



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

August 8, 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: 876339
Sprint Site ID: CT03XC155
782 Old Clinton Road, Westbrook Middlesex County, CT
Latitude: 41° 17' 25.7" / Longitude: -72° 28' 7.9"

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 160-foot level of the existing 160-foot monopole tower at 782 Old Clinton Road, Westbrook, CT. The tower is owned by Crown Castle. The property is owned by Richard and Catherine A. Wade. Sprint intends to install (3) antennas and (3) RRUs with (1) hybrid cable.

This facility was approved by the Connecticut Siting Council Petition No. 511 on July 11, 2001. This approval was given without conditions.

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 The First Selectman of Westbrook, Noel Bishop, the Town Planner Meg Parulis, AICP, the land owners Richard and Catherine A. Wade, and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

The Foundation for a Wireless World.

CrownCastle.com

Melanie A. Bachman

August 8, 2017

Page 2

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

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@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 Noel Bishop
Town of Westbrook
866 Boston Post Road
Westbrook, CT 06498

Meg Parulis, AICP, Town Planner
Town of Westbrook
866 Boston Post Road
Westbrook, CT 06498

Richard & Catherine Wade
782 Old Clinton Road
Westbrook, CT 06498

782 OLD CLINTON RD

Location 782 OLD CLINTON RD

Mblu 169 / / 018 / /

Acct# E0110900

Owner WADE CATHERINE A

Assessment \$469,430

Appraisal \$671,630

PID 1175

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$556,890	\$114,740	\$671,630

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$395,120	\$74,310	\$469,430

Owner of Record

Owner WADE CATHERINE A

Sale Price \$0

Co-Owner

Certificate

Address 782 OLD CLINTON RD
WESTBROOK, CT 06498

Book & Page 162 / 83

Sale Date 11/10/1993

Instrument 25

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
WADE CATHERINE A	\$0		162 / 83	25	11/10/1993

Building Information

Building 1 : Section 1

Year Built: 1946
Living Area: 3,142
Replacement Cost: \$281,163
Building Percent 58
Good:
Replacement Cost
Less Depreciation: \$163,070

Building Attributes	
Field	Description

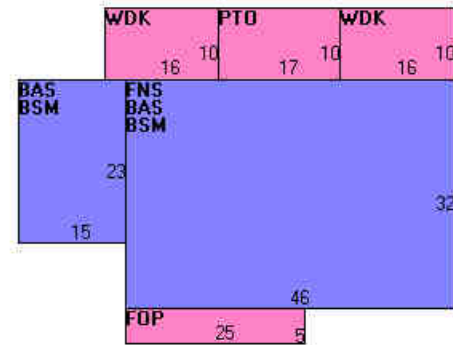
Style	Colonial
Model	Residential
Grade:	C+
Stories	1.9
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gambrel
Roof Cover	Asphalt
Interior Wall 1	Drywall
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	7
Full Bthrms:	3
Half Baths:	0
Extra Fixtures	3
Total Rooms:	10
Bath Style:	Modern
Kitchen Style:	Average
Extra Kitchens	0
Fireplace(s)	1
Gas Fireplace(s)	0
Stacks	1
Bsmnt Garage(s)	0
Callback	
Fin Bsmnt	0
Bsmnt Heat	
Int Vs Ext	Same

Building Photo



(http://images.vgsi.com/photos2/WestbrookCTPhotos//\00\00\50

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,817	1,817
FNS	Finished 90% Story	1,472	1,325
BSM	Basement	1,817	0
FOP	Open Porch	125	0
PTO	Patio	170	0
WDK	Deck	320	0
		5,721	3,142

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 101
Description Res Dwelling
Zone RR
Neighborhood 0045
Alt Land Appr Category No

Land Line Valuation

Size (Acres) 5
Depth
Assessed Value \$74,310
Appraised Value \$114,740

Special Land

Land Use Code	Land Use Description	Units	Unit Type
712	490 Tillable C	2	AC

Outbuildings

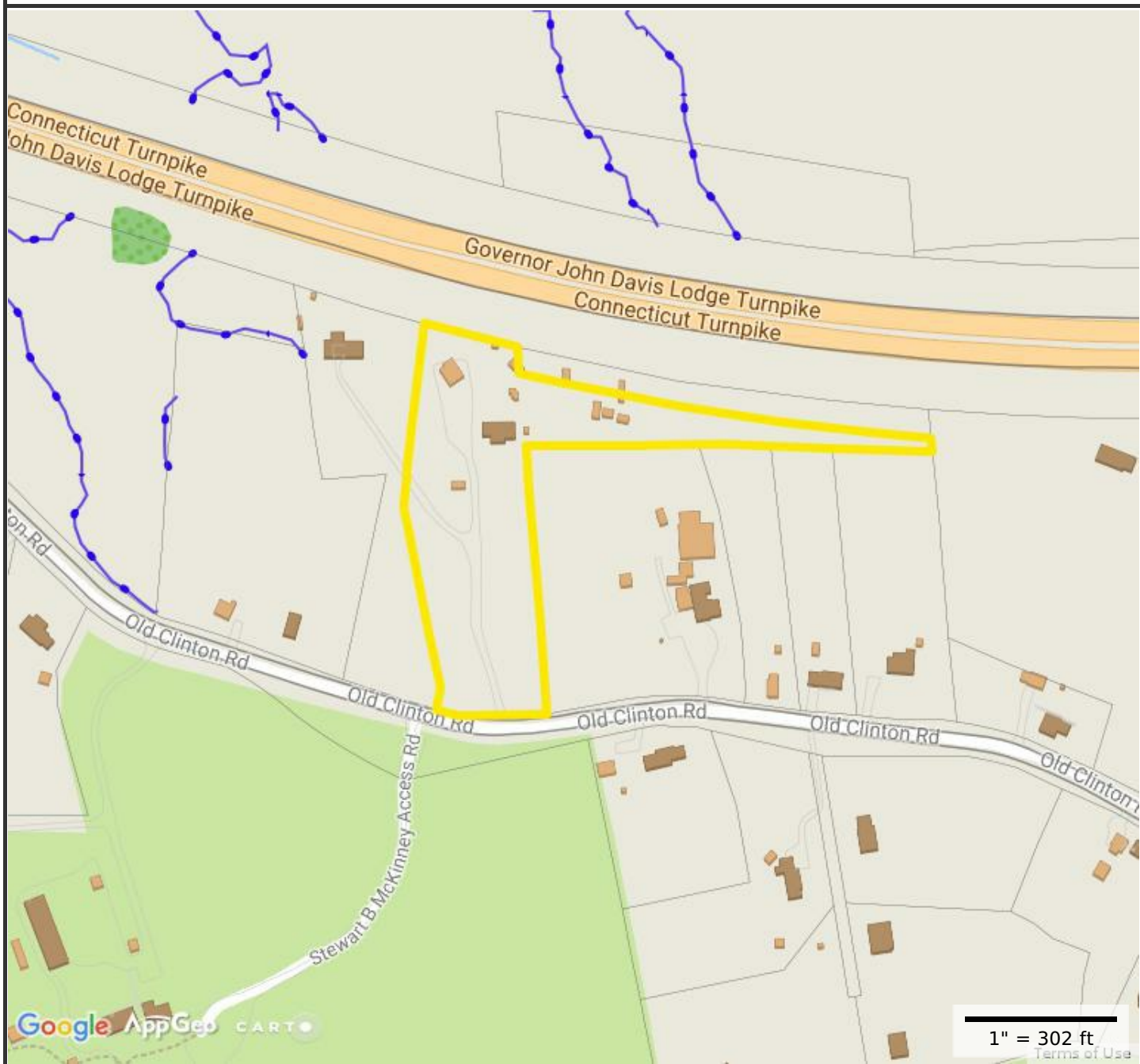
Outbuildings							Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #	Comment
FGR1	Garage			868 S.F.	\$10,850	1	2CGAR
TCB	Telecomm Bldg			216 UNITS	\$59,400	1	TELCOMM BLDG
TCS	Telecomm Site			700 UNITS	\$269,500	1	TELCOMM SITE
SPL1	Inground Pool - Typical			512 S.F.	\$4,610	1	IG POOL
SHD1	Shed			180 S.F.	\$1,800	1	SHED 2
BRN1	1 Story Barn			360 S.F.	\$5,400	1	
STB	Stable			310 S.F.	\$6,980	1	
LNT	Lean To			264 S.F.	\$660	1	
SHD1	Shed			140 S.F.	\$1,400	1	
GAZ	Gazebo			77 S.F.	\$770	1	
TCM	Telecomm			100 S.F.&HGT	\$2,450	1	SPRINT
TCM	Telecomm			1 S.F.&HGT	\$10,000	1	VERIZEN
TCM	Telecomm			3 S.F.&HGT	\$10,000	1	3 NEW ANTENNAS & 1 FIBRE CAB
TCM	Telecomm			1 S.F.&HGT	\$10,000	1	ADD 3 ANT;3 RADIOHEADS;CABLE

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$556,890	\$114,740	\$671,630
2015	\$662,200	\$112,010	\$774,210
2014	\$657,580	\$112,010	\$769,590

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$395,120	\$74,310	\$469,430
2015	\$463,550	\$72,490	\$536,040
2014	\$460,310	\$72,490	\$532,800

map



Property Information

Property ID 169/018
Location 782 OLD CLINTON RD
Owner WADE CATHERINE A



**MAP FOR REFERENCE ONLY
 NOT A LEGAL DOCUMENT**

Town of Westbrook, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated July 2016
 Properties updated 08/01/2017



Petition No. 511
Sprint Sites USA
Westbrook, Connecticut
Staff Report
July 11, 2001

On May 24, 2000, Connecticut Siting Council (Council) member William H. Smith and Council Staff Paul M. Aresta met representatives for Sprint Sites USA (SSUSA) and Julie Cashin for an inspection of an existing 160-foot tall monopole tower located at 782 Old Clinton Road, in Westbrook, Connecticut. SSUSA seeks a declaratory ruling that the proposed expansion of the existing compound, modification of the existing access road, co-location of three additional telecommunications carriers, and reinforcement of the existing tower would not have a substantial adverse environmental effect, and that no Certificate of Environmental Compatibility and Public Need (Certificate) would be required.

