipment to any approved tower.

11) A fence not lower than 8' shall surround each tower and associated equipment.

12) Unless necessary to comply with order 13, no lights shall be installed on any of these towers.

13) The facilities' construction and any future tower sharing shall be in accordance with all applicable federal, state, and municipal laws and regulations. Shared uses by entities not subject to jurisdiction pursuant to Section 16-50k of the CGS shall be subject to all applicable federal, state, and municipal laws and regulations.

14) Construction activities shall take place during daylight working hours.

15) This decision and order shall be void and the towers and associate equipment shall be dismantled and removed, or reapplication for any new use shall be made to the Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction.

16) This decision and order shall be void if all construction authorized herein is not completed within three years of the issuance of this decision, or within three years of the completion of any appeal if appeal of this decision is taken, unless otherwise approved by the Council.

Pursuant to CGS Section 16-50p, we hereby direct that a copy of the decision and order shall be served on each person listed below. A notice of the issuance shall be published in the Hartford Courant, Middletown Press, Manchester Journal Inquirer, and the Willimantic Chronicle.

The parties to the proceeding are:

Metro Mobile (applicant)
5 Eversley Avenue
Norwalk, Connecticut 06855
ATTN: Armand Mascioli
General Manager

Howard L. Slater, Esq. (its attorneys)
Scott A. Gursky, Esq.
Byrne, Slater,Sandler,
Shulman & Rouse, P.C.
111 Pearl Street
Hartford, Connecticut 06103

Richard Rubin, Esq.
Fleischman and Walsh, P.C.
1725 N Street, N.W.
Washington, D. C. 20036

Mr. William Wamester
1225 Randolph Road
Middletown, Connecticut 06457

The Southern New England Telephone Company
227 Church Street
New Haven, Connecticut 06506
ATTN: Peter J. Tyrrell, Esq.

Mr. James W. Tilney — represented by:
Patricia A. Ayars
Samuel Baily, Jr.
Robinson & Cole
One Commercial Plaza
Hartford, CT. 06103-3597

Mr. Samuel DuBosar, Chairman
Bessie Bennett, Esq.
Town Plan & Zoning Commission
P.O. Box 337
Bloomfield, Connecticut 06002

Town of Somers — represented by:

Mr. Robert F. Peters
Town Counsel
Tatoian, Devline, Peters
& Davis
11 South Road
P.O. Box 415
Somers, CT. 06071

Town of Haddam
represented by:

Lucy R. Petrella
Chairperson
Town Office Building
Route 9A
P.O. Box 87
Haddam, CT. 06438

Midstate Regional Planning Agency

represented by:

Thomas M.Gilligan
Regional Planner
P.O. Box 139
Middletown, CT. 06457

Dr. Donald P. LaSalle
Director
Talcott Mountain Science Center
Montevideo Road
Avon, Connecticut 06001

Barnard Tilson (service waived)
Secretary
Avon Planning and Zoning
60 West Main Street
Avon, Connecticut 06001

Alden Giddings
33 Privelege Road
Bloomfield, Connecticut 06002

Town of Bloomfield

represented by:

Joseph M.Suggs, Jr.
Deputy Mayor
Town Hall
880 Bloomfield Avenue
P.O. Box 337
Bloomfield, CT. 06002
(service waived)

Town of Middlefield represented by:

David Silverstone, Esq.
Silverstone & Koontz
37 Lewis Street
Hartford, CT. 06103

with a copy to:

Geoffrey Colegrove
Midstate Regional Planning Agency
100 DeKoven Drive
Middletown, CT. 06457

Zoning Commission represented by:
Town of Somers

Joseph A. Paradis
Chairman
Town Hall
600 Main Street
P.O. Box 803
Somers, CT. 06071

Barbara Sirwilo, Secretary (service waived)
Planning & Zoning Commission
Town of Rocky Hill
600 Old Main Street
P.O. Box 657
Rocky Hill, Connecticut 06067

H. Robert Goodrich (service waived)
Goodrich Lane
Portland, Connecticut 06480

The Honorable Richard P. Antonetti
State Representative (service waived)
5 Sachem Circle
Meriden, Connecticut 06450

John Hevrin
R.D. #1 - Plains Road
Haddam, Connecticut 06438

Norman and Darlene Manning (represented by)

Elizabeth Allen, Esq.
P.O. Box 467
Higganum, CT. 06441
(service waived)

C E R T I F I C A T I O N

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

Dated at New Britain, Connecticut, this 11th day of July, 1986.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Absent
Commissioner John Downey Designee: Patricia Shea	Yes
Commissioner Stanley Pac Designee: Christopher Cooper	Yes
Owen L. Clark	Yes
Mortimer A. Gelston	Yes
James G. Horsfall	Yes
Pamela B. Katz	Absent
William H. Smith	Yes
Colin C. Tait	Yes

STATE OF CONNECTICUT)
: ss. New Britain, July 11, 1986
COUNTY OF HARTFORD)

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

ATTEST:

Christopher S. Wood, Executive Director
Connecticut Siting Council

Portland, CT : Assessor Database

Property Search:

Parcel ID:	Alternate ID:	Owner 1 Name:	Street Number:	Street Name:
			74	GOODRICH LANE

Search Reset

Property Detail:

Parcel ID:	Alternate ID/Map Block Lot:	Card:	Card:	Street Name:	Street Number:	Zoning:	LUC:	Acres:
084-0009	00354100			GOODRICH LANE	74	R25	Communication Towers	0.08

Owner Information:

Owner 1 Name:	HALE JOAN J
Owner 2 Name:	CROWN ATLANTIC LLC
Street 1:	PMB 353
Street 2:	4017 WASHINGTON RD
City:	MCMURRAY
State:	PA
Zip:	15317
Volume:	284
Page:	47

Property Images:

Picture:

There is no picture available.

Sketch:

There is no sketch available.

Valuation:

Appraised Land:	$74,900.00
Appraised Bldg:	$139,200.00
Appraised Total:	$214,100.00
Total Assessment:	$149,870.00

Out-Buildings:

Code:	Description:	Units:	Year Built:	Size1:	Size2:	Area:	Grade:	Condition:
FN1	FENCE CHAIN	3	1996	8	260	0	2	
TT4	TOWER CELLULAR	4	1978	1	160	0	1	
SH1	FRAME MACHINERY SHED	4	1978	1	200	0	2	
SH1	FRAME MACHINERY SHED	4	2000	1	96	0	9	
PC3	PAVING CONCRETE MAT/SLAB	3	1996	1	2640	0	2	

Mon. January 9, 2017 : 03:47 PM : 0.13s : 9mb

Google Maps 74 Goodrich Ln

Imagery ©2017 Google, Map data ©2017 Google 100 ft

Sprint

SPRINT SITE NUMBER:	**CT03XC166**
SPRINT SITE NAME:	**---**
SITE TYPE:	**MONOPOLE**
TOWER HEIGHT:	**160'-0"**
CROWN CASTLE BU #:	**806382**
SITE ADDRESS:	**74 GOODRICH LANE PORTLAND, CT 06480**
COUNTY:	**MIDDLESEX**
JURISDICTION:	**TOWN OF PORTLAND**

SPRINT 2016-2017 INITIATIVE

SITE INFORMATION

CROWN CASTLE SITE NAME:	HRT 082 943274
SITE ADDRESS:	74 GOODRICH LANE PORTLAND,CT 06480
COUNTY:	MIDDLESEX
MAP/PARCEL #:	PORT-000084-000000-000009
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41° 36' 29.9"
LONGITUDE:	-72° 35' 29.56"
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	315 FT.
CURRENT ZONING:	R-15
JURISDICTION:	TOWN OF PORTLAND
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	VB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	HALE, JOAN J. 3060 N ATLANTIC AVENUE APT. 301 COCOA BEACH, FL 32931-5046
TOWER OWNER:	CROWN ATLANTIC COMPANY LLC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	SPRINT 6391 SPRINT PARKWAY OVERLAND PARK, KS 66251-2650
CROWN CASTLE APPLICATION ID:	366727
ELECTRIC PROVIDER:	CONNECTICUT LIGHT & POWER CO (800) 286-2000
TELCO PROVIDER:	FRONTIER (877) 459-8959

PROJECT TEAM

CROWN CASTLE A&E FIRM:
CROWN CASTLE
2000 CORPORATE DRIVE
CANONSBURG, PA 15317
CROWNAE.APPROVAL@CROWNCASTLE.COM

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

MARYELLEN PERROTTA - PROJECT MANAGER
(781) 970-0057
JASON D'AMICO - CONSTRUCTION MANAGER
(860) 209-0104

WILLIAM STONE - A&E PROJECT MANAGER
WILLIAM.STONE.CONTRACTOR@CROWNCASTLE.COM
(518) 373-3543

SPRINT CONTACT:
FLORENCE NICOLAS
FLORENCE.NICOLAS@SPRINT.COM

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
T-3	GENERAL NOTES
C-1	ENLARGED SITE PLAN
C-2	EXISTING AND NEW ELEVATION
C-3	ANTENNA PLANS AND SCHEMATIC
C-4	CONDUIT ROUTING SCHEMATIC
C-5	INSTALLATION SPECS AND DETAILS
C-6	EQUIPMENT SPECIFICATIONS
C-7	PLUMBING DIAGRAM
G-1	GROUNDING DETAILS
G-2	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11X17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

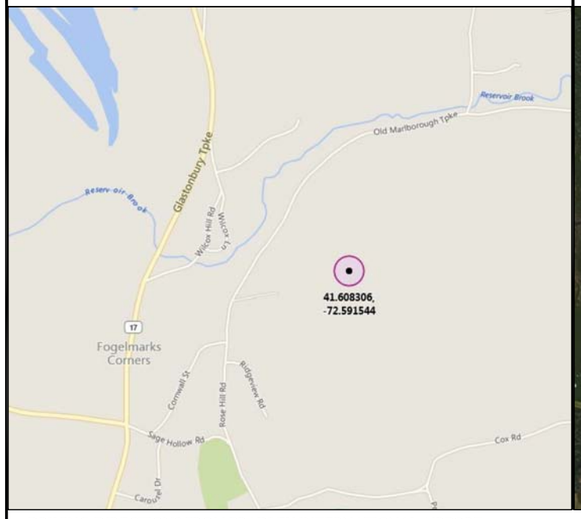
- REMOVE (6) ANTENNAS
- REMOVE (6) 1-5/8" COAX CABLES
- REMOVE (1) 1/2" COAX CABLE
- RELOCATE (3) RRHs FROM GROUND TO TOWER
- INSTALL (6) ANTENNAS
- INSTALL (3) 1-1/4" HYBRID CABLES
- INSTALL (1) 7/8" POWER LINE INSIDE 1" CONDUIT
- INSTALL (4) 17/64" FIBER LINES & (1) 1/8" ETHERNET LINE INSIDE 1" CONDUIT
- INSTALL (6) RRHs
- INSTALL (1) JUNCTION BOX

DESIGN PACKAGE BASED ON RF DATA SHEET
VERSION: 3.15
ISSUED: 10/04/16

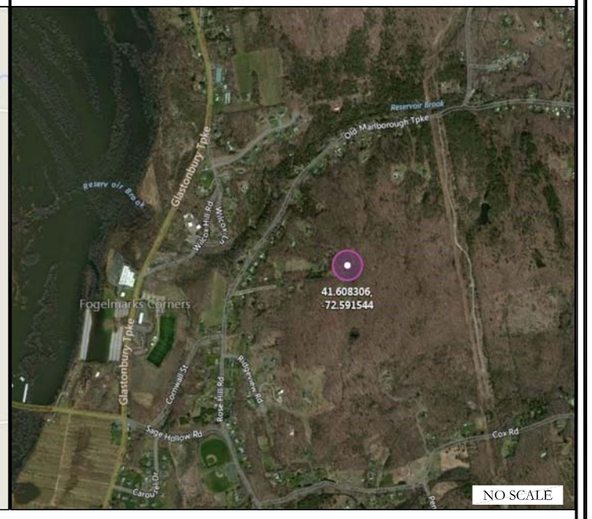
DESIGN PACKAGE BASED ON THE APPLICATION
ID: 366727
REVISION: 2

THE PARTIES ABOVE HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES AND MODIFICATIONS THEY MAY IMPOSE.

VICINITY MAP



AERIAL MAP



DRIVING DIRECTIONS FROM BRADLEY INTERNATIONAL AIRPORT:
EXIT BRADLEY INTERNATIONAL AIRPORT VIA SHOEPHOESTER RD TOWARD CT-20 E. CONTINUE ONTO CT-20 E/BRADLEY INTERNATIONAL AIRPORT CON, THEN USE THE RIGHT TWO LANES TO MERGE ONTO I-91 S TOWARD HARTFORD. USE THE LEFT LANE TO TAKE EXIT 30 FOR I-84 E TOWARD CT-2/EAST HARTFORD/NEW LONDON. MERGE ONTO I-84 E THEN TAKE EXIT 55 FOR CT-2 E TOWARD NORWICH/NEW LONDON/I-84 E. CONTINUE ONTO CT-2 E THEN AFTER APPROXIMATELY 4 MILES USE THE LEFT LANE TO TAKE EXIT 7 FOR CT-17 S TOWARD PORTLAND. CONTINUE ONTO CT-17 S/GLASTONBURY EXPY THEN TURN LEFT ONTO SAGE HOLLOW RD. TURN LEFT ONTO CRONWALL ST THEN TURN LEFT ONTO OLD MARLBOROUGH TURNPIKE. TURN RIGHT ONTO GOODRICH LN, SITE ACCESS IS ON THE LEFT AT THE END OF THE ROAD.

APPLICABLE CODES/REFERENCE DOCUMENTS

ALL WORK SHALL BE PERFORMED AND MATERIALS 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 THESE CODES:

CODE TYPE	CODE
BUILDING	2016 CONNECTICUT STATE BUILDING CODE/2012 IBC W/ CT AMENDMENTS
MECHANICAL	2016 CONNECTICUT STATE BUILDING CODE/2012 IBC W/ CT AMENDMENTS
ELECTRICAL	2016 CONNECTICUT STATEUILDING CODE/2012 IBC W/ CT AMENDMENTS

REFERENCE DOCUMENTS:
STRUCTURAL ANALYSIS: BY OTHERS

CALL CONNECTICUT ONE CALL
(800) 922-4455
CALL 3 WORKING DAYS
BEFORE YOU DIG!

811

APPROVALS

APPROVAL	SIGNATURE	DATE
SITE ACQ. & ZONING		
CONSTRUCTION MGR		
A&E MGR		
PLANNING CONSULTANT		
RF MGR		
PROPERTY OWNER		
SPRINT REP.		

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650

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

SPRINT SITE NUMBER:
CT03XC166

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING 160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	CJ	PRELIMINARY	LR
0	01/05/17	CJ	CONSTRUCTION	AF

DocuSigned by:
BAD8666DD9024E4...

STATE OF CONNECTICUT
ANDREW JOSEPH FANDOZZI III
No. 30515
LICENSED PROFESSIONAL ENGINEER
1/6/2017 | 9:06:07 AM EST

Crown Castle USA, Inc.
Firm Registration #14842

SHEET NUMBER: T-1

REVISION: 0

CROWN CASTLE SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE 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 AND EXCAVATION.
3. ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE TOWER SITE" AND LATEST VERSION OF TIA 1019 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
4. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS.
5. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
6. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
7. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
11. THE AREAS OF THE OWNERS 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 AS SPECIFIED ON THE PROJECT SPECIFICATIONS.
12. 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.
13. NOTICE TO PROCEED- NO WORK TO COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF A PURCHASE ORDER.
14. 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/TIA 1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

SPRINT CONSTRUCTION NOTES

SECTION 01 100 – SCOPE OF WORK

THE WORK:

MUST COMPLY WITH ALL APPLICABLE ADOPTED CODES AND STANDARDS, AND PORTIONS THEREOF. SPRINT METHOD OF PROCEDURE (MOP) AND SPRINT STANDARDS AT THE TIME OF CONSTRUCTION START.

PRECEDENCE:

SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS. INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. ALONG WITH SPRINT CONSTRUCTION MANAGER APPROVAL.

SITE FAMILIARITY:

CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

ON-SITE SUPERVISION:

THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE:

THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

A. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO PROVIDE A COMPLETE FUNCTIONING SYSTEM. MODIFICATIONS MAY BE REQUIRED TO SUITE JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

B. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

C. MARK THE FIELD SET OF DRAWINGS IN RED, DOCUMENTING ANY CHANGES FROM THE CONSTRUCTION DOCUMENTS.

METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION:

CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS. CONTRACTOR IS RESPONSIBLE FOR DISTRIBUTION OF LATEST MOPS.

A. TOP HAT
B. HOW TO INSTALL A NEW CABINET
C. BASE BAND UNIT IN EXISTING UNIT
D. INSTALLATION OF BATTERIES
E. INSTALLATION OF FIBER CABLE
F. INSTALLATION OF RRU'S
G. CABLING
H. TS-0200 REV 5 – ANTENNA LINE ACCEPTANCE STANDARDS
I. SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.
J. COMMISSIONING MOPS

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

A. COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DRAWINGS.

B. CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT TO ENSURE IT IS PROTECTED AND HANDLED PROPERLY THROUGHOUT THE CONSTRUCTION DURATION.

C. CONTRACTOR IS RESPONSIBLE FOR RECEIPT OF SPRINT FURNISHED EQUIPMENT AT CELL SITE OR CONTRACTORS LOCATION. CONTRACTOR TO COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE. CONTRACTOR MAY BE REQUIRED TO PICK UP MATERIAL AT LOCATION PRESCRIBED BY SPRINT.

SECTION 01 300 – CELL SITE CONSTRUCTION

NOTICE TO PROCEED:

NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF WORK ORDER.

SITE CLEANLINESS:

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

SECTION 01 400 – SUBMITTALS AND TESTS

ALTERNATIVES:

AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED.

TESTS AND INSPECTIONS:

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. COAX SWEEPS AND FIBER TESTS PER TS-200 REV 5 ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT: PROVIDE AN AUTOMATED REPORT UPLOADED TO SITERRA USING A COMMERCIAL MADE-FOR PURPOSE ELECTRONIC ANTENNA ALIGNMENT TOOL (AAT). INSTALLED AZIMUTH, CENTERLINE AND DOWNTILT MUST CONFORM WITH RF CONFIGURATION DATA.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
4. ALL TESTING REQUIRED BY APPLICABLE INSTALLATION MOPS.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:
1. AZIMUTH, DOWNTILT, AGL FROM SUNSIGHT INSTRUMENTS – ANTENNA ALIGNMENT TOOL (AAT)
2. SWEEP AND FIBER TESTS.
3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT.
4. ALL AVAILABLE JURISDICTIONAL PERMIT AND OCCUPANCY INFORMATION.
5. PDF SCAN OF REDLINES PRODUCED IN FIELD.
6. A PDF SCAN OF REDLINE MARK-UPS SUITABLE FOR USE IN ELECTRONIC AS-BUILT DRAWING PRODUCTION.
7. LIEN WAIVERS.
8. FINAL PAYMENT APPLICATION.
9. REQUIRED FINAL CONSTRUCTION PHOTOS.
10. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS.
11. APPLICABLE POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINT'S DOCUMENT REPOSITORY OF RECORD).
12. CLOSEOUT PHOTOGRAPHS AND CLOSEOUT CHECKLIST: SPRINT WILL PROVIDE SEPARATE GUIDANCE.

a. PROVIDE PHOTOGRAPHS OF FINAL PROJECT PER THE FOLLOWING LIST. ADDITIONAL PHOTOS MAY BE REQUIRED TO SUPPORT ACCEPTANCE PROCESSES
(i) BACK MAIN FIBER CABLE ROUTE (MINIMUM TWO PHOTOS)
(ii) OF EACH ANTENNA AND RRU
(iii) MANUFACTURERS NAME TAG FOR ALL SERIALIZED EQUIPMENT
(iv) PULL AND DISTRIBUTION BOXES INTERMEDIATE BETWEEN RRU'S AND RBS (DOOR OPEN)
(v) RBS CABINET WITH DOOR OPEN SHOWING MODIFICATIONS
(vi) POWER CABINET, DOORS OPEN, BATTERIES INSTALLED
(vii) BREAK OUT CYLINDERS
(viii) ASR SIGNAGE FOR SPRINT OWNED TOWERS
(ix) RADIATION EXPOSURE WARNING SIGNS
(x) PHOTOGRAPH FROM EACH SECTOR FROM APPROXIMATELY RAD CENTER OF ANY NEW ANTENNA AT HORIZON.

b. LOAD PHOTOS TO SITERRA PROJECT LIBRARY 15. IN 15 CREATE NEW CATEGORY; 2.5 DEPLOYMENT, AND SECTION; PERMANENT CONSTRUCTION. LABEL PHOTOS WITH SITE CASCADE AND VIEW BEING DEPICTED. CAMERAS USED TO TAKE PHOTOS SHALL BE GPS ENABLED SUCH THAT THE GPS COORDINATES ARE INCLUDED IN THE PHOTO MEDIA-FILE INFORMATION.

COMMISSIONING:

PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

INTEGRATION:

PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPS

SECTION 09 900 – PAINTING

QUALITY ASSURANCE:

A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. COMPLY WITH ALL ENVIRONMENTAL REGULATIONS FOR VOLATILE ORGANIC COMPOUNDS.

MATERIALS:

A. MANUFACTURERS: BENJAMIN MOORE, ICI DEVOE COATINGS, PPG, SHERWIN WILLIAMS OR APPROVED PROVIDE PREMIUM GRADE, PROFESSIONAL-QUALITY PRODUCTS FOR COATING SYSTEMS.

PAINT SCHEDULE:

A. EXTERIOR ANTENNAE AND ANTENNA MOUNTING HARDWARE: ONE COAT OF PRIMER AND TWO FINISH COATS. PAINT FOR ANTENNAE SHALL BE NON-METALLIC BASED AND CONTAIN NO METALLIC PARTICLES. PROVIDE COLORS AND PATTERNS AS REQUIRED TO MASK APPEARANCE OF ANTENNAE ON ADJACENT BUILDING SURFACES AND AS ACCEPTABLE TO THE OWNER. REFER TO ANTENNA MANUFACTURER'S INSTRUCTION WHENEVER POSSIBLE.

B. WATER TANKS: TOUCH UP – PREPARE SURFACES TO BE REPAIRED. FOLLOW INDUSTRY STANDARDS AND REQUIREMENTS OF OWNER TO MATCH EXISTING COATING AND FINISH.

PAINTING APPLICATION:

1. INSPECT SURFACES, REPORT UNSATISFACTORY CONDITIONS IN WRITING; BEGINNING WORK MEANS ACCEPTANCE OF SUBSTRATE.
2. COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR PREPARATION, PRIMING AND COATING WORK. COORDINATE WITH WORK OF OTHER SECTIONS.
3. MATCH APPROVED MOCK-UPS FOR COLOR, TEXTURE, AND PATTERN. RE-COAT OR REMOVE AND REPLACE WORK WHICH DOES NOT MATCH OR SHOWS LOSS OF ADHESION.
4. CLEAN UP, TOUCH UP AND PROTECT WORK.

TOUCHUP PAINTING:

1. GALVANIZING DAMAGE AND ALL BOLTS AND NUTS SHALL BE TOUCHED UP AFTER TOWER ERECTION WITH "GALVANOX," "DRY GALV," OR "ZINC-IT".
2. FIELD TOUCHUP PAINT SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
3. ALL METAL COMPONENTS SHALL BE HANDLED WITH CARE TO PREVENT DAMAGE TO THE COMPONENTS, THEIR PRESERVATIVE TREATMENT, OR THEIR PROTECTIVE COATINGS.

SECTION 11 700 – ANTENNA ASSEMBLY, REMOTE RADIO UNITS AND CABLE INSTALLATION

SUMMARY:

THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRU'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRU'S:

THE NUMBER AND TYPE OF ANTENNAS AND RRU'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

NV FIBER CABLE:

EXISTING NV FIBER CABLE WILL BE USED AT EACH SITE. CABLE SHALL BE USED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTIONS:

FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2" FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE, MINIMUM LENGTH FOR JUMPER SHALL BE SO AS TO ALLOW FOR THE PROPER BEND RADIUS PER MANUFACTURER OR SPRINT SPECIFICATIONS.

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:

INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:

THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH AND FEED ORIENTATION INFORMATION SHALL BE AS DESIGNATED ON THE CONSTRUCTION DRAWINGS.

A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.

B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE CONSTRUCTION DRAWINGS.

FIBER CABLE INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAT THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

1. FASTENING MAIN FIBER CABLES:

a. LATTICE AND GUYED TOWERS:

ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS. HOISTING GRIPS SHOULD BE INSTALLED AT MID-POINT IF CABLE RUN EXCEEDS 200' AS WELL AS TOP SIDE.

a. MONOPOLE:

ALL CABLES SHALL BE PERMANENTLY SUPPORTED WITH HOISTING GRIPS AT INTERVALS OF NO MORE THAN 200' (ONE HOISTING GRIP PER COAX).

1. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA). WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES.

a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH AT 18" O.C. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.

b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.

2. FASTENING OR SECURING JUMPERS SHOULD CONSIST OF STAINLESS STEEL CLIPS, 18" FROM REAR OF CONNECTOR AND 24" THEREAFTER AND AT NO TIME SHALL THEY CONTACT TOWER OR STRUCTURAL STEEL.

3. CABLE INSTALLATION:

a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE. NOTIFY THE CONSTRUCTION MANAGER.

b. CABLE ROUTING CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOPE AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.

c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.

5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 REV 5.
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY A ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650

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

SPRINT SITE NUMBER:
CT03XC166

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING 160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	CJ	PRELIMINARY	LR
0	01/05/17	CJ	CONSTRUCTION	AF

DocuSigned by:
BAD6086DD9024F4...

STATE OF CONNECTICUT
ANDREW JOSEPH FANDOZZI III
No. 30515
LICENSED PROFESSIONAL ENGINEER

1/6/2017 | 9:06:07 AM EST

Crown Castle USA, Inc.
Firm Registration #14842

SHEET NUMBER: T-2

REVISION: 0

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER AND COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF AMALGAMATING TAPE.
2. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
3. JMA-WPS SERIES ENCLOSURE.
4. BUTYL AND TAPE, 1 COMPLETE WRAP OF 3/4" PRE-TAPE, BUTYL WRAPPED IN HALF INCH LAP LAYERS, ENDED WITH SHINGLED DOWNWARD 3 WRAPS OF 2" TAPE, 3 WRAPS OF 3/4" TAPE SHINGLED DOWNWARD, FREE OF WRINKLES, BUCKLES AND FLAGGING.
5. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

C. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE CONSTRUCTION DRAWINGS.

FIBER CABLE INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAT THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

1. FASTENING MAIN FIBER CABLES:

a. LATTICE AND GUYED TOWERS:

ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS. HOISTING GRIPS SHOULD BE INSTALLED AT MID-POINT IF CABLE RUN EXCEEDS 200' AS WELL AS TOP SIDE.

b. MONOPOLE:

ALL CABLES SHALL BE PERMANENTLY SUPPORTED WITH HOISTING GRIPS AT INTERVALS OF NO MORE THAN 200' (ONE HOISTING GRIP PER COAX).

2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA). WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES.

a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH AT 18" O.C. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.

b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.

3. FASTENING OR SECURING JUMPERS SHOULD CONSIST OF STAINLESS STEEL CLIPS, 18" FROM REAR OF CONNECTOR AND 24" THEREAFTER AND AT NO TIME SHALL THEY CONTACT TOWER OR STRUCTURAL STEEL.

4. CABLE INSTALLATION:

a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE. NOTIFY THE CONSTRUCTION MANAGER.

b. CABLE ROUTING CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOPE AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.

c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.

5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.

6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 REV 5.

7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER AND COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF AMALGAMATING TAPE.
2. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
3. JMA-WPS SERIES ENCLOSURE.
4. BUTYL AND TAPE, 1 COMPLETE WRAP OF 3/4" PRE-TAPE, BUTYL WRAPPED IN HALF INCH LAP LAYERS, ENDED WITH SHINGLED DOWNWARD 3 WRAPS OF 2" TAPE, 3 WRAPS OF 3/4" TAPE SHINGLED DOWNWARD, FREE OF WRINKLES, BUCKLES AND FLAGGING.
5. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

SECTION 11 800 – INSTALLATION OF MULTIMODAL BASE STATIONS (MMBS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BUT NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRED BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURER'S INSTALLATION AND START-UP REQUIREMENTS.

DC CIRCUIT BREAKER LABELING:

A. LABEL CIRCUIT BREAKERS ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.

SECTION 26 100 – BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS.

QUALITY ASSURANCE:

A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTING ARE AVAILABLE IN THE INDUSTRY.

B. MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE NEW USE FOR THIS PROJECT.

C. MATERIALS AND EQUIPMENT: ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS. PROVIDE PRODUCTS BY THE FOLLOWING:

1. ALLIED TUBE AND CONDUIT.
2. B-LINE SYSTEM.
3. UNISTRUT DIVERSIFIED PRODUCTS.
4. THOMAS & BETTS

B. FASTENERS: TYPES, MATERIALS AND CONSTRUCTION FEATURES AS FOLLOWS:

1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL. DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
3. FASTEN BY MEANS OF WOOD SCREWS IN WOOD.
4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

SUPPORTING DEVICES:

A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.

B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.

C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:

1. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.
2. USE VIBRATION AND SHOCK-RESISTANT FASTNERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 – ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR UNDERGROUND RUNS. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED – SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D. ALL UNDERGROUND CONDUIT OR CONDUIT IN CONCRETE SHOULD BE PVC. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATIONS C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRED BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED HUB SHALL INCLUDE LOCK NUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION

B. CABLE TERMINATION FITTINGS FOR CONDUIT

1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL BY ROXTEC.

2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO – CL2075, OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKET COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION, PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM:

A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM TO THE EXTENT INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMET. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS EXCEPT AS OTHERWISE NOTED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO-HOLE SPADES WITH NO-OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CONSTRUCTION MANAGER FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

ADDITIONAL REQUIRED NOTES:

- GC IS RESPONSIBLE FOR HIRING ALL 3RD PARTY SPECIAL INSPECTIONS AS REQUIRED PER MUNICIPALITY
- GC IS RESPONSIBLE FOR VERIFYING ALL FIELD MEASUREMENTS PRIOR TO STARTING CONSTRUCTION
- DO NOT OPEN RRU PACKAGES IN THE RAIN
- NO OPEN FLAME ON SITE
- GC TO ENSURE HYBRIDS ARE SUPPORTED EVERY 3'-0" ON HORIZONTAL AND 4'-0" ON VERTICAL RUNS

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650

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

SPRINT SITE NUMBER:
CT03XC166

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING 160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	CJ	PRELIMINARY	LR
0	01/05/17	CJ	CONSTRUCTION	AF

DocuSigned by:
BAD6086DD3024F4...