The existing 160-foot tall monopole tower was approved by the Town of Westbrook on May 26, 1998. The Council approved the shared use of this tower by Omnipoint Communication at a centerline height of 145 feet above ground level (AGL) on June 16, 1999, and Nextel Communication at a centerline height of 130 feet AGL on September 16, 1999. SSUSA contends that the existing tower currently supports antennas for Sprint at the 160 feet AGL, Voicestream's (formerly Omnipoint) at 142.5 AGL, and Nextel at 150 feet AGL. SSUSA request that the Council amend the previous approvals to acknowledge the existing antennas at their current heights.

AT&T Wireless Services (AT&T) proposes to place up to twelve panel antennas on a platform at the 130-foot level; Verizon proposes to place up to fifteen panel antennas on a platform at the 120-foot level; and Springwichee Cellular proposes to place up to twelve panel antennas on a platform at the 110-foot level of the existing tower.

The existing tower and foundation would require reinforcing to support all of the proposed equipment. SSUSA has included two proposals to reinforce the existing structure. SSUSA would either construct a structural support consisting of three approximately 125-foot tall columns with eleven cross-braces around the existing monopole structure. The proposed columns would each be constructed of eight-inch diameter pipe filled with post-tensioned concrete. Alternately, SSUSA could install a collar type reinforcement around the existing monopole tower up to 109 feet AGL. The collar would be bolted together around the existing tower. The reinforcement would involve removing the antennas below the 110-foot height on the tower; installing 20-foot deep rock anchors through the existing foundation at each corner; installing the steel sleeve; and reinstalling the existing antennas. The exterior finish on the collar reinforcement would be galvanized steel.

SSUSA proposes to expand the existing fenced compound from 34 feet by 28 feet to 50 feet by 90 feet to accommodate three 12-foot by 20-foot telecommunications equipment buildings. The existing fence would be removed and a new approximately six-foot tall chain link fence with three strands of barbed wire would be constructed around the expanded compound. All vegetation within the existing compound would be removed. Evergreen landscaping would be installed around the perimeter of the expanded site compound and approximately six eight-foot white pines would be installed approximately 35 feet southwest of the expanded site compound. A vehicle turnaround would be constructed on the west side of the expanded compound, and a portion of the existing ten-foot wide gravel access road would be re-routed, at the request of the landowner. Utilities are available within the existing site compound. Verizon would install a 40-kW emergency diesel generator.

The worst case power density for the existing and proposed telecommunications operations at the site would be approximately 79 percent of the applicable ANSI standard at the base of the tower. SSUSA contends that the proposed expansion of the compound, tower reinforcement, and addition of the three telecommunications entities would not cause a significant change to the physical or environmental characteristics of this site.

NOTE:
 INFINIGY ENGINEERING HAS NOT EVALUATED THE EXISTING TOWER OR MOUNT FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO STRUCTURAL ANALYSIS BY OTHERS PRIOR TO ANY CONSTRUCTION.

NOTE:
 SPRINT TOWER TOP WORK CONTINGENT ON FOLLOWING: COMPLETION OF STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE, COMPLETION OF ANTENNA/RRU MOUNTING ASSESSMENT (PROVIDED BY AE)

NOTE:
 SEE DETAIL 2 ON A-3 FOR ANTENNA LAYOUT

INSTALL (1) RRU-2.5 EACH SECTOR
 (SEE SHEET A-5 DETAILS 1)

☉ OF EXISTING/TO BE INSTALLED SPRINT ANTENNAS ELEV. = 160'-0" A.G.L.

TOP OF EXISTING TOWER ELEV. = ±160'-0" A.G.L.

INSTALL (1) SPRINT 2.5 ANTENNA EACH SECTOR
 (SEE SHEET A-5 DETAIL 3)

NOTE:
 EXISTING IDEN ANTENNAS AT 151' AGL TO BE REMOVED PRIOR TO CONSTRUCTION

EXISTING CARRIER PANEL ANTENNAS

EXISTING CARRIER PANEL ANTENNAS

EXISTING CARRIER PANEL ANTENNAS

EXISTING CARRIER PANEL ANTENNAS

EXISTING MONOPOLE TOWER

INSTALL FIBER CABLE FROM EXISTING SPRINT FIBER JUNCTION BOX TO PROPOSED TOWER MOUNTED RRU UNIT (SEE SHEET A-6 DETAIL 2)

GROUND LEVEL

TOWER ELEVATION

NO SCALE

1

DETAIL NOT USED

NO SCALE

3

DETAIL NOT USED

NO SCALE

4

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:

DRAWING NOTICE:

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REVISIONS:

DESCRIPTION	DATE	BY	REV
REVISED PER COMMENTS	6/19/14	AHS	B
ISSUED FOR REVIEW	5/22/14	JDV	A

SITE NAME:

POND MEADOW RD.
 STABLE

SITE CASCADE:

CT03XC155

SITE ADDRESS:

782 OLD CLINTON RD
 WESTBROOK, CT 06498-1767

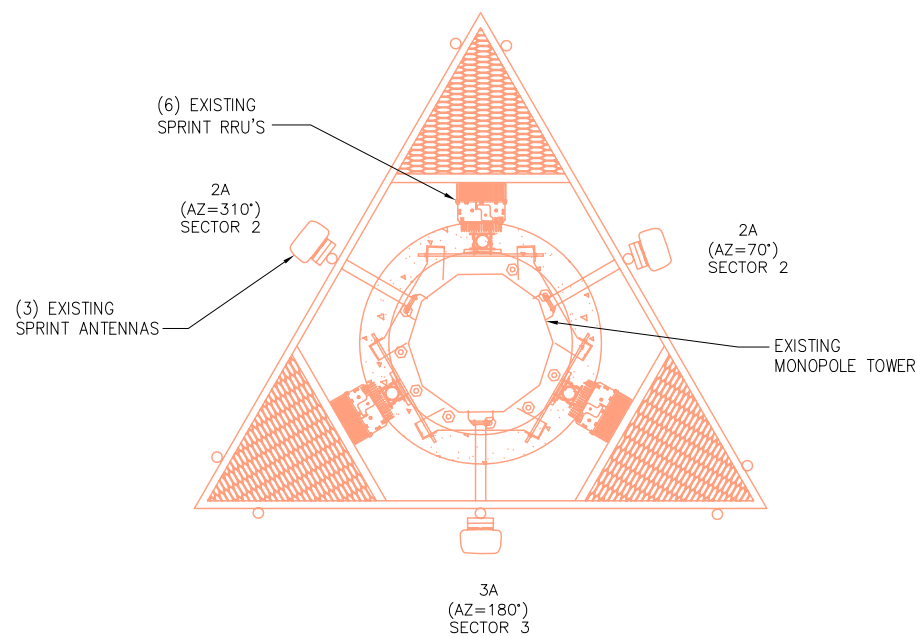
SHEET DESCRIPTION:

TOWER ELEVATION
 & CABLE PLAN

SHEET NUMBER:

A-2

NOTE:
EXISTING IDEN ANTENNAS AT 151' AGL TO BE REMOVED PRIOR TO CONSTRUCTION



EXISTING ANTENNA & RRU LAYOUT

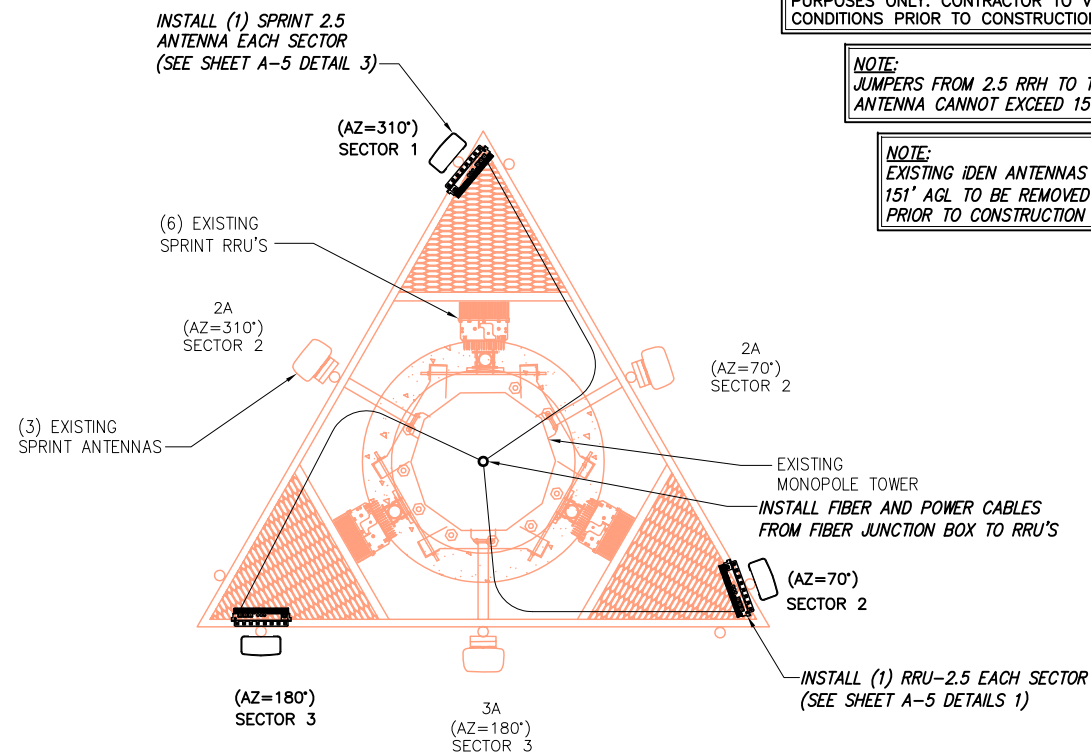
NO SCALE

1

THE CONFIGURATION PLANS ARE BASED ON PROVIDED INFORMATION AND ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.

NOTE:
JUMPERS FROM 2.5 RRH TO THE 2.5 ANTENNA CANNOT EXCEED 15 FEET

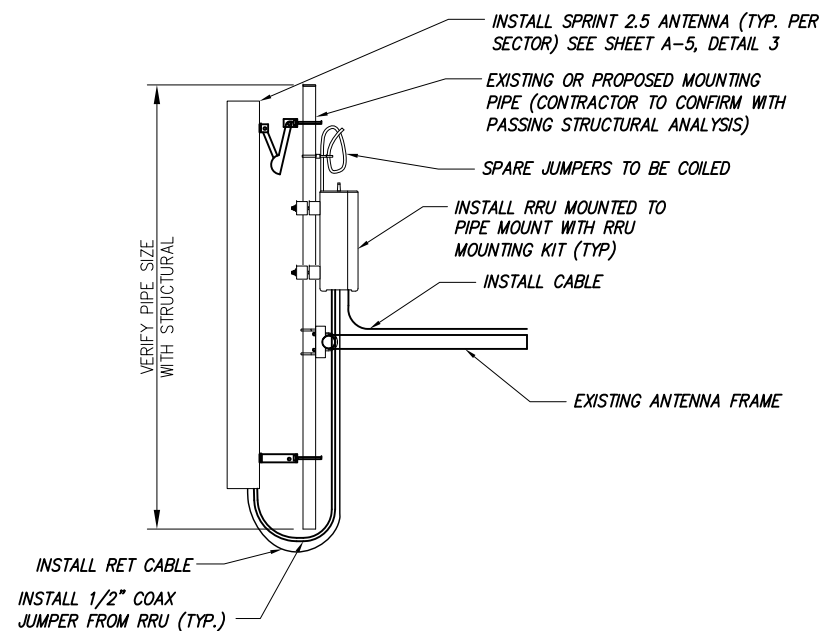
NOTE:
EXISTING IDEN ANTENNAS AT 151' AGL TO BE REMOVED PRIOR TO CONSTRUCTION



FINAL ANTENNA LAYOUT

NO SCALE

2



NOTES:

- CUT DC CONDUCTORS TO LENGTH.
- COIL FIBER CABLE AND SECURE AT SIDE OF RRU.
- DO NOT EXCEED BEND RADIUS.

NOTE:
CONTRACTOR TO POSITION RRU ON MOUNT BEHIND ANTENNA SUCH THAT THE RRU DOES NOT INTERFERE WITH THE EXISTING PLATFORM/T-ARM MOUNTING HARDWARE.

NOTE:
SPARE DC CABLES ARE COILED UP ON NV RRHS AT SPRINT ARRAY. THESE ARE TO BE USED TO POWER UP THE 2.5 RRHS AND TIED INTO EXISTING DC BREAKERS INSIDE THE FIBER JUNCTION BOX LOCATED AT EQUIPMENT.

NOTE:
THE DIAGRAM IS FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR IS TO REFER TO PASSING STRUCTURAL ANALYSIS FOR ANTENNA AND RRU MOUNTING DETAILS

DETAIL NOT USED

NO SCALE

3

TYPICAL ANTENNA & RRU MOUNTING DETAILS

NO SCALE

4

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:

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REVISED PER COMMENTS	6/19/14	AHS	B
ISSUED FOR REVIEW	5/22/14	JDV	A

SITE NAME:

POND MEADOW RD.
STABLE

SITE CASCADE:

CT03XC155

SITE ADDRESS:

782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

SHEET DESCRIPTION:

ANTENNA LAYOUT
& MOUNTING DETAILS

SHEET NUMBER:

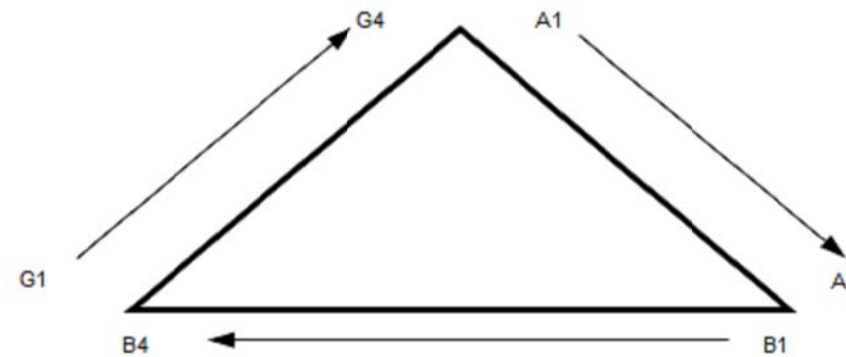
A-3

NV CABLES				
BAND	INDICATOR		PORT	COLOR
800-1	YEL	GRN	NV-1	GRN
1900-1	YEL	RED	NV-2	BLU
1900-2	YEL	BRN	NV-3	BRN
1900-3	YEL	BLU	NV-4	WHT
1900-4	YEL	SLT	NV-5	RED
800-2	YEL	ORG	NV-6	SLT
SPARE	YEL	WHT	NV-7	PPL
2500	YEL	PPL	NV-8	ORG

HYBRID	
HYBRID	COLOR
1	GRN
2	BLU
3	BRN
4	WHT
5	RED
6	SLT
7	PPL
8	ORG

2.5 Band		
2500 Radio 1	COLOR	
YEL	WHT	GRN
YEL	WHT	BLU
YEL	WHT	BRN
YEL	WHT	WHT
YEL	WHT	RED
YEL	WHT	SLT
YEL	WHT	PPL
YEL	WHT	ORG

Figure 1: Antenna Orientation



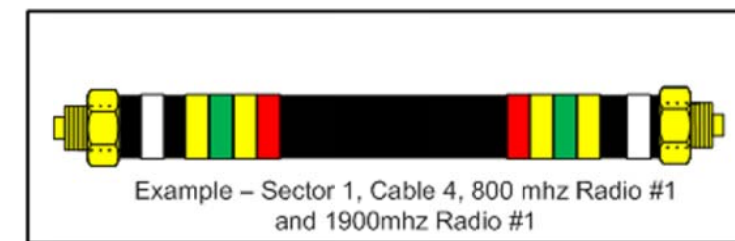
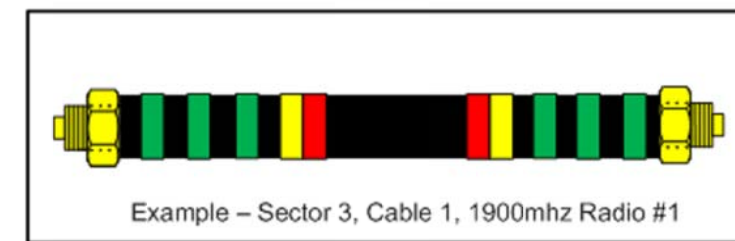
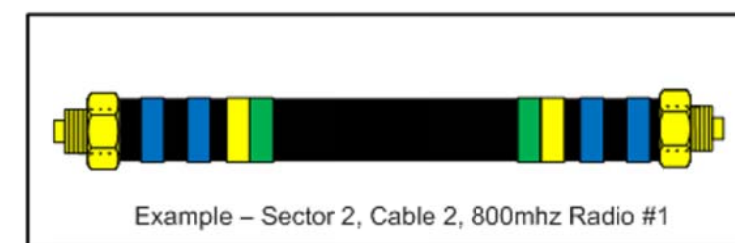
NOTES:

- ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
- THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAK-OUT CYLINDER. THERE SHALL BE A 1" SPACE BETWEEN EACH RING FOR THE CABLE IDENTIFIER, AND NO SPACES BETWEEN THE FREQUENCY BANDS.
- A 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
- THE 2" COLORED TAPE(S) SHALL EACH BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.
- SITES WITH MORE THAN FOUR (4) SECTORS WILL REQUIRE ADDITIONAL RINGS FOR EACH SECTOR, FOLLOWING THE PATTERN. HIGH CAPACITY SITES WILL USE THE NEXT COLOR IN THE SEQUENCE FOR ADDITIONAL CABLES IN EACH SECTOR.
- HYBRID FIBER CABLE SHALL BE SECTOR IDENTIFIED INSIDE THE CABINET ON FREQUENCY BUNDLES, ON THE SEALTITE, ON THE MAIN LINE UPON EXIT OF SEALTITE, AND BEFORE AND AFTER THE BREAKOUT UNIT (MEDUSA), AS WELL AS BEFORE AND AFTER ANY ENTRANCE OR EXIT.
- HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.
- INDIVIDUAL POWER PAIRS AND FIBER BUNDLES SHALL BE LABELED WITH BOTH THE CABLE AND FREQUENCY.

Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
	2	Blue	No Tape	No Tape
	3	Brown	No Tape	No Tape
	4	White	No Tape	No Tape
	5	Red	No Tape	No Tape
	6	Grey	No Tape	No Tape
	7	Purple	No Tape	No Tape
	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
	2	Blue	Blue	No Tape
	3	Brown	Brown	No Tape
	4	White	White	No Tape
	5	Red	Red	No Tape
	6	Grey	Grey	No Tape
	7	Purple	Purple	No Tape
	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
	2	Blue	Blue	Blue
	3	Brown	Brown	Brown
	4	White	White	White
	5	Red	Red	Red
	6	Grey	Grey	Grey
	7	Purple	Purple	Purple
	8	Orange	Orange	Orange

NV FREQUENCY	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	PPL

2.5 FREQUENCY	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL



PLANS PREPARED FOR:

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

JOB NUMBER 353-000

MLA PARTNER:

ENGINEERING LICENSE:

DRAWING NOTICE:

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STABLE

SITE CASCADE:

CT03XC155

SITE ADDRESS:

782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

SHEET DESCRIPTION:

COLOR CODING
AND NOTES

SHEET NUMBER:

A-4

RFS HYBRIFLEX RISER CABLE SCHEDULE

Fiber Only (Existing DC Power)	Hybrid cable MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50 ft	50 ft
	MN: HB058-M12-075F	75 ft
	MN: HB058-M12-100F	100 ft
	MN: HB058-M12-125F	125 ft
	MN: HB058-M12-150F	150 ft
	MN: HB058-M12-175F	175 ft
	MN: HB058-M12-200F	200 ft
8 AWG Power	Hybrid cable MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50 ft	50 ft
	MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft
	MN: HB114-08U3M12-125F	125 ft
	MN: HB114-08U3M12-150F	150 ft
	MN: HB114-08U3M12-175F	175 ft
	MN: HB114-08U3M12-200F	200 ft
6 AWG Power	Hybrid cable MN: HB114-13U3M12-225F 3x 6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft	225 ft
	MN: HB114-13U3M12-250F	250 ft
	MN: HB114-13U3M12-275F	275 ft
	MN: HB114-13U3M12-300F	300 ft
4 AWG Power	Hybrid cable MN: HB114-21U3M12-325F 3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

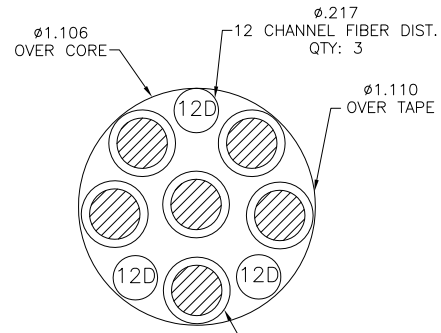
Fiber Only	Hybrid Jumper cable MN: HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN: HBF012-M3-10F1	10 ft
	MN: HBF012-M3-15F1	15 ft
	MN: HBF012-M3-20F1	20 ft
	MN: HBF012-M3-25F1	25 ft
	MN: HBF012-M3-30F1	30 ft
8 AWG Power	Hybrid Jumper cable MN: HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-08U1M3-10F1	10 ft
	MN: HBF058-08U1M3-15F1	15 ft
	MN: HBF058-08U1M3-20F1	20 ft
	MN: HBF058-08U1M3-25F1	25 ft
	MN: HBF058-08U1M3-30F1	30 ft
6 AWG Power	Hybrid Jumper cable MN: HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-13U1M3-10F1	10 ft
	MN: HBF058-13U1M3-15F1	15 ft
	MN: HBF058-13U1M3-20F1	20 ft
	MN: HBF058-13U1M3-25F1	25 ft
	MN: HBF058-13U1M3-30F1	30 ft
4 AWG Power	Hybrid Jumper cable MN: HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 7/8 cable	5 ft
	MN: HBF078-21U1M3-10F1	10 ft
	MN: HBF078-21U1M3-15F1	15 ft
	MN: HBF078-21U1M3-20F1	20 ft
	MN: HBF078-21U1M3-25F1	25 ft
	MN: HBF078-21U1M3-30F1	30 ft

NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE
AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF
HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.

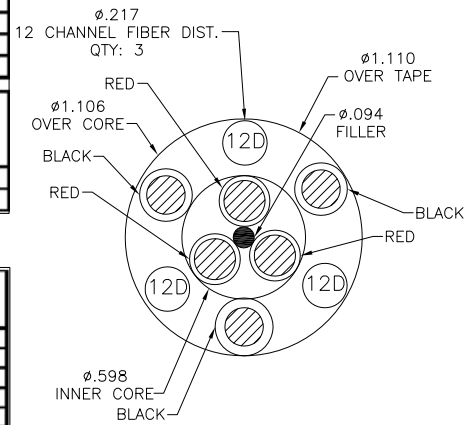
2.5 CABLE CROSS SECTION DATA

NO SCALE

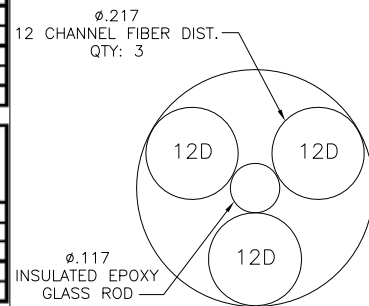
1



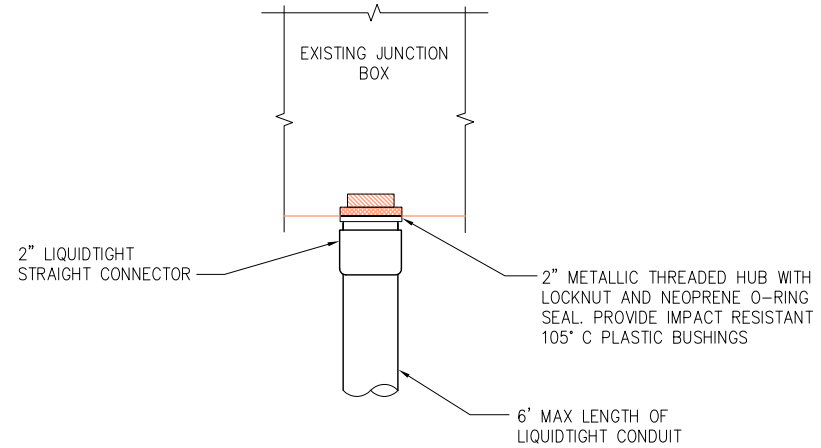
4 AWG



8 & 6 AWG



FIBER ONLY



FIBER JUNCTION BOX PENETRATION

NO SCALE

2

DETAIL NOT USED

NO SCALE

3

PLANS PREPARED FOR:



PLANS PREPARED BY:



1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

JOB NUMBER 353-000

MLA PARTNER:



ENGINEERING LICENSE:

DRAWING NOTICE:

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REVISIONS:

DESCRIPTION	DATE	BY	REV
REVISED PER COMMENTS	6/19/14	AHS	B
ISSUED FOR REVIEW	5/22/14	JDV	A

SITE NAME:

POND MEADOW RD.
STABLE

SITE CASCADE:

CT03XC155

SITE ADDRESS:

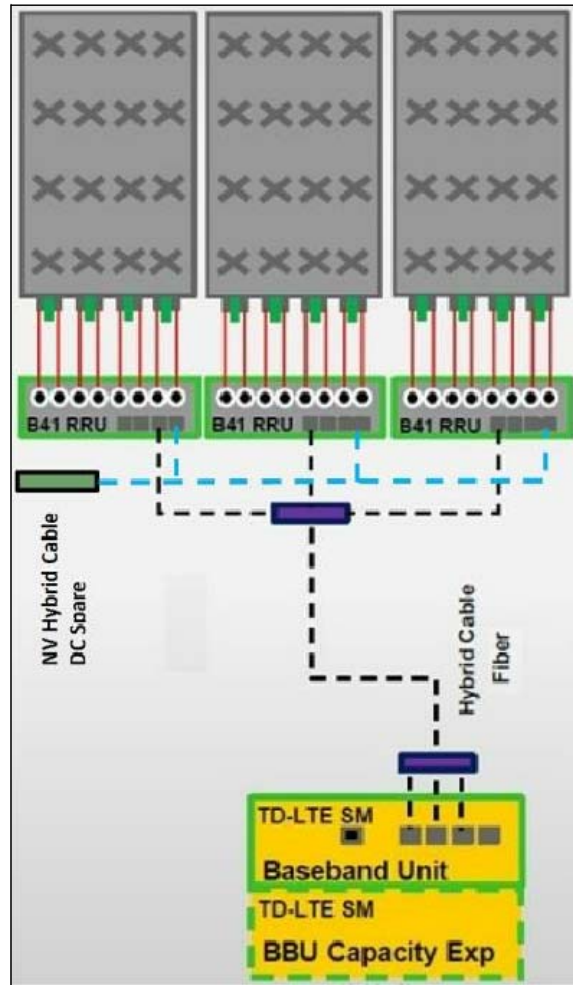
782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