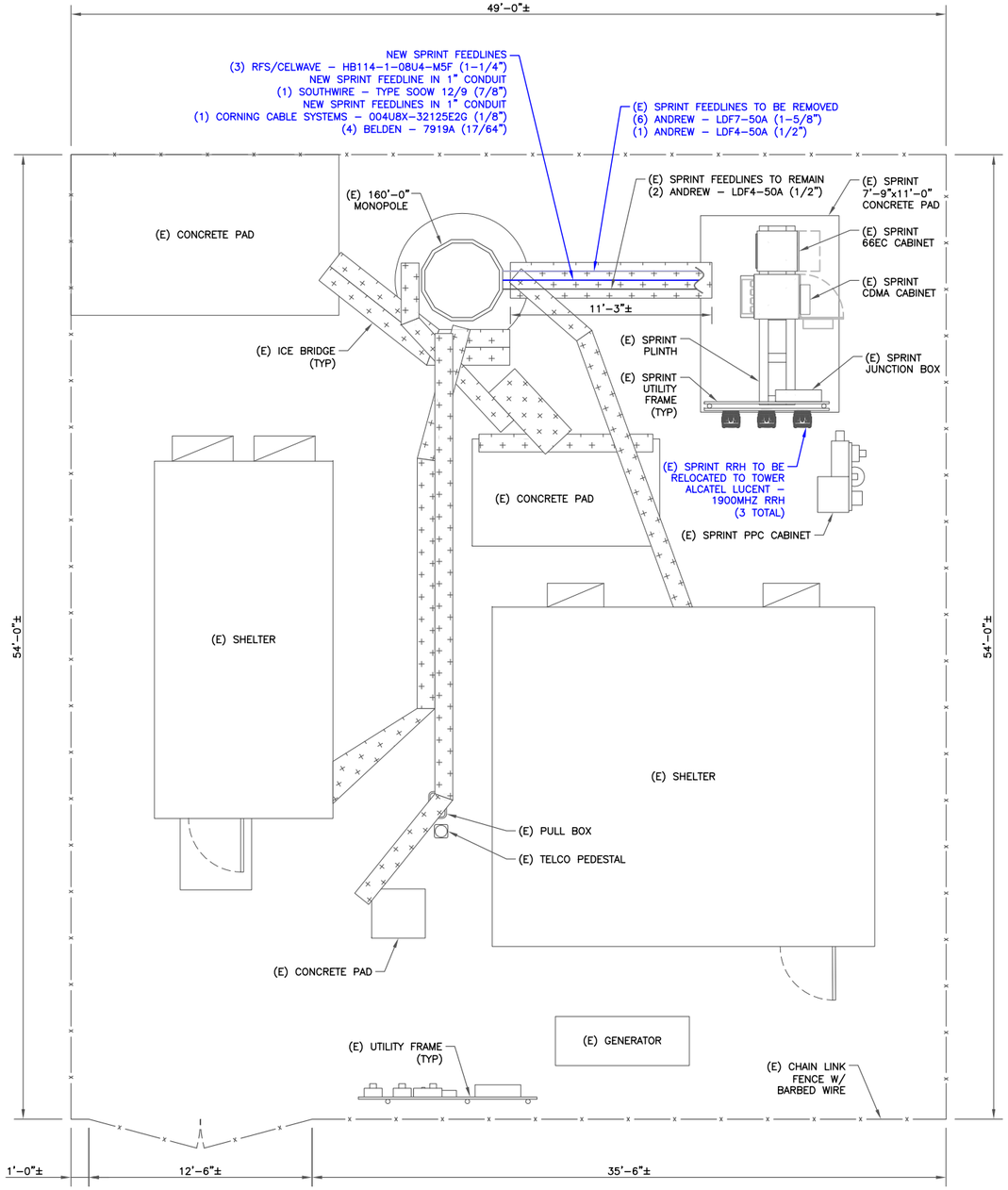
STATE OF CONNECTICUT
ANDREW JOSEPH FANDOZZI III
No. 30515
LICENSED
PROFESSIONAL ENGINEER

1/6/2017 | 9:06:07 AM EST

Crown Castle USA, Inc.
Firm Registration #14842

SHEET NUMBER: T-3

REVISION: 0



1 ENLARGED SITE PLAN

SCALE: 4' 3' 2' 1' 0 4' — 1/4"=1'-0" (FULL SIZE) 1/8"=1'-0" (11x17)

N

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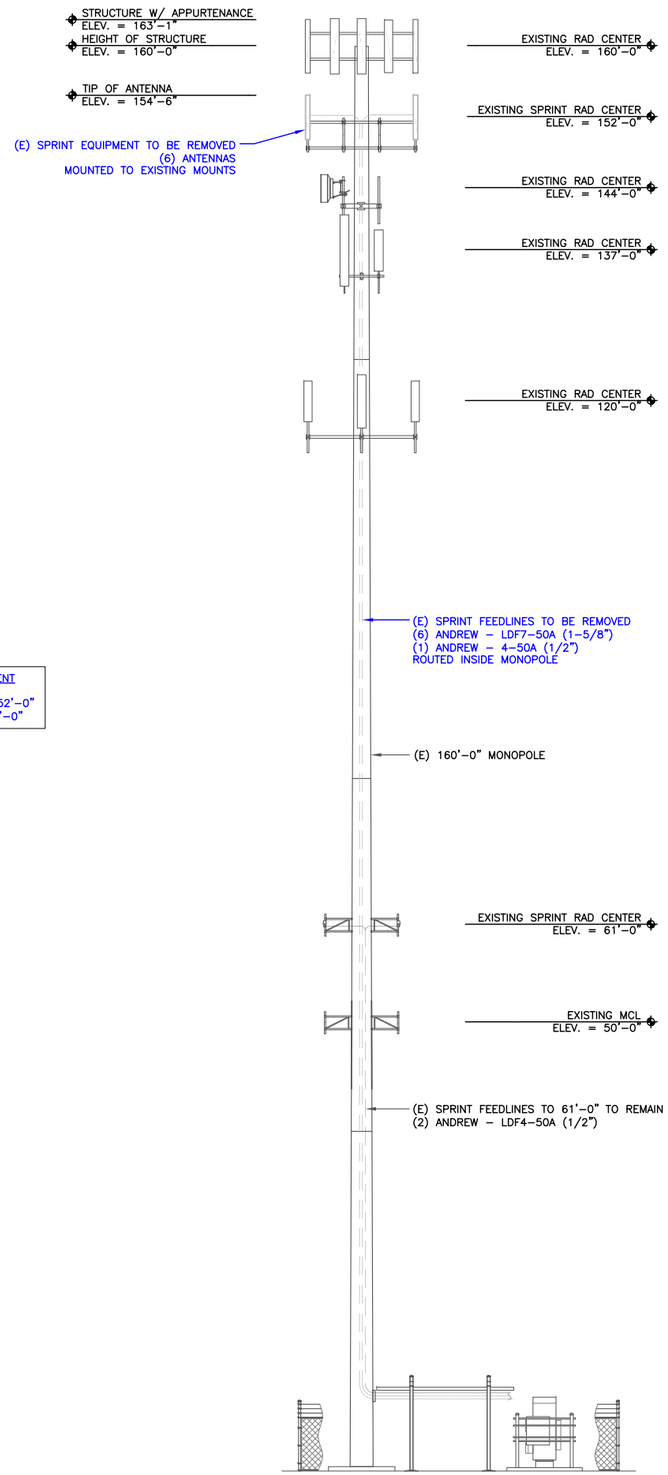
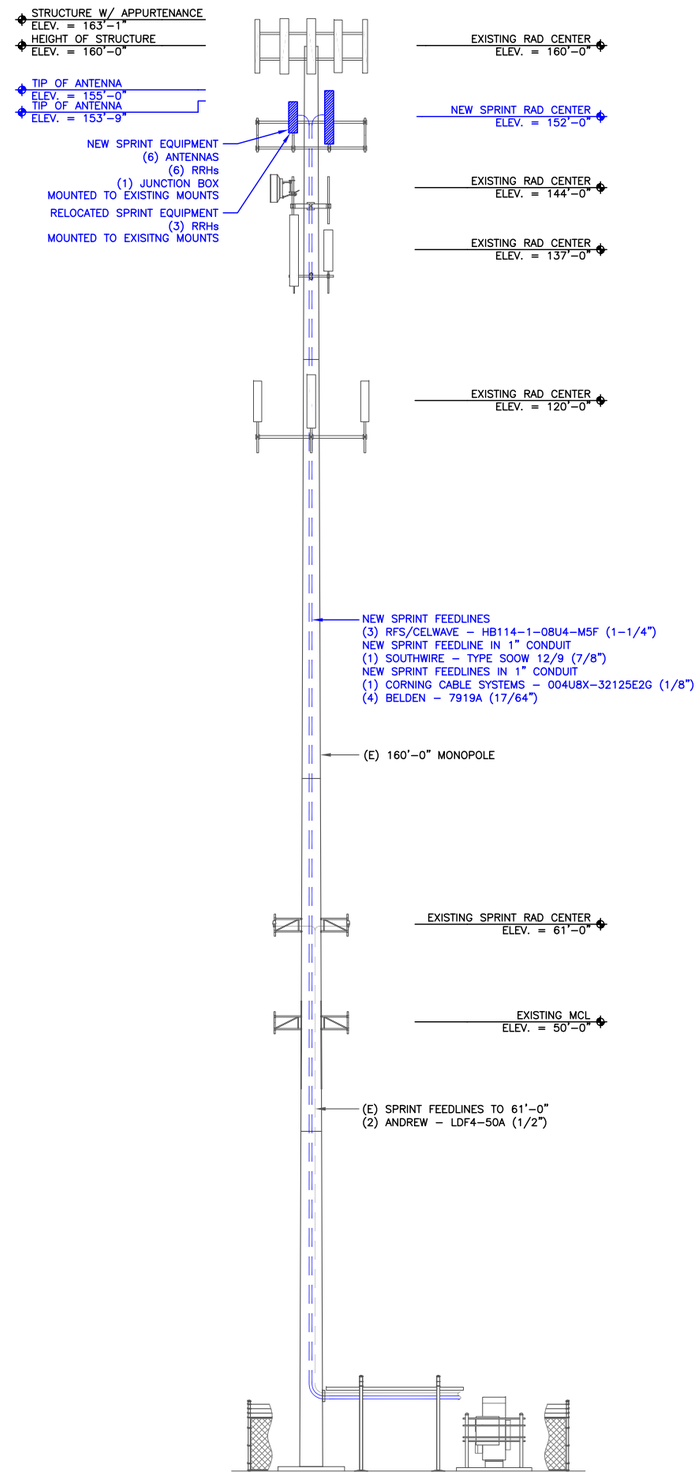
SHEET NUMBER: C-1

REVISION: 0



1 EXISTING ELEVATION
SCALE: NOT TO SCALE



2 FINAL ELEVATION
SCALE: NOT TO SCALE

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CROWN CASTLE
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PORTLAND, CT 06480

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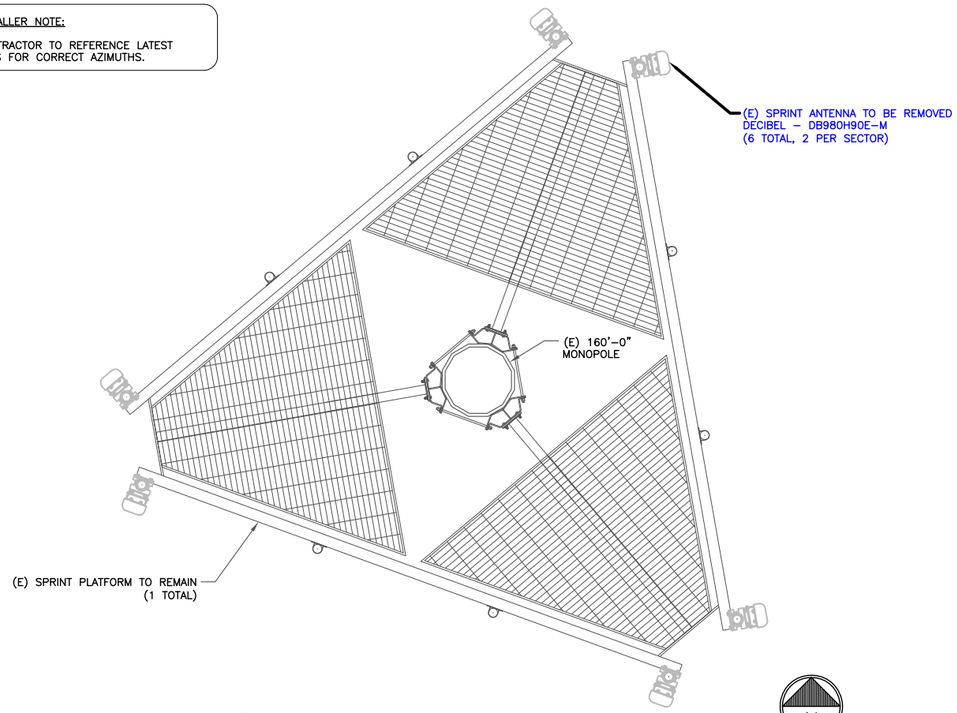
SHEET NUMBER: C-2

REVISION: 0

INSTALLER NOTE:

CONTRACTOR TO REFERENCE LATEST RFDS FOR CORRECT AZIMUTHS.



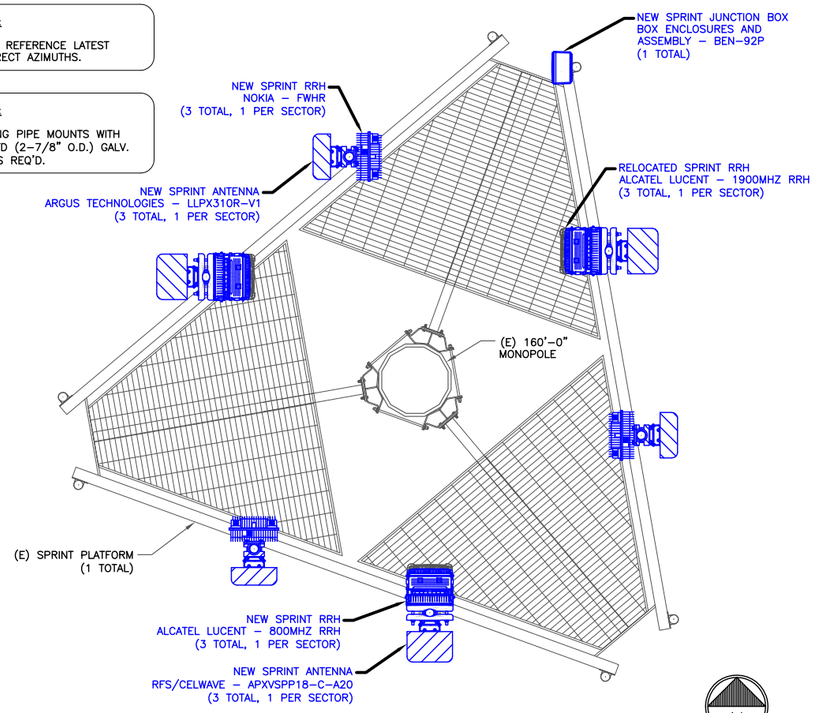
1 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE

INSTALLER NOTE:

CONTRACTOR TO REFERENCE LATEST RFDS FOR CORRECT AZIMUTHS.

INSTALLER NOTE:

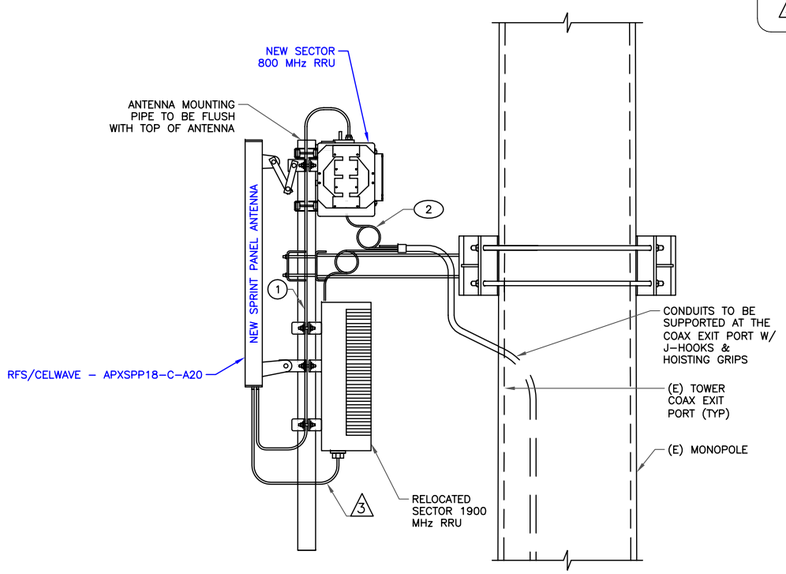
REPLACE EXISTING PIPE MOUNTS WITH NEW 2–1/2" STD (2–7/8" O.D.) GALV. SCH 40 PIPE AS REQ'D.



2 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

KEYED CABLE LEGEND

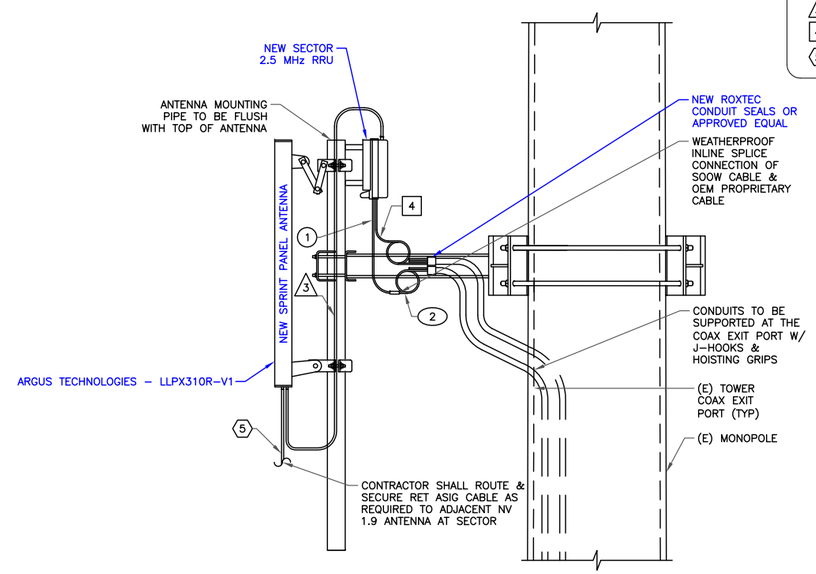
1. 1/2" RF JUMPERS
2. ETHERNET/FIBER
3. RET



3 800/1900 ANTENNA SCHEMATIC
SCALE: NOT TO SCALE

KEYED CABLE LEGEND

1. OEM PROPRIETARY
2. SOOW
3. 1/2" RF JUMPERS
4. ETHERNET/FIBER
5. RET



4 2.5 ANTENNA SCHEMATIC
SCALE: NOT TO SCALE

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CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
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SPRINT SITE NUMBER:
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BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING 160'-0" MONOPOLE

ISSUED FOR:

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1/6/2017 | 9:06:07 AM EST

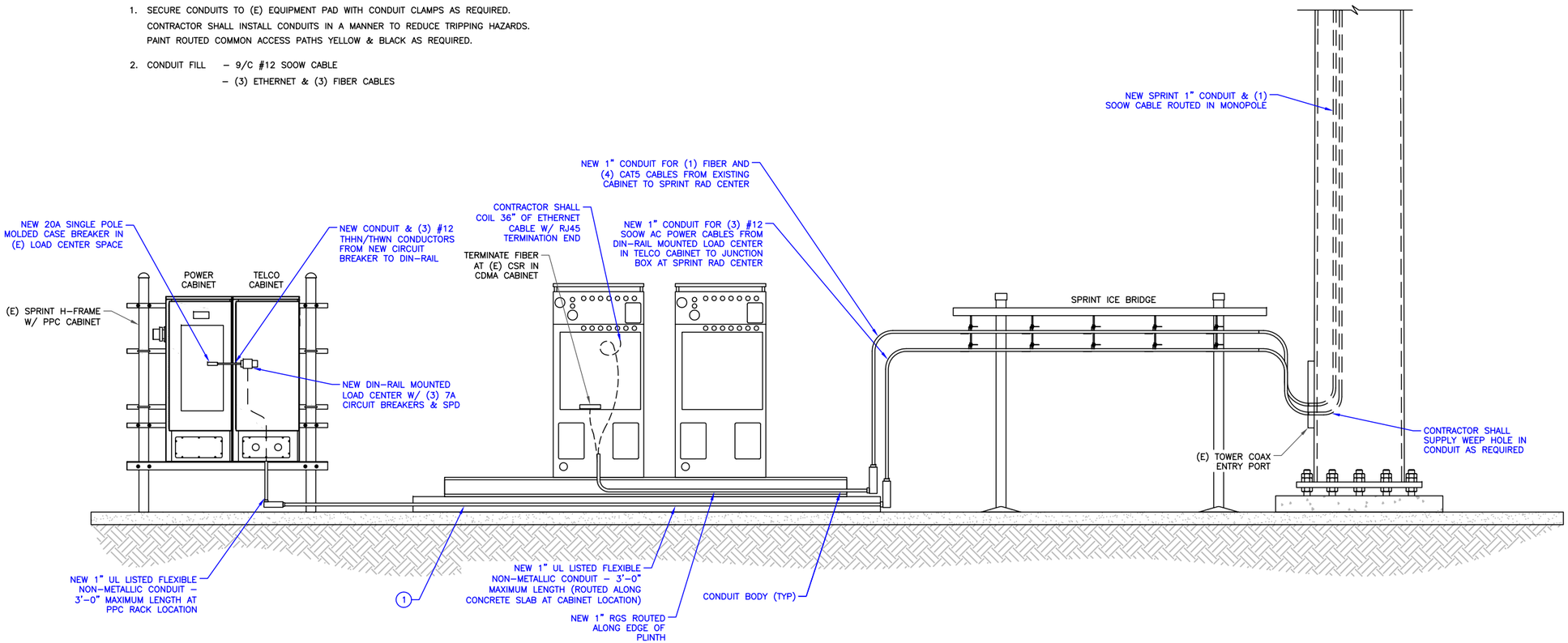
Crown Castle USA, Inc.
Firm Registration #14842

SHEET NUMBER: C-3

REVISION: 0

CONDUIT NOTES:

1. SECURE CONDUITS TO (E) EQUIPMENT PAD WITH CONDUIT CLAMPS AS REQUIRED. CONTRACTOR SHALL INSTALL CONDUITS IN A MANNER TO REDUCE TRIPPING HAZARDS. PAINT ROUTED COMMON ACCESS PATHS YELLOW & BLACK AS REQUIRED.
2. CONDUIT FILL – 9/C #12 SOOW CABLE
   – (3) ETHERNET & (3) FIBER CABLES



1 CONDUIT ROUTING SCHEMATIC
SCALE: NOT TO SCALE

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

SPRINT SITE NUMBER:
CT03XC166

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING 160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	CJ	PRELIMINARY	LR
0	01/05/17	CJ	CONSTRUCTION	AF

DocuSigned by:
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STATE OF CONNECTICUT
ANDREW JOSEPH FANDOZZI, III
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LICENSED PROFESSIONAL ENGINEER

1/6/2017 | 9:06:07 AM EST

Crown Castle USA, Inc.
Firm Registration #14842

SHEET NUMBER: C-4

REVISION: 0

REV. 0 7/25/16

SPRINT CONSTRUCTION SPECIFICATIONS
MINI–MACRO CELL SITES

1) BASIC REQUIREMENTS
- a) MEET ALL REQUIREMENTS OF JURISDICTIONS.
- b) IF EQUIPMENT FURNISHED BY THE COMPANY DOES NOT MATCH THE EQUIPMENT LISTED ON THE RFDS AND SHOWN ON THE PERMITTING DRAWINGS, RESOLVE DISCREPANCY THROUGH INSTALLER'S CONSTRUCTION MANAGER AND COMPANY'S POINT OF CONTACT
- c) CABLE INSTALLATIONS
  - i) ALL CABLES MUST BE OUTDOOR RATED AND HAVE UV RESISTANT OUTER JACKETS
  - ii) CABLE BENDS MUST NOT EXCEED MANUFACTURER'S ALLOWABLE CABLE BEND RADII
  - iii) AT RADIOS INSTALL SERVICE LOOPS FOR POWER, FIBER, AND ETHERNET SECURED AT LEAST TWICE 180° TO THE STRUCTURE
  - iv) SPARE FIBERS MUST BE ENCASED IN A LOW PROFILE WEATHERTIGHT ASSEMBLY
- d) FIBERS MUST BE FIELD–TERMINATED WITH LC TYPE CONNECTORS
- e) CONDUITS IN EARTH: PROVIDE PVC. CONDUITS EXPOSED IN FACILITIES: PROVIDE RGS. HAND DIG TRENCHES IN COMPOUNDS
- f) SECURE AND SUPPORT CONDUITS AND CABLES ON NO MORE THAN 48" INTERVALS
- g) ON TOWER SITES RGS CONDUITS MAY BE SURFACE MOUNTED AWAY FROM WALKWAYS AND ACCESS/EGRESS PATHS. IF INSTALLATIONS IN WALKWAYS AND ACCESS/EGRESS PATHS CANNOT BE AVOIDED, IDENTIFY THE CONDUIT ENVELOPE/TRIP HAZARD BY ALTERNATING YELLOW AND BLACK STRIPES PAINTED ON CONCRETE AND CONDUIT.

2) SPRINT – FURNISHED EQUIPMENT
- a) INSTALL THE FOLLOWING EQUIPMENT AT LOCATIONS AND AZIMUTHS SHOWN ON THE CONSTRUCTION DRAWINGS.
  - i) PANEL ANTENNAS
  - ii) RADIOS
  - iii) GPS ANTENNAS
  - iv) FILTERS
  - v) 120 VOLT DIN–RAIL CIRCUIT BREAKER ASSEMBLY

3) TOWER INSTALLATIONS
- a)MEET ALL REQUIREMENTS OF THE TOWER OWNER
- b) INSTALL CORRUGATED FLEXIBLE CONDUIT UP THE TOWER TO COMPANY'S RAD CENTER
- c) PROVIDE HANGING GRIPS OR CONDUIT CLAMPS AND ENSURE CONDUITS AS WELL AS INNER CABLES ARE SUPPORTED
- d) CONDUIT RISERS: AT THE TOP OF THE TOWER TURN CONDUIT DOWN AND PROVIDE CABLE TERMINATION FITTINGS. EXTEND CABLES TO RADIOS EXPOSED AND SECURED TO THE STRUCTURE, AT CONDUIT EXIT FROM TOWER, PROVIDE DRIP LOOPS AND WEEP HOLES.
- e) AT THE ICE BRIDGE RUN CABLES IN RGS CONDUIT. UTILIZE CONDULETS TO MAKE COMPACT 90 DEGREE TURNS

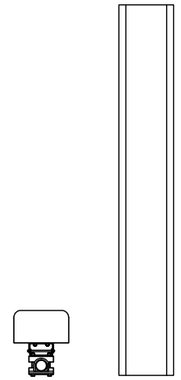
4) AC POWER TIE–IN
- a) INSTALL SPRINT'S 120 VOLT DIN–RAIL CIRCUIT BREAKER ASSEMBLY IN THE EXISTING POWER PROTECTION CABINET TELCO SECTION
- b) INSTALL A 20 AMPERE MOLDED CASE CIRCUIT BREAKER IN AVAILABLE SPACE IN THE ADJACENT PPC POWER SECTION LOAD CENTER

5) GROUNDING
- a) 120 VOLT CIRCUITS: POWER CABLES MUST BE 3–WIRE WITH EQUIPMENT GROUNDING CONDUCTOR
- b) SUPPLEMENTAL GROUNDING: ALL GROUNDING HARDWARE MUST BE UL STAMPED AS SUITABLE FOR GROUNDING HARDWARE
- c) RADIOS: BOND RADIO TO THE TOWER TOP OR SECTOR GROUND BAR WITH #6 BARE TINNED COPPER WIRE (GREEN INSULATED ON ROOFTOPS)
- d) DIN–RAIL CIRCUIT BREAKER ASSEMBLY: BOND SURGE ARRESTOR TO PPC TELCO BOARD GROUND BAR

6) MINOR MATERIALS
- a) CONDUIT
  - i) RIGID GALVANIZED STEEL CONDUIT (RGS): UL LISTED, COMPLIANT WITH ANSI STANDARD C80, HOT–DIP GALVANIZED, WITH THREADED FITTINGS. MANUFACTURERS: ALLIED, REPUBLIC, WHEATLAND, OR EQUAL.
  - ii)CORRUGATED FLEXIBLE CONDUIT: DURALINE OR EQUAL.
  - iii) LIQUID–TIGHT FLEXIBLEMETALLIC CONDUIT (LFMC): UL LABLED, UC RESISTANT, FLAME RETARDANT PVC JACKET, HOT–DIP GALVANIZED, GREY. MANUFACTURERS: AFC, ANACONDA, SOUTHWIRE, OR EQUAL.
  - iv) PVC CONDUIT: SCHEDULE 40. CARLON OR EQUAL
  - v) CABINET HUBS AND CABLE TERMINATION FITTINGS: OZ GEDNEY OR ROXTEC
- b) COAXIAL CABLE JUMPERS: ½" LDF–4 MANUFACTURERS: COMMSCOPE, RFS OR FCT.
- c)FASTENERS AND HARDWARE
  - i) TO SECURE RACEWAYS, UTILIZE NON CORRODING NON–MAGNETS METALLIC FASTENERS AND HARDWARE SUITABLE FOR THE PURPOSE
- d) POWER CABLES – 3/C #12 SOOW BY SOUTHWIRE OR EQUAL
- e) ETHERNET CABLES AND CONNECTORS: OUTDOOR RATED, CAT 5E, BELDEN OR EQUAL
- f) FIBER CABLES: CORNING "FREEDOM FAN OUT" OUTDOOR RISER CABLE, 4F, SINGLE MODE, OR EQUAL
- g) RF TRANSPARENT PAINT FOR ANTENNA CONCEALMENT: SELECT NO/LOW CARBON PAINTS, WITH NO/LOW TITANIUM DIOXIDE, AND WITHOUT SUSPENDED METAL PARTICLES (ALUMINUM, ZINC, COPPER, ETC)

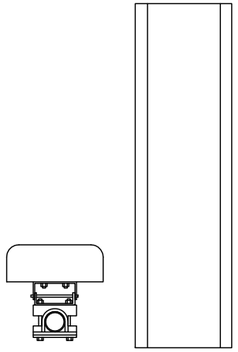
7) COLOR CODING
- a) COLOR CODE CABLES AND CONDUITS AS REQUIRED BY SPRINT STANDARD TS–0200

8) TESTING AND CONSTRUCTION COMPLETE
- a) SWEEP ALL COAXIAL CABLES ACCORDING TO SPRINT STANDARD TS–0200
- b) PANEL ANTENNA ALIGNMENT – USING ELECTRONIC ALIGNMENT TOOL. AZIMUTH/DOWNTILT +/– 1 DEGREE
- c) LEAVE EQUIPMENT DE–ENERGIZED UNTIL INSTRUCTED BY THE COMMISSIONING AND INTEGRATION TEAM TO ENERGIZE
- d) OTHER REQUIREMENTS AND DELIVERABLES MAY BE REQUIRED BEFORE THE CONSTRUCTION COMPLETE MILESTONE CAN BE ACTUALIZED IN SITERRA (SPRINT'S DATABASE–OF–RECORD).



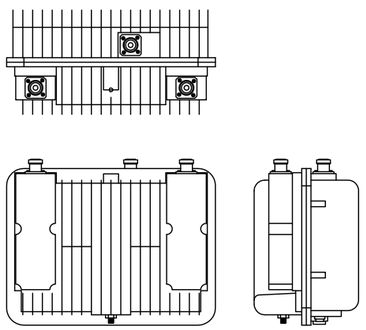
RFS/CELWAVE – APXVSPP18–C–A20
WEIGHT (WITHOUT MOUNTING HARDWARE): 92.0 LBS
SIZE (HxWxD): 72.0x11.8x7.9 IN.
MOUNTING HARDWARE: APM40–2 DOWNTILT KIT
MOUNTING HARDWARE WEIGHT: 7.5 LBS

1 RFS/CELWAVE – APXVSPP18–C–A20
SCALE: NOT TO SCALE



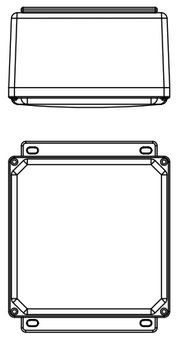
ARGUS TECHNOLOGIES – LLPX310R–V4
WEIGHT (WITHOUT MOUNTING HARDWARE): 28.66 LBS
SIZE (HxWxD): 42.13x11.81x4.53 IN.
MOUNTING HARDWARE P/N: F–042–GL–E OR T–045–GL–E
RATED WIND VELOCITY: 124.27 MPH

2 ARGUS TECHNOLOGIES – LLPX310R–V4
SCALE: NOT TO SCALE



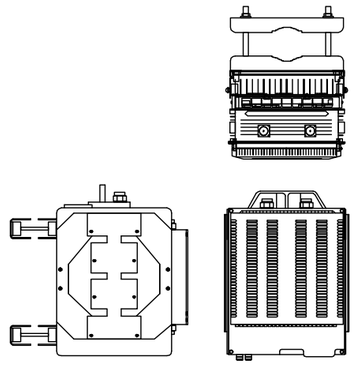
NOKIA – FWHR
WEIGHT: 24.7 LBS
SIZE (HxWxD): 9.7x12.9x6.3 IN.

3 NOKIA – FWHR
SCALE: NOT TO SCALE



BOX ENCLOSURES AND ASSEMBLY – BEN–92P
WEIGHT (WITHOUT MOUNTING HARDWARE): 2.2 LBS
SIZE (HxWxD): 9.7x12.8"x6.3 IN.

4 BOX ENCLOSURES AND ASSEMBLY – BEN–92P
SCALE: NOT TO SCALE



ALCATEL LUCENT – 800MHZ RRH
WEIGHT (WITHOUT MOUNTING HARDWARE): 53.0 LBS
SIZE (HxWxD): 19.7x13.0x10.8 IN.

5 ALCATEL LUCENT – 800MHZ RRH
SCALE: NOT TO SCALE

Sprint
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OVERLAND PARK, KS 66251-2650

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Crown Castle USA, Inc.
Firm Registration #14842

SHEET NUMBER: C-5

REVISION: 0

1 NOT USED
SCALE: NOT TO SCALE

ALL MATERIALS ON THIS PAGE SHALL BE SUPPLIED BY THE CONTRACTOR

3-9 SOOW ROYAL® MULTI-CONDUCTOR SOOW

Royal® 90°C Rubber Cord. 600 Volts.
Flexible Stranding. Flame and Ozone Resistant.
Black Jacket. Rated -40°C to 90°C.
RoHS Compliant. UL Listed and CSA Certified for Indoor and Outdoor Use.
Provides Premium Oil Resistance, Water Resistant and High Flexibility.
Excellent Abrasion Resistance. Rated Extra-Hard Usage.

VIPER RUBBER TYPE MULTI–CONDUCTOR TYPE SOOW CONTROL

CONDUCTOR SIZE (AWG)	CONDUCTOR STRANDING (#AWG)	NOMINAL INSULATION THICKNESS (mils)	NOMINAL JACKET WALL (mils)	NOMINAL OVERALL DIAMETER (mils)	WEIGHT (lbs/1000ft)	AMPACITY
12/9	65 x 30	45	95	880	510	14

2 SOOW POWER CABLE
SCALE: NOT TO SCALE

Detailed Specifications & Technical Data
ENGLISH MEASUREMENT VERSION

BELDEN

7919A Multi-Conductor - Category 5e DataTuff® Twisted Pair Cable

For more information please call
1-800-Belden1

Description:
24 AWG solid bare copper conductors, twisted pairs, polyolefin insulation, overall Beldfoil shield (100% coverage), 24 AWG stranded TC drain wire, industrial grade sunlight- and oil-resistant PVC jacket, rip cord. Sequential marking at two foot intervals

Usage (Overall)
Suitable Applications: Industrial Ethernet Cable, Harsh Environments, 100MHz Category 5e, Gigabit Ethernet, 100BaseTX, 100BaseVG ANYLAN, 155ATM, 622ATM, NTSC/PAL Component or Composite Video, AES/EBU Digital Audio, RS-422, CMX - Outdoor, RJ-45 Compatible, Noisy Environments

Physical Characteristics (Overall)
Conductor
AWG:

# Pairs	AWG	Stranding	Conductor Material
4	24	Solid	BC - Bare Copper

Insulation
Insulation Material:

Insulation Material	Wall Thickness (in.)
PO - Polyolefin	.010

Outer Shield
Outer Shield Material:

Outer Shield Trade Name	Type	Outer Shield Material	Coverage (%)
Beldfoil®	Tape	Aluminum Foil-Polyester Tape	100

Outer Shield Drain Wire AWG:

AWG	Stranding	Drain Wire Conductor Material
24	7x32	TC - Tinned Copper

Outer Jacket
Outer Jacket Material:

Outer Jacket Material
Industrial Grade PVC - Polyvinyl Chloride

Outer Jacket Ripcord: No

Overall Cable
Overall Nominal Diameter: 0.265 in.

Pair
Pair Color Code Chart:

Number	Color
1	White/Blue Stripe & Blue
2	White/Orange Stripe & Orange
3	White/Green Stripe & Green
4	White/Brown Stripe & Brown

Mechanical Characteristics (Overall)
Installation Temperature Range: +25°C To +75°C

Distributed By: INTERSTATE WIRE CO. INCORPORATED Page 1 of 4 1-800-527-0010 01-05-2012

3 CAT5 CABLE
SCALE: NOT TO SCALE

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650

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

SPRINT SITE NUMBER:
CT03XC166

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING 160'-0" MONOPOLE

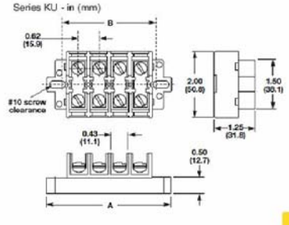
Connectors
COOPER Bussmann

Base Mount Double Row Terminal Blocks

Series KU

Specifications
Description: Base mount double row terminal blocks.
Ratings:
Volts: — 600V
Amps: — 60A*
Center Spacing: 0.625" (15.88mm)
Number of Poles: 2- to 12-poles
Wire Range: #6-22 AWG Cu
Screw Size: #10-32
Torque Rating: 20 lb-in.
Distance Between Barriers: 0.437" (11.09mm)
Mounting: Base mount
Material: Molded base: Black, UL rated 94V1 Nuclear Grade Noryl
Terminal plating: Nickel over brass
Operating Temperature: 105°C max.
Agency Information: UL File E62622, CSA File 47235
* 60A rating achieved with #8 copper wire crimped to ring terminal.

Series KU - in (mm)



Dimensions - in

Poles	KU A	KU B	KUX Only A
02	0.50	1.62	2.00
03	1.12	2.25	2.62
04	1.75	2.87	3.25
05	4.37	3.50	3.87
06	5.00	4.12	4.50
07	5.62	4.75	5.12
08	6.25	5.37	5.75
09	6.87	6.00	6.37
10	7.50	6.62	7.00
11	8.12	7.25	7.62
12	8.75	7.87	8.25

1" = 25.4mm.

Catalog Number Build-A-Code

Series	Poles	Screw Options	Covers	Marking Strip
□□□□□	□□ - □□		□□	□□□
KU = Standard block KUH = Block KUX = Short block KURL = Standard wiremovable link KUXRL = Short block wiremovable link	02 to 12	00 = Screws shipped bulk W = Brass washer head, nickel-plated P = Steel screw w/pressure plate zinc-plated B = Brass washer head, no plating BP = Brass philslot, nickel-plated	WC = Top cover & 2 end plates	MT = Matte finish NU = Numbered 1 to 12, horizontal NUV = Numbered 1 to 12, vertical PT = Marker strip for cover

4 TERMINAL BLOCK
SCALE: NOT TO SCALE

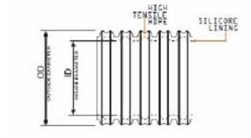
CORRUGATED
www.duraline.com
ISO 9001 REGISTERED
Customer Service
800-847-7661

FEATURES:
- Available in 1", 1 ¼", 1 ½", 2"
- Manufactured from flexible HDPE
- Continuous lengths on reels or in coils
- Rugged corrugated design is flexible and light weight, yet provides excellent crush resistance
- Outstanding long term cable protection from shifting ground, rock and root impingement
- Provides a permanent pathway, simplifies future cable repairs or replacement
- Available with UV protectant for above ground applications
- Plenum and Riser products available

CORRUGATED – SPECS
Customer Service 800-847-7661 www.duraline.com

SPECIFICATIONS:

Nominal Size	OD (in.)	Wall Thick. (min. in.)	Wall Thick. (max. in.)	ID Ref.	Safe Working Pull Strength	Weight lb/ft	Bend Radius	Brittleness Temp
1"	1.330±0.010	0.045	0.065	1.220	500 lbs	0.121	14	-75°C
1 ¼"	1.550±0.010	0.045	0.065	1.440	500 lbs	0.141	16	-75°C
1 ½"	1.860±0.010	0.055	0.075	1.670	500 lbs	0.165	19	-75°C
2"	2.265±0.010	0.055	0.075	2.135	500 lbs	0.196	22	-75°C

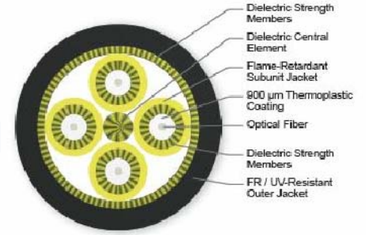


5 CORRUGATED CONDUIT
SCALE: NOT TO SCALE

FREEDM® Fan-Out Tight-Buffered Cable, Riser
4 F, Single-mode (OS2)

CORNING

Part Number: 004E6F-31331-29



Cross Section of Part Number: 004E6F-31331-29

6 FIBER CABLE
SCALE: NOT TO SCALE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	CJ	PRELIMINARY	LR
0	01/05/17	CJ	CONSTRUCTION	AF

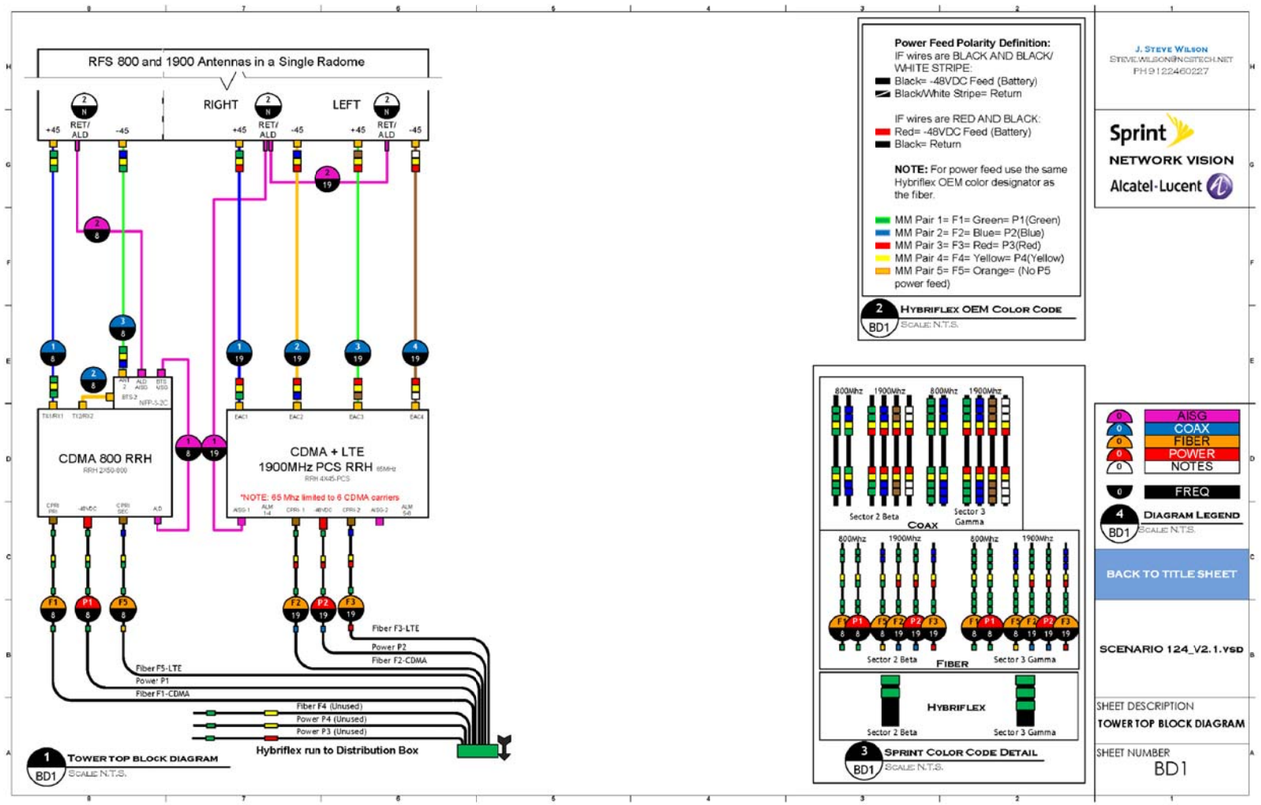
DocuSigned by:
BAD6086DD3024F4...

STATE OF CONNECTICUT
ANDREW JOSEPH FANDOZZI III
No. 30515
LICENSED PROFESSIONAL ENGINEER

1/6/2017 | 9:06:07 AM EST

Crown Castle USA, Inc.
Firm Registration #14842

SHEET NUMBER: C-6
REVISION: 0



Power Feed Polarity Definition:
IF wires are BLACK AND BLACK/ WHITE STRIPE:
Black= -48VDC Feed (Battery)
Black/White Stripe= Return

IF wires are RED AND BLACK:
Red= -48VDC Feed (Battery)
Black= Return

NOTE: For power feed use the same Hybriflex OEM color designator as the fiber.

MM Pair 1= F1= Green= P1(Green)
MM Pair 2= F2= Blue= P2(Blue)
MM Pair 3= F3= Red= P3(Red)
MM Pair 4= F4= Yellow= P4(Yellow)
MM Pair 5= F5= Orange= (No P5 power feed)

2 HYBRIFLEX OEM COLOR CODE BD1 SCALE: N.T.S.

J. STEVE WILSON
STEVE.WILSON@NCSTECH.NET
PH 9122460227

Sprint NETWORK VISION Alcatel·Lucent

3 SPRINT COLOR CODE DETAIL BD1 SCALE: N.T.S.

AISG
COAX
FIBER
POWER
NOTES
FREQ

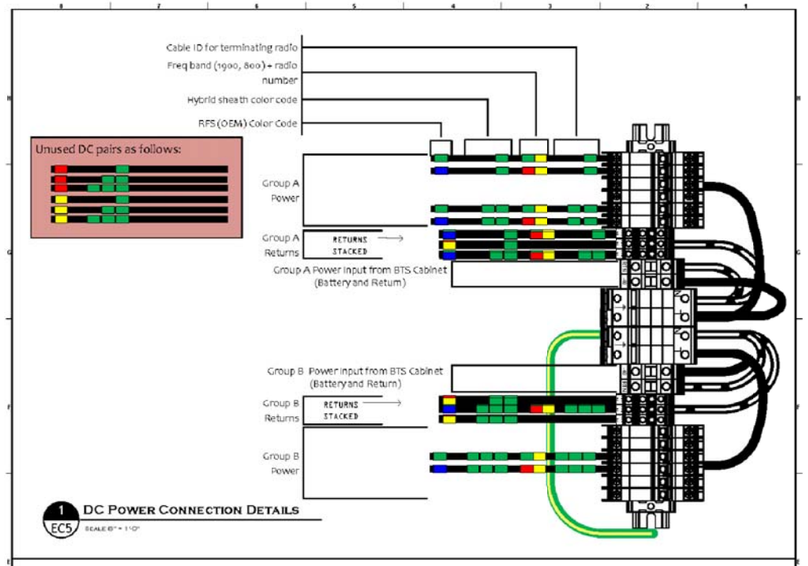
4 DIAGRAM LEGEND BD1 SCALE: N.T.S.

BACK TO TITLE SHEET

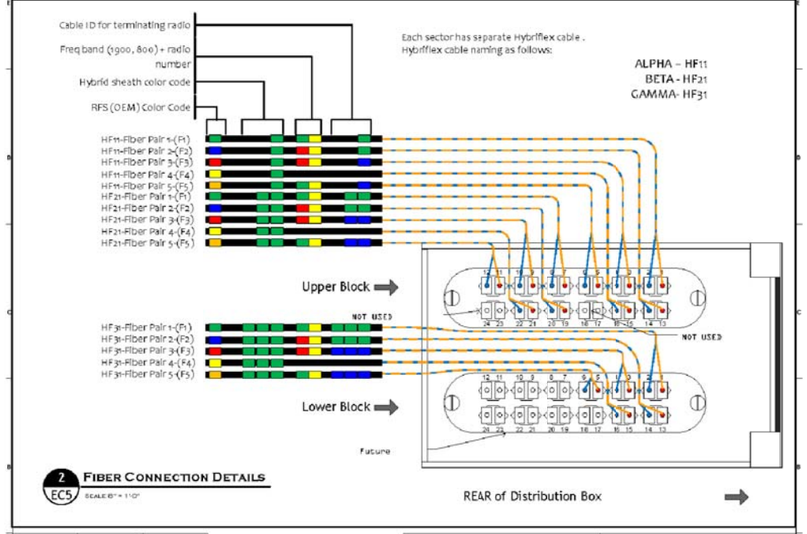
SCENARIO 124_V2.1.VSD

SHEET DESCRIPTION
TOWER TOP BLOCK DIAGRAM

SHEET NUMBER
BD1



1 EC5 DC POWER CONNECTION DETAILS SCALE: 6" = 1'-0"



2 EC5 FIBER CONNECTION DETAILS SCALE: 6" = 1'-0"

SHEET NUMBER: EC5
SHEET DESCRIPTION: DISTRIBUTION BOX CONNECTION DETAILS FOR TOWER MOUNTED RRH
FILE NAME: SCENARIO 124_V2.1.VSD

BACK TO TITLE SHEET

Sprint NETWORK VISION Alcatel·Lucent

J. STEVE WILSON
STEVE.WILSON@NCSTECH.NET
PH 9122460227

1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650

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

SPRINT SITE NUMBER:
CT03XC166

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING 160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	CJ	PRELIMINARY	LR
0	01/05/17	CJ	CONSTRUCTION	AF

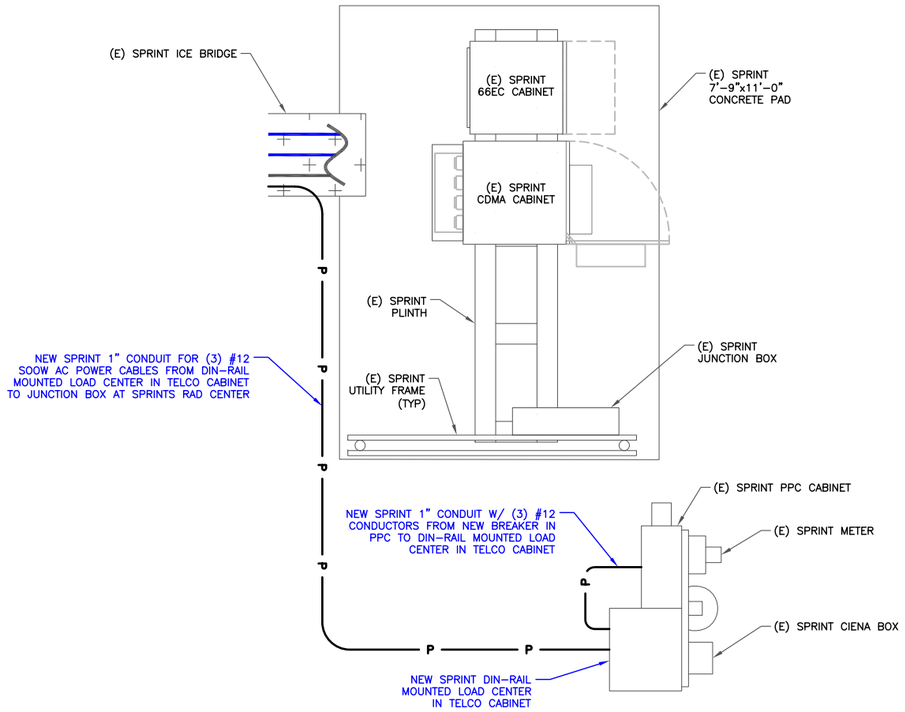
DocuSigned by:
BAD6086DD3024F4...

STATE OF CONNECTICUT
ANDREW JOSEPH FANDOZZI III
No. 30515
LICENSED PROFESSIONAL ENGINEER

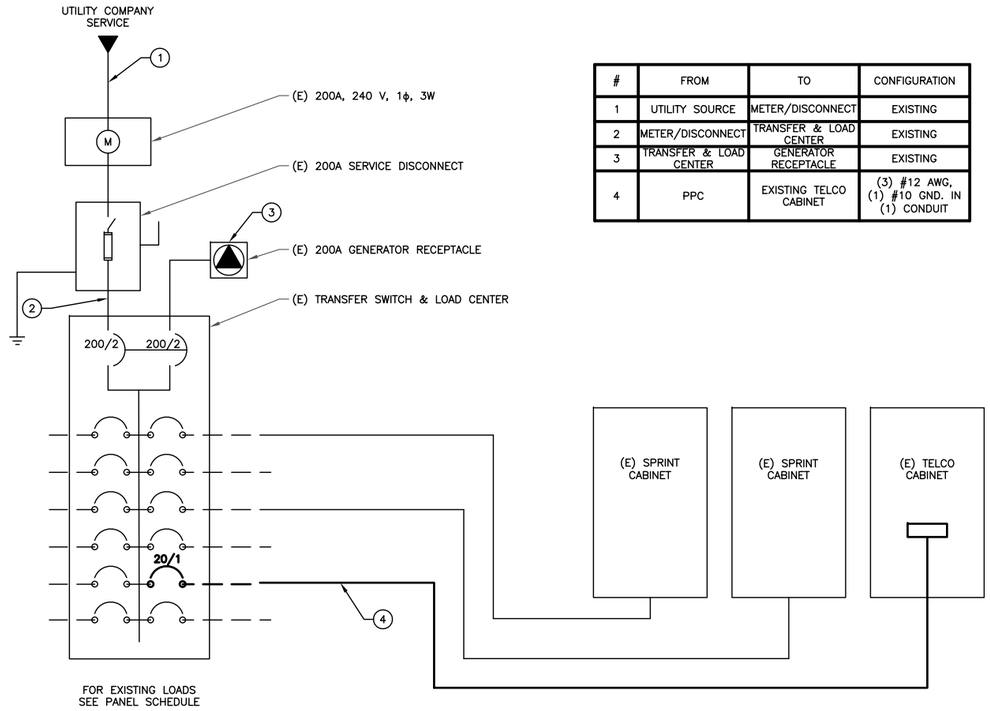
1/6/2017 | 9:06:07 AM EST

Crown Castle USA, Inc.
Firm Registration #14842

SHEET NUMBER: C-7
REVISION: 0



1 ELECTRICAL AND GROUNDING PLAN
SCALE: NOT TO SCALE



#	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/DISCONNECT	EXISTING
2	METER/DISCONNECT	TRANSFER & LOAD CENTER	EXISTING
3	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	PPC	EXISTING TELCO CABINET	(3) #12 AWG, (1) #10 GND. IN (1) CONDUIT

2 ELECTRICAL ONE-LINE DIAGRAM
SCALE: NOT TO SCALE

EXISTING PANEL PANEL

MAIN: 200 AMP MAIN BREAKER | **VOLTAGE/PHASE**: 120/240V, 1-PHASE, 3-WIRE | **SHORT CIRCUIT CURRENT RATING**: 22,000 AMPS
MOUNTING: SURFACE | **ENCLOSURE**: NEMA 1 | **SURGE PROTECTION DEVICE**: YES
SERVICE FROM: N/A | **MANUFACTURER**: NORTHERN TECHNOLOGIES, INC (SQUARE D) | **MODEL NUMBER**: QO142M200

DESCRIPTION	LOAD (VA)	C or NC	C/B	CIR No.	LOAD (VA) A-PHASE	LOAD (VA) B-PHASE	CIR No.	C/B	C or NC	LOAD (VA)	DESCRIPTION
MMBTS	9600	C	100	1	9600		2	60	C	0	SURGE ARRESTOR
MMBTS	9600	C	-	3		9600	4	-	C	0	SURGE ARRESTOR
				5	0		6	80	NC	0	SPARE
				7		0	8	-	NC	0	SPARE
SPARE	0	NC	20	9	180		10	15	NC	180	GFCI
TELCO FAN	300	C	10	11		300	12				
					BASE LOAD (VA) =	9780		9900			
					25% OF CONTINUOUS LOAD (VA) =	2400		2475			
					TOTAL LOAD (VA) =	12180		12375			
					TOTAL LOAD (A) =	102		104			

"C" DESIGNATION IDENTIFIES CONTINUOUS LOADS AND MOTOR LOADS AS REQUIRED BY SECTIONS 230.42 AND 430.24 OF THE NEC

PROPOSED PANEL PANEL

MAIN: 200 AMP MAIN BREAKER | **VOLTAGE/PHASE**: 120/240V, 1-PHASE, 3-WIRE | **SHORT CIRCUIT CURRENT RATING**: 22,000 AMPS
MOUNTING: SURFACE | **ENCLOSURE**: NEMA 1 | **SURGE PROTECTION DEVICE**: YES
SERVICE FROM: N/A | **MANUFACTURER**: NORTHERN TECHNOLOGIES, INC (SQUARE D) | **MODEL NUMBER**: QO142M200

DESCRIPTION	LOAD (VA)	C or NC	C/B	CIR No.	LOAD (VA) A-PHASE	LOAD (VA) B-PHASE	CIR No.	C/B	C or NC	LOAD (VA)	DESCRIPTION
MMBTS	9600	C	100	1	9600		2	60	C	0	SURGE ARRESTOR
MMBTS	9600	C	-	3		9600	4	-	C	0	SURGE ARRESTOR
				5	0		6	80	NC	0	SPARE
DIN-RAIL	**1200**	**C**	**20**	7		1200	8	-	NC	0	SPARE
SPARE	0	NC	20	9	180		10	15	NC	180	GFCI
TELCO FAN	300	C	10	11		300	12				
					BASE LOAD (VA) =	9780		11100			
					25% OF CONTINUOUS LOAD (VA) =	2400		2775			
					TOTAL LOAD (VA) =	12180		13875			
					TOTAL LOAD (A) =	102		116			

"C" DESIGNATION IDENTIFIES CONTINUOUS LOADS AND MOTOR LOADS AS REQUIRED BY SECTIONS 230.42 AND 430.24 OF THE NEC

3 EXISTING/NEW PANEL SCHEDULE AND NOTES
SCALE: NOT TO SCALE

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650

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

SPRINT SITE NUMBER:
CT03XC166

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING 160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	CJ	PRELIMINARY	LR
0	01/05/17	CJ	CONSTRUCTION	AF

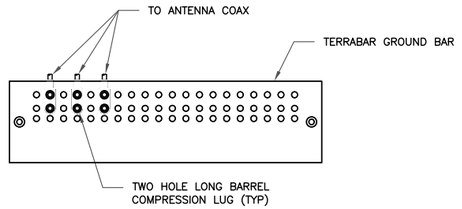
DocuSigned by:
BAD6086DD3D24F4...

STATE OF CONNECTICUT
ANDREW JOSEPH FANDOZZI III
No. 30515
LICENSED PROFESSIONAL ENGINEER

1/6/2017 | 9:06:07 AM EST

Crown Castle USA, Inc.
Firm Registration #14842

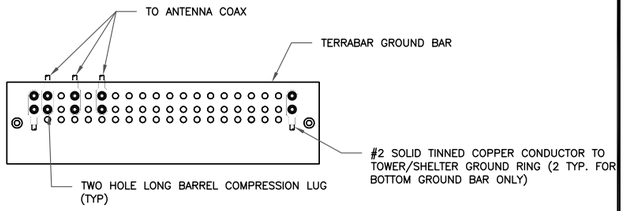
SHEET NUMBER: E-1
REVISION: 0



NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL.

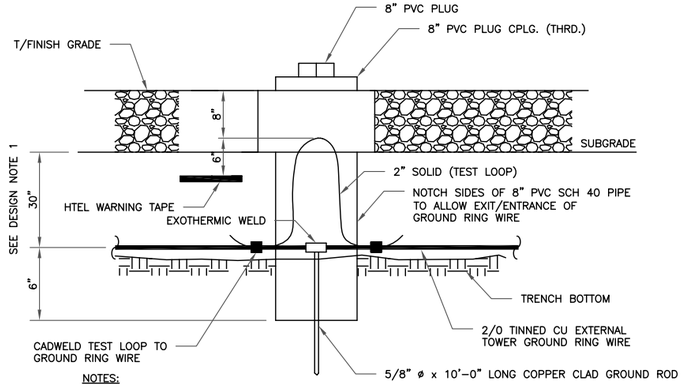
1 ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. INSTALL GROUND BARS AT 75 FT. INTERVAL MAXIMUM.
4. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

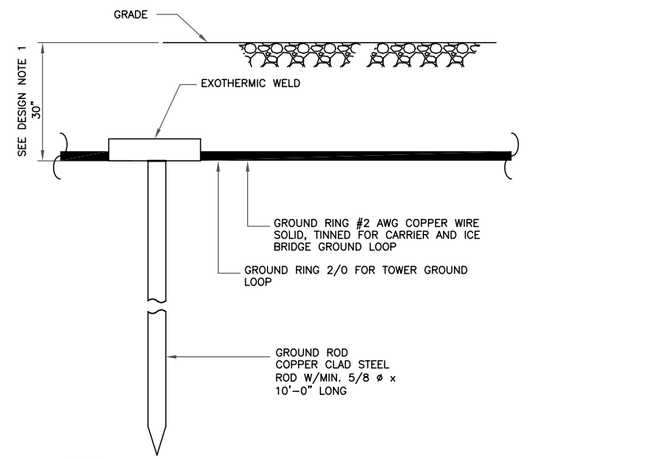
3 INSPECTION PORT DETAIL
SCALE: NOT TO SCALE

NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF MONOPOLE, ANTENNA LOCATION AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET IN/ON THE POLE SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE 2/0 AWG. STRANDED IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM 8 FEET TO 10 FEET.

4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE

5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650

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

SPRINT SITE NUMBER:
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BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING 160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	CJ	PRELIMINARY	LR
0	01/05/17	CJ	CONSTRUCTION	AF

DocuSigned by:
BAD0A1DD3024F4...

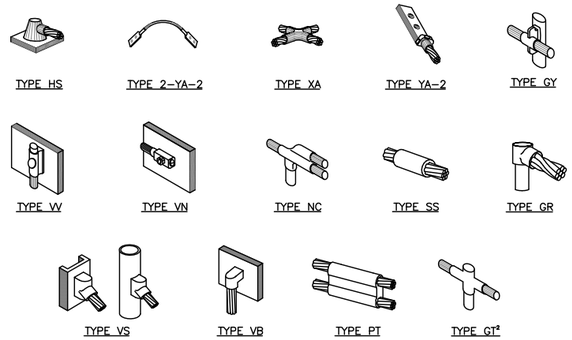
STATE OF CONNECTICUT
ANDREW JOSEPH FANDOZZI III
No. 30515
LICENSED PROFESSIONAL ENGINEER

1/6/2017 | 9:06:07 AM EST

Crown Castle USA, Inc.
Firm Registration #14842

SHEET NUMBER: G-1

REVISION: 0

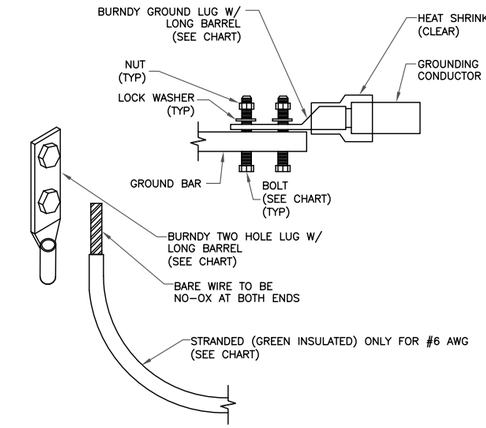


NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

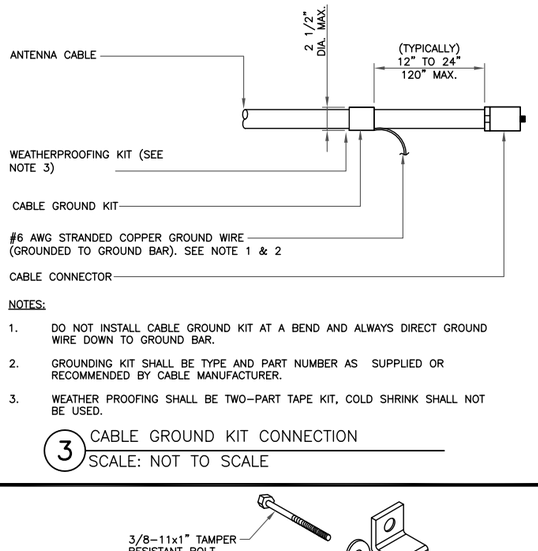
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER,GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

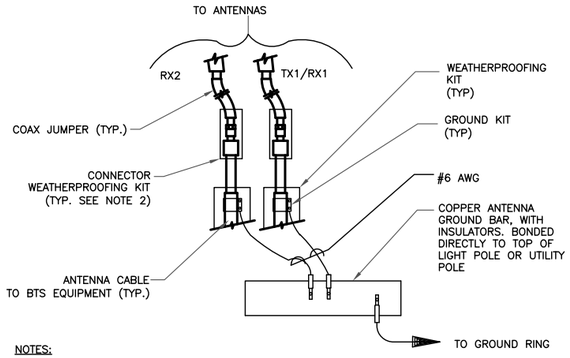
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

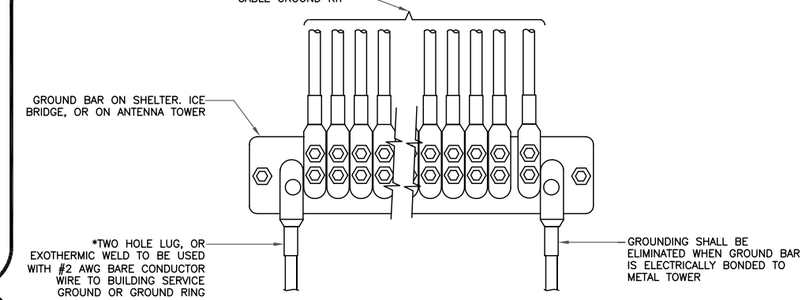
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



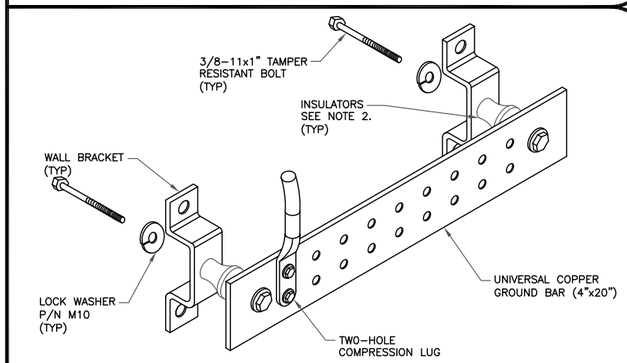
NOTES:

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.