SHEET DESCRIPTION:

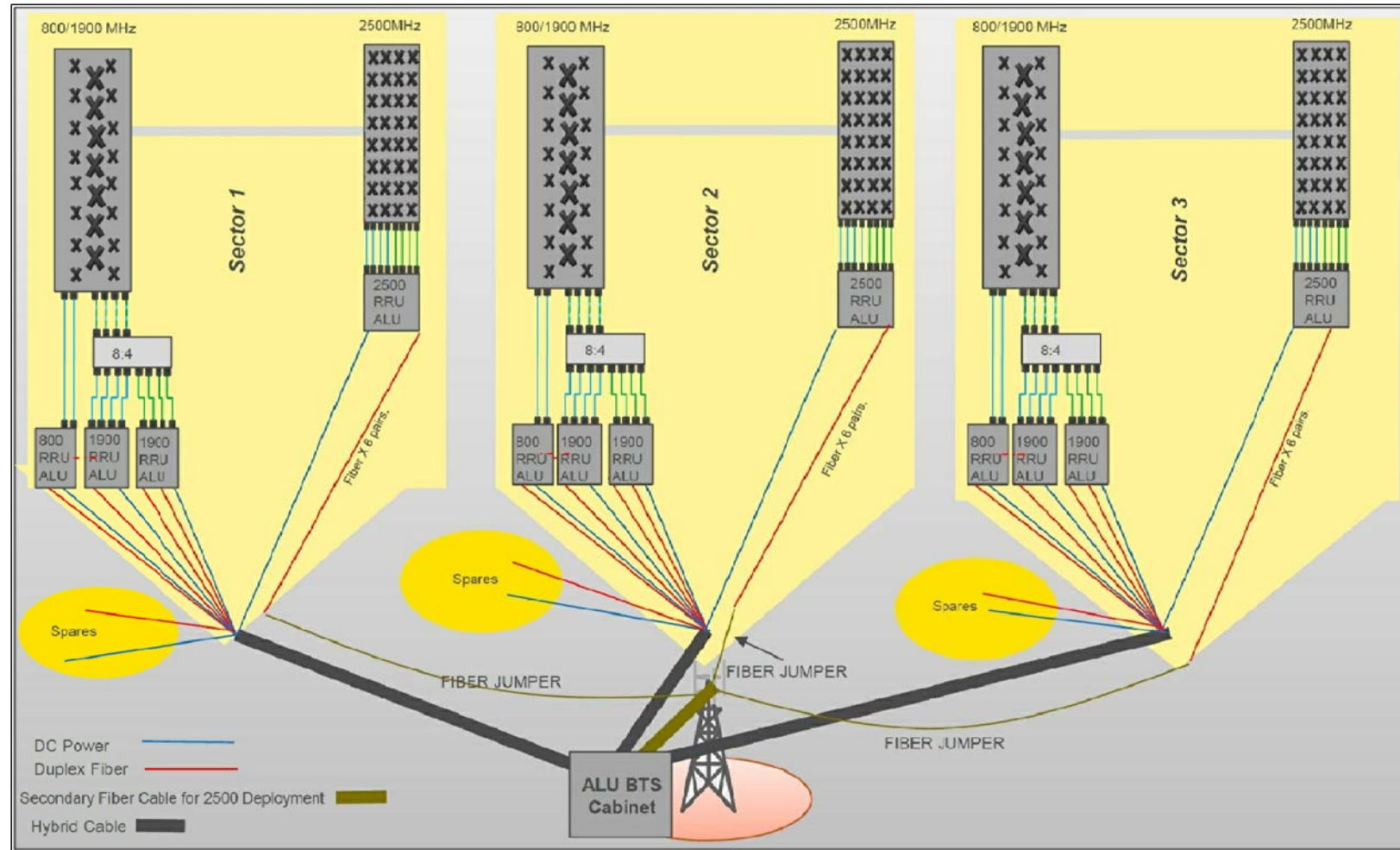
CIVIL DETAILS

SHEET NUMBER:

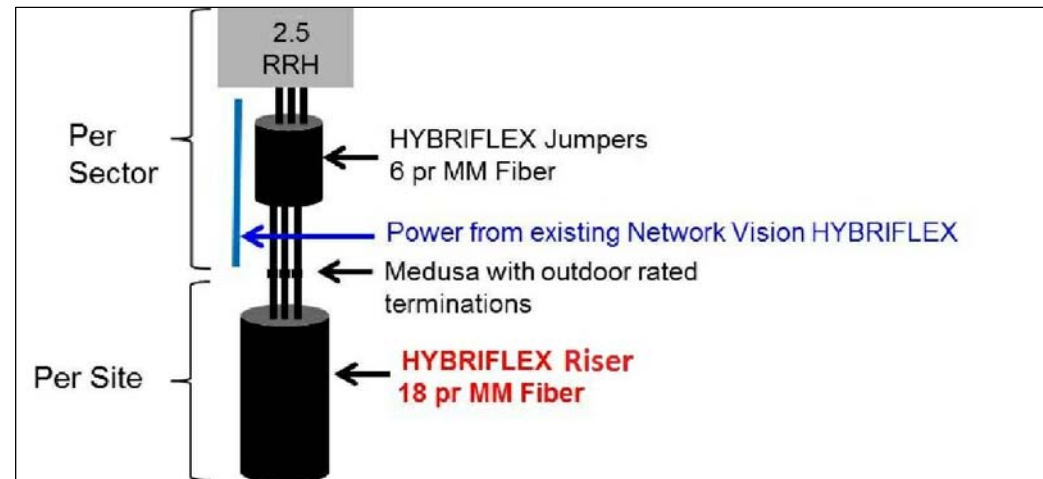
A-6



ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



RF 2.5 ALU SCENARIO 1

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



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CT03XC155

SITE ADDRESS:

782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

SHEET DESCRIPTION:

CIVIL DETAILS

SHEET NUMBER:

A-7



Date: June 20, 2017

Charles Trask
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
980.209.8228

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

Subject: Structural Analysis Report

Carrier Designation: *Sprint PCS Co-Locate*
Carrier Site Number: CT03XC155
Carrier Site Name: N/A

Crown Castle Designation:
Crown Castle BU Number: 876339
Crown Castle Site Name: Pond Meadow Rd. Stable
Crown Castle JDE Job Number: 439467
Crown Castle Work Order Number: 1418754
Crown Castle Application Number: 391718 Rev. 1

Engineering Firm Designation: Paul J Ford and Company Project Number: 37517-2315.001.7805

Site Data: 782 Old Clinton Road, WESTBROOK, Middlesex County, CT
Latitude 41° 17' 25.7", Longitude -72° 28' 7.9"
160 Foot - Monopole Tower

Dear Charles Trask,

Paul J Ford and Company 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 1047989, in accordance with application 391718, revision 1.

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

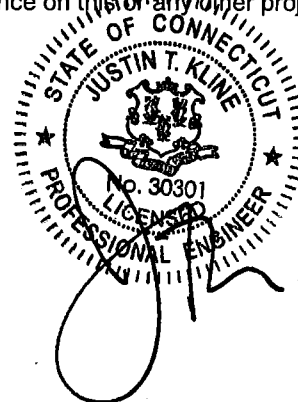
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 135 mph converted to a nominal 3-second gust wind speed of 105 mph per section 1609.3.1 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a topographic category 1 and Risk Category II were used in this analysis.

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

Respectfully submitted by:

Bob Koors, P.E.
Project Engineer *MLS*



6-20-17

Date: **June 20, 2017**

Charles Trask
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3530 Toringdon Way, Suite 300
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Columbus, OH 43215
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rkoors@pjfweb.com

Subject: Structural Analysis Report

Carrier Designation: **Sprint PCS Co-Locate**
Carrier Site Number: CT03XC155
Carrier Site Name: N/A

Crown Castle Designation: **Crown Castle BU Number:** 876339
Crown Castle Site Name: Pond Meadow Rd. Stable
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Crown Castle Application Number: 391718 Rev. 1

Engineering Firm Designation: **Paul J Ford and Company Project Number:** 37517-2315.001.7805

Site Data: **782 Old Clinton Road, WESTBROOK, Middlesex County, CT**
Latitude 41° 17' 25.7", Longitude -72° 28' 7.9"
160 Foot - Monopole Tower

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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 135 mph converted to a nominal 3-second gust wind speed of 105 mph per section 1609.3.1 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a topographic category 1 and Risk Category II were used in this analysis.

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Bob Koors, P.E.
Project Engineer

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1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by VALMONT in July of 1998. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 135 mph converted to a nominal 3-second gust wind speed of 105 mph per section 1609.3.1 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a topographic category 1 and Risk Category II were used in this analysis.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
159.0	160.0	3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	-
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

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
159.0	160.0	1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe	3	1-1/4	1
		2	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe			
	159.0	1	tower mounts	Platform Mount [LP 602-1]			
155.0	156.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	1
	155.0	1	tower mounts	Side Arm Mount [SO 102-3]			
	154.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
142.0	145.0	3	commscope	LNx-6515DS-VTM w/ Mount Pipe	13	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		3	ericsson	RRUS 11 B12			
	142.0	1	tower mounts	Platform Mount [LP 602-1]			
130.0	130.0	3	rfs celwave	APXV18-206517S-ACU w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
116.0	118.0	3	alcatel lucent	B13 RRH 4X30	2	1-5/8	2
		3	alcatel lucent	B66A RRH4X45			
		3	alcatel lucent	RRH2X60-PCS			
		6	commscope	SBNHH-1D65B w/ Mount Pipe			
		2	rfs celwave	DB-T1-6Z-8AB-0Z			
		4	antel	LPA-80063-4CF-EDIN-5 w/ Mount Pipe			
	2	antel	LPA-80080-4CF-EDIN-0 w/ Mount Pipe	12	1-5/8	1	
	116.0	1	tower mounts	Platform Mount [LP 303-1]			
96.0	98.0	3	ericsson	RRUS 12 B2	-	-	2
	103.0	1	gps	GPS_A			
	98.0	3	ericsson	RRUS-11	1 1 2 12	3/8 1/2 3/4 1-5/8	1
		3	kmw communications	AM-X-CD-14-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	TT19-08BP111-001			
			1	raycap	DC6-48-60-18-8F		
	96.0	1	tower mounts	T-Arm Mount [TA 602-3]			
92.0	93.0	1	lucent	KS24019-L112A	1	1/2	1
	92.0	1	tower mounts	Side Arm Mount [SO 701-1]			
87.0	87.0	1	tower mounts	Side Arm Mount [SO 701-1]	-	-	1

- Notes:
 1) Existing Equipment
 2) Reserved Equipment
 3) Equipment to be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
GEOTECHNICAL REPORTS	FDH, 10-12295E G1, 01/10/2011	1532966	CCISITES
TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Semaan, 17818, 07/06/1998	1533020	CCISITES
TOWER MANUFACTURER DRAWINGS	Valmont, 17618-98, 07/14/1998	1531985	CCISITES
POST-MODIFICATION INSPECTION	TEP, 111347, 07/18/2011	2923975	CCISITES
POST-MODIFICATION INSPECTION	TEP, 131001.876339, 08/23/2013	4023333	CCISITES
POST-MODIFICATION INSPECTION	TEP, 128324, 1/11/2013	3633208	CCISITES
TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 31002-0028, 5/8/2002	3682464	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
 - 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
 - 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
 - 4) Monopole was modified in conformance with the referenced modification drawings.
- This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	160 - 117.33	Pole	TP30.46x22.35x0.2188	1	-8.37	1268.11	54.2	Pass
L2	117.33 - 94	Pole	TP34.455x29.1348x0.2813	2	-17.87	2001.25	75.7	Pass
L3	94 - 82.5	Pole	TP36.64x34.455x0.3821	3	-19.38	2342.22	73.2	Pass
L4	82.5 - 72.75	Pole	TP37.9423x34.8309x0.375	4	-24.16	3187.04	69.7	Pass
L5	72.75 - 56	Pole	TP41.1383x37.9423x0.4482	5	-29.24	3349.64	81.5	Pass
L6	56 - 40.583	Pole	TP44.08x41.1383x0.6042	6	-32.82	3750.89	80.4	Pass
L7	40.583 - 31.5	Pole	TP45.0389x41.6472x0.6915	7	-42.04	4288.66	82.5	Pass
L8	31.5 - 28.75	Pole	TP45.5593x45.0389x0.7353	8	-43.41	4609.63	78.6	Pass
L9	28.75 - 11	Pole	TP48.9183x45.5593x0.6172	9	-51.50	4732.20	86.6	Pass
L10	11 - 8.5	Pole	TP49.3914x48.9183x0.698	10	-52.80	5388.94	77.6	Pass
L11	8.5 - 0	Pole	TP51x49.3914x0.5706	11	-56.67	5005.51	87.7	Pass
							Summary	
						Pole (L11)	87.7	Pass
						Rating =	87.7	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	59.5	Pass
1	Base Plate	0	37.4	Pass
1	Base Foundation Steel	0	37.1	Pass
1	Base Foundation Soil Interaction	0	31.5	Pass

Structure Rating (max from all components) =	87.7%
---	--------------

Notes:

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

APPENDIX A
TNXTOWER OUTPUT

Tower Input Data

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

- 1) Tower is located in Middlesex County, Connecticut.
- 2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- 3) Basic wind speed of 105 mph.
- 4) Structure Class II.
- 5) Exposure Category B.
- 6) Topographic Category 1.
- 7) Crest Height 0.00 ft.
- 8) Nominal ice thickness of 0.7500 in.
- 9) Ice thickness is considered to increase with height.
- 10) Ice density of 56.00 pcf.
- 11) A wind speed of 50 mph is used in combination with ice.
- 12) Temperature drop of 50 °F.
- 13) Deflections calculated using a wind speed of 60 mph.
- 14) A non-linear (P-delta) analysis was used.
- 15) Pressures are calculated at each section.
- 16) Stress ratio used in pole design is 1.
- 17) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

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
L1	160.00-117.33	42.67	4.67	12	22.3500	30.4600	0.2188	0.8752	A572-65 (65 ksi)
L2	117.33-94.00	28.00	0.00	12	29.1348	34.4550	0.2813	1.1252	A572-65 (65 ksi)
L3	94.00-82.50	11.50	5.50	12	34.4550	36.6400	0.3821	1.5282	Reinf 47.68 ksi (48 ksi)
L4	82.50-72.75	15.25	0.00	12	34.8309	37.9423	0.3750	1.5000	A572-65 (65 ksi)
L5	72.75-56.00	16.75	0.00	12	37.9423	41.1383	0.4482	1.7928	Reinf 50.30 ksi (50 ksi)
L6	56.00-40.58	15.42	6.42	12	41.1383	44.0800	0.6042	2.4167	Reinf 40.24 ksi (40 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
L7	40.58-31.50	15.50	0.00	12	41.6472	45.0389	0.6915	2.7660	Reinf 38.30 ksi (38 ksi)
L8	31.50-28.75	2.75	0.00	12	45.0389	45.5593	0.7353	2.9414	Reinf 38.30 ksi (38 ksi)
L9	28.75-11.00	17.75	0.00	12	45.5593	48.9183	0.6172	2.4689	Reinf 43.47 ksi (43 ksi)
L10	11.00-8.50	2.50	0.00	12	48.9183	49.3914	0.6980	2.7921	Reinf 43.42 ksi (43 ksi)
L11	8.50-0.00	8.50		12	49.3914	51.0000	0.5706	2.2824	Reinf 47.64 ksi (48 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	I/Q in ²	w in	w/t
L1	23.1384	15.5922	974.7742	7.9230	11.5773	84.1970	1975.1568	7.6740	5.4034	24.696
	31.5345	21.3060	2487.0596	10.8263	15.7783	157.6255	5039.4571	10.4862	7.5769	34.629
L2	31.0812	26.1351	2777.2008	10.3296	15.0918	184.0202	5627.3618	12.8629	7.0542	25.077
	35.6704	30.9540	4614.0938	12.2342	17.8477	258.5263	9349.4050	15.2346	8.4800	30.146
L3	35.6704	41.9165	6211.4084	12.1981	17.8477	348.0234	12585.997	20.6300	8.2100	21.489
	37.9325	44.6046	7484.6546	12.9803	18.9795	394.3543	15165.939	21.9530	8.7956	23.022
L4	37.2213	41.6055	6304.6845	12.3352	18.0424	349.4371	12775.000	20.4770	8.3297	22.212
	39.2808	45.3625	8171.5301	13.4491	19.6541	415.7668	16557.735	22.3261	9.1635	24.436
L5	39.2808	54.1116	9709.6331	13.4229	19.6541	494.0254	19674.349	26.6321	8.9674	20.008
	42.5895	58.7242	12410.260	14.5671	21.3097	582.3774	25146.552	28.9022	9.8239	21.919
L6	42.5895	78.8576	16537.557	14.5112	21.3097	776.0594	33509.575	38.8113	9.4059	15.568
	45.6350	84.5805	20405.700	15.5643	22.8334	893.6761	41347.481	41.6279	10.1942	16.873
L7	44.5701	91.1920	19524.149	14.6622	21.5733	905.0159	39561.219	44.8819	9.3083	13.461
	46.6277	98.7438	24787.420	15.8764	23.3301	1062.4639	50226.034	48.5987	10.2172	14.776
L8	46.6277	104.9016	26281.171	15.8607	23.3301	1126.4906	53252.777	51.6294	10.0997	13.735
	47.1664	106.1339	27218.243	16.0470	23.5997	1153.3297	55151.540	52.2359	10.2392	13.924
L9	47.1664	89.3215	23027.536	16.0893	23.5997	975.7552	46660.032	43.9613	10.5557	17.102
	50.6440	95.9975	28586.429	17.2918	25.3397	1128.1284	57923.856	47.2470	11.4559	18.56
L10	50.6440	108.3827	32166.635	17.2629	25.3397	1269.4168	65178.323	53.3427	11.2394	16.102
	51.1338	109.4461	33122.757	17.4322	25.5848	1294.6281	67115.685	53.8660	11.3662	16.283
L11	51.1338	89.6985	27288.646	17.4779	25.5848	1066.5974	55294.195	44.1469	11.7077	20.519
	52.7991	92.6539	30075.831	18.0537	26.4180	1138.4598	60941.788	45.6015	12.1388	21.274