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



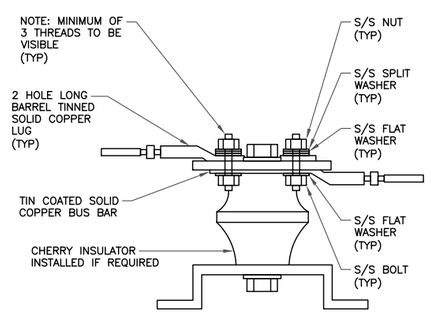
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



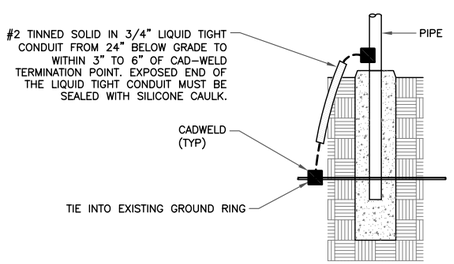
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650

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

SPRINT SITE NUMBER:
CT03XC166

BU #: **806382**
HRT 082 943274

74 GOODRICH LANE
PORTLAND, CT 06480

EXISTING 160'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	CJ	PRELIMINARY	LR
0	01/05/17	CJ	CONSTRUCTION	AF

DocuSigned by:
BAD6086DD3024F4...

STATE OF CONNECTICUT
ANDREW JOSEPH FANDOZZI, III
No. 30515
LICENSED PROFESSIONAL ENGINEER

1/6/2017 | 9:06:07 AM EST

Crown Castle USA, Inc.
Firm Registration #14842

SHEET NUMBER: G-2
REVISION: 0

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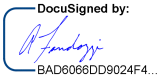
Andrew Fandozzi andrew.fandozzi@crowncastle.com Senior Project Engineer Crown Castle Security Level: Email, Account Authentication (None) Electronic Record and Signature Disclosure: Not Offered via DocuSign ID:	DocuSigned by:  BAD6066DD9024F4... Using IP Address: 98.111.229.47 Signed using mobile	Sent: 1/6/2017 | 9:02:57 AM Viewed: 1/6/2017 | 9:03:54 AM Signed: 1/6/2017 | 9:06:07 AM

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Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Notary Events		Timestamp

Envelope Summary Events	Status	Timestamps
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Certified Delivered	Security Checked	1/6/2017 | 9:03:54 AM
Signing Complete	Security Checked	1/6/2017 | 9:06:07 AM
Completed	Security Checked	1/6/2017 | 9:06:07 AM

Payment Events	Status	Timestamps

Date: **November 23, 2016**

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

SSOE Group
320 Seven Springs Way, Suite 350
Brentwood, TN 37027
(615) 661-7585
srudramurthy@ssoe.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate** **Carrier Site Number:**	 CT03XC166
Crown Castle Designation:	**Crown Castle BU Number:** **Crown Castle Site Name:** **Crown Castle JDE Job Number:** **Crown Castle Work Order Number:** **Crown Castle Application Number:**	806382 HRT 082 943274 405037 1325410 366727 Rev. 2
Engineering Firm Designation:	**SSOE Group Project Number:**	017-00013-00 BC 1008
Site Data:	**74 Goodrich Lane, Portland, CT 06480, Middlesex County** **Latitude *41° 36' 29.9"*, Longitude *-72° 35' 29.56"*** **160 Foot – Modified Valmont Monopole Tower**	

Dear Mr. Charles McGuirt,

SSOE Group is pleased to submit this **"Structural Analysis 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 972659, in accordance with application 366727, revision 2.

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:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved 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 126 mph converted to a nominal 3-second gust wind speed of 98 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis

We at *SSOE Group* 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.

Structural analysis prepared by: Shruthi Rudramurthy

Respectfully submitted by:

STATE OF CONNECTICUT
BARRY W. BURGESS
NO. 26165
LICENSED
PROFESSIONAL ENGINEER

Barry W. Burgess, PE
Section Manager

11/23/2016

TABLE OF CONTENTS

1) INTRODUCTION

The existing 160' monopole has twelve sides and is evenly tapered from 62.00" (flat-flat) at the base to 18.87" (flat-flat) at the top. It has four major sections, connected with slip joints. The structure is galvanized and has no tower lighting.

The tower was originally designed for Bechtel by Valmont Industries, Inc. of Valley, Nebraska for a 85 mph wind speed with 0.5" radial ice in accordance with EIA/TIA-222-F.

Modifications designed by B+T Group (Project #: 81363.004.01, dated 5/29/13), which consisted of installing shaft reinforcement from 42.5' to 52.5', were considered in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 98 mph with no ice, 50 mph with 0.75" ice thickness and 60 mph under service loads, exposure category B.

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
150.0	152.0	3	Alcatel Lucent	1900MHz RRH	1 4 1 3	1/8 17/64 7/8 1-1/4	1
		3	Alcatel Lucent	800MHZ RRH			
		3	Argus Technologies	LLPX310R-V1 w/ Mount Pipe			
		1	Box Enclosures And Assembly	BEN-92P			
		3	Nokia	FWHR			
		3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe			

Notes:
1) See Appendix B for the proposed coax layout.

Table 2 – Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	160.0	3	Alcatel Lucent	RRH2X60-AWS			2
		3	Alcatel Lucent	RRH2X60-PCS			
		6	Andrew	SBNHH-1D65B w/ Mount Pipe			
		1	RFS Celwave	DB-B1-6C-8AB-0Z			
		3	Alcatel Lucent	RRH2x60-700			
		3	Andrew	HBXX-6517DS-A2M w/ Mount Pipe	1 2 11	1/2 1-1/4 1-5/8	
		2	Decibel	DB846F65ZAXY w/ Mount Pipe			
		4	Decibel	DB846H80E-SX w/ Mount Pipe			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		2	RFS Celwave	FD9R6004/2C-3L			
		1		Platform Mount [LP 602-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150.0	152.0	6	Decibel	DB980H90E-M w/ Mount Pipe	1 6	1/2 1-5/8	1
	150.0	1		Platform Mount [LP 602-1]			
142.0	144.0	2	Radiowaves	HP3-11	2	1/2	
	142.0	1		Side Arm Mount [SO 101-3]			
134.0	137.0	3	Commscope	SBNH-1D65C-SR w/ Mount Pipe	1	1-5/8	
		3	Ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	Ericsson	RRUS 11 B12			
		3	Ericsson	RRUS 11 B2			
	134.0	1		Side Arm Mount [SO 602-3]			
116.0	120.0	6	Ericsson	RRUS-11			2
		3	Kathrein	782 10253			
		3	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	1 2 12	3/8 3/4 1-1/4	
		6	Powerwave Technologies	7770.00 w/ Mount Pipe			
		6	Powerwave Technologies	LGP21401			
		6	Powerwave Technologies	LGP21901			
		1	Raycap	DC6-48-60-18-8F			
	116.0	1		Platform Mount [LP 303-1]			
61.0	61.0	2		Side Arm Mount [SO 701-1]	2	1/2	
		2	Misc	GPS			
50.0	50.0	2		Side Arm Mount [SO 701-1]			3

Notes:
1) Existing equipment to be removed; not considered in this analysis.
2) Reserved Loading
3) Empty Mount

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)
157.0	157.0	12	Allgon	ALP 9212-N	-	-
		1		Cellular Platform		
148.0	148.0	12	Decibel	DB980H90	-	-
		1		Cellular Platform		
138.0	138.0	12	Allgon	ALP 9212-N	-	-
		1		Cellular Platform		
128.0	128.0	12	Allgon	ALP 9212-N	-	-
		1		Cellular Platform		
60.0	60.0	4	Misc	GPA Antennas	-	-
50.0	50.0	4	Misc	GPA Antennas	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Original Tower Drawings	Valmont Industries, Inc Order #: 16750-98, dated 3/10/97	Doc ID#: 255193	Crown DMZ
Foundation Drawings	Valmont Industries, Inc Order #: 16750-98, dated 3/10/97	Doc ID#: 301226	Crown DMZ
Geotechnical Report	Timmerman Geotechnical Group, Inc Project #: 067058, dated 7/28/06	Doc ID#: 1041653	Crown DMZ
Reinforcement Drawing	B+T Group Project #: 81363.004.01, dated 5/29/13	Doc ID#: 3865159	Crown DMZ

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) The tower and foundation were constructed in accordance with their original design and maintained per the manufacturer's specifications, are in good condition, and the tower is twist free and plumb.
2) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
3) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package, dated 8/5/15 with any adjustments as noted below.

This analysis may be affected if any assumptions are not valid or have been made in error. SSOE Group 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
159.67 - 154.67	Pole	TP20.284x18.87x0.189	Pole	12.5%	Pass
154.67 - 149.67	Pole	TP21.698x20.284x0.189	Pole	23.7%	Pass
149.67 - 144.67	Pole	TP23.112x21.698x0.189	Pole	36.2%	Pass
144.67 - 139.67	Pole	TP24.526x23.112x0.189	Pole	48.0%	Pass
139.67 - 134.67	Pole	TP25.939x24.526x0.189	Pole	58.9%	Pass
134.67 - 129.67	Pole	TP27.353x25.939x0.189	Pole	72.7%	Pass
129.67 - 128	Pole	TP29.05x27.353x0.189	Pole	76.6%	Pass
128 - 123	Pole	TP28.848x27.447x0.313	Pole	42.7%	Pass
123 - 118	Pole	TP30.249x28.848x0.313	Pole	46.9%	Pass
118 - 113	Pole	TP31.651x30.249x0.313	Pole	52.2%	Pass
113 - 108	Pole	TP33.052x31.651x0.313	Pole	56.5%	Pass
108 - 103	Pole	TP34.453x33.052x0.313	Pole	60.5%	Pass
103 - 98	Pole	TP35.854x34.453x0.313	Pole	64.1%	Pass
98 - 93	Pole	TP37.256x35.854x0.313	Pole	67.4%	Pass
93 - 88	Pole	TP38.657x37.256x0.313	Pole	70.6%	Pass
88 - 83	Pole	TP40.058x38.657x0.313	Pole	73.5%	Pass
83 - 82	Pole	TP41.95x40.058x0.313	Pole	74.1%	Pass
82 - 75.25	Pole	TP41.604x39.713x0.344	Pole	69.1%	Pass
75.25 - 70.25	Pole	TP43.004x41.604x0.344	Pole	71.2%	Pass
70.25 - 65.25	Pole	TP44.405x43.004x0.344	Pole	73.2%	Pass
65.25 - 60.25	Pole	TP45.806x44.405x0.344	Pole	75.2%	Pass
60.25 - 55.25	Pole	TP47.207x45.806x0.344	Pole	77.2%	Pass
55.25 - 51	Pole	TP48.398x47.207x0.344	Pole	78.8%	Pass
51 - 50.75	Pole	TP48.468x48.398x0.344	Pole	78.9%	Pass
50.75 - 45.75	Pole	TP49.869x48.468x0.344	Pole	80.8%	Pass
45.75 - 44	Pole	TP52.32x49.869x0.344	Pole	81.5%	Pass
44 - 36	Pole	TP51.913x49.671x0.406	Pole	66.1%	Pass
36 - 31	Pole	TP53.314x51.913x0.406	Pole	67.3%	Pass
31 - 26	Pole	TP54.715x53.314x0.406	Pole	68.4%	Pass
26 - 21	Pole	TP56.116x54.715x0.406	Pole	69.5%	Pass
21 - 16	Pole	TP57.517x56.116x0.406	Pole	70.7%	Pass
16 - 11	Pole	TP58.918x57.517x0.406	Pole	71.8%	Pass
11 - 6	Pole	TP60.319x58.918x0.406	Pole	72.9%	Pass
6 - 1	Pole	TP61.72x60.319x0.406	Pole	74.1%	Pass
1 - 0	Pole	TP62x61.72x0.406	Pole	74.3%	Pass
				Summary	

			Pole	81.5%	Pass
			Reinforcement	0.0%	Pass
			Overall	**81.5%**	**Pass**

Table 6 – Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods		71.7%	Pass
1	Base Plate		38.8%	Pass
1	Foundation (Structural)		50.3%	Pass
1	Foundation (Soil Interaction)		73.9%	Pass

Structure Rating (max from all components) =	**81.5%**

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

4.1) Recommendations

The existing tower and its foundations are sufficient for the proposed loads and do not require modifications.

5) DISCLAIMER OF WARRANTIES

SSOE Group has not performed a site visit to the tower to verify member sizes or antenna/coax loading. SSOE Group shall be contacted immediately if the existing conditions are not as represented on the tower elevation contained in this report in order to evaluate the significance of the discrepancy. SSOE Group has not performed a condition assessment of the tower foundation. This report does not replace a full tower inspection

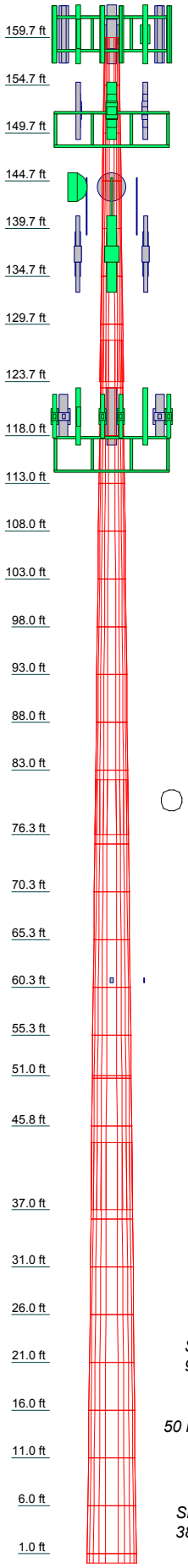
The engineering services rendered by SSOE Group in connection with this structural analysis are limited to an analysis of the tower structure and theoretical capacity of its main structural members. Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as part of our work. We recommend that material of suitable size and strength be purchased from a reputable tower manufacturer.

SSOE Group makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. SSOE Group will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data contained in this report. The maximum liability of SSOE Group pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Length (ft)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.25	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	1.00
Number of Sides	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Thickness (in)	0.1890	0.1890	0.1890	0.1890	0.1890	0.1890	0.1890	0.3130	0.3130	0.3130	0.3130	0.3130	0.3130	0.3130	0.3130	0.3130	0.3130	0.3440	0.3440	0.3440	0.3440	0.3440	0.3440	0.3440	0.3440	0.3440	0.4060	0.4060	0.4060	0.4060	0.4060	0.4060	0.4060	0.4060	0.4060
Socket Length (ft)							4.33										5.75									7.00										
Top Dia (in)	18.8700	20.2839	21.6978	23.1117	24.5256	25.9394	27.3533	28.7672	30.1811	31.6506	33.0519	34.4531	35.8544	37.2557	38.6570	40.0583	41.4596	42.8609	44.2622	45.8061	47.2070	48.6079	49.8854	51.1629	52.3200	53.3135	54.7146	56.1156	57.5167	58.9177	60.3188	61.7198	62.0000	62.0000	62.0000
Bot Dia (in)	20.2839	21.6978	23.1117	24.5256	25.9394	27.3533	28.7672	30.1811	31.6506	33.0519	34.4531	35.8544	37.2557	38.6570	40.0583	41.4596	42.8609	43.0045	44.4053	45.8061	47.2070	48.6079	49.8854	51.1629	52.3200	53.3135	54.7146	56.1156	57.5167	58.9177	60.3188	61.7198	62.0000	62.0000	62.0000
Grade	A572-65																																		
Weight (K)	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.9	1.0	0.8	0.8	0.8	0.9	0.8	0.0	0.9	1.7	1.8	1.2	1.2	1.2	1.3	1.3	1.3	1.3	0.3



ALL REACTIONS ARE FACTORED

AXIAL 87 K

SHEAR 9 K

MOMENT 1032 kip-ft

TORQUE 0 kip-ft

50 mph WIND - 0.7500 in ICE

AXIAL 49 K

SHEAR 38 K

MOMENT 4209 kip-ft

TORQUE 1 kip-ft

REACTIONS - 98 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 602-1]	160	Side Arm Mount [SO 101-3]	142
(2) SBNHH-1D65B w/ Mount Pipe	160	(2) 2" x 6' Mount Pipe	142
		(2) 2" x 6' Mount Pipe	142
DB-B1-6C-8AB-0Z	160	(2) 2" x 6' Mount Pipe	142
RRH2x60-700	160	HP3-11	142
RRH2X60-PCS	160	HP3-11	142
RRH2X60-AWS	160	SBNH-1D65C-SR w/ Mount Pipe	134
(2) DB846H80E-SX w/ Mount Pipe	160	RRUS 11 B2	134
		RRUS 11 B12	134
HBXX-6517DS-A2M w/ Mount Pipe	160	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	134
(2) SBNHH-1D65B w/ Mount Pipe	160	SBNH-1D65C-SR w/ Mount Pipe	134
		RRUS 11 B2	134
RRH2x60-700	160	RRUS 11 B12	134
RRH2X60-PCS	160	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	134
RRH2X60-AWS	160	SBNH-1D65C-SR w/ Mount Pipe	134
(2) DB846H80E-SX w/ Mount Pipe	160	RRUS 11 B2	134
HBXX-6517DS-A2M w/ Mount Pipe	160	RRUS 11 B12	134
(2) FD9R6004/2C-3L	160	Side Arm Mount [SO 602-3]	134
DB-T1-6Z-8AB-0Z	160	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	134
(2) SBNHH-1D65B w/ Mount Pipe	160	(2) RRUS-11	116
		(2) 7770.00 w/ Mount Pipe	116
RRH2x60-700	160	AM-X-CD-16-65-00T-RET w/ Mount Pipe	116
RRH2X60-PCS	160	(2) LGP21401	116
RRH2X60-AWS	160	(2) LGP21901	116
(2) DB846F65ZAXY w/ Mount Pipe	160	782 10253	116
HBXX-6517DS-A2M w/ Mount Pipe	160	(2) RRUS-11	116
Platform Mount [LP 602-1]	150	(2) 7770.00 w/ Mount Pipe	116
APXVSPP18-C-A20 w/ Mount Pipe	150	AM-X-CD-16-65-00T-RET w/ Mount Pipe	116
LLPX310R-V1 w/ Mount Pipe	150	(2) LGP21401	116
1900MHz RRH	150	(2) LGP21901	116
800MHZ RRH	150	782 10253	116
FWHR	150	(2) RRUS-11	116
APXVSPP18-C-A20 w/ Mount Pipe	150	(2) 7770.00 w/ Mount Pipe	116
		AM-X-CD-16-65-00T-RET w/ Mount Pipe	116
LLPX310R-V1 w/ Mount Pipe	150	(2) LGP21401	116
BEN-92P	150	(2) LGP21901	116
800MHZ RRH	150	DC6-48-60-18-8F	116
1900MHz RRH	150	Platform Mount [LP 303-1]	116
FWHR	150	782 10253	116
APXVSPP18-C-A20 w/ Mount Pipe	150	GPS	61
LLPX310R-V1 w/ Mount Pipe	150	GPS	61
1900MHz RRH	150	Side Arm Mount [SO 701-1]	61
800MHZ RRH	150	Side Arm Mount [SO 701-1]	61
FWHR	150	Side Arm Mount [SO 701-1]	50
		Side Arm Mount [SO 701-1]	50

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 98 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Tower Capacity: 81.5%

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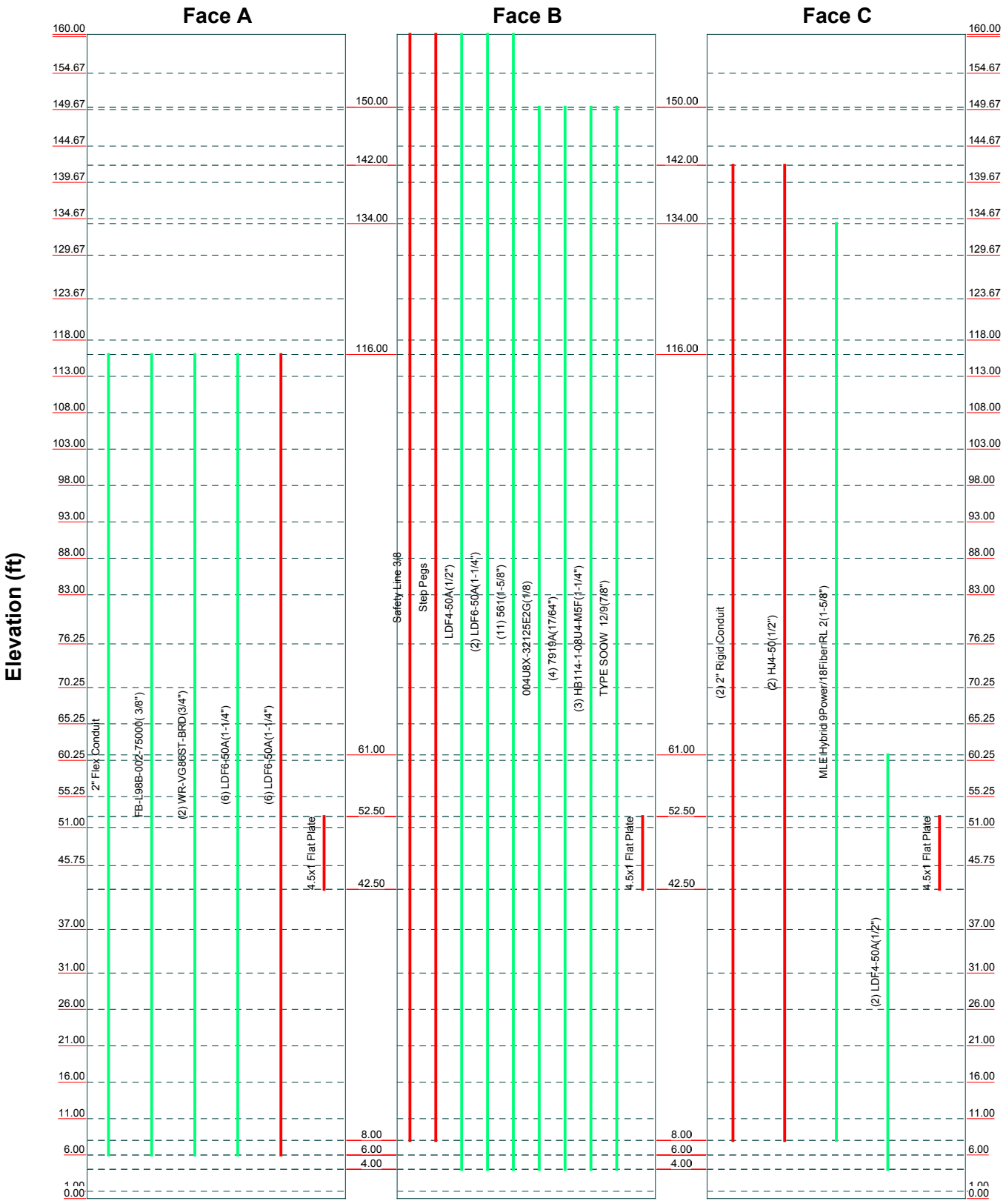
SSOE Group
320 Seven Springs Way, Suite 350
Brentwood, TN
Phone: (615) 661-7585
FAX: (615) 661-7569

Job: BU 806382		
Project: 017-00013-00		
Client: CCI	Drawn by: 15228	App'd:
Code: TIA-222-G	Date: 11/23/16	Scale: NTS
Path: C:\Users\15228\Desktop\Towers\SA\017-00013-00\806382\Working\TNX\871703_Modified.en		Dwg No. E-1

Feed Line Distribution Chart
0' - 160'

Round | Flat | App In Face | App Out Face | Truss Leg



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SSOE Group
320 Seven Springs Way, Suite 350
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Phone: (615) 661-7585
FAX: (615) 661-7569

Job: ***BU 806382***		
Project: ***017-00013-00***		
Client: CCI	Drawn by: 15228	App'd:
Code: TIA-222-G	Date: 11/23/16	Scale: NTS
Path: C:\Users\15228\Desktop\Towers\SA\017-00013-00\806382\Working\TNX\871703_Modified.en		Dwg No. E-7

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 Middlesex County, Connecticut.
Basic wind speed of 98 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	159.67-154.67	5.00	0.00	12	18.8700	20.2839	0.1890	0.7560	A572-65 (65 ksi)
L2	154.67-149.67	5.00	0.00	12	20.2839	21.6978	0.1890	0.7560	A572-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	149.67-144.67	5.00	0.00	12	21.6978	23.1117	0.1890	0.7560	(65 ksi) A572-65 (65 ksi)
L4	144.67-139.67	5.00	0.00	12	23.1117	24.5256	0.1890	0.7560	A572-65 (65 ksi)
L5	139.67-134.67	5.00	0.00	12	24.5256	25.9394	0.1890	0.7560	A572-65 (65 ksi)
L6	134.67-129.67	5.00	0.00	12	25.9394	27.3533	0.1890	0.7560	A572-65 (65 ksi)
L7	129.67-123.67	6.00	4.33	12	27.3533	29.0500	0.1890	0.7560	A572-65 (65 ksi)
L8	123.67-123.00	5.00	0.00	12	27.4467	28.8480	0.3130	1.2520	A572-65 (65 ksi)
L9	123.00-118.00	5.00	0.00	12	28.8480	30.2493	0.3130	1.2520	A572-65 (65 ksi)
L10	118.00-113.00	5.00	0.00	12	30.2493	31.6506	0.3130	1.2520	A572-65 (65 ksi)
L11	113.00-108.00	5.00	0.00	12	31.6506	33.0519	0.3130	1.2520	A572-65 (65 ksi)
L12	108.00-103.00	5.00	0.00	12	33.0519	34.4531	0.3130	1.2520	A572-65 (65 ksi)
L13	103.00-98.00	5.00	0.00	12	34.4531	35.8544	0.3130	1.2520	A572-65 (65 ksi)
L14	98.00-93.00	5.00	0.00	12	35.8544	37.2557	0.3130	1.2520	A572-65 (65 ksi)
L15	93.00-88.00	5.00	0.00	12	37.2557	38.6570	0.3130	1.2520	A572-65 (65 ksi)
L16	88.00-83.00	5.00	0.00	12	38.6570	40.0583	0.3130	1.2520	A572-65 (65 ksi)
L17	83.00-76.25	6.75	5.75	12	40.0583	41.9500	0.3130	1.2520	A572-65 (65 ksi)
L18	76.25-75.25	6.75	0.00	12	39.7125	41.6036	0.3440	1.3760	A572-65 (65 ksi)
L19	75.25-70.25	5.00	0.00	12	41.6036	43.0045	0.3440	1.3760	A572-65 (65 ksi)
L20	70.25-65.25	5.00	0.00	12	43.0045	44.4053	0.3440	1.3760	A572-65 (65 ksi)
L21	65.25-60.25	5.00	0.00	12	44.4053	45.8061	0.3440	1.3760	A572-65 (65 ksi)
L22	60.25-55.25	5.00	0.00	12	45.8061	47.2070	0.3440	1.3760	A572-65 (65 ksi)
L23	55.25-51.00	4.25	0.00	12	47.2070	48.3977	0.3440	1.3760	A572-65 (65 ksi)
L24	51.00-50.75	0.25	0.00	12	48.3977	48.4677	0.3440	1.3760	A572-65 (65 ksi)
L25	50.75-45.75	5.00	0.00	12	48.4677	49.8685	0.3440	1.3760	A572-65 (65 ksi)
L26	45.75-37.00	8.75	7.00	12	49.8685	52.3200	0.3440	1.3760	A572-65 (65 ksi)
L27	37.00-36.00	8.00	0.00	12	49.6708	51.9125	0.4060	1.6240	A572-65 (65 ksi)
L28	36.00-31.00	5.00	0.00	12	51.9125	53.3135	0.4060	1.6240	A572-65 (65 ksi)
L29	31.00-26.00	5.00	0.00	12	53.3135	54.7146	0.4060	1.6240	A572-65 (65 ksi)
L30	26.00-21.00	5.00	0.00	12	54.7146	56.1156	0.4060	1.6240	A572-65 (65 ksi)
L31	21.00-16.00	5.00	0.00	12	56.1156	57.5167	0.4060	1.6240	A572-65 (65 ksi)
L32	16.00-11.00	5.00	0.00	12	57.5167	58.9177	0.4060	1.6240	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L33	11.00-6.00	5.00	0.00	12	58.9177	60.3188	0.4060	1.6240	A572-65 (65 ksi)
L34	6.00-1.00	5.00	0.00	12	60.3188	61.7198	0.4060	1.6240	A572-65 (65 ksi)
L35	1.00-0.00	1.00		12	61.7198	62.0000	0.4060	1.6240	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	19.5357	11.3689	506.4120	6.6878	9.7747	51.8087	1026.1280	5.5954	4.5506	24.077
	20.9994	12.2293	630.3191	7.1940	10.5071	59.9901	1277.1973	6.0189	4.9296	26.082
L2	20.9994	12.2293	630.3191	7.1940	10.5071	59.9901	1277.1973	6.0189	4.9296	26.082
	22.4632	13.0898	772.9490	7.7001	11.2394	68.7711	1566.2042	6.4424	5.3085	28.087
L3	22.4632	13.0898	772.9490	7.7001	11.2394	68.7711	1566.2042	6.4424	5.3085	28.087
	23.9270	13.9503	935.6190	8.2063	11.9718	78.1516	1895.8178	6.8659	5.6874	30.092
L4	23.9270	13.9503	935.6190	8.2063	11.9718	78.1516	1895.8178	6.8659	5.6874	30.092
	25.3907	14.8107	1119.6466	8.7125	12.7042	88.1317	2268.7075	7.2894	6.0663	32.097
L5	25.3907	14.8107	1119.6466	8.7125	12.7042	88.1317	2268.7075	7.2894	6.0663	32.097
	26.8545	15.6712	1326.3490	9.2187	13.4366	98.7114	2687.5427	7.7129	6.4453	34.102
L6	26.8545	15.6712	1326.3490	9.2187	13.4366	98.7114	2687.5427	7.7129	6.4453	34.102
	28.3183	16.5317	1557.0436	9.7248	14.1690	109.8907	3154.9925	8.1364	6.8242	36.107
L7	28.3183	16.5317	1557.0436	9.7248	14.1690	109.8907	3154.9925	8.1364	6.8242	36.107
	30.0748	17.5642	1867.4017	10.3322	15.0479	124.0972	3783.8621	8.6446	7.2789	38.513
L8	29.6721	27.3470	2569.8890	9.7139	14.2174	180.7566	5207.2918	13.4594	6.5169	20.821
	29.8657	28.7593	2988.9599	10.2155	14.9433	200.0205	6056.4431	14.1544	6.8924	22.021
L9	29.8657	28.7593	2988.9599	10.2155	14.9433	200.0205	6056.4431	14.1544	6.8924	22.021
	31.3164	30.1716	3451.2789	10.7172	15.6691	220.2597	6993.2268	14.8495	7.2680	23.22
L10	31.3164	30.1716	3451.2789	10.7172	15.6691	220.2597	6993.2268	14.8495	7.2680	23.22
	32.7671	31.5839	3958.9699	11.2189	16.3950	241.4743	8021.9463	15.5446	7.6435	24.42
L11	32.7671	31.5839	3958.9699	11.2189	16.3950	241.4743	8021.9463	15.5446	7.6435	24.42
	34.2178	32.9962	4514.1565	11.7205	17.1209	263.6641	9146.9049	16.2397	8.0191	25.62
L12	34.2178	32.9962	4514.1565	11.7205	17.1209	263.6641	9146.9049	16.2397	8.0191	25.62
	35.6685	34.4085	5118.9626	12.2222	17.8467	286.8292	10372.4060	16.9348	8.3946	26.82
L13	35.6685	34.4085	5118.9626	12.2222	17.8467	286.8292	10372.4060	16.9348	8.3946	26.82
	37.1192	35.8208	5775.5120	12.7238	18.5726	310.9697	11702.7532	17.6299	8.7701	28.02
L14	37.1192	35.8208	5775.5120	12.7238	18.5726	310.9697	11702.7532	17.6299	8.7701	28.02
	38.5699	37.2331	6485.9286	13.2255	19.2985	336.0854	13142.2497	18.3250	9.1457	29.219
L15	38.5699	37.2331	6485.9286	13.2255	19.2985	336.0854	13142.2497	18.3250	9.1457	29.219
	40.0207	38.6454	7252.3360	13.7271	20.0243	362.1764	14695.1990	19.0201	9.5212	30.419
L16	40.0207	38.6454	7252.3360	13.7271	20.0243	362.1764	14695.1990	19.0201	9.5212	30.419
	41.4714	40.0577	8076.8582	14.2288	20.7502	389.2427	16365.9045	19.7152	9.8968	31.619
L17	41.4714	40.0577	8076.8582	14.2288	20.7502	389.2427	16365.9045	19.7152	9.8968	31.619
	43.4298	41.9643	9285.9096	14.9060	21.7301	427.3294	18815.7704	20.6535	10.4038	33.239
L18	42.7812	43.6077	8626.7595	14.0939	20.5711	419.3633	17480.1536	21.4624	9.7210	28.259
	43.0713	45.7025	9930.6291	14.7710	21.5507	460.8033	20122.1469	22.4934	10.2279	29.732
L19	43.0713	45.7025	9930.6291	14.7710	21.5507	460.8033	20122.1469	22.4934	10.2279	29.732
	44.5215	47.2542	10976.8411	15.2725	22.2763	492.7583	22242.0560	23.2571	10.6033	30.823
L20	44.5215	47.2542	10976.8411	15.2725	22.2763	492.7583	22242.0560	23.2571	10.6033	30.823
	45.9718	48.8058	12094.0678	15.7739	23.0019	525.7845	24505.8603	24.0207	10.9787	31.915
L21	45.9718	48.8058	12094.0678	15.7739	23.0019	525.7845	24505.8603	24.0207	10.9787	31.915
	47.4220	50.3575	13284.6412	16.2754	23.7276	559.8819	26918.2846	24.7844	11.3541	33.006
L22	47.4220	50.3575	13284.6412	16.2754	23.7276	559.8819	26918.2846	24.7844	11.3541	33.006
	48.8722	51.9092	14550.8930	16.7769	24.4532	595.0504	29484.0542	25.5481	11.7295	34.098
L23	48.8722	51.9092	14550.8930	16.7769	24.4532	595.0504	29484.0542	25.5481	11.7295	34.098

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	50.1050	53.2281	15688.4511	17.2032	25.0700	625.7860	31789.0553	26.1972	12.0487	35.025
L24	50.1050	53.2281	15688.4511	17.2032	25.0700	625.7860	31789.0553	26.1972	12.0487	35.025
	50.1775	53.3057	15757.1521	17.2283	25.1063	627.6180	31928.2622	26.2354	12.0674	35.08
L25	50.1775	53.3057	15757.1521	17.2283	25.1063	627.6180	31928.2622	26.2354	12.0674	35.08
	51.6277	54.8573	17173.6175	17.7298	25.8319	664.8219	34798.4051	26.9991	12.4429	36.171
L26	51.6277	54.8573	17173.6175	17.7298	25.8319	664.8219	34798.4051	26.9991	12.4429	36.171
	54.1656	57.5728	19852.2084	18.6074	27.1018	732.5062	40225.9564	28.3356	13.0998	38.081
L27	53.4537	64.4049	19951.6589	17.6368	25.7295	775.4392	40427.4701	31.6981	12.2237	30.108
	53.7438	67.3355	22801.0084	18.4393	26.8907	847.9150	46201.0246	33.1405	12.8245	31.587
L28	53.7438	67.3355	22801.0084	18.4393	26.8907	847.9150	46201.0246	33.1405	12.8245	31.587
	55.1942	69.1671	24712.7269	18.9409	27.6164	894.8564	50074.6847	34.0419	13.1999	32.512
L29	55.1942	69.1671	24712.7269	18.9409	27.6164	894.8564	50074.6847	34.0419	13.1999	32.512
	56.6447	70.9987	26728.4228	19.4425	28.3422	943.0625	54159.0311	34.9434	13.5754	33.437
L30	56.6447	70.9987	26728.4228	19.4425	28.3422	943.0625	54159.0311	34.9434	13.5754	33.437
	58.0952	72.8303	28850.8494	19.9440	29.0679	992.5332	58459.6428	35.8449	13.9509	34.362
L31	58.0952	72.8303	28850.8494	19.9440	29.0679	992.5332	58459.6428	35.8449	13.9509	34.362
	59.5456	74.6619	31082.7601	20.4456	29.7936	1043.2685	62982.0990	36.7463	14.3264	35.287
L32	59.5456	74.6619	31082.7601	20.4456	29.7936	1043.2685	62982.0990	36.7463	14.3264	35.287
	60.9961	76.4935	33426.9084	20.9472	30.5194	1095.2685	67731.9789	37.6478	14.7019	36.211
L33	60.9961	76.4935	33426.9084	20.9472	30.5194	1095.2685	67731.9789	37.6478	14.7019	36.211
	62.4466	78.3251	35886.0477	21.4488	31.2451	1148.5331	72714.8617	38.5492	15.0773	37.136
L34	62.4466	78.3251	35886.0477	21.4488	31.2451	1148.5331	72714.8617	38.5492	15.0773	37.136
	63.8970	80.1567	38462.9313	21.9503	31.9709	1203.0624	77936.3266	39.4507	15.4528	38.061
L35	63.8970	80.1567	38462.9313	21.9503	31.9709	1203.0624	77936.3266	39.4507	15.4528	38.061
	64.1871	80.5231	38992.6796	22.0507	32.1160	1214.1201	79009.7404	39.6310	15.5279	38.246

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 159.67-154.67				1	1	1			
L2 154.67-149.67				1	1	1			
L3 149.67-144.67				1	1	1			
L4 144.67-139.67				1	1	1			
L5 139.67-134.67				1	1	1			
L6 134.67-129.67				1	1	1			
L7 129.67-123.67				1	1	1			
L8 123.67-123.00				1	1	1			
L9 123.00-118.00				1	1	1			
L10 118.00-113.00				1	1	1			
L11 113.00-108.00				1	1	1			
L12 108.00-103.00				1	1	1			
L13 103.00-98.00				1	1	1			
L14 98.00-93.00				1	1	1			
L15 93.00-88.00				1	1	1			

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L16 88.00-83.00				1	1	1			
L17 83.00-76.25				1	1	1			
L18 76.25-75.25				1	1	1			
L19 75.25-70.25				1	1	1			
L20 70.25-65.25				1	1	1			
L21 65.25-60.25				1	1	1			
L22 60.25-55.25				1	1	1			
L23 55.25-51.00				1	1	1			
L24 51.00-50.75				1	1	1			
L25 50.75-45.75				1	1	1			
L26 45.75-37.00				1	1	1			
L27 37.00-36.00				1	1	1			
L28 36.00-31.00				1	1	1			
L29 31.00-26.00				1	1	1			
L30 26.00-21.00				1	1	1			
L31 21.00-16.00				1	1	1			
L32 16.00-11.00				1	1	1			
L33 11.00-6.00				1	1	1			
L34 6.00-1.00				1	1	1			
L35 1.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	B	Surface Ar (CaAa)	160.00 - 8.00	1	1	0.500 0.500	0.3750		0.22
Step Pegs	B	Surface Ar (CaAa)	160.00 - 8.00	1	1	0.500 0.500	0.8000		2.72
LDF6-50A(1-1/4")	A	Surface Ar (CaAa)	116.00 - 6.00	6	6	-0.300 -0.200	1.5500		0.66
2" Rigid Conduit	C	Surface Ar (CaAa)	142.00 - 8.00	2	2	0.250 0.280	2.0000		2.80
HJ4-50(1/2")	C	Surface Ar (CaAa)	142.00 - 8.00	2	2	0.280 0.295	0.5800		0.25
4.5x1 Flat Plate	A	Surface Af (CaAa)	52.50 - 42.50	1	1	0.000 0.000	4.5000	11.0000	0.00

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
4.5x1 Flat Plate	B	Surface Af (CaAa)	52.50 - 42.50	1	1	0.000 0.000	4.5000	11.0000	0.00
4.5x1 Flat Plate	C	Surface Af (CaAa)	52.50 - 42.50	1	1	0.000 0.000	4.5000	11.0000	0.00

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
2" Flex Conduit	A	No	Inside Pole	116.00 - 6.00	1	No Ice	0.00	0.32
						1/2" Ice	0.00	0.32
						1" Ice	0.00	0.32
FB-L98B-002-75000(3/8")	A	No	Inside Pole	116.00 - 6.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4")	A	No	Inside Pole	116.00 - 6.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
LDF6-50A(1-1/4")	A	No	Inside Pole	116.00 - 6.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
MLE Hybrid 9Power/18Fiber RL 2(1-5/8")	C	No	Inside Pole	134.00 - 8.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	1.07
						1" Ice	0.00	1.07
LDF4-50A(1/2")	C	No	Inside Pole	61.00 - 4.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF4-50A(1/2")	B	No	Inside Pole	160.00 - 4.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF6-50A(1-1/4")	B	No	Inside Pole	160.00 - 4.00	2	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
561(1-5/8")	B	No	Inside Pole	160.00 - 4.00	11	No Ice	0.00	1.35
						1/2" Ice	0.00	1.35
						1" Ice	0.00	1.35
004U8X-32125E2G(1/8)	B	No	Inside Pole	150.00 - 4.00	1	No Ice	0.00	0.01
						1/2" Ice	0.00	0.01
						1" Ice	0.00	0.01
7919A(17/64")	B	No	Inside Pole	150.00 - 4.00	4	No Ice	0.00	0.03
						1/2" Ice	0.00	0.03
						1" Ice	0.00	0.03
HB114-1-08U4-M5F(1-1 /4")	B	No	Inside Pole	150.00 - 4.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
TYPE SOOW 12/9(7/8")	B	No	Inside Pole	150.00 - 4.00	1	No Ice	0.00	0.51
						1/2" Ice	0.00	0.51
						1" Ice	0.00	0.51

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

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	159.67-154.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.588	0.000	0.10
		C	0.000	0.000	0.000	0.000	0.00
L2	154.67-149.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.588	0.000	0.10
		C	0.000	0.000	0.000	0.000	0.00
L3	149.67-144.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	0.000	0.000	0.00
L4	144.67-139.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	1.204	0.000	0.01
L5	139.67-134.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.03
L6	134.67-129.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L7	129.67-123.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.705	0.000	0.14
		C	0.000	0.000	3.096	0.000	0.04
L8	123.67-123.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.078	0.000	0.02
		C	0.000	0.000	0.344	0.000	0.00
L9	123.00-118.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L10	118.00-113.00	A	0.000	0.000	2.790	0.000	0.03
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L11	113.00-108.00	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L12	108.00-103.00	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L13	103.00-98.00	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L14	98.00-93.00	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L15	93.00-88.00	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L16	88.00-83.00	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L17	83.00-76.25	A	0.000	0.000	6.277	0.000	0.06
		B	0.000	0.000	0.793	0.000	0.16
		C	0.000	0.000	3.483	0.000	0.05
L18	76.25-75.25	A	0.000	0.000	0.930	0.000	0.01
		B	0.000	0.000	0.118	0.000	0.02
		C	0.000	0.000	0.516	0.000	0.01
L19	75.25-70.25	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L20	70.25-65.25	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L21	65.25-60.25	A	0.000	0.000	4.650	0.000	0.05

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L22	60.25-55.25	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L23	55.25-51.00	A	0.000	0.000	5.077	0.000	0.04
		B	0.000	0.000	1.624	0.000	0.10
		C	0.000	0.000	3.318	0.000	0.03
L24	51.00-50.75	A	0.000	0.000	0.420	0.000	0.00
		B	0.000	0.000	0.217	0.000	0.01
		C	0.000	0.000	0.317	0.000	0.00
L25	50.75-45.75	A	0.000	0.000	8.400	0.000	0.05
		B	0.000	0.000	4.338	0.000	0.12
		C	0.000	0.000	6.330	0.000	0.04
L26	45.75-37.00	A	0.000	0.000	10.575	0.000	0.08
		B	0.000	0.000	3.466	0.000	0.20
		C	0.000	0.000	6.952	0.000	0.07
L27	37.00-36.00	A	0.000	0.000	0.930	0.000	0.01
		B	0.000	0.000	0.118	0.000	0.02
		C	0.000	0.000	0.516	0.000	0.01
L28	36.00-31.00	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L29	31.00-26.00	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L30	26.00-21.00	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L31	21.00-16.00	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L32	16.00-11.00	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.588	0.000	0.12
		C	0.000	0.000	2.580	0.000	0.04
L33	11.00-6.00	A	0.000	0.000	4.650	0.000	0.05
		B	0.000	0.000	0.352	0.000	0.11
		C	0.000	0.000	1.548	0.000	0.02
L34	6.00-1.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.00
L35	1.00-0.00	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	0.000	0.00

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	159.67-154.67	A	1.753	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	4.094	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.00
L2	154.67-149.67	A	1.748	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	4.083	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.00
L3	149.67-144.67	A	1.742	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	4.071	0.000	0.17

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	0.000	0.00
L4	144.67-139.67	A	1.736	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	4.059	0.000	0.16
		C		0.000	0.000	3.530	0.000	0.05
L5	139.67-134.67	A	1.730	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	4.047	0.000	0.16
		C		0.000	0.000	7.549	0.000	0.11
L6	134.67-129.67	A	1.723	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	4.034	0.000	0.16
		C		0.000	0.000	7.533	0.000	0.12
L7	129.67-123.67	A	1.716	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	4.823	0.000	0.20
		C		0.000	0.000	9.018	0.000	0.14
L8	123.67-123.00	A	1.711	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.536	0.000	0.02
		C		0.000	0.000	1.002	0.000	0.02
L9	123.00-118.00	A	1.707	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	4.002	0.000	0.16
		C		0.000	0.000	7.493	0.000	0.12
L10	118.00-113.00	A	1.700	0.000	0.000	4.763	0.000	0.08
		B		0.000	0.000	3.988	0.000	0.16
		C		0.000	0.000	7.475	0.000	0.12
L11	113.00-108.00	A	1.693	0.000	0.000	7.928	0.000	0.14
		B		0.000	0.000	3.973	0.000	0.16
		C		0.000	0.000	7.457	0.000	0.12
L12	108.00-103.00	A	1.685	0.000	0.000	7.919	0.000	0.14
		B		0.000	0.000	3.957	0.000	0.16
		C		0.000	0.000	7.437	0.000	0.12
L13	103.00-98.00	A	1.677	0.000	0.000	7.908	0.000	0.14
		B		0.000	0.000	3.941	0.000	0.16
		C		0.000	0.000	7.417	0.000	0.12
L14	98.00-93.00	A	1.668	0.000	0.000	7.898	0.000	0.14
		B		0.000	0.000	3.924	0.000	0.16
		C		0.000	0.000	7.395	0.000	0.11
L15	93.00-88.00	A	1.659	0.000	0.000	7.886	0.000	0.13
		B		0.000	0.000	3.906	0.000	0.16
		C		0.000	0.000	7.373	0.000	0.11
L16	88.00-83.00	A	1.650	0.000	0.000	7.875	0.000	0.13
		B		0.000	0.000	3.887	0.000	0.16
		C		0.000	0.000	7.349	0.000	0.11
L17	83.00-76.25	A	1.638	0.000	0.000	10.611	0.000	0.18
		B		0.000	0.000	5.216	0.000	0.22
		C		0.000	0.000	9.882	0.000	0.15
L18	76.25-75.25	A	1.630	0.000	0.000	1.572	0.000	0.03
		B		0.000	0.000	0.773	0.000	0.03
		C		0.000	0.000	1.464	0.000	0.02
L19	75.25-70.25	A	1.623	0.000	0.000	7.842	0.000	0.13
		B		0.000	0.000	3.834	0.000	0.16
		C		0.000	0.000	7.283	0.000	0.11
L20	70.25-65.25	A	1.612	0.000	0.000	7.827	0.000	0.13
		B		0.000	0.000	3.811	0.000	0.16
		C		0.000	0.000	7.255	0.000	0.11
L21	65.25-60.25	A	1.600	0.000	0.000	7.812	0.000	0.13
		B		0.000	0.000	3.787	0.000	0.16
		C		0.000	0.000	7.224	0.000	0.11
L22	60.25-55.25	A	1.586	0.000	0.000	7.795	0.000	0.13
		B		0.000	0.000	3.760	0.000	0.16
		C		0.000	0.000	7.191	0.000	0.11
L23	55.25-51.00	A	1.573	0.000	0.000	8.010	0.000	0.13
		B		0.000	0.000	4.571	0.000	0.15
		C		0.000	0.000	7.482	0.000	0.11

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
L24	51.00-50.75	A	1.566	0.000	0.000	0.621	0.000	0.01
		B		0.000	0.000	0.419	0.000	0.01
		C		0.000	0.000	0.590	0.000	0.01
L25	50.75-45.75	A	1.558	0.000	0.000	12.411	0.000	0.18
		B		0.000	0.000	8.354	0.000	0.21
		C		0.000	0.000	11.771	0.000	0.16
L26	45.75-37.00	A	1.534	0.000	0.000	16.543	0.000	0.26
		B		0.000	0.000	9.413	0.000	0.30
		C		0.000	0.000	15.371	0.000	0.22
L27	37.00-36.00	A	1.515	0.000	0.000	1.546	0.000	0.03
		B		0.000	0.000	0.731	0.000	0.03
		C		0.000	0.000	1.412	0.000	0.02
L28	36.00-31.00	A	1.502	0.000	0.000	7.690	0.000	0.13
		B		0.000	0.000	3.592	0.000	0.15
		C		0.000	0.000	6.981	0.000	0.11
L29	31.00-26.00	A	1.478	0.000	0.000	7.660	0.000	0.12
		B		0.000	0.000	3.544	0.000	0.15
		C		0.000	0.000	6.920	0.000	0.10
L30	26.00-21.00	A	1.450	0.000	0.000	7.625	0.000	0.12
		B		0.000	0.000	3.487	0.000	0.15
		C		0.000	0.000	6.850	0.000	0.10
L31	21.00-16.00	A	1.416	0.000	0.000	7.582	0.000	0.12
		B		0.000	0.000	3.419	0.000	0.15
		C		0.000	0.000	6.764	0.000	0.10
L32	16.00-11.00	A	1.372	0.000	0.000	7.527	0.000	0.12
		B		0.000	0.000	3.331	0.000	0.15
		C		0.000	0.000	6.654	0.000	0.10
L33	11.00-6.00	A	1.310	0.000	0.000	7.449	0.000	0.11
		B		0.000	0.000	1.924	0.000	0.13
		C		0.000	0.000	3.899	0.000	0.06
L34	6.00-1.00	A	1.198	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.00
L35	1.00-0.00	A	0.987	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

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	159.67-154.67	0.1425	0.0823	0.6387	0.3688
L2	154.67-149.67	0.1428	0.0825	0.6538	0.3775
L3	149.67-144.67	0.1431	0.0826	0.6675	0.3854
L4	144.67-139.67	-0.0437	0.3470	0.2083	0.7111
L5	139.67-134.67	-0.2135	0.5892	-0.0778	0.9276
L6	134.67-129.67	-0.2152	0.5945	-0.0800	0.9569
L7	129.67-123.67	-0.2168	0.5998	-0.0824	0.9876
L8	123.67-123.00	-0.2174	0.6016	-0.0831	0.9985
L9	123.00-118.00	-0.2182	0.6041	-0.0846	1.0127
L10	118.00-113.00	-0.7798	0.5203	-0.5760	0.8605
L11	113.00-108.00	-1.0786	0.4813	-0.8360	0.7941
L12	108.00-103.00	-1.0927	0.4876	-0.8592	0.8150
L13	103.00-98.00	-1.1060	0.4936	-0.8818	0.8352
L14	98.00-93.00	-1.1187	0.4993	-0.9039	0.8547
L15	93.00-88.00	-1.1307	0.5048	-0.9255	0.8735

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L16	88.00-83.00	-1.1422	0.5099	-0.9466	0.8916
L17	83.00-76.25	-1.1550	0.5157	-0.9708	0.9120
L18	76.25-75.25	-1.1584	0.5172	-0.9771	0.9180
L19	75.25-70.25	-1.1645	0.5200	-0.9900	0.9267
L20	70.25-65.25	-1.1744	0.5244	-1.0098	0.9426
L21	65.25-60.25	-1.1839	0.5287	-1.0292	0.9577
L22	60.25-55.25	-1.1929	0.5327	-1.0482	0.9722
L23	55.25-51.00	-1.0538	0.4706	-0.9682	0.8950
L24	51.00-50.75	-0.8655	0.3866	-0.8367	0.7721
L25	50.75-45.75	-0.8713	0.3892	-0.8453	0.7782
L26	45.75-37.00	-1.0702	0.4780	-1.0047	0.9191
L27	37.00-36.00	-1.2236	0.5465	-1.1161	1.0211
L28	36.00-31.00	-1.2281	0.5486	-1.1289	1.0235
L29	31.00-26.00	-1.2353	0.5518	-1.1469	1.0326
L30	26.00-21.00	-1.2423	0.5550	-1.1649	1.0402
L31	21.00-16.00	-1.2490	0.5580	-1.1831	1.0458
L32	16.00-11.00	-1.2554	0.5609	-1.2021	1.0484
L33	11.00-6.00	-1.2269	0.3499	-1.3265	0.7043
L34	6.00-1.00	0.0000	0.0000	0.0000	0.0000
L35	1.00-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	Safety Line 3/8	154.67 - 159.67	1.0000	1.0000
L1	2	Step Pegs	154.67 - 159.67	1.0000	1.0000
L2	1	Safety Line 3/8	149.67 - 154.67	1.0000	1.0000
L2	2	Step Pegs	149.67 - 154.67	1.0000	1.0000
L3	1	Safety Line 3/8	144.67 - 149.67	1.0000	1.0000
L3	2	Step Pegs	144.67 - 149.67	1.0000	1.0000
L4	1	Safety Line 3/8	139.67 - 144.67	1.0000	1.0000
L4	2	Step Pegs	139.67 - 144.67	1.0000	1.0000
L4	10	2" Rigid Conduit	139.67 - 142.00	1.0000	1.0000
L4	11	HJ4-50(1/2")	139.67 - 142.00	1.0000	1.0000
L5	1	Safety Line 3/8	134.67 - 139.67	1.0000	1.0000
L5	2	Step Pegs	134.67 - 139.67	1.0000	1.0000
L5	10	2" Rigid Conduit	134.67 - 139.67	1.0000	1.0000
L5	11	HJ4-50(1/2")	134.67 - 139.67	1.0000	1.0000
L6	1	Safety Line 3/8	129.67 - 134.67	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L6	2	Step Pegs	129.67 - 134.67	1.0000	1.0000
L6	10	2" Rigid Conduit	129.67 - 134.67	1.0000	1.0000
L6	11	HJ4-50(1/2")	129.67 - 134.67	1.0000	1.0000
L7	1	Safety Line 3/8	123.67 - 129.67	1.0000	1.0000
L7	2	Step Pegs	123.67 - 129.67	1.0000	1.0000
L7	10	2" Rigid Conduit	123.67 - 129.67	1.0000	1.0000
L7	11	HJ4-50(1/2")	123.67 - 129.67	1.0000	1.0000
L9	1	Safety Line 3/8	118.00 - 123.00	1.0000	1.0000
L9	2	Step Pegs	118.00 - 123.00	1.0000	1.0000
L9	10	2" Rigid Conduit	118.00 - 123.00	1.0000	1.0000
L9	11	HJ4-50(1/2")	118.00 - 123.00	1.0000	1.0000
L10	1	Safety Line 3/8	113.00 - 118.00	1.0000	1.0000
L10	2	Step Pegs	113.00 - 118.00	1.0000	1.0000
L10	8	LDF6-50A(1-1/4")	113.00 - 116.00	1.0000	1.0000
L10	10	2" Rigid Conduit	113.00 - 118.00	1.0000	1.0000
L10	11	HJ4-50(1/2")	113.00 - 118.00	1.0000	1.0000
L11	1	Safety Line 3/8	108.00 - 113.00	1.0000	1.0000
L11	2	Step Pegs	108.00 - 113.00	1.0000	1.0000
L11	8	LDF6-50A(1-1/4")	108.00 - 113.00	1.0000	1.0000
L11	10	2" Rigid Conduit	108.00 - 113.00	1.0000	1.0000
L11	11	HJ4-50(1/2")	108.00 - 113.00	1.0000	1.0000
L12	1	Safety Line 3/8	103.00 - 108.00	1.0000	1.0000
L12	2	Step Pegs	103.00 - 108.00	1.0000	1.0000
L12	8	LDF6-50A(1-1/4")	103.00 - 108.00	1.0000	1.0000
L12	10	2" Rigid Conduit	103.00 - 108.00	1.0000	1.0000
L12	11	HJ4-50(1/2")	103.00 - 108.00	1.0000	1.0000
L13	1	Safety Line 3/8	98.00 - 103.00	1.0000	1.0000
L13	2	Step Pegs	98.00 - 103.00	1.0000	1.0000
L13	8	LDF6-50A(1-1/4")	98.00 - 103.00	1.0000	1.0000
L13	10	2" Rigid Conduit	98.00 - 103.00	1.0000	1.0000
L13	11	HJ4-50(1/2")	98.00 - 103.00	1.0000	1.0000
L14	1	Safety Line 3/8	93.00 - 98.00	1.0000	1.0000
L14	2	Step Pegs	93.00 - 98.00	1.0000	1.0000
L14	8	LDF6-50A(1-1/4")	93.00 - 98.00	1.0000	1.0000
L14	10	2" Rigid Conduit	93.00 - 98.00	1.0000	1.0000
L14	11	HJ4-50(1/2")	93.00 - 98.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L15	1	Safety Line 3/8	88.00 - 93.00	1.0000	1.0000
L15	2	Step Pegs	88.00 - 93.00	1.0000	1.0000
L15	8	LDF6-50A(1-1/4")	88.00 - 93.00	1.0000	1.0000
L15	10	2" Rigid Conduit	88.00 - 93.00	1.0000	1.0000
L15	11	HJ4-50(1/2")	88.00 - 93.00	1.0000	1.0000
L16	1	Safety Line 3/8	83.00 - 88.00	1.0000	1.0000
L16	2	Step Pegs	83.00 - 88.00	1.0000	1.0000
L16	8	LDF6-50A(1-1/4")	83.00 - 88.00	1.0000	1.0000
L16	10	2" Rigid Conduit	83.00 - 88.00	1.0000	1.0000
L16	11	HJ4-50(1/2")	83.00 - 88.00	1.0000	1.0000
L17	1	Safety Line 3/8	76.25 - 83.00	1.0000	1.0000
L17	2	Step Pegs	76.25 - 83.00	1.0000	1.0000
L17	8	LDF6-50A(1-1/4")	76.25 - 83.00	1.0000	1.0000
L17	10	2" Rigid Conduit	76.25 - 83.00	1.0000	1.0000
L17	11	HJ4-50(1/2")	76.25 - 83.00	1.0000	1.0000
L19	1	Safety Line 3/8	70.25 - 75.25	1.0000	1.0000
L19	2	Step Pegs	70.25 - 75.25	1.0000	1.0000
L19	8	LDF6-50A(1-1/4")	70.25 - 75.25	1.0000	1.0000
L19	10	2" Rigid Conduit	70.25 - 75.25	1.0000	1.0000
L19	11	HJ4-50(1/2")	70.25 - 75.25	1.0000	1.0000
L20	1	Safety Line 3/8	65.25 - 70.25	1.0000	1.0000
L20	2	Step Pegs	65.25 - 70.25	1.0000	1.0000
L20	8	LDF6-50A(1-1/4")	65.25 - 70.25	1.0000	1.0000
L20	10	2" Rigid Conduit	65.25 - 70.25	1.0000	1.0000
L20	11	HJ4-50(1/2")	65.25 - 70.25	1.0000	1.0000
L21	1	Safety Line 3/8	60.25 - 65.25	1.0000	1.0000
L21	2	Step Pegs	60.25 - 65.25	1.0000	1.0000
L21	8	LDF6-50A(1-1/4")	60.25 - 65.25	1.0000	1.0000
L21	10	2" Rigid Conduit	60.25 - 65.25	1.0000	1.0000
L21	11	HJ4-50(1/2")	60.25 - 65.25	1.0000	1.0000
L22	1	Safety Line 3/8	55.25 - 60.25	1.0000	1.0000
L22	2	Step Pegs	55.25 - 60.25	1.0000	1.0000
L22	8	LDF6-50A(1-1/4")	55.25 - 60.25	1.0000	1.0000
L22	10	2" Rigid Conduit	55.25 - 60.25	1.0000	1.0000
L22	11	HJ4-50(1/2")	55.25 - 60.25	1.0000	1.0000
L23	1	Safety Line 3/8	51.00 - 55.25	1.0000	1.0000
L23	2	Step Pegs	51.00 - 55.25	1.0000	1.0000
L23	8	LDF6-50A(1-1/4")	51.00 - 55.25	1.0000	1.0000
L23	10	2" Rigid Conduit	51.00 - 55.25	1.0000	1.0000
L23	11	HJ4-50(1/2")	51.00 - 55.25	1.0000	1.0000
L23	29	4.5x1 Flat Plate	51.00 - 52.50	1.0000	1.0000
L23	30	4.5x1 Flat Plate	51.00 - 52.50	1.0000	1.0000
L23	31	4.5x1 Flat Plate	51.00 - 52.50	1.0000	1.0000
L24	1	Safety Line 3/8	50.75 - 51.00	1.0000	1.0000
L24	2	Step Pegs	50.75 - 51.00	1.0000	1.0000
L24	8	LDF6-50A(1-1/4")	50.75 - 51.00	1.0000	1.0000
L24	10	2" Rigid Conduit	50.75 - 51.00	1.0000	1.0000
L24	11	HJ4-50(1/2")	50.75 - 51.00	1.0000	1.0000
L24	29	4.5x1 Flat Plate	50.75 - 51.00	1.0000	1.0000
L24	30	4.5x1 Flat Plate	50.75 - 51.00	1.0000	1.0000
L24	31	4.5x1 Flat Plate	50.75 - 51.00	1.0000	1.0000
L25	1	Safety Line 3/8	45.75 - 50.75	1.0000	1.0000
L25	2	Step Pegs	45.75 - 50.75	1.0000	1.0000
L25	8	LDF6-50A(1-1/4")	45.75 - 50.75	1.0000	1.0000
L25	10	2" Rigid Conduit	45.75 - 50.75	1.0000	1.0000
L25	11	HJ4-50(1/2")	45.75 - 50.75	1.0000	1.0000
L25	29	4.5x1 Flat Plate	45.75 - 50.75	1.0000	1.0000
L25	30	4.5x1 Flat Plate	45.75 - 50.75	1.0000	1.0000
L25	31	4.5x1 Flat Plate	45.75 - 50.75	1.0000	1.0000
L26	1	Safety Line 3/8	37.00 - 45.75	1.0000	1.0000
L26	2	Step Pegs	37.00 - 45.75	1.0000	1.0000
L26	8	LDF6-50A(1-1/4")	37.00 - 45.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L26	10	2" Rigid Conduit	37.00 - 45.75	1.0000	1.0000
L26	11	HJ4-50(1/2")	37.00 - 45.75	1.0000	1.0000
L26	29	4.5x1 Flat Plate	42.50 - 45.75	1.0000	1.0000
L26	30	4.5x1 Flat Plate	42.50 - 45.75	1.0000	1.0000
L26	31	4.5x1 Flat Plate	42.50 - 45.75	1.0000	1.0000
L28	1	Safety Line 3/8	31.00 - 36.00	1.0000	1.0000
L28	2	Step Pegs	31.00 - 36.00	1.0000	1.0000
L28	8	LDF6-50A(1-1/4")	31.00 - 36.00	1.0000	1.0000
L28	10	2" Rigid Conduit	31.00 - 36.00	1.0000	1.0000
L28	11	HJ4-50(1/2")	31.00 - 36.00	1.0000	1.0000
L29	1	Safety Line 3/8	26.00 - 31.00	1.0000	1.0000
L29	2	Step Pegs	26.00 - 31.00	1.0000	1.0000
L29	8	LDF6-50A(1-1/4")	26.00 - 31.00	1.0000	1.0000
L29	10	2" Rigid Conduit	26.00 - 31.00	1.0000	1.0000
L29	11	HJ4-50(1/2")	26.00 - 31.00	1.0000	1.0000
L30	1	Safety Line 3/8	21.00 - 26.00	1.0000	1.0000
L30	2	Step Pegs	21.00 - 26.00	1.0000	1.0000
L30	8	LDF6-50A(1-1/4")	21.00 - 26.00	1.0000	1.0000
L30	10	2" Rigid Conduit	21.00 - 26.00	1.0000	1.0000
L30	11	HJ4-50(1/2")	21.00 - 26.00	1.0000	1.0000
L31	1	Safety Line 3/8	16.00 - 21.00	1.0000	1.0000
L31	2	Step Pegs	16.00 - 21.00	1.0000	1.0000
L31	8	LDF6-50A(1-1/4")	16.00 - 21.00	1.0000	1.0000
L31	10	2" Rigid Conduit	16.00 - 21.00	1.0000	1.0000
L31	11	HJ4-50(1/2")	16.00 - 21.00	1.0000	1.0000
L32	1	Safety Line 3/8	11.00 - 16.00	1.0000	1.0000
L32	2	Step Pegs	11.00 - 16.00	1.0000	1.0000
L32	8	LDF6-50A(1-1/4")	11.00 - 16.00	1.0000	1.0000
L32	10	2" Rigid Conduit	11.00 - 16.00	1.0000	1.0000
L32	11	HJ4-50(1/2")	11.00 - 16.00	1.0000	1.0000
L33	1	Safety Line 3/8	8.00 - 11.00	1.0000	1.0000
L33	2	Step Pegs	8.00 - 11.00	1.0000	1.0000
L33	8	LDF6-50A(1-1/4")	6.00 - 11.00	1.0000	1.0000
L33	10	2" Rigid Conduit	8.00 - 11.00	1.0000	1.0000
L33	11	HJ4-50(1/2")	8.00 - 11.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Platform Mount [LP 602-1]	C	None		0.0000	160.00	No Ice	32.03	32.03	1.34
						1/2" Ice	38.71	38.71	1.80
						1" Ice	45.39	45.39	2.26
(2) SBNHH-1D65B w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	8.16 8.62 9.09	6.82 7.78 8.61	0.06 0.13 0.20
DB-B1-6C-8AB-0Z	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	0.04 0.08 0.12
RRH2x60-700	A	From	4.00	0.0000	160.00	No Ice	3.50	1.82	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
		Centroid-Leg	0.00				1/2" Ice	3.76	2.05	0.08
			0.00				1" Ice	4.03	2.29	0.11
RRH2X60-PCS	A	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	2.20	1.72	0.06
			0.00				1/2" Ice	2.39	1.90	0.08
			0.00				1" Ice	2.59	2.09	0.10
RRH2X60-AWS	A	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	3.50	1.82	0.06
			0.00				1/2" Ice	3.76	2.05	0.08
			0.00				1" Ice	4.03	2.29	0.11
(2) DB846H80E-SX w/ Mount Pipe	A	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	5.33	7.74	0.04
			0.00				1/2" Ice	5.89	8.93	0.10
			0.00				1" Ice	6.41	9.84	0.16
HBXX-6517DS-A2M w/ Mount Pipe	A	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	8.77	6.96	0.07
			0.00				1/2" Ice	9.34	8.18	0.14
			0.00				1" Ice	9.89	9.14	0.21
(2) SBNHH-1D65B w/ Mount Pipe	B	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	8.16	6.82	0.06
			0.00				1/2" Ice	8.62	7.78	0.13
			0.00				1" Ice	9.09	8.61	0.20
RRH2x60-700	B	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	3.50	1.82	0.06
			0.00				1/2" Ice	3.76	2.05	0.08
			0.00				1" Ice	4.03	2.29	0.11
RRH2X60-PCS	B	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	2.20	1.72	0.06
			0.00				1/2" Ice	2.39	1.90	0.08
			0.00				1" Ice	2.59	2.09	0.10
RRH2X60-AWS	B	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	3.50	1.82	0.06
			0.00				1/2" Ice	3.76	2.05	0.08
			0.00				1" Ice	4.03	2.29	0.11
(2) DB846H80E-SX w/ Mount Pipe	B	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	5.33	7.74	0.04
			0.00				1/2" Ice	5.89	8.93	0.10
			0.00				1" Ice	6.41	9.84	0.16
HBXX-6517DS-A2M w/ Mount Pipe	B	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	8.77	6.96	0.07
			0.00				1/2" Ice	9.34	8.18	0.14
			0.00				1" Ice	9.89	9.14	0.21
(2) FD9R6004/2C-3L	B	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	0.31	0.08	0.00
			0.00				1/2" Ice	0.39	0.12	0.01
			0.00				1" Ice	0.47	0.17	0.01
DB-T1-6Z-8AB-0Z	B	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	4.80	2.00	0.04
			0.00				1/2" Ice	5.07	2.19	0.08
			0.00				1" Ice	5.35	2.39	0.12
(2) SBNHH-1D65B w/ Mount Pipe	C	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	8.16	6.82	0.06
			0.00				1/2" Ice	8.62	7.78	0.13
			0.00				1" Ice	9.09	8.61	0.20
RRH2x60-700	C	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	3.50	1.82	0.06
			0.00				1/2" Ice	3.76	2.05	0.08
			0.00				1" Ice	4.03	2.29	0.11
RRH2X60-PCS	C	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	2.20	1.72	0.06
			0.00				1/2" Ice	2.39	1.90	0.08
			0.00				1" Ice	2.59	2.09	0.10
RRH2X60-AWS	C	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	3.50	1.82	0.06
			0.00				1/2" Ice	3.76	2.05	0.08
			0.00				1" Ice	4.03	2.29	0.11
(2) DB846F65ZAXY w/ Mount Pipe	C	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	7.27	7.82	0.05
			0.00				1/2" Ice	7.83	9.01	0.11
			0.00				1" Ice	8.35	9.91	0.19
HBXX-6517DS-A2M w/ Mount Pipe	C	From Centroid-Leg	4.00	0.00	0.0000	160.00	No Ice	8.77	6.96	0.07
			0.00				1/2" Ice	9.34	8.18	0.14
			0.00				1" Ice	9.89	9.14	0.21
Platform Mount [LP 602-1]	C	None			0.0000	150.00	No Ice	32.03	32.03	1.34