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 160.00-117.33				1	1	1			
L2 117.33-94.00				1	1	1			
L3 94.00-				1	1	1			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_r	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
82.50									
L4 82.50-72.75				1	1	1			
L5 72.75-56.00				1	1	1			
L6 56.00-40.58				1	1	1			
L7 40.58-31.50				1	1	1			
L8 31.50-28.75				1	1	1			
L9 28.75-11.00				1	1	1			
L10 11.00-8.50				1	1	1			
L11 8.50-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		$C_A A_A$	Weight		
				ft			ft ² /ft	plf		
HB114-21U3M12-XXXF(1-1/4)	C	No	Inside Pole	159.00 - 0.00	1	No Ice	0.00	1.22		
						1/2" Ice	0.00	1.22		
						1" Ice	0.00	1.22		
HB114-1-08U4-M5J(1-1/4)	C	No	Inside Pole	159.00 - 0.00	3	No Ice	0.00	1.08		
						1/2" Ice	0.00	1.08		
						1" Ice	0.00	1.08		
**										
AL7-50(1-5/8)	C	No	Inside Pole	142.00 - 0.00	6	No Ice	0.00	0.52		
						1/2" Ice	0.00	0.52		
						1" Ice	0.00	0.52		
LDF7-50A(1-5/8)	C	No	Inside Pole	142.00 - 0.00	6	No Ice	0.00	0.82		
						1/2" Ice	0.00	0.82		
						1" Ice	0.00	0.82		
MLE Hybrid 9Power/18Fiber RL 2(1-5/8)	C	No	Inside Pole	142.00 - 0.00	1	No Ice	0.00	1.07		
						1/2" Ice	0.00	1.07		
						1" Ice	0.00	1.07		
**										
AVA7-50(1-5/8)	C	No	Inside Pole	130.00 - 0.00	6	No Ice	0.00	0.70		
						1/2" Ice	0.00	0.70		
						1" Ice	0.00	0.70		
**										
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	116.00 - 0.00	2	No Ice	0.00	1.30		
						1/2" Ice	0.00	1.30		
						1" Ice	0.00	1.30		
LDF7-50A(1-5/8)	C	No	Inside Pole	116.00 - 0.00	12	No Ice	0.00	0.82		
						1/2" Ice	0.00	0.82		
						1" Ice	0.00	0.82		
**										
2" (Nominal) Conduit	C	No	CaAa (Out Of Face)	96.00 - 0.00	1	No Ice	0.00	0.72		
						1/2" Ice	0.00	2.48		
						1" Ice	0.00	4.84		
2" (Nominal) Conduit	C	No	Inside Pole	96.00 - 0.00	1	No Ice	0.00	0.72		
						1/2" Ice	0.00	0.72		
						1" Ice	0.00	0.72		

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA}		Weight
						In Face	Out Face	
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	96.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
LDF4-50A(1/2)	C	No	Inside Pole	96.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	96.00 - 0.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
LDF7-50A(1-5/8)	C	No	CaAa (Out Of Face)	96.00 - 0.00	10	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
LDF7-50A(1-5/8)	C	No	CaAa (Out Of Face)	96.00 - 0.00	2	No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46
**								
LDF4-50A(1/2)	C	No	CaAa (Out Of Face)	92.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
**								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	58.25 - 0.00	1	No Ice	0.21	0.00
						1/2" Ice	0.32	0.00
						1" Ice	0.43	0.00
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	74.00 - 44.00	1	No Ice	0.13	0.00
						1/2" Ice	0.24	0.00
						1" Ice	0.35	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	13.00 - 0.00	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	42.25 - 27.25	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	96.00 - 86.00	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
**								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	160.00-117.33	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	0.46
L2	117.33-94.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.125	0.71
L3	94.00-82.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.887	0.49
L4	82.50-72.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.017	0.42
L5	72.75-56.00	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	9.196	0.72
L6	56.00-40.58	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	11.095	0.66
L7	40.58-31.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	7.003	0.39
L8	31.50-28.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.120	0.12
L9	28.75-11.00	A	0.000	0.000	0.000	0.000	0.00

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L10	11.00-8.50	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	11.310	0.76
		A	0.000	0.000	0.000	0.000	0.00
L11	8.50-0.00	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.928	0.11
		A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.553	0.37

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	160.00-117.33	A	1.730	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	0.46
L2	117.33-94.00	A	1.685	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.279	0.93
L3	94.00-82.50	A	1.655	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	16.442	1.69
L4	82.50-72.75	A	1.634	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	10.931	1.44
L5	72.75-56.00	A	1.603	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	26.708	2.40
L6	56.00-40.58	A	1.558	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	30.771	2.15
L7	40.58-31.50	A	1.513	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	18.952	1.27
L8	31.50-28.75	A	1.486	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.572	0.37
L9	28.75-11.00	A	1.425	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	28.158	2.28
L10	11.00-8.50	A	1.328	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.731	0.30
L11	8.50-0.00	A	1.221	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	15.320	0.95

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	160.00-117.33	0.0000	0.0000	0.0000	0.0000
L2	117.33-94.00	-0.0632	0.0365	-0.1624	0.0938
L3	94.00-82.50	-0.5493	0.3171	-1.1501	0.6640
L4	82.50-72.75	-0.4582	0.2646	-0.9794	0.5655
L5	72.75-56.00	-0.5944	0.3432	-1.2965	0.7485
L6	56.00-40.58	-0.7550	0.4359	-1.5512	0.8956
L7	40.58-31.50	-0.8042	0.4643	-1.6187	0.9346
L8	31.50-28.75	-0.8080	0.4665	-1.6072	0.9279
L9	28.75-11.00	-0.6916	0.3993	-1.3755	0.7941
L10	11.00-8.50	-0.8186	0.4726	-1.5846	0.9149
L11	8.50-0.00	-0.8212	0.4741	-1.5456	0.8924

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
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Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
APXV9ERR18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.00	159.00	No Ice	8.26	7.47	0.09
			0.00			1/2"	8.82	8.66	0.16
			1.00			Ice	9.35	9.56	0.24
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.00	159.00	No Ice	8.26	6.95	0.08
			0.00			1/2"	8.82	8.13	0.15
			1.00			Ice	9.35	9.02	0.23
APXVSP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.00	159.00	No Ice	8.26	6.95	0.08
			0.00			1/2"	8.82	8.13	0.15
			1.00			Ice	9.35	9.02	0.23
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00	0.00	159.00	No Ice	6.58	4.96	0.08
			0.00			1/2"	7.03	5.75	0.13
			1.00			Ice	7.47	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00	0.00	159.00	No Ice	6.58	4.96	0.08
			0.00			1/2"	7.03	5.75	0.13
			1.00			Ice	7.47	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00	0.00	159.00	No Ice	6.58	4.96	0.08
			0.00			1/2"	7.03	5.75	0.13
			1.00			Ice	7.47	6.47	0.19
TD-RRH8x20-25	A	From Leg	4.00	0.00	159.00	No Ice	4.05	1.53	0.07
			0.00			1/2"	4.30	1.71	0.10
			1.00			Ice	4.56	1.90	0.13
TD-RRH8x20-25	B	From Leg	4.00	0.00	159.00	No Ice	4.05	1.53	0.07
			0.00			1/2"	4.30	1.71	0.10
			1.00			Ice	4.56	1.90	0.13
TD-RRH8x20-25	C	From Leg	4.00	0.00	159.00	No Ice	4.05	1.53	0.07
			0.00			1/2"	4.30	1.71	0.10
			1.00			Ice	4.56	1.90	0.13
Platform Mount [LP 602-1]	C	None		0.00	159.00	No Ice	32.03	32.03	1.34
						1/2"	38.71	38.71	1.80
						Ice	45.39	45.39	2.26
(2) 2.375" OD x 6' Mount Pipe	A	From Leg	4.00	0.00	159.00	No Ice	1.43	1.43	0.03
			0.00			1/2"	1.92	1.92	0.04
			0.00			Ice	2.29	2.29	0.05
(2) 2.375" OD x 6' Mount Pipe	B	From Leg	4.00	0.00	159.00	No Ice	1.43	1.43	0.03
			0.00			1/2"	1.92	1.92	0.04
			0.00			Ice	2.29	2.29	0.05
(2) 2.375" OD x 6' Mount Pipe	C	From Leg	4.00	0.00	159.00	No Ice	1.43	1.43	0.03
			0.00			1/2"	1.92	1.92	0.04
			0.00			Ice	2.29	2.29	0.05
**									
800MHz 2X50W RRH W/FILTER	A	From Leg	2.00 0.00	0.00	155.00	No Ice 1/2"	2.06 2.24	1.93 2.11	0.06 0.09