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1/2" Ice	38.71	38.71	1.80
						1" Ice	45.39	45.39	2.26
APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	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
LLPX310R-V1 w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.54 4.89 5.25	2.98 3.53 4.09	0.05 0.08 0.13
1900MHz RRH	A	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.49 2.70 2.91	3.26 3.48 3.72	0.04 0.08 0.11
800MHZ RRH	A	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
FWHR	A	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	1.03 1.16 1.30	0.51 0.60 0.70	0.03 0.04 0.05
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	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
LLPX310R-V1 w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.54 4.89 5.25	2.98 3.53 4.09	0.05 0.08 0.13
BEN-92P	B	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.65 0.75 0.86	0.42 0.51 0.60	0.00 0.01 0.02
800MHZ RRH	B	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
1900MHz RRH	B	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.49 2.70 2.91	3.26 3.48 3.72	0.04 0.08 0.11
FWHR	B	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	1.03 1.16 1.30	0.51 0.60 0.70	0.03 0.04 0.05
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	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
LLPX310R-V1 w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.54 4.89 5.25	2.98 3.53 4.09	0.05 0.08 0.13
1900MHz RRH	C	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.49 2.70 2.91	3.26 3.48 3.72	0.04 0.08 0.11
800MHZ RRH	C	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
FWHR	C	From Centroid-Face	4.00 0.00 2.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	1.03 1.16 1.30	0.51 0.60 0.70	0.03 0.04 0.05
Side Arm Mount [SO 101-3]	C	None		0.0000	142.00	No Ice 1/2" Ice 1" Ice	7.50 8.90 10.30	7.50 8.90 10.30	0.25 0.33 0.41
(2) 2" x 6' Mount Pipe	A	From Face	2.00 0.00 0.00	0.0000	142.00	No Ice 1/2" Ice 1" Ice	1.20 1.80 2.17	1.20 1.80 2.17	0.03 0.04 0.05
(2) 2" x 6' Mount Pipe	B	From Face	2.00	0.0000	142.00	No Ice	1.20	1.20	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2" Ice	1.80	1.80	0.04
			0.00				1" Ice	2.17	2.17	0.05
(2) 2" x 6' Mount Pipe	C	From Face	2.00		0.0000	142.00	No Ice	1.20	1.20	0.03
			0.00				1/2" Ice	1.80	1.80	0.04
			0.00				1" Ice	2.17	2.17	0.05
Side Arm Mount [SO 602-3]	C	None			0.0000	134.00	No Ice	17.61	17.61	0.44
							1/2" Ice	24.67	24.67	0.67
							1" Ice	31.73	31.73	0.90
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Face	3.00		0.0000	134.00	No Ice	6.33	5.64	0.11
			0.00				1/2" Ice	6.78	6.43	0.17
			3.00				1" Ice	7.21	7.13	0.23
SBNH-1D65C-SR w/ Mount Pipe	A	From Face	3.00		0.0000	134.00	No Ice	11.45	9.12	0.07
			0.00				1/2" Ice	12.06	10.21	0.15
			3.00				1" Ice	12.69	11.18	0.24
RRUS 11 B2	A	From Face	3.00		0.0000	134.00	No Ice	2.83	1.18	0.05
			0.00				1/2" Ice	3.04	1.33	0.07
			3.00				1" Ice	3.26	1.48	0.10
RRUS 11 B12	A	From Face	3.00		0.0000	134.00	No Ice	2.83	1.18	0.05
			0.00				1/2" Ice	3.04	1.33	0.07
			3.00				1" Ice	3.26	1.48	0.10
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Face	3.00		0.0000	134.00	No Ice	6.33	5.64	0.11
			0.00				1/2" Ice	6.78	6.43	0.17
			3.00				1" Ice	7.21	7.13	0.23
SBNH-1D65C-SR w/ Mount Pipe	B	From Face	3.00		0.0000	134.00	No Ice	11.45	9.12	0.07
			0.00				1/2" Ice	12.06	10.21	0.15
			3.00				1" Ice	12.69	11.18	0.24
RRUS 11 B2	B	From Face	3.00		0.0000	134.00	No Ice	2.83	1.18	0.05
			0.00				1/2" Ice	3.04	1.33	0.07
			3.00				1" Ice	3.26	1.48	0.10
RRUS 11 B12	B	From Face	3.00		0.0000	134.00	No Ice	2.83	1.18	0.05
			0.00				1/2" Ice	3.04	1.33	0.07
			3.00				1" Ice	3.26	1.48	0.10
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Face	3.00		0.0000	134.00	No Ice	6.33	5.64	0.11
			0.00				1/2" Ice	6.78	6.43	0.17
			3.00				1" Ice	7.21	7.13	0.23
SBNH-1D65C-SR w/ Mount Pipe	C	From Face	3.00		0.0000	134.00	No Ice	11.45	9.12	0.07
			0.00				1/2" Ice	12.06	10.21	0.15
			3.00				1" Ice	12.69	11.18	0.24
RRUS 11 B2	C	From Face	3.00		0.0000	134.00	No Ice	2.83	1.18	0.05
			0.00				1/2" Ice	3.04	1.33	0.07
			3.00				1" Ice	3.26	1.48	0.10
RRUS 11 B12	C	From Face	3.00		0.0000	134.00	No Ice	2.83	1.18	0.05
			0.00				1/2" Ice	3.04	1.33	0.07
			3.00				1" Ice	3.26	1.48	0.10
Platform Mount [LP 303-1]	C	None			0.0000	116.00	No Ice	14.66	14.66	1.25
							1/2" Ice	18.87	18.87	1.48
							1" Ice	23.08	23.08	1.71
782 10253	A	From Centroid-Leg	4.00		0.0000	116.00	No Ice	0.11	0.06	0.00
			0.00				1/2" Ice	0.15	0.10	0.00
			4.00				1" Ice	0.20	0.14	0.01
(2) RRUS-11	A	From Centroid-Leg	4.00		0.0000	116.00	No Ice	2.78	1.19	0.05
			0.00				1/2" Ice	2.99	1.33	0.07
			4.00				1" Ice	3.21	1.49	0.09
(2) 7770.00 w/ Mount Pipe	A	From Centroid-Leg	4.00		0.0000	116.00	No Ice	5.84	4.35	0.06
			0.00				1/2" Ice	6.32	5.20	0.11
			4.00				1" Ice	6.77	5.92	0.16
AM-X-CD-16-65-00T-RET	A	From	4.00		0.0000	116.00	No Ice	8.26	6.30	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
w/ Mount Pipe		Centroid-Le	0.00			1/2" Ice	8.82	7.48	0.14
		g	4.00			1" Ice	9.35	8.37	0.21
(2) LGP21401	A	From	4.00	0.0000	116.00	No Ice	1.10	0.21	0.01
		Centroid-Le	0.00			1/2" Ice	1.24	0.27	0.02
		g	4.00			1" Ice	1.38	0.35	0.03
(2) LGP21901	A	From	4.00	0.0000	116.00	No Ice	0.23	0.16	0.01
		Centroid-Le	0.00			1/2" Ice	0.29	0.21	0.01
		g	4.00			1" Ice	0.36	0.28	0.01
782 10253	B	From	4.00	0.0000	116.00	No Ice	0.11	0.06	0.00
		Centroid-Le	0.00			1/2" Ice	0.15	0.10	0.00
		g	4.00			1" Ice	0.20	0.14	0.01
(2) RRUS-11	B	From	4.00	0.0000	116.00	No Ice	2.78	1.19	0.05
		Centroid-Le	0.00			1/2" Ice	2.99	1.33	0.07
		g	4.00			1" Ice	3.21	1.49	0.09
(2) 7770.00 w/ Mount Pipe	B	From	4.00	0.0000	116.00	No Ice	5.84	4.35	0.06
		Centroid-Le	0.00			1/2" Ice	6.32	5.20	0.11
		g	4.00			1" Ice	6.77	5.92	0.16
AM-X-CD-16-65-00T-RET	B	From	4.00	0.0000	116.00	No Ice	8.26	6.30	0.07
w/ Mount Pipe		Centroid-Le	0.00			1/2" Ice	8.82	7.48	0.14
		g	4.00			1" Ice	9.35	8.37	0.21
(2) LGP21401	B	From	4.00	0.0000	116.00	No Ice	1.10	0.21	0.01
		Centroid-Le	0.00			1/2" Ice	1.24	0.27	0.02
		g	4.00			1" Ice	1.38	0.35	0.03
(2) LGP21901	B	From	4.00	0.0000	116.00	No Ice	0.23	0.16	0.01
		Centroid-Le	0.00			1/2" Ice	0.29	0.21	0.01
		g	4.00			1" Ice	0.36	0.28	0.01
782 10253	C	From	4.00	0.0000	116.00	No Ice	0.11	0.06	0.00
		Centroid-Le	0.00			1/2" Ice	0.15	0.10	0.00
		g	4.00			1" Ice	0.20	0.14	0.01
(2) RRUS-11	C	From	4.00	0.0000	116.00	No Ice	2.78	1.19	0.05
		Centroid-Le	0.00			1/2" Ice	2.99	1.33	0.07
		g	4.00			1" Ice	3.21	1.49	0.09
(2) 7770.00 w/ Mount Pipe	C	From	4.00	0.0000	116.00	No Ice	5.84	4.35	0.06
		Centroid-Le	0.00			1/2" Ice	6.32	5.20	0.11
		g	4.00			1" Ice	6.77	5.92	0.16
AM-X-CD-16-65-00T-RET	C	From	4.00	0.0000	116.00	No Ice	8.26	6.30	0.07
w/ Mount Pipe		Centroid-Le	0.00			1/2" Ice	8.82	7.48	0.14
		g	4.00			1" Ice	9.35	8.37	0.21
(2) LGP21401	C	From	4.00	0.0000	116.00	No Ice	1.10	0.21	0.01
		Centroid-Le	0.00			1/2" Ice	1.24	0.27	0.02
		g	4.00			1" Ice	1.38	0.35	0.03
(2) LGP21901	C	From	4.00	0.0000	116.00	No Ice	0.23	0.16	0.01
		Centroid-Le	0.00			1/2" Ice	0.29	0.21	0.01
		g	4.00			1" Ice	0.36	0.28	0.01
DC6-48-60-18-8F	C	From	4.00	0.0000	116.00	No Ice	1.90	1.90	0.02
		Centroid-Le	0.00			1/2" Ice	2.09	2.09	0.04
		g	4.00			1" Ice	2.28	2.28	0.06
Side Arm Mount [SO 701-1]	A	From Leg	2.00	0.0000	61.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
Side Arm Mount [SO 701-1]	C	From Face	2.00	0.0000	61.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
GPS	A	From Leg	2.00	0.0000	61.00	No Ice	0.15	0.15	0.00
			0.00			1/2" Ice	0.20	0.20	0.00
			0.00			1" Ice	0.26	0.26	0.00
GPS	B	From Face	2.00	0.0000	61.00	No Ice	0.15	0.15	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	0.20	0.20	0.00
			0.00			1" Ice	0.26	0.26	0.00
Side Arm Mount [SO 701-1]	A	From Leg	2.00	0.0000	50.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
Side Arm Mount [SO 701-1]	C	From Face	2.00	0.0000	50.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
HP3-11	A	Paraboloid w/Shroud (HP)	From Leg	2.00	-42.0000		142.00	3.00	No Ice	7.07	0.05
				0.00					1/2" Ice	7.47	0.04
				2.00					1" Ice	7.86	0.00
HP3-11	C	Paraboloid w/Shroud (HP)	From Leg	2.00	-50.0000		142.00	3.00	No Ice	7.07	0.05
				0.00					1/2" Ice	7.47	0.04
				2.00					1" Ice	7.86	0.00

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice

Comb. No.	Description
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	159.667 - 154.667	Pole	Max Tension	26	0.00	-0.00	0.00
			Max. Compression	26	-10.79	-0.58	0.13
			Max. Mx	8	-2.80	-41.85	0.05
			Max. My	2	-2.80	-0.12	41.60
			Max. Vy	8	8.07	-41.85	0.05
			Max. Vx	2	-8.05	-0.12	41.60
			Max. Torque	12			0.33
L2	154.667 - 149.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-17.70	-0.74	0.15
			Max. Mx	8	-5.26	-88.29	0.08
			Max. My	2	-5.26	-0.18	87.88
			Max. Vy	8	12.13	-88.29	0.08
			Max. Vx	2	-12.10	-0.18	87.88
			Max. Torque	12			0.39
L3	149.667 - 144.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.43	-0.80	0.11
			Max. Mx	8	-5.67	-150.12	0.12
			Max. My	2	-5.66	-0.24	149.53
			Max. Vy	8	12.60	-150.12	0.12
			Max. Vx	2	-12.57	-0.24	149.53
			Max. Torque	12			0.39

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	144.667 - 139.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20.37	-0.80	0.02
			Max. Mx	8	-6.64	-217.88	-0.46
			Max. My	2	-6.62	0.23	218.08
			Max. Vy	8	14.24	-217.88	-0.46
			Max. Vx	2	-14.38	0.23	218.08
			Max. Torque	7			1.27
L5	139.667 - 134.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.28	-0.79	-0.14
			Max. Mx	8	-7.15	-290.29	-1.18
			Max. My	2	-7.13	0.69	291.13
			Max. Vy	8	14.74	-290.29	-1.18
			Max. Vx	2	-14.87	0.69	291.13
			Max. Torque	7			1.27
L6	134.667 - 129.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.77	-0.78	-0.32
			Max. Mx	8	-8.94	-384.99	-1.90
			Max. My	2	-8.91	1.15	386.49
			Max. Vy	8	18.32	-384.99	-1.90
			Max. Vx	2	-18.46	1.15	386.49
			Max. Torque	7			1.27
L7	129.667 - 123.667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.10	-0.77	-0.38
			Max. Mx	8	-9.12	-415.66	-2.15
			Max. My	2	-9.10	1.30	417.38
			Max. Vy	8	18.49	-415.66	-2.15
			Max. Vx	2	-18.63	1.30	417.38
			Max. Torque	7			1.27
L8	123.667 - 123	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.89	-0.75	-0.57
			Max. Mx	8	-10.19	-509.59	-2.88
			Max. My	2	-10.17	1.76	511.96
			Max. Vy	8	19.09	-509.59	-2.88
			Max. Vx	2	-19.23	1.76	511.96
			Max. Torque	7			1.27
L9	123 - 118	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.14	-0.74	-0.76
			Max. Mx	8	-11.01	-606.43	-3.61
			Max. My	2	-10.99	2.22	609.44
			Max. Vy	8	19.66	-606.43	-3.61
			Max. Vx	2	-19.80	2.22	609.44
			Max. Torque	7			1.27
L10	118 - 113	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.85	-0.26	-1.16
			Max. Mx	8	-14.32	-725.69	-4.39
			Max. My	2	-14.30	2.77	729.41
			Max. Vy	8	23.52	-725.69	-4.39
			Max. Vx	2	-23.66	2.77	729.41
			Max. Torque	7			1.27
L11	113 - 108	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.32	-0.08	-1.37
			Max. Mx	8	-15.28	-844.68	-5.14
			Max. My	2	-15.26	3.27	849.08
			Max. Vy	8	24.11	-844.68	-5.14
			Max. Vx	2	-24.25	3.27	849.08
			Max. Torque	7			1.27
L12	108 - 103	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-40.84	0.11	-1.59
			Max. Mx	8	-16.27	-966.62	-5.89
			Max. My	2	-16.26	3.78	971.70
			Max. Vy	8	24.70	-966.62	-5.89
			Max. Vx	2	-24.84	3.78	971.70
			Max. Torque	7			1.27
L13	103 - 98	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.40	0.31	-1.81
			Max. Mx	8	-17.30	-1091.54	-6.64
			Max. My	2	-17.29	4.28	1097.31
			Max. Vy	8	25.30	-1091.54	-6.64
			Max. Vx	2	-25.44	4.28	1097.31
			Max. Torque	7			1.26
L14	98 - 93	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.99	0.51	-2.04
			Max. Mx	8	-18.36	-1219.50	-7.39
			Max. My	2	-18.35	4.78	1225.95
			Max. Vy	8	25.92	-1219.50	-7.39
			Max. Vx	2	-26.06	4.78	1225.95
			Max. Torque	7			1.26
L15	93 - 88	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.63	0.72	-2.27
			Max. Mx	8	-19.46	-1350.53	-8.14
			Max. My	2	-19.44	5.29	1357.66
			Max. Vy	8	26.53	-1350.53	-8.14
			Max. Vx	2	-26.67	5.29	1357.66
			Max. Torque	7			1.26
L16	88 - 83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.31	0.93	-2.51
			Max. Mx	8	-20.58	-1484.67	-8.90
			Max. My	2	-20.57	5.79	1492.48
			Max. Vy	8	27.16	-1484.67	-8.90
			Max. Vx	2	-27.30	5.79	1492.48
			Max. Torque	7			1.26
L17	83 - 76.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.65	0.98	-2.55
			Max. Mx	8	-20.81	-1511.87	-9.05
			Max. My	2	-20.80	5.89	1519.82
			Max. Vy	8	27.28	-1511.87	-9.05
			Max. Vx	2	-27.42	5.89	1519.82
			Max. Torque	7			1.26
L18	76.25 - 75.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.54	1.26	-2.86
			Max. Mx	8	-23.38	-1699.20	-10.08
			Max. My	2	-23.37	6.58	1708.06
			Max. Vy	8	28.25	-1699.20	-10.08
			Max. Vx	2	-28.39	6.58	1708.06
			Max. Torque	7			1.26
L19	75.25 - 70.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.38	1.47	-3.08
			Max. Mx	8	-24.65	-1841.90	-10.84
			Max. My	2	-24.64	7.09	1851.44
			Max. Vy	8	28.88	-1841.90	-10.84
			Max. Vx	2	-29.02	7.09	1851.44
			Max. Torque	7			1.26
L20	70.25 - 65.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-55.26	1.69	-3.32
			Max. Mx	8	-25.96	-1987.76	-11.60
			Max. My	2	-25.95	7.59	1997.97
			Max. Vy	8	29.51	-1987.76	-11.60
			Max. Vx	2	-29.65	7.59	1997.97

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	7			1.26
L21	65.25 - 60.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.45	1.89	-3.50
			Max. Mx	8	-27.46	-2136.87	-12.37
			Max. My	14	-27.45	-11.46	-2147.75
			Max. Vy	8	30.28	-2136.87	-12.37
			Max. Vx	2	-30.36	8.10	2147.72
			Max. Torque	7			1.28
L22	60.25 - 55.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-59.41	2.12	-3.74
			Max. Mx	8	-28.84	-2289.70	-13.13
			Max. My	14	-28.83	-12.13	-2301.01
			Max. Vy	8	30.90	-2289.70	-13.13
			Max. Vx	2	-30.99	8.61	2300.93
			Max. Torque	7			1.28
L23	55.25 - 51	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.15	2.32	-3.96
			Max. Mx	8	-30.04	-2422.08	-13.78
			Max. My	14	-30.03	-12.69	-2433.76
			Max. Vy	8	31.44	-2422.08	-13.78
			Max. Vx	2	-31.52	9.05	2433.63
			Max. Torque	7			1.28
L24	51 - 50.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.26	2.33	-3.97
			Max. Mx	8	-30.12	-2429.93	-13.82
			Max. My	14	-30.11	-12.72	-2441.64
			Max. Vy	8	31.46	-2429.93	-13.82
			Max. Vx	2	-31.54	9.07	2441.51
			Max. Torque	7			1.28
L25	50.75 - 45.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.69	2.57	-4.22
			Max. Mx	8	-31.71	-2589.19	-14.58
			Max. My	14	-31.71	-13.39	-2601.09
			Max. Vy	8	32.20	-2589.19	-14.58
			Max. Vx	2	-32.23	9.58	2600.91
			Max. Torque	7			1.28
L26	45.75 - 37	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.43	2.66	-4.31
			Max. Mx	8	-32.21	-2645.68	-14.85
			Max. My	14	-32.21	-13.62	-2657.65
			Max. Vy	8	32.42	-2645.68	-14.85
			Max. Vx	2	-32.45	9.76	2657.44
			Max. Torque	7			1.28
L27	37 - 36	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-70.48	3.05	-4.73
			Max. Mx	8	-36.45	-2909.26	-16.08
			Max. My	14	-36.45	-14.67	-2921.49
			Max. Vy	8	33.51	-2909.26	-16.08
			Max. Vx	2	-33.54	10.58	2921.18
			Max. Torque	7			1.28
L28	36 - 31	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-72.81	3.30	-4.99
			Max. Mx	8	-38.18	-3078.18	-16.84
			Max. My	14	-38.17	-15.32	-3090.58
			Max. Vy	8	34.10	-3078.18	-16.84
			Max. Vx	2	-34.13	11.09	3090.19
			Max. Torque	7			1.28
L29	31 - 26	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-75.18	3.55	-5.26
			Max. Mx	8	-39.94	-3250.01	-17.61
			Max. My	14	-39.94	-15.97	-3262.59

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	8	34.68	-3250.01	-17.61
			Max. Vx	2	-34.71	11.60	3262.13
			Max. Torque	7			1.28
L30	26 - 21	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.58	3.81	-5.52
			Max. Mx	8	-41.74	-3424.76	-18.38
			Max. My	14	-41.74	-16.62	-3437.51
			Max. Vy	8	35.27	-3424.76	-18.38
			Max. Vx	2	-35.30	12.11	3436.97
			Max. Torque	7			1.28
L31	21 - 16	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-80.01	4.07	-5.79
			Max. Mx	8	-43.59	-3602.48	-19.14
			Max. My	14	-43.59	-17.26	-3615.41
			Max. Vy	8	35.87	-3602.48	-19.14
			Max. Vx	2	-35.89	12.62	3614.78
			Max. Torque	7			1.28
L32	16 - 11	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-82.47	4.32	-6.06
			Max. Mx	8	-45.47	-3783.22	-19.91
			Max. My	14	-45.47	-17.90	-3796.32
			Max. Vy	8	36.48	-3783.22	-19.91
			Max. Vx	2	-36.50	13.13	3795.61
			Max. Torque	7			1.28
L33	11 - 6	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-84.89	4.57	-6.21
			Max. Mx	8	-47.36	-3967.03	-20.64
			Max. My	14	-47.36	-18.53	-3980.27
			Max. Vy	8	37.10	-3967.03	-20.64
			Max. Vx	2	-37.12	13.64	3979.54
			Max. Torque	7			1.28
L34	6 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-87.02	4.57	-6.21
			Max. Mx	8	-49.13	-4154.03	-21.30
			Max. My	14	-49.13	-19.24	-4167.27
			Max. Vy	8	37.73	-4154.03	-21.30
			Max. Vx	2	-37.75	14.07	4166.66
			Max. Torque	7			1.28
L35	1 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-87.42	4.57	-6.21
			Max. Mx	8	-49.48	-4191.81	-21.43
			Max. My	14	-49.48	-19.38	-4205.05
			Max. Vy	8	37.86	-4191.81	-21.43
			Max. Vx	2	-37.88	14.16	4204.46
			Max. Torque	7			1.28

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	87.42	0.00	-0.00
	Max. H_x	20	49.49	37.80	0.06
	Max. H_z	3	37.12	0.09	37.87
	Max. M_x	2	4204.46	0.09	37.87
	Max. M_z	8	4191.81	-37.84	-0.13
	Max. Torsion	7	1.28	-32.71	18.97

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Vert	23	37.12	32.69	19.03
	Min. H_x	9	37.12	-37.84	-0.13
	Min. H_z	15	37.12	-0.14	-37.84
	Min. M_x	14	-4205.05	-0.14	-37.84
	Min. M_z	20	-4188.71	37.80	0.06
	Min. Torsion	19	-1.08	32.71	-18.89

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	41.24	0.00	0.00	1.57	1.10	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	49.49	-0.09	-37.87	-4204.46	14.16	-0.47
0.9 Dead+1.6 Wind 0 deg - No Ice	37.12	-0.09	-37.87	-4168.67	13.69	-0.47
1.2 Dead+1.6 Wind 30 deg - No Ice	49.49	18.83	-32.83	-3647.18	-2081.18	-0.91
0.9 Dead+1.6 Wind 30 deg - No Ice	37.12	18.83	-32.83	-3616.19	-2063.59	-0.91
1.2 Dead+1.6 Wind 60 deg - No Ice	49.49	32.71	-18.97	-2106.50	-3620.21	-1.27
0.9 Dead+1.6 Wind 60 deg - No Ice	37.12	32.71	-18.97	-2088.80	-3589.36	-1.28
1.2 Dead+1.6 Wind 90 deg - No Ice	49.49	37.84	0.13	21.43	-4191.81	-0.71
0.9 Dead+1.6 Wind 90 deg - No Ice	37.12	37.84	0.13	20.74	-4156.03	-0.71
1.2 Dead+1.6 Wind 120 deg - No Ice	49.49	32.77	19.05	2122.24	-3629.94	-0.17
0.9 Dead+1.6 Wind 120 deg - No Ice	37.12	32.77	19.05	2103.43	-3599.01	-0.17
1.2 Dead+1.6 Wind 150 deg - No Ice	49.49	18.92	32.83	3650.81	-2095.17	-0.01
0.9 Dead+1.6 Wind 150 deg - No Ice	37.12	18.92	32.83	3618.83	-2077.46	-0.01
1.2 Dead+1.6 Wind 180 deg - No Ice	49.49	0.14	37.84	4205.05	-19.38	0.10
0.9 Dead+1.6 Wind 180 deg - No Ice	37.12	0.14	37.84	4168.30	-19.53	0.10
1.2 Dead+1.6 Wind 210 deg - No Ice	49.49	-18.77	32.76	3640.08	2075.71	0.49
0.9 Dead+1.6 Wind 210 deg - No Ice	37.12	-18.77	32.76	3608.20	2057.51	0.49
1.2 Dead+1.6 Wind 240 deg - No Ice	49.49	-32.71	18.89	2099.53	3623.30	1.08
0.9 Dead+1.6 Wind 240 deg - No Ice	37.12	-32.71	18.89	2080.94	3591.76	1.08
1.2 Dead+1.6 Wind 270 deg - No Ice	49.49	-37.80	-0.06	-6.53	4188.71	0.68
0.9 Dead+1.6 Wind 270 deg - No Ice	37.12	-37.80	-0.06	-6.95	4152.29	0.68
1.2 Dead+1.6 Wind 300 deg - No Ice	49.49	-32.69	-19.03	-2115.11	3619.51	0.08
0.9 Dead+1.6 Wind 300 deg - No Ice	37.12	-32.69	-19.03	-2097.33	3588.00	0.08

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
1.2 Dead+1.6 Wind 330 deg - No Ice	49.49	-18.87	-32.84	-3648.13	2090.09	-0.28
0.9 Dead+1.6 Wind 330 deg - No Ice	37.12	-18.87	-32.84	-3617.14	2071.76	-0.28
1.2 Dead+1.0 Ice+1.0 Temp	87.42	-0.00	0.00	6.21	4.57	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	87.42	-0.02	-8.59	-1019.59	7.60	-0.07
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	87.42	4.28	-7.44	-883.28	-504.39	-0.16
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	87.42	7.44	-4.30	-507.42	-880.32	-0.24
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	87.42	8.60	0.03	10.68	-1019.70	-0.15
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	87.42	7.48	4.33	525.17	-886.07	-0.05
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	87.42	4.30	7.44	896.34	-507.72	-0.03
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	87.42	0.03	8.58	1031.76	0.20	-0.01
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	87.42	-4.27	7.43	893.87	512.13	0.08
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	87.42	-7.44	4.28	518.04	889.81	0.21
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	87.42	-8.60	-0.01	4.42	1027.93	0.14
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	87.42	-7.46	-4.33	-511.66	892.80	0.03
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	87.42	-4.29	-7.45	-883.74	515.55	-0.03
Dead+Wind 0 deg - Service	41.24	-0.02	-7.94	-876.29	3.80	-0.10
Dead+Wind 30 deg - Service	41.24	3.95	-6.88	-759.98	-433.51	-0.19
Dead+Wind 60 deg - Service	41.24	6.86	-3.98	-438.43	-754.72	-0.27
Dead+Wind 90 deg - Service	41.24	7.93	0.03	5.68	-874.01	-0.15
Dead+Wind 120 deg - Service	41.24	6.87	3.99	444.13	-756.76	-0.04
Dead+Wind 150 deg - Service	41.24	3.97	6.88	763.16	-436.44	-0.00
Dead+Wind 180 deg - Service	41.24	0.03	7.93	878.84	-3.20	0.02
Dead+Wind 210 deg - Service	41.24	-3.93	6.87	760.91	434.06	0.10
Dead+Wind 240 deg - Service	41.24	-6.86	3.96	439.39	757.05	0.23
Dead+Wind 270 deg - Service	41.24	-7.92	-0.01	-0.15	875.05	0.14
Dead+Wind 300 deg - Service	41.24	-6.85	-3.99	-440.22	756.26	0.02
Dead+Wind 330 deg - Service	41.24	-3.96	-6.88	-760.18	437.06	-0.06

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	-41.24	0.00	0.00	41.24	0.00	0.000%
2	-0.09	-49.49	-37.87	0.09	49.49	37.87	0.000%
3	-0.09	-37.12	-37.87	0.09	37.12	37.87	0.000%
4	18.83	-49.49	-32.83	-18.83	49.49	32.83	0.000%
5	18.83	-37.12	-32.83	-18.83	37.12	32.83	0.000%
6	32.71	-49.49	-18.97	-32.71	49.49	18.97	0.000%
7	32.71	-37.12	-18.97	-32.71	37.12	18.97	0.000%
8	37.84	-49.49	0.13	-37.84	49.49	-0.13	0.000%
9	37.84	-37.12	0.13	-37.84	37.12	-0.13	0.000%
10	32.77	-49.49	19.05	-32.77	49.49	-19.05	0.000%
11	32.77	-37.12	19.05	-32.77	37.12	-19.05	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
12	18.92	-49.49	32.83	-18.92	49.49	-32.83	0.000%
13	18.92	-37.12	32.83	-18.92	37.12	-32.83	0.000%
14	0.14	-49.49	37.84	-0.14	49.49	-37.84	0.000%
15	0.14	-37.12	37.84	-0.14	37.12	-37.84	0.000%
16	-18.77	-49.49	32.76	18.77	49.49	-32.76	0.000%
17	-18.77	-37.12	32.76	18.77	37.12	-32.76	0.000%
18	-32.71	-49.49	18.89	32.71	49.49	-18.89	0.000%
19	-32.71	-37.12	18.89	32.71	37.12	-18.89	0.000%
20	-37.80	-49.49	-0.06	37.80	49.49	0.06	0.000%
21	-37.80	-37.12	-0.06	37.80	37.12	0.06	0.000%
22	-32.69	-49.49	-19.03	32.69	49.49	19.03	0.000%
23	-32.69	-37.12	-19.03	32.69	37.12	19.03	0.000%
24	-18.87	-49.49	-32.84	18.87	49.49	32.84	0.000%
25	-18.87	-37.12	-32.84	18.87	37.12	32.84	0.000%
26	0.00	-87.42	0.00	0.00	87.42	-0.00	0.000%
27	-0.02	-87.42	-8.59	0.02	87.42	8.59	0.000%
28	4.28	-87.42	-7.44	-4.28	87.42	7.44	0.000%
29	7.44	-87.42	-4.30	-7.44	87.42	4.30	0.000%
30	8.60	-87.42	0.03	-8.60	87.42	-0.03	0.000%
31	7.48	-87.42	4.33	-7.48	87.42	-4.33	0.000%
32	4.30	-87.42	7.44	-4.30	87.42	-7.44	0.000%
33	0.03	-87.42	8.58	-0.03	87.42	-8.58	0.000%
34	-4.27	-87.42	7.43	4.27	87.42	-7.43	0.000%
35	-7.44	-87.42	4.28	7.44	87.42	-4.28	0.000%
36	-8.60	-87.42	-0.01	8.60	87.42	0.01	0.000%
37	-7.46	-87.42	-4.33	7.46	87.42	4.33	0.000%
38	-4.29	-87.42	-7.45	4.29	87.42	7.45	0.000%
39	-0.02	-41.24	-7.94	0.02	41.24	7.94	0.000%
40	3.95	-41.24	-6.88	-3.95	41.24	6.88	0.000%
41	6.86	-41.24	-3.98	-6.86	41.24	3.98	0.000%
42	7.93	-41.24	0.03	-7.93	41.24	-0.03	0.000%
43	6.87	-41.24	3.99	-6.87	41.24	-3.99	0.000%
44	3.97	-41.24	6.88	-3.97	41.24	-6.88	0.000%
45	0.03	-41.24	7.93	-0.03	41.24	-7.93	0.000%
46	-3.93	-41.24	6.87	3.93	41.24	-6.87	0.000%
47	-6.86	-41.24	3.96	6.86	41.24	-3.96	0.000%
48	-7.92	-41.24	-0.01	7.92	41.24	0.01	0.000%
49	-6.85	-41.24	-3.99	6.85	41.24	3.99	0.000%
50	-3.96	-41.24	-6.88	3.96	41.24	6.88	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00007151
3	Yes	4	0.00000001	0.00093474
4	Yes	6	0.00000001	0.00008956
5	Yes	5	0.00000001	0.00095045
6	Yes	6	0.00000001	0.00009315
7	Yes	5	0.00000001	0.00098950
8	Yes	5	0.00000001	0.00005381
9	Yes	4	0.00000001	0.00062998
10	Yes	6	0.00000001	0.00009151
11	Yes	5	0.00000001	0.00097127
12	Yes	6	0.00000001	0.00009156

13	Yes	5	0.00000001	0.00097159
14	Yes	5	0.00000001	0.00005821
15	Yes	4	0.00000001	0.00070133
16	Yes	6	0.00000001	0.00009142
17	Yes	5	0.00000001	0.00097025
18	Yes	6	0.00000001	0.00008935
19	Yes	5	0.00000001	0.00094819
20	Yes	5	0.00000001	0.00007492
21	Yes	5	0.00000001	0.00002975
22	Yes	6	0.00000001	0.00009152
23	Yes	5	0.00000001	0.00097174
24	Yes	6	0.00000001	0.00009165
25	Yes	5	0.00000001	0.00097272
26	Yes	4	0.00000001	0.00014434
27	Yes	6	0.00000001	0.00026949
28	Yes	6	0.00000001	0.00029680
29	Yes	6	0.00000001	0.00029717
30	Yes	6	0.00000001	0.00026964
31	Yes	6	0.00000001	0.00030248
32	Yes	6	0.00000001	0.00030142
33	Yes	6	0.00000001	0.00027260
34	Yes	6	0.00000001	0.00030067
35	Yes	6	0.00000001	0.00030019
36	Yes	6	0.00000001	0.00027042
37	Yes	6	0.00000001	0.00029994
38	Yes	6	0.00000001	0.00029876
39	Yes	4	0.00000001	0.00028900
40	Yes	4	0.00000001	0.00088614
41	Yes	4	0.00000001	0.00096805
42	Yes	4	0.00000001	0.00028909
43	Yes	4	0.00000001	0.00092786
44	Yes	4	0.00000001	0.00092968
45	Yes	4	0.00000001	0.00028592
46	Yes	4	0.00000001	0.00093447
47	Yes	4	0.00000001	0.00088871
48	Yes	4	0.00000001	0.00029112
49	Yes	4	0.00000001	0.00092740
50	Yes	4	0.00000001	0.00093300

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	159.667 - 154.667 (1)	TP20.2839x18.87x0.189	5.00	0.00	0.0	12.2293	-2.80	839.44	0.003
L2	154.667 - 149.667 (2)	TP21.6978x20.2839x0.189	5.00	0.00	0.0	13.0898	-5.26	872.74	0.006
L3	149.667 - 144.667 (3)	TP23.1117x21.6978x0.189	5.00	0.00	0.0	13.9503	-5.67	902.66	0.006
L4	144.667 - 139.667 (4)	TP24.5256x23.1117x0.189	5.00	0.00	0.0	14.8107	-6.62	929.19	0.007
L5	139.667 - 134.667 (5)	TP25.9394x24.5256x0.189	5.00	0.00	0.0	15.6712	-7.13	952.33	0.007
L6	134.667 -	TP27.3533x25.9394x0.189	5.00	0.00	0.0	16.5317	-8.91	972.09	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L7	129.667 (6) 129.667 - 123.667 (7)	TP29.05x27.3533x0.189	6.00	0.00	0.0	16.8185	-9.10	977.92	0.009
L8	123.667 - 123 (8)	TP28.848x27.4467x0.313	5.00	0.00	0.0	28.7593	-10.17	2088.74	0.005
L9	123 - 118 (9)	TP30.2493x28.848x0.313	5.00	0.00	0.0	30.1716	-10.99	2155.78	0.005
L10	118 - 113 (10)	TP31.6506x30.2493x0.313	5.00	0.00	0.0	31.5839	-14.30	2219.49	0.006
L11	113 - 108 (11)	TP33.0519x31.6506x0.313	5.00	0.00	0.0	32.9962	-15.26	2279.87	0.007
L12	108 - 103 (12)	TP34.4531x33.0519x0.313	5.00	0.00	0.0	34.4085	-16.25	2336.93	0.007
L13	103 - 98 (13)	TP35.8544x34.4531x0.313	5.00	0.00	0.0	35.8208	-17.28	2390.66	0.007
L14	98 - 93 (14)	TP37.2557x35.8544x0.313	5.00	0.00	0.0	37.2331	-18.35	2441.07	0.008
L15	93 - 88 (15)	TP38.657x37.2557x0.313	5.00	0.00	0.0	38.6454	-19.44	2488.15	0.008
L16	88 - 83 (16)	TP40.0583x38.657x0.313	5.00	0.00	0.0	40.0577	-20.57	2531.90	0.008
L17	83 - 76.25 (17)	TP41.95x40.0583x0.313	6.75	0.00	0.0	40.3401	-20.80	2540.25	0.008
L18	76.25 - 75.25 (18)	TP41.6036x39.7125x0.344	6.75	0.00	0.0	45.7025	-23.36	2973.34	0.008
L19	75.25 - 70.25 (19)	TP43.0045x41.6036x0.344	5.00	0.00	0.0	47.2542	-24.64	3023.67	0.008
L20	70.25 - 65.25 (20)	TP44.4053x43.0045x0.344	5.00	0.00	0.0	48.8058	-25.95	3070.67	0.008
L21	65.25 - 60.25 (21)	TP45.8061x44.4053x0.344	5.00	0.00	0.0	50.3575	-27.45	3114.35	0.009
L22	60.25 - 55.25 (22)	TP47.207x45.8061x0.344	5.00	0.00	0.0	51.9092	-28.83	3154.71	0.009
L23	55.25 - 51 (23)	TP48.3977x47.207x0.344	4.25	0.00	0.0	53.2281	-30.03	3186.39	0.009
L24	51 - 50.75 (24)	TP48.4677x48.3977x0.344	0.25	0.00	0.0	53.3057	-30.11	3188.18	0.009
L25	50.75 - 45.75 (25)	TP49.8685x48.4677x0.344	5.00	0.00	0.0	54.8573	-31.70	3222.22	0.010
L26	45.75 - 37 (26)	TP52.32x49.8685x0.344	8.75	0.00	0.0	55.4004	-32.21	3233.35	0.010
L27	37 - 36 (27)	TP51.9125x49.6708x0.406	8.00	0.00	0.0	67.3355	-36.44	4258.13	0.009
L28	36 - 31 (28)	TP53.3135x51.9125x0.406	5.00	0.00	0.0	69.1671	-38.17	4311.17	0.009
L29	31 - 26 (29)	TP54.7146x53.3135x0.406	5.00	0.00	0.0	70.9987	-39.94	4360.88	0.009
L30	26 - 21 (30)	TP56.1156x54.7146x0.406	5.00	0.00	0.0	72.8303	-41.74	4407.26	0.009
L31	21 - 16 (31)	TP57.5167x56.1156x0.406	5.00	0.00	0.0	74.6619	-43.59	4450.32	0.010
L32	16 - 11 (32)	TP58.9177x57.5167x0.406	5.00	0.00	0.0	76.4935	-45.47	4490.06	0.010
L33	11 - 6 (33)	TP60.3188x58.9177x0.406	5.00	0.00	0.0	78.3251	-47.36	4526.47	0.010
L34	6 - 1 (34)	TP61.7198x60.3188x0.406	5.00	0.00	0.0	80.1567	-49.13	4559.55	0.011
L35	1 - 0 (35)	TP62x61.7198x0.406	1.00	0.00	0.0	80.5231	-49.48	4565.77	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	159.667 - 154.667 (1)	TP20.2839x18.87x0.189	41.85	343.15	0.122	0.00	343.15	0.000
L2	154.667 - 149.667 (2)	TP21.6978x20.2839x0.189	88.29	382.10	0.231	0.00	382.10	0.000
L3	149.667 - 144.667 (3)	TP23.1117x21.6978x0.189	150.12	421.40	0.356	0.00	421.40	0.000
L4	144.667 - 139.667 (4)	TP24.5256x23.1117x0.189	218.12	460.76	0.473	0.00	460.76	0.000
L5	139.667 - 134.667 (5)	TP25.9394x24.5256x0.189	291.13	499.89	0.582	0.00	499.89	0.000
L6	134.667 - 129.667 (6)	TP27.3533x25.9394x0.189	386.55	538.48	0.718	0.00	538.48	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L7	129.667 - 123.667 (7)	TP29.05x27.3533x0.189	417.47	551.17	0.757	0.00	551.17	0.000
L8	123.667 - 123 (8)	TP28.848x27.4467x0.313	512.15	1210.59	0.423	0.00	1210.59	0.000
L9	123 - 118 (9)	TP30.2493x28.848x0.313	609.74	1311.47	0.465	0.00	1311.47	0.000
L10	118 - 113 (10)	TP31.6506x30.2493x0.313	729.86	1414.09	0.516	0.00	1414.09	0.000
L11	113 - 108 (11)	TP33.0519x31.6506x0.313	849.64	1518.16	0.560	0.00	1518.16	0.000
L12	108 - 103 (12)	TP34.4531x33.0519x0.313	972.36	1623.39	0.599	0.00	1623.39	0.000
L13	103 - 98 (13)	TP35.8544x34.4531x0.313	1098.08	1729.50	0.635	0.00	1729.50	0.000
L14	98 - 93 (14)	TP37.2557x35.8544x0.313	1226.83	1836.20	0.668	0.00	1836.20	0.000
L15	93 - 88 (15)	TP38.657x37.2557x0.313	1358.66	1943.20	0.699	0.00	1943.20	0.000
L16	88 - 83 (16)	TP40.0583x38.657x0.313	1493.59	2050.22	0.729	0.00	2050.22	0.000
L17	83 - 76.25 (17)	TP41.95x40.0583x0.313	1520.95	2071.60	0.734	0.00	2071.60	0.000
L18	76.25 - 75.25 (18)	TP41.6036x39.7125x0.344	1709.37	2498.27	0.684	0.00	2498.27	0.000
L19	75.25 - 70.25 (19)	TP43.0045x41.6036x0.344	1852.88	2627.53	0.705	0.00	2627.53	0.000
L20	70.25 - 65.25 (20)	TP44.4053x43.0045x0.344	1999.53	2756.69	0.725	0.00	2756.69	0.000
L21	65.25 - 60.25 (21)	TP45.8061x44.4053x0.344	2149.43	2885.48	0.745	0.00	2885.48	0.000
L22	60.25 - 55.25 (22)	TP47.207x45.8061x0.344	2302.84	3013.61	0.764	0.00	3013.61	0.000
L23	55.25 - 51 (23)	TP48.3977x47.207x0.344	2435.72	3121.78	0.780	0.00	3121.78	0.000
L24	51 - 50.75 (24)	TP48.4677x48.3977x0.344	2443.61	3128.13	0.781	0.00	3128.13	0.000
L25	50.75 - 45.75 (25)	TP49.8685x48.4677x0.344	2603.28	3254.20	0.800	0.00	3254.20	0.000
L26	45.75 - 37 (26)	TP52.32x49.8685x0.344	2659.91	3297.99	0.807	0.00	3297.99	0.000
L27	37 - 36 (27)	TP51.9125x49.6708x0.406	2924.11	4468.34	0.654	0.00	4468.34	0.000
L28	36 - 31 (28)	TP53.3135x51.9125x0.406	3093.42	4648.02	0.666	0.00	4648.02	0.000
L29	31 - 26 (29)	TP54.7146x53.3135x0.406	3265.64	4827.06	0.677	0.00	4827.06	0.000
L30	26 - 21 (30)	TP56.1156x54.7146x0.406	3440.78	5005.19	0.687	0.00	5005.19	0.000
L31	21 - 16 (31)	TP57.5167x56.1156x0.406	3618.90	5182.12	0.698	0.00	5182.12	0.000
L32	16 - 11 (32)	TP58.9177x57.5167x0.406	3800.03	5357.55	0.709	0.00	5357.55	0.000
L33	11 - 6 (33)	TP60.3188x58.9177x0.406	3984.19	5531.22	0.720	0.00	5531.22	0.000
L34	6 - 1 (34)	TP61.7198x60.3188x0.406	4171.46	5702.81	0.731	0.00	5702.81	0.000
L35	1 - 0 (35)	TP62x61.7198x0.406	4209.29	5736.86	0.734	0.00	5736.86	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	159.667 - 154.667 (1)	TP20.2839x18.87x0.189	8.07	419.72	0.019	0.14	695.80	0.000
L2	154.667 - 149.667 (2)	TP21.6978x20.2839x0.189	12.13	436.37	0.028	0.17	774.78	0.000
L3	149.667 - 144.667 (3)	TP23.1117x21.6978x0.189	12.60	451.33	0.028	0.17	854.48	0.000
L4	144.667 - 139.667 (4)	TP24.5256x23.1117x0.189	14.33	464.59	0.031	0.79	934.28	0.001
L5	139.667 - 134.667 (5)	TP25.9394x24.5256x0.189	14.87	476.16	0.031	0.26	1013.61	0.000
L6	134.667 - 129.667 (6)	TP27.3533x25.9394x0.189	18.46	486.04	0.038	0.25	1091.86	0.000
L7	129.667 -	TP29.05x27.3533x0.189	18.64	488.96	0.038	0.25	1117.61	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L8	123.667 (7) 123.667 - 123 (8)	TP28.848x27.4467x0.313	19.23	1044.37	0.018	0.25	2454.71	0.000
L9	123 - 118 (9)	TP30.2493x28.848x0.313	19.80	1077.89	0.018	0.25	2659.26	0.000
L10	118 - 113 (10)	TP31.6506x30.2493x0.313	23.67	1109.74	0.021	0.01	2867.33	0.000
L11	113 - 108 (11)	TP33.0519x31.6506x0.313	24.25	1139.94	0.021	0.01	3078.35	0.000
L12	108 - 103 (12)	TP34.4531x33.0519x0.313	24.84	1168.47	0.021	0.01	3291.72	0.000
L13	103 - 98 (13)	TP35.8544x34.4531x0.313	25.45	1195.33	0.021	0.01	3506.88	0.000
L14	98 - 93 (14)	TP37.2557x35.8544x0.313	26.06	1220.53	0.021	0.01	3723.24	0.000
L15	93 - 88 (15)	TP38.657x37.2557x0.313	26.68	1244.07	0.021	0.01	3940.21	0.000
L16	88 - 83 (16)	TP40.0583x38.657x0.313	27.30	1265.95	0.022	0.01	4157.21	0.000
L17	83 - 76.25 (17)	TP41.95x40.0583x0.313	27.43	1270.13	0.022	0.01	4200.56	0.000
L18	76.25 - 75.25 (18)	TP41.6036x39.7125x0.344	28.39	1486.67	0.019	0.01	5065.71	0.000
L19	75.25 - 70.25 (19)	TP43.0045x41.6036x0.344	29.02	1511.83	0.019	0.01	5327.80	0.000
L20	70.25 - 65.25 (20)	TP44.4053x43.0045x0.344	29.65	1535.34	0.019	0.01	5589.71	0.000
L21	65.25 - 60.25 (21)	TP45.8061x44.4053x0.344	30.37	1557.18	0.020	0.01	5850.86	0.000
L22	60.25 - 55.25 (22)	TP47.207x45.8061x0.344	31.00	1577.35	0.020	0.01	6110.67	0.000
L23	55.25 - 51 (23)	TP48.3977x47.207x0.344	31.54	1593.20	0.020	0.01	6330.01	0.000
L24	51 - 50.75 (24)	TP48.4677x48.3977x0.344	31.56	1594.09	0.020	0.01	6342.86	0.000
L25	50.75 - 45.75 (25)	TP49.8685x48.4677x0.344	32.26	1611.11	0.020	0.01	6598.51	0.000
L26	45.75 - 37 (26)	TP52.32x49.8685x0.344	32.48	1616.68	0.020	0.01	6687.30	0.000
L27	37 - 36 (27)	TP51.9125x49.6708x0.406	33.57	2129.07	0.016	0.01	9060.42	0.000
L28	36 - 31 (28)	TP53.3135x51.9125x0.406	34.16	2155.58	0.016	0.01	9424.75	0.000
L29	31 - 26 (29)	TP54.7146x53.3135x0.406	34.74	2180.44	0.016	0.01	9787.75	0.000
L30	26 - 21 (30)	TP56.1156x54.7146x0.406	35.33	2203.63	0.016	0.01	10149.00	0.000
L31	21 - 16 (31)	TP57.5167x56.1156x0.406	35.92	2225.16	0.016	0.01	10507.75	0.000
L32	16 - 11 (32)	TP58.9177x57.5167x0.406	36.53	2245.03	0.016	0.01	10863.42	0.000
L33	11 - 6 (33)	TP60.3188x58.9177x0.406	37.15	2263.23	0.016	0.01	11215.58	0.000
L34	6 - 1 (34)	TP61.7198x60.3188x0.406	37.78	2279.78	0.017	0.01	11563.50	0.000
L35	1 - 0 (35)	TP62x61.7198x0.406	37.91	2282.88	0.017	0.01	11632.58	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	159.667 - 154.667 (1)	0.003	0.122	0.000	0.019	0.000	0.126 ✔	1.000	4.8.2 ✔
L2	154.667 - 149.667 (2)	0.006	0.231	0.000	0.028	0.000	0.238 ✔	1.000	4.8.2 ✔
L3	149.667 - 144.667 (3)	0.006	0.356	0.000	0.028	0.000	0.363 ✔	1.000	4.8.2 ✔
L4	144.667 - 139.667 (4)	0.007	0.473	0.000	0.031	0.001	0.482 ✔	1.000	4.8.2 ✔
L5	139.667 - 134.667 (5)	0.007	0.582	0.000	0.031	0.000	0.591 ✔	1.000	4.8.2 ✔
L6	134.667 -	0.009	0.718	0.000	0.038	0.000	0.728	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	129.667 (6)						✔		
L7	129.667 - 123.667 (7)	0.009	0.757	0.000	0.038	0.000	0.768 ✔	1.000	4.8.2 ✔
L8	123.667 - 123 (8)	0.005	0.423	0.000	0.018	0.000	0.428 ✔	1.000	4.8.2 ✔
L9	123 - 118 (9)	0.005	0.465	0.000	0.018	0.000	0.470 ✔	1.000	4.8.2 ✔
L10	118 - 113 (10)	0.006	0.516	0.000	0.021	0.000	0.523 ✔	1.000	4.8.2 ✔
L11	113 - 108 (11)	0.007	0.560	0.000	0.021	0.000	0.567 ✔	1.000	4.8.2 ✔
L12	108 - 103 (12)	0.007	0.599	0.000	0.021	0.000	0.606 ✔	1.000	4.8.2 ✔
L13	103 - 98 (13)	0.007	0.635	0.000	0.021	0.000	0.643 ✔	1.000	4.8.2 ✔
L14	98 - 93 (14)	0.008	0.668	0.000	0.021	0.000	0.676 ✔	1.000	4.8.2 ✔
L15	93 - 88 (15)	0.008	0.699	0.000	0.021	0.000	0.707 ✔	1.000	4.8.2 ✔
L16	88 - 83 (16)	0.008	0.729	0.000	0.022	0.000	0.737 ✔	1.000	4.8.2 ✔
L17	83 - 76.25 (17)	0.008	0.734	0.000	0.022	0.000	0.743 ✔	1.000	4.8.2 ✔
L18	76.25 - 75.25 (18)	0.008	0.684	0.000	0.019	0.000	0.692 ✔	1.000	4.8.2 ✔
L19	75.25 - 70.25 (19)	0.008	0.705	0.000	0.019	0.000	0.714 ✔	1.000	4.8.2 ✔
L20	70.25 - 65.25 (20)	0.008	0.725	0.000	0.019	0.000	0.734 ✔	1.000	4.8.2 ✔
L21	65.25 - 60.25 (21)	0.009	0.745	0.000	0.020	0.000	0.754 ✔	1.000	4.8.2 ✔
L22	60.25 - 55.25 (22)	0.009	0.764	0.000	0.020	0.000	0.774 ✔	1.000	4.8.2 ✔
L23	55.25 - 51 (23)	0.009	0.780	0.000	0.020	0.000	0.790 ✔	1.000	4.8.2 ✔
L24	51 - 50.75 (24)	0.009	0.781	0.000	0.020	0.000	0.791 ✔	1.000	4.8.2 ✔
L25	50.75 - 45.75 (25)	0.010	0.800	0.000	0.020	0.000	0.810 ✔	1.000	4.8.2 ✔
L26	45.75 - 37 (26)	0.010	0.807	0.000	0.020	0.000	0.817 ✔	1.000	4.8.2 ✔
L27	37 - 36 (27)	0.009	0.654	0.000	0.016	0.000	0.663 ✔	1.000	4.8.2 ✔
L28	36 - 31 (28)	0.009	0.666	0.000	0.016	0.000	0.675 ✔	1.000	4.8.2 ✔
L29	31 - 26 (29)	0.009	0.677	0.000	0.016	0.000	0.686 ✔	1.000	4.8.2 ✔
L30	26 - 21 (30)	0.009	0.687	0.000	0.016	0.000	0.697 ✔	1.000	4.8.2 ✔
L31	21 - 16 (31)	0.010	0.698	0.000	0.016	0.000	0.708 ✔	1.000	4.8.2 ✔
L32	16 - 11 (32)	0.010	0.709	0.000	0.016	0.000	0.720 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L33	11 - 6 (33)	0.010	0.720	0.000	0.016	0.000	0.731 ✔	1.000	4.8.2 ✔
L34	6 - 1 (34)	0.011	0.731	0.000	0.017	0.000	0.743 ✔	1.000	4.8.2 ✔
L35	1 - 0 (35)	0.011	0.734	0.000	0.017	0.000	0.745 ✔	1.000	4.8.2 ✔

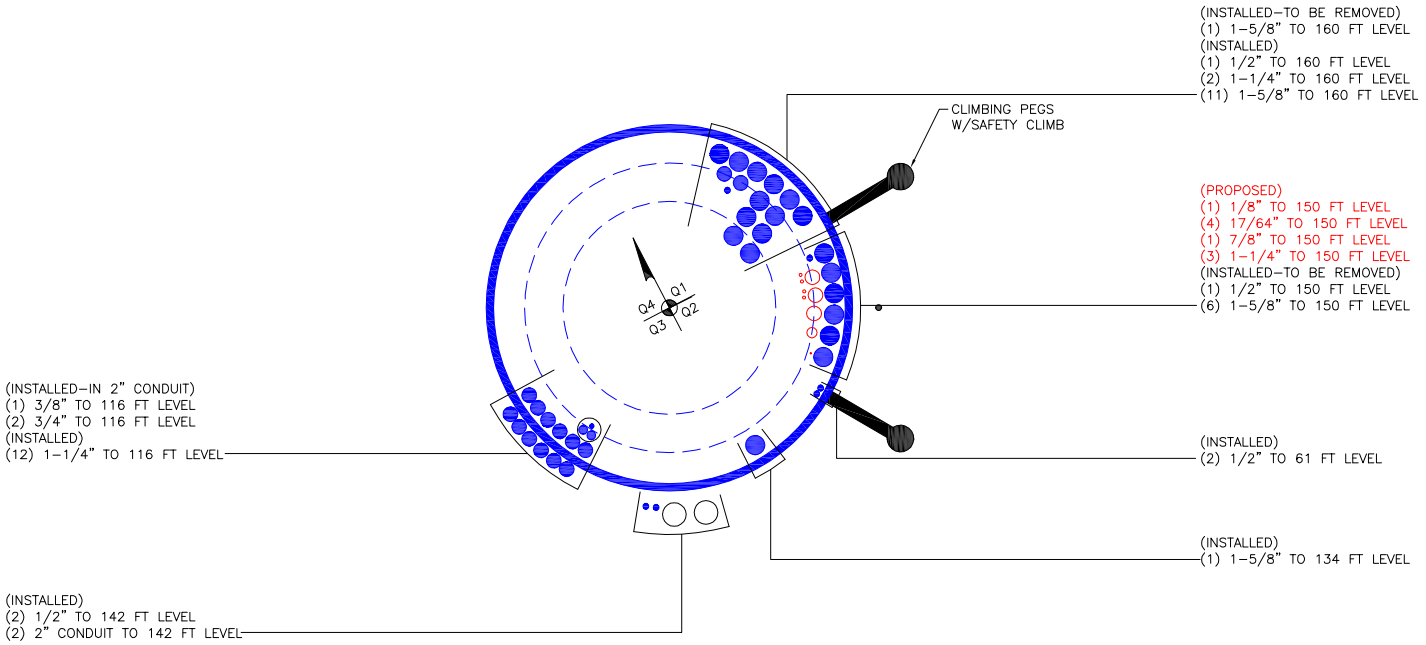
Section Capacity Table

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
159.67 - 154.67	Pole	TP20.284x18.87x0.189	Pole	12.5%	Pass
154.67 - 149.67	Pole	TP21.698x20.284x0.189	Pole	23.7%	Pass
149.67 - 144.67	Pole	TP23.112x21.698x0.189	Pole	36.2%	Pass
144.67 - 139.67	Pole	TP24.526x23.112x0.189	Pole	48.0%	Pass
139.67 - 134.67	Pole	TP25.939x24.526x0.189	Pole	58.9%	Pass
134.67 - 129.67	Pole	TP27.353x25.939x0.189	Pole	72.7%	Pass
129.67 - 128	Pole	TP29.05x27.353x0.189	Pole	76.6%	Pass
128 - 123	Pole	TP28.848x27.447x0.313	Pole	42.7%	Pass
123 - 118	Pole	TP30.249x28.848x0.313	Pole	46.9%	Pass
118 - 113	Pole	TP31.651x30.249x0.313	Pole	52.2%	Pass
113 - 108	Pole	TP33.052x31.651x0.313	Pole	56.5%	Pass
108 - 103	Pole	TP34.453x33.052x0.313	Pole	60.5%	Pass
103 - 98	Pole	TP35.854x34.453x0.313	Pole	64.1%	Pass
98 - 93	Pole	TP37.256x35.854x0.313	Pole	67.4%	Pass
93 - 88	Pole	TP38.657x37.256x0.313	Pole	70.6%	Pass
88 - 83	Pole	TP40.058x38.657x0.313	Pole	73.5%	Pass
83 - 82	Pole	TP41.95x40.058x0.313	Pole	74.1%	Pass
82 - 75.25	Pole	TP41.604x39.713x0.344	Pole	69.1%	Pass
75.25 - 70.25	Pole	TP43.004x41.604x0.344	Pole	71.2%	Pass
70.25 - 65.25	Pole	TP44.405x43.004x0.344	Pole	73.2%	Pass
65.25 - 60.25	Pole	TP45.806x44.405x0.344	Pole	75.2%	Pass

60.25 - 55.25	Pole	TP47.207x45.806x0.344	Pole	77.2%	Pass
55.25 - 51	Pole	TP48.398x47.207x0.344	Pole	78.8%	Pass
51 - 50.75	Pole	TP48.468x48.398x0.344	Pole	78.9%	Pass
50.75 - 45.75	Pole	TP49.869x48.468x0.344	Pole	80.8%	Pass
45.75 - 44	Pole	TP52.32x49.869x0.344	Pole	81.5%	Pass
44 - 36	Pole	TP51.913x49.671x0.406	Pole	66.1%	Pass
36 - 31	Pole	TP53.314x51.913x0.406	Pole	67.3%	Pass
31 - 26	Pole	TP54.715x53.314x0.406	Pole	68.4%	Pass
26 - 21	Pole	TP56.116x54.715x0.406	Pole	69.5%	Pass
21 - 16	Pole	TP57.517x56.116x0.406	Pole	70.7%	Pass
16 - 11	Pole	TP58.918x57.517x0.406	Pole	71.8%	Pass
11 - 6	Pole	TP60.319x58.918x0.406	Pole	72.9%	Pass
6 - 1	Pole	TP61.72x60.319x0.406	Pole	74.1%	Pass
1 - 0	Pole	TP62x61.72x0.406	Pole	74.3%	Pass
				Summary	
			Pole	81.5%	Pass
			Reinforcement	0.0%	Pass
			Overall	**81.5%**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806382 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

CCIpole

per TIA-222- G

Site BU: 806382

Work Order: 1325410

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	159.667	36	4.333	12	18.87	29.05	0.189	0.756	A572-65
2	128	51.75	5.75	12	27.45	41.95	0.313	1.252	A572-65
3	82	45	7	12	39.71	52.32	0.344	1.376	A572-65
4	44	44	0	12	49.67	62	0.406	1.624	A572-65

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
1	44	51	plate	CCI-SFP-045100	3			1				1				1	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

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	4.5	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	159.667 - 154.667	5		12	18.870	20.284	0.189	A572-65	1.000
2	154.667 - 149.667	5		12	20.284	21.698	0.189	A572-65	1.000
3	149.667 - 144.667	5		12	21.698	23.112	0.189	A572-65	1.000
4	144.667 - 139.667	5		12	23.112	24.526	0.189	A572-65	1.000
5	139.667 - 134.667	5		12	24.526	25.939	0.189	A572-65	1.000
6	134.667 - 129.667	5		12	25.939	27.353	0.189	A572-65	1.000
7	129.667 - 128	6	4.333	12	27.353	29.050	0.189	A572-65	1.000
8	128 - 123	5		12	27.447	28.848	0.313	A572-65	1.000
9	123 - 118	5		12	28.848	30.249	0.313	A572-65	1.000
10	118 - 113	5		12	30.249	31.651	0.313	A572-65	1.000
11	113 - 108	5		12	31.651	33.052	0.313	A572-65	1.000
12	108 - 103	5		12	33.052	34.453	0.313	A572-65	1.000
13	103 - 98	5		12	34.453	35.854	0.313	A572-65	1.000
14	98 - 93	5		12	35.854	37.256	0.313	A572-65	1.000
15	93 - 88	5		12	37.256	38.657	0.313	A572-65	1.000
16	88 - 83	5		12	38.657	40.058	0.313	A572-65	1.000
17	83 - 82	6.75	5.75	12	40.058	41.950	0.313	A572-65	1.000
18	82 - 75.25	6.75		12	39.713	41.604	0.344	A572-65	1.000
19	75.25 - 70.25	5		12	41.604	43.004	0.344	A572-65	1.000
20	70.25 - 65.25	5		12	43.004	44.405	0.344	A572-65	1.000
21	65.25 - 60.25	5		12	44.405	45.806	0.344	A572-65	1.000
22	60.25 - 55.25	5		12	45.806	47.207	0.344	A572-65	1.000
23	55.25 - 51	4.25		12	47.207	48.398	0.344	A572-65	1.000
24	51 - 50.75	0.25		12	48.398	48.468	0.344	A572-65	1.000
25	50.75 - 45.75	5		12	48.468	49.869	0.344	A572-65	1.000
26	45.75 - 44	8.75	7	12	49.869	52.320	0.344	A572-65	1.000
27	44 - 36	8		12	49.671	51.913	0.406	A572-65	1.000
28	36 - 31	5		12	51.913	53.314	0.406	A572-65	1.000
29	31 - 26	5		12	53.314	54.715	0.406	A572-65	1.000
30	26 - 21	5		12	54.715	56.116	0.406	A572-65	1.000
31	21 - 16	5		12	56.116	57.517	0.406	A572-65	1.000
32	16 - 11	5		12	57.517	58.918	0.406	A572-65	1.000
33	11 - 6	5		12	58.918	60.319	0.406	A572-65	1.000
34	6 - 1	5		12	60.319	61.720	0.406	A572-65	1.000
35	1 - 0	1		12	61.720	62.000	0.406	A572-65	1.000

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	159.667 - 154.667	2.8013	41.847	8.0744
2	154.667 - 149.667	5.2627	88.293	12.134
3	149.667 - 144.667	5.6671	150.12	12.598
4	144.667 - 139.667	6.6241	218.12	14.332
5	139.667 - 134.667	7.1254	291.14	14.875
6	134.667 - 129.667	8.9133	386.55	18.462
7	129.667 - 128	9.1008	417.47	18.636
8	128 - 123	10.173	512.15	19.231
9	123 - 118	10.986	609.74	19.8
10	118 - 113	14.301	729.86	23.666
11	113 - 108	15.26	849.64	24.251
12	108 - 103	16.255	972.36	24.845
13	103 - 98	17.283	1098.1	25.448
14	98 - 93	18.346	1226.8	26.06
15	93 - 88	19.441	1358.7	26.678
16	88 - 83	20.569	1493.6	27.302
17	83 - 82	20.799	1521	27.427
18	82 - 75.25	23.364	1709.4	28.39
19	75.25 - 70.25	24.64	1852.9	29.02
20	70.25 - 65.25	25.951	1999.5	29.652
21	65.25 - 60.25	27.449	2149.4	30.374
22	60.25 - 55.25	28.83	2302.8	31.003
23	55.25 - 51	30.03	2435.7	31.535
24	51 - 50.75	30.112	2443.6	31.558
25	50.75 - 45.75	31.703	2603.3	32.259
26	45.75 - 44	32.208	2659.9	32.477
27	44 - 36	36.445	2924.1	33.571
28	36 - 31	38.172	3093.4	34.16
29	31 - 26	39.938	3265.6	34.738
30	26 - 21	41.742	3440.8	35.326
31	21 - 16	43.585	3618.9	35.925
32	16 - 11	45.467	3800	36.534
33	11 - 6	47.363	3984.2	37.153
34	6 - 1	49.13	4171.5	37.782
35	1 - 0	49.479	4209.3	37.909

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
159.67 - 154.67	Pole	TP20.284x18.87x0.189	Pole	12.5%	Pass
154.67 - 149.67	Pole	TP21.698x20.284x0.189	Pole	23.7%	Pass
149.67 - 144.67	Pole	TP23.112x21.698x0.189	Pole	36.2%	Pass
144.67 - 139.67	Pole	TP24.526x23.112x0.189	Pole	48.0%	Pass
139.67 - 134.67	Pole	TP25.939x24.526x0.189	Pole	58.9%	Pass
134.67 - 129.67	Pole	TP27.353x25.939x0.189	Pole	72.7%	Pass
129.67 - 128	Pole	TP29.05x27.353x0.189	Pole	76.6%	Pass
128 - 123	Pole	TP28.848x27.447x0.313	Pole	42.7%	Pass
123 - 118	Pole	TP30.249x28.848x0.313	Pole	46.9%	Pass
118 - 113	Pole	TP31.651x30.249x0.313	Pole	52.2%	Pass
113 - 108	Pole	TP33.052x31.651x0.313	Pole	56.5%	Pass
108 - 103	Pole	TP34.453x33.052x0.313	Pole	60.5%	Pass
103 - 98	Pole	TP35.854x34.453x0.313	Pole	64.1%	Pass
98 - 93	Pole	TP37.256x35.854x0.313	Pole	67.4%	Pass
93 - 88	Pole	TP38.657x37.256x0.313	Pole	70.6%	Pass
88 - 83	Pole	TP40.058x38.657x0.313	Pole	73.5%	Pass
83 - 82	Pole	TP41.95x40.058x0.313	Pole	74.1%	Pass
82 - 75.25	Pole	TP41.604x39.713x0.344	Pole	69.1%	Pass
75.25 - 70.25	Pole	TP43.004x41.604x0.344	Pole	71.2%	Pass
70.25 - 65.25	Pole	TP44.405x43.004x0.344	Pole	73.2%	Pass
65.25 - 60.25	Pole	TP45.806x44.405x0.344	Pole	75.2%	Pass
60.25 - 55.25	Pole	TP47.207x45.806x0.344	Pole	77.2%	Pass
55.25 - 51	Pole	TP48.398x47.207x0.344	Pole	78.8%	Pass
51 - 50.75	Pole	TP48.468x48.398x0.344	Pole	78.9%	Pass
50.75 - 45.75	Pole	TP49.869x48.468x0.344	Pole	80.8%	Pass
45.75 - 44	Pole	TP52.32x49.869x0.344	Pole	81.5%	Pass
44 - 36	Pole	TP51.913x49.671x0.406	Pole	66.1%	Pass
36 - 31	Pole	TP53.314x51.913x0.406	Pole	67.3%	Pass
31 - 26	Pole	TP54.715x53.314x0.406	Pole	68.4%	Pass
26 - 21	Pole	TP56.116x54.715x0.406	Pole	69.5%	Pass
21 - 16	Pole	TP57.517x56.116x0.406	Pole	70.7%	Pass
16 - 11	Pole	TP58.918x57.517x0.406	Pole	71.8%	Pass
11 - 6	Pole	TP60.319x58.918x0.406	Pole	72.9%	Pass
6 - 1	Pole	TP61.72x60.319x0.406	Pole	74.1%	Pass
1 - 0	Pole	TP62x61.72x0.406	Pole	74.3%	Pass
				Summary	
			Pole	81.5%	Pass
			Reinforcement	0.0%	Pass
			Overall	81.5%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity	
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1
159.67 - 154.67	631	n/a	631	12.21	n/a	12.21	12.5%	
154.67 - 149.67	774	n/a	774	13.07	n/a	13.07	23.7%	
149.67 - 144.67	937	n/a	937	13.93	n/a	13.93	36.2%	
144.67 - 139.67	1121	n/a	1121	14.79	n/a	14.79	48.0%	
139.67 - 134.67	1328	n/a	1328	15.65	n/a	15.65	58.9%	
134.67 - 129.67	1559	n/a	1559	16.51	n/a	16.51	72.7%	
129.67 - 128	1642	n/a	1642	16.79	n/a	16.79	76.6%	
128 - 123	2993	n/a	2993	28.72	n/a	28.72	42.7%	
123 - 118	3456	n/a	3456	30.13	n/a	30.13	46.9%	
118 - 113	3964	n/a	3964	31.54	n/a	31.54	52.2%	
113 - 108	4520	n/a	4520	32.95	n/a	32.95	56.5%	
108 - 103	5126	n/a	5126	34.36	n/a	34.36	60.5%	
103 - 98	5783	n/a	5783	35.77	n/a	35.77	64.1%	
98 - 93	6495	n/a	6495	37.18	n/a	37.18	67.4%	
93 - 88	7262	n/a	7262	38.59	n/a	38.59	70.6%	
88 - 83	8088	n/a	8088	40.00	n/a	40.00	73.5%	
83 - 82	8260	n/a	8260	40.28	n/a	40.28	74.1%	
82 - 75.25	9944	n/a	9944	45.64	n/a	45.64	69.1%	
75.25 - 70.25	10992	n/a	10992	47.19	n/a	47.19	71.2%	
70.25 - 65.25	12110	n/a	12110	48.74	n/a	48.74	73.2%	
65.25 - 60.25	13302	n/a	13302	50.29	n/a	50.29	75.2%	
60.25 - 55.25	14570	n/a	14570	51.83	n/a	51.83	77.2%	
55.25 - 51	15709	n/a	15709	53.15	n/a	53.15	78.8%	
51 - 50.75	15778	n/a	15778	53.23	n/a	53.23	78.9%	
50.75 - 45.75	17197	n/a	17197	54.78	n/a	54.78	80.8%	
45.75 - 44	17712	n/a	17712	55.32	n/a	55.32	81.5%	
44 - 36	22832	n/a	22832	67.24	n/a	67.24	66.1%	
36 - 31	24746	n/a	24746	69.07	n/a	69.07	67.3%	
31 - 26	26764	n/a	26764	70.90	n/a	70.90	68.4%	
26 - 21	28889	n/a	28889	72.73	n/a	72.73	69.5%	
21 - 16	31124	n/a	31124	74.56	n/a	74.56	70.7%	
16 - 11	33472	n/a	33472	76.38	n/a	76.38	71.8%	
11 - 6	35934	n/a	35934	78.21	n/a	78.21	72.9%	
6 - 1	38514	n/a	38514	80.04	n/a	80.04	74.1%	
1 - 0	39045	n/a	39045	80.41	n/a	80.41	74.3%	

Note: Section capacity checked in 5 degree increments.

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#:	*806382*
Site Name:	*HRT 082 943274*
App #:	*366727 Rev. 2*
Pole Manufacturer:	*Other*

Reactions		
Mu:	4209.29	ft-kips
Axial, Pu:	49.49	kips
Shear, Vu:	37.91	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	70.69	in

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

Anchor Rod Results

Max Rod (Cu+ Vu/ή):	186.5 Kips	Rigid
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	AISC LRFD
Anchor Rod Stress Ratio:	71.7% **Pass**	φ*Tn

Plate Data		
Diam:	76.69	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	12.46	in

Base Plate Results Flexural Check

Base Plate Stress:	21.0 ksi	Rigid
Allowable Plate Stress:	54.0 ksi	AISC LRFD
Base Plate Stress Ratio:	38.8% **Pass**	φ*Fy
		Y.L. Length: 33.96

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

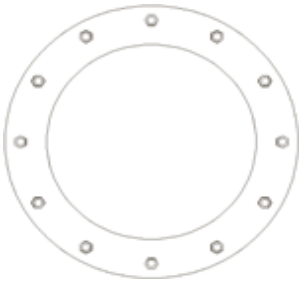
Stiffener Results

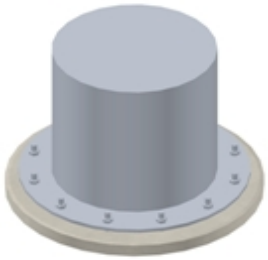
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Diam:	62	in
Thick:	0.40625	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	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

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

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

Site Data

BU#: *806328*
Site Name: *HRT 082 943274*
App #: *366727 Rev. 2*

Loads Already Factored		
For M (WL)	1.3	<----Disregard
For P (DL)	1.3	<----Disregard

Pier Properties

Concrete:

Pier Diameter =	7.5	ft
Concrete Area =	6361.7	in^2

Reinforcement:

Clear Cover to **Tie**=	4.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	6.61	ft
Vert. Cage Diameter =	79.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	36	
As Total=	56.16	in^2
A s/ Aconc, Rho:	0.0088	0.88%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:
(3)*(Sqrt(f'c)/Fy: 0.0032
200 / Fy: 0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.88%	**OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	12900.43	kips
at Mu=(ϕ=0.65)Mn=	8378.42	ft-kips
Max Tu, (φ=0.9) Tn =	3032.64	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	G	
Max. Factored Shaft Mu:	4690.91	ft-kips **(* Note)**
Max. Factored Shaft Pu:	49.49	kips
Max Axial Force Type:	Comp.	

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

Load Factor	Shaft Factored Loads		
1.00	Mu:	4690.91	ft-kips
1.00	Pu:	49.49	kips

Material Properties

Concrete Comp. strength, f'c =	4000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code=	2008	

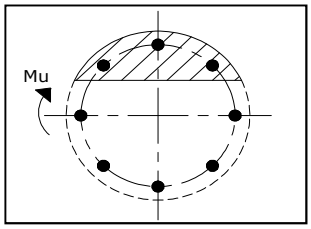
Seismic Properties

Seismic Design Category =	B	
Seismic Risk =	**Low**	

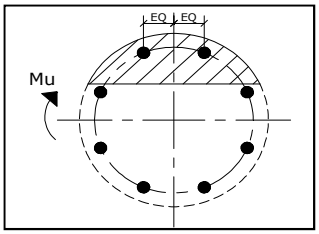
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis:	**15.60**	in
Extreme Steel Strain, ϵt:	**0.0133**	
	ϵt > 0.0050, Tension Controlled	
Reduction Factor,φ:	**0.900**	

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	47.77	kips
Drilled Shaft Moment Capacity, φMn:	**9327.94**	ft-kips
Drilled Shaft Superimposed Mu:	**4690.91**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**50.3%**

Caisson Analysis (G)

806382

017-00013-00

Moment =	4209.29	k*ft
Axial =	49.49	k
Shear =	37.91	k

Foundation Data		
Diameter =	7.5	ft
Length =	20.5	ft
Rebar Size =	#11	
# of bars =	36	
Tie Size =	#5	
Clear Cover =	4	in
f'c =	4	ksi

Soil Capacity From Caisson Program Using Additional Safety Factors

Additional Safety Factor from Caisson = 1.8

Phi (Soil) = 0.75

$$\text{Capacity} = \frac{1/\text{phi(soil)}}{\text{Additional Safety Factor}} = \frac{1.33}{1.80} = 73.9\%$$ **O.K.**

Project Title: BU# 803682 HRT 082 943274
Project Notes: 017-00013-00

Calculation Method: Full 8CD

******* I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
7.50	0.50	4.00	60.00

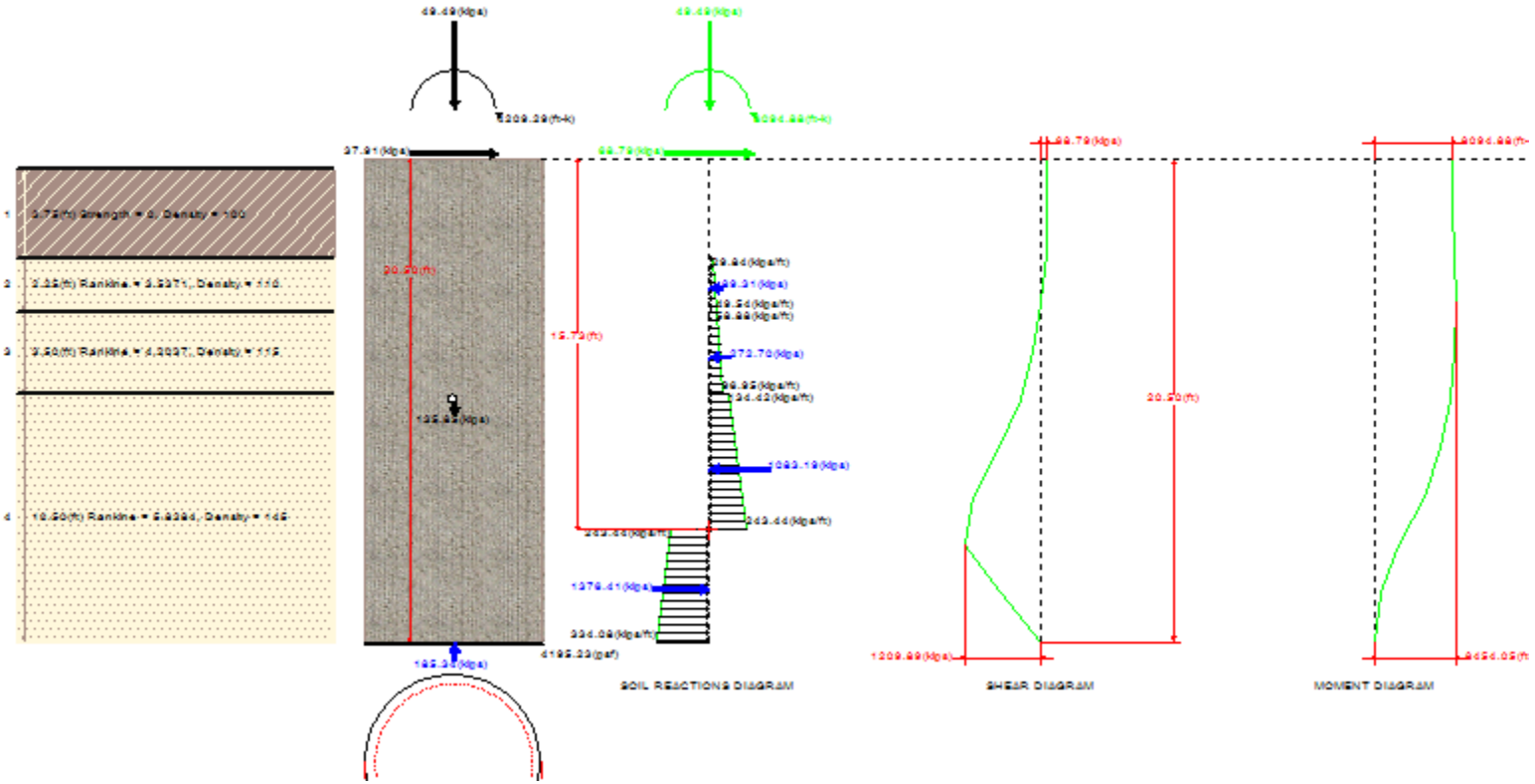
Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	3.75	0.00	100.0			
2	Sand	2.25	3.75	110.0		3.537	34.00
3	Sand	3.50	6.00	115.0		4.204	38.00
4	Sand	10.50	9.50	145.0		5.828	45.00

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
4209.3	49.5	37.91	1.80

******* R E S U L T S



Calculated Pier Properties

Length (ft)	Weight (kips)	Pressure Due To Axial Load (psf)	Pressure Due To Weight (psf)	Total End-Bearing Pressure (psf)
20.500	135.849	1120.2	3075.0	4195.2

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)

Clay	0.50	3.75	100.0		0.00	2.38
Sand	4.25	2.25	110.0	3.537	89.31	5.47
Sand	6.50	3.50	115.0	4.204	272.70	8.39
Sand	10.00	5.73	145.0	5.828	1083.19	13.14
Sand	15.73	4.77	145.0	5.828	-1376.41	18.24

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
0.00	68.8	8094.9	38.2	4497.2
2.05	68.8	8235.9	38.2	4575.5
4.10	68.8	8376.9	38.2	4653.8
6.15	-3.7	8454.0	-2.1	4696.7
8.20	-136.3	8321.0	-75.7	4622.8
10.25	-327.4	7862.1	-181.9	4367.8
12.30	-652.7	6871.2	-362.6	3817.3
14.35	-1057.8	5131.5	-587.7	2850.9
16.40	-1209.9	2589.5	-672.2	1438.6
18.45	-644.9	674.7	-358.3	374.8
20.50	0.0	-0.0	0.0	-0.0

Reinforcement and Capacity

Total Reinforcement Percent	Reinforcement Area (in^2)	Usable Axial Capacity (kips)	Usable Moment Capacity (ft-k)
0.44	27.99	49.5	4763.8

US Standard Re-Bars (Select one of the following)

Quantity	Name	Area (in^2)	Diameter (in)	Spacing (in)
140	#4	0.20	0.500	1.80
91	#5	0.31	0.625	2.76
64	#6	0.44	0.750	3.93
47	#7	0.60	0.875	5.35
36	#8	0.79	1.000	6.98
28	#9	1.00	1.128	8.98

23	#10	1.27	1.270	10.93
18	#11	1.56	1.410	13.96
13	#14	2.25	1.693	19.33

RF EMISSIONS COMPLIANCE REPORT

Crown Castle on behalf of Sprint

Crown Castle BUN: 806382
Application ID: 366727
Site Name: HRT 082 943274
74 Goodrich Lane
Portland, CT 06480
12/7/2016

Report Status:

Sprint Is Compliant.

Prepared By:

Sitesafe, Inc.

200 North Glebe Road, Suite 1000 Arlington, VA 22203 Voice 703-276-1100
Fax 703-276-1169

Engineering Statement in Re:
Electromagnetic Energy Analysis
Sprint
Portland, CT 06480

My signature on the cover of this document indicates:

That I am registered as a Professional Engineer in the jurisdiction indicated; and

That I have extensive professional experience in the wireless communications engineering industry; and

That I am an employee of Sitesafe, Inc. in Arlington, Virginia; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission ("the FCC" and "the FCC Rules") both in general and specifically as they apply to the FCC's Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; and

That the technical information serving as the basis for this report was supplied by Crown Castle (See attached Site Summary and Carrier documents), and that Sprint's installations involve communications equipment, antennas and associated technical equipment at a location referred to as the "HRT 082 943274" ("the site"); and

That Sprint proposes to operate at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by Sprint and shown on the worksheet, and that worst-case 100% duty cycle have been assumed; and

That this analysis has been performed with the assumption that the ground immediately surrounding the tower is primarily flat or falling; and

That at this time, the FCC requires that certain licensees address specific levels of radio-frequency energy to which workers or members of the public might possibly be exposed (at §1.1307(b) of the FCC Rules); and

That such consideration of possible exposure of humans to radio-frequency radiation must utilize the standards set by the FCC, which is the Federal Agency having jurisdiction over communications facilities; and

That the FCC rules define two tiers of permissible exposure guidelines: 1) "uncontrolled environments," defined as situations in which persons may not be aware of (the "general public"), or may not be able to control their exposure to a transmission facility; and (2) "controlled environments," which defines situations in which persons are aware of their potential for exposure (industry personnel); and

That this statement specifically addresses the uncontrolled environment (which is more conservative than the controlled environment) and the limit set forth in the FCC rules for licensees of Sprint's operating frequency as shown on the attached antenna worksheet; and

That when applying the uncontrolled environment standards, the predicted Maximum Power Density at two meters above ground level from the proposed Sprint operation is no more than 0.458% of the maximum in any accessible area on the ground and

That it is understood per FCC Guidelines and OET65 Appendix A, that regardless of the existent radio-frequency environment, only those licenses whose contributions exceed five percent of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any non-compliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the proposed operation is no more than 2.881% of the maximum in any accessible area up to two meters above the ground per OET-65; and

That the calculations provided in this report are based on data provided by the client and antenna pattern data supplied by the antenna manufacturer, in accordance with FCC guidelines listed in OET-65. Horizontal and vertical antenna patterns are combined for modeling purposes to accurately reflect the energy two meters above ground level where on-axis energy refers to maximum energy two meters above the ground along the azimuth of the antenna and where area energy refers to the maximum energy anywhere two meters above the ground regardless of the antenna azimuth, accounting for cumulative energy from multiple antennas for the carrier and frequency range indicated; and

That the Occupational Safety and Health Administration has policies in place which address worker safety in and around communications sites, thus individual companies will be responsible for their employees' training regarding Radio Frequency Safety.

In summary, it is stated here that the proposed operation at the site would not result in exposure of the Public to excessive levels of radio-frequency energy as defined in the FCC Rules and Regulations, specifically 47 CFR 1.1307 and that Sprint's proposed operation is completely compliant.

Finally, it is stated that access to the tower should be restricted to communication industry professionals, and approved contractor personnel trained in radio-frequency safety; and that the instant analysis addresses exposure levels at two meters above ground level and does not address exposure levels on the tower, or in the immediate proximity of the antennas.

Crown Castle BUN: 806382
HRT 082 943274
Site Summary

Carrier	Area Maximum Percentage MPE
AT&T Mobility	0.196 %
AT&T Mobility	0.227 %
AT&T Mobility	0.488 %
Clearwire	0.001 %
Sprint (Proposed)	0.002 %
Sprint (Proposed)	0.126 %
Sprint (Proposed)	0.267 %
Sprint (Proposed)	0.063 %
T-Mobile	0.234 %
T-Mobile	0.156 %
T-Mobile	0.212 %
Verizon Wireless	0.149 %
Verizon Wireless	0.166 %
Verizon Wireless	0.261 %
Verizon Wireless	0.333 %

Composite Site MPE: 2.881 %

AT&T Mobility
HRT 082 943274
Carrier Summary

Frequency:	737	MHz
Maximum Permissible Exposure (MPE):	491.33	µW/cm^2
Maximum power density at ground level:	0.96306	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.19601	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
KMW	AM-X-CD-16-65-VTM	120	10	1239	0.924326	0.188126	0.958498	0.195081
KMW	AM-X-CD-16-65-VTM	120	140	1239	0.926649	0.188599	0.958498	0.195081
KMW	AM-X-CD-16-65-VTM	120	260	1239	0.926649	0.188599	0.958498	0.195081

AT&T Mobility
HRT 082 943274
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	2.26566	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.22657	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Powerwave	7770	120	10	2339	0.810035	0.081003	1.852086	0.185209
Powerwave	7770	120	140	2339	0.810035	0.081003	1.852086	0.185209
Powerwave	7770	120	260	2339	0.810035	0.081003	1.852086	0.185209

AT&T Mobility
HRT 082 943274
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	2.76568	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.48806	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Powerwave	7770	120	10	1368	0.937224	0.165392	1.443629	0.254758
Powerwave	7770	120	10	547	0.374892	0.066157	0.577456	0.101904
Powerwave	7770	120	140	1368	0.93603	0.165182	1.443629	0.254758
Powerwave	7770	120	140	547	0.374415	0.066073	0.577456	0.101904
Powerwave	7770	120	260	1368	0.93603	0.165182	1.443629	0.254758
Powerwave	7770	120	260	547	0.374415	0.066073	0.577456	0.101904

Clearwire
HRT 082 943274
Carrier Summary

Frequency:	11505	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	0.00765	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.00077	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Radiowaves	HP3-11	142	190	100	0.007652	0.000765	0.007652	0.000765
Radiowaves	HP3-11	142	318	100	0.007652	0.000765	0.007652	0.000765

Sprint (Proposed)
HRT 082 943274
Carrier Summary

Frequency:	5800	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	0.02371	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.00237	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Lucent	KS24019-L112A	61	0	20	0.023705	0.00237	0.023705	0.00237
Lucent	KS24019-L112A	61	180	20	0.023705	0.00237	0.023705	0.00237

Sprint (Proposed)
HRT 082 943274
Carrier Summary

Frequency:	2500	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	1.26137	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.12614	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ARGUS	LLPX310R	152	90	1600	0.540258	0.054026	0.979149	0.097915
ARGUS	LLPX310R	152	180	1600	0.540258	0.054026	0.979149	0.097915
ARGUS	LLPX310R	152	270	1600	0.540258	0.054026	0.979149	0.097915

Sprint (Proposed)
HRT 082 943274
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	2.66553	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.26655	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVSPP18-C-A20	152	90	5072	1.066357	0.106636	1.967386	0.196739
RFS	APXVSPP18-C-A20	152	180	5072	1.066357	0.106636	1.967386	0.196739
RFS	APXVSPP18-C-A20	152	270	5072	1.066357	0.106636	1.967386	0.196739

Sprint (Proposed)
HRT 082 943274
Carrier Summary

Frequency:	862	MHz
Maximum Permissible Exposure (MPE):	574.67	µW/cm^2
Maximum power density at ground level:	0.36426	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.06339	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVSPP18-C-A20	152	90	867	0.267291	0.046512	0.273347	0.047566
RFS	APXVSPP18-C-A20	152	180	867	0.267291	0.046512	0.273347	0.047566
RFS	APXVSPP18-C-A20	152	270	867	0.267291	0.046512	0.273347	0.047566

T-Mobile
HRT 082 943274
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	2.34062	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.23406	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Ericsson	AIR 21 B4A B2P	137	75	4123	1.068788	0.106879	1.2231	0.12231
Ericsson	AIR 21 B4A B2P	137	250	4123	1.068788	0.106879	1.2231	0.12231
Ericsson	AIR 21 B4A B2P	137	315	4123	1.068788	0.106879	1.2231	0.12231

T-Mobile
HRT 082 943274
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	1.56041	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.15604	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Ericsson	AIR 21 B4A B2P	137	75	2748	0.712525	0.071252	0.815399	0.08154
Ericsson	AIR 21 B4A B2P	137	250	2748	0.712525	0.071252	0.815399	0.08154
Ericsson	AIR 21 B4A B2P	137	315	2748	0.712525	0.071252	0.815399	0.08154

T-Mobile
HRT 082 943274
Carrier Summary

Frequency:	728	MHz
Maximum Permissible Exposure (MPE):	485.33	µW/cm^2
Maximum power density at ground level:	1.02863	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.21194	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	SBNH-1D65C	137	75	745	0.319813	0.065896	0.540945	0.111458
ANDREW	SBNH-1D65C	137	250	745	0.319813	0.065896	0.540945	0.111458
ANDREW	SBNH-1D65C	137	315	745	0.319813	0.065896	0.540945	0.111458

Verizon Wireless
HRT 082 943274
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	1.4933	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.14933	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	SBNHH-1D65B	160	340	2577	0.850577	0.085058	1.320192	0.132019
ANDREW	SBNHH-1D65B	160	100	2577	0.849169	0.084917	1.320191	0.132019
ANDREW	SBNHH-1D65B	160	200	2577	0.849169	0.084917	1.320192	0.132019

Verizon Wireless
HRT 082 943274
Carrier Summary

Frequency:	751	MHz
Maximum Permissible Exposure (MPE):	500.67	µW/cm^2
Maximum power density at ground level:	0.83175	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.16613	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	SBNHH-1D65B	160	340	1021	0.287829	0.057489	0.463803	0.092637
ANDREW	SBNHH-1D65B	160	100	1021	0.287829	0.057489	0.463803	0.092637
ANDREW	SBNHH-1D65B	160	200	1021	0.288196	0.057562	0.463804	0.092637

Verizon Wireless
HRT 082 943274
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	2.60585	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.26058	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	HBXX-6517DS-VTM	160	340	4189	0.882878	0.088288	1.588833	0.158883
ANDREW	HBXX-6517DS-VTM	160	100	4189	0.887729	0.088773	1.588833	0.158883
ANDREW	HBXX-6517DS-VTM	160	200	4189	0.887729	0.088773	1.588833	0.158883

Verizon Wireless
HRT 082 943274
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	1.88859	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.33328	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	DB846H80ESX	160	340	3617	1.010213	0.178273	1.263463	0.222964
ANDREW	DB846H80ESX	160	100	3617	1.010213	0.178273	1.263463	0.222964
ANDREW	DB846H80ESX	160	200	3617	1.008926	0.178046	1.263463	0.222964