Description	Face or Leg	Offset Type	Offsets:			Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			Horz ft	Lateral ft	Vert ft					Azimuth Adjustment °
			1.00							
800MHz 2X50W RRH W/FILTER	B	From Leg				Ice	2.43	2.29	0.11	
						1" Ice				
			2.00	0.00	155.00	No Ice	2.06	1.93	0.06	
			0.00			1/2"	2.24	2.11	0.09	
			1.00			Ice	2.43	2.29	0.11	
						1" Ice				
800MHz 2X50W RRH W/FILTER	C	From Leg				No Ice	2.06	1.93	0.06	
			2.00	0.00	155.00	1/2"	2.24	2.11	0.09	
			0.00			Ice	2.43	2.29	0.11	
			1.00			1" Ice				
PCS 1900MHz 4x45W- 65MHz	A	From Leg				No Ice	2.32	2.24	0.06	
			2.00	0.00	155.00	1/2"	2.53	2.44	0.08	
			0.00			Ice	2.74	2.65	0.11	
			-1.00			1" Ice				
PCS 1900MHz 4x45W- 65MHz	B	From Leg				No Ice	2.32	2.24	0.06	
			2.00	0.00	155.00	1/2"	2.53	2.44	0.08	
			0.00			Ice	2.74	2.65	0.11	
			-1.00			1" Ice				
PCS 1900MHz 4x45W- 65MHz	C	From Leg				No Ice	2.32	2.24	0.06	
			2.00	0.00	155.00	1/2"	2.53	2.44	0.08	
			0.00			Ice	2.74	2.65	0.11	
			-1.00			1" Ice				
Side Arm Mount [SO 102- 3]	C	None				No Ice	3.00	3.00	0.08	
					0.00	155.00	1/2"	3.48	3.48	0.11
						Ice	3.96	3.96	0.14	
						1" Ice				
**										
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg				No Ice	6.33	5.64	0.11	
			4.00	0.00	142.00	1/2"	6.78	6.43	0.17	
			0.00			Ice	7.21	7.13	0.23	
			3.00			1" Ice				
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg				No Ice	6.33	5.64	0.11	
			4.00	0.00	142.00	1/2"	6.78	6.43	0.17	
			0.00			Ice	7.21	7.13	0.23	
			3.00			1" Ice				
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg				No Ice	6.33	5.64	0.11	
			4.00	0.00	142.00	1/2"	6.78	6.43	0.17	
			0.00			Ice	7.21	7.13	0.23	
			3.00			1" Ice				
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg				No Ice	11.68	9.84	0.08	
			4.00	0.00	142.00	1/2"	12.40	11.37	0.17	
			0.00			Ice	13.14	12.91	0.27	
			3.00			1" Ice				
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg				No Ice	11.68	9.84	0.08	
			4.00	0.00	142.00	1/2"	12.40	11.37	0.17	
			0.00			Ice	13.14	12.91	0.27	
			3.00			1" Ice				
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg				No Ice	11.68	9.84	0.08	
			4.00	0.00	142.00	1/2"	12.40	11.37	0.17	
			0.00			Ice	13.14	12.91	0.27	
			3.00			1" Ice				
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg				No Ice	6.32	5.63	0.11	
			4.00	0.00	142.00	1/2"	6.76	6.42	0.17	
			0.00			Ice	7.20	7.12	0.23	
			3.00			1" Ice				
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg				No Ice	6.32	5.63	0.11	
			4.00	0.00	142.00	1/2"	6.76	6.42	0.17	
			0.00			Ice	7.20	7.12	0.23	
			3.00			1" Ice				
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg				No Ice	6.32	5.63	0.11	
			4.00	0.00	142.00	1/2"	6.76	6.42	0.17	
			0.00			Ice	7.20	7.12	0.23	
			3.00			1" Ice				
KRY 112 144/1	A	From Leg				No Ice	0.35	0.17	0.01	
			4.00	0.00	142.00	1/2"	0.43	0.23	0.01	

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			3.00			Ice 1" Ice No Ice	0.51 0.35 0.43	0.30 0.17 0.23	0.02 0.01 0.01
KRY 112 144/1	B	From Leg	4.00 0.00 3.00	0.00	142.00	Ice 1" Ice No Ice	0.51 0.35 0.43	0.30 0.17 0.23	0.02 0.01 0.01
KRY 112 144/1	C	From Leg	4.00 0.00 3.00	0.00	142.00	Ice 1" Ice No Ice	0.51 0.35 0.43	0.30 0.17 0.23	0.02 0.01 0.01
RRUS 11 B12	A	From Leg	4.00 0.00 3.00	0.00	142.00	Ice 1" Ice No Ice	0.51 2.83 3.04	0.30 1.18 1.33	0.02 0.05 0.07
RRUS 11 B12	B	From Leg	4.00 0.00 3.00	0.00	142.00	Ice 1" Ice No Ice	0.51 2.83 3.04	0.30 1.18 1.33	0.02 0.05 0.07
RRUS 11 B12	C	From Leg	4.00 0.00 3.00	0.00	142.00	Ice 1" Ice No Ice	0.51 2.83 3.04	0.30 1.18 1.33	0.02 0.05 0.07
Platform Mount [LP 602-1]	C	None		0.00	142.00	Ice 1" Ice No Ice 1/2" Ice	45.39 32.03 38.71 45.39	45.39 32.03 38.71 45.39	2.26 1.34 1.80 2.26
**									
APXV18-206517S-ACU w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice	5.40 5.96 6.48	4.70 5.86 6.73	0.05 0.10 0.15
APXV18-206517S-ACU w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice	5.40 5.96 6.48	4.70 5.86 6.73	0.05 0.10 0.15
APXV18-206517S-ACU w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice	5.40 5.96 6.48	4.70 5.86 6.73	0.05 0.10 0.15
Pipe Mount [PM 601-3]	C	None		0.00	130.00	Ice 1" Ice No Ice 1/2" Ice	6.57 4.39 5.48 6.57	6.57 4.39 5.48 6.57	0.28 0.20 0.24 0.28
**									
(2) LPA-80080-4CF-EDIN- 0 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.00	116.00	No Ice 1/2" Ice	2.86 3.22 3.59	6.57 7.19 7.84	0.03 0.08 0.13
(2) LPA-80063-4CF-EDIN- 5 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.00	116.00	No Ice 1/2" Ice	6.38 6.78 7.19	6.56 7.19 7.84	0.04 0.10 0.18
(2) LPA-80063-4CF-EDIN- 5 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.00	116.00	No Ice 1/2" Ice	6.38 6.78 7.19	6.56 7.19 7.84	0.04 0.10 0.18
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.00	116.00	No Ice 1/2" Ice	8.40 8.96 9.49	7.07 8.26 9.18	0.07 0.14 0.21
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.00	116.00	No Ice 1/2" Ice	8.40 8.96 9.49	7.07 8.26 9.18	0.07 0.14 0.21
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00	0.00	116.00	No Ice	8.40	7.07	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Mount Pipe			0.00 2.00			1/2" Ice 9.49	8.26 9.18	0.14 0.21
RRH2X60-PCS	A	From Leg	4.00 0.00 2.00	0.00	116.00	1" Ice No Ice 1/2" Ice 2.59	2.20 1.72 1.90 2.09	0.06 0.08 0.10
RRH2X60-PCS	B	From Leg	4.00 0.00 2.00	0.00	116.00	1" Ice No Ice 1/2" Ice 2.59	2.20 1.72 1.90 2.09	0.06 0.08 0.10
RRH2X60-PCS	C	From Leg	4.00 0.00 2.00	0.00	116.00	1" Ice No Ice 1/2" Ice 2.59	2.20 1.72 1.90 2.09	0.06 0.08 0.10
B13 RRH 4X30	A	From Leg	4.00 0.00 2.00	0.00	116.00	1" Ice No Ice 1/2" Ice 2.43	2.06 1.32 1.48 1.64	0.06 0.07 0.09
B13 RRH 4X30	B	From Leg	4.00 0.00 2.00	0.00	116.00	1" Ice No Ice 1/2" Ice 2.43	2.06 1.32 1.48 1.64	0.06 0.07 0.09
B13 RRH 4X30	C	From Leg	4.00 0.00 2.00	0.00	116.00	1" Ice No Ice 1/2" Ice 2.43	2.06 1.32 1.48 1.64	0.06 0.07 0.09
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0.00 2.00	0.00	116.00	1" Ice No Ice 1/2" Ice 5.35	4.80 2.00 2.19 2.39	0.04 0.08 0.12
DB-T1-6Z-8AB-0Z	B	From Leg	4.00 0.00 2.00	0.00	116.00	1" Ice No Ice 1/2" Ice 5.35	4.80 2.00 2.19 2.39	0.04 0.08 0.12
B66A RRH4X45	A	From Leg	4.00 0.00 2.00	0.00	116.00	1" Ice No Ice 1/2" Ice 3.01	2.58 1.63 1.81 2.00	0.07 0.09 0.11
B66A RRH4X45	B	From Leg	4.00 0.00 2.00	0.00	116.00	1" Ice No Ice 1/2" Ice 3.01	2.58 1.63 1.81 2.00	0.07 0.09 0.11
B66A RRH4X45	C	From Leg	4.00 0.00 2.00	0.00	116.00	1" Ice No Ice 1/2" Ice 3.01	2.58 1.63 1.81 2.00	0.07 0.09 0.11
Platform Mount [LP 303-1]	C	None		0.00	116.00	1" Ice No Ice 1/2" Ice 23.08	14.66 14.66 18.87 23.08	1.25 1.48 1.71
** (2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.00	96.00	1" Ice No Ice 1/2" Ice 6.70	5.83 4.71 5.51 6.21	0.09 0.14 0.21
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.00	96.00	1" Ice No Ice 1/2" Ice 6.70	5.83 4.71 5.51 6.21	0.09 0.14 0.21
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.00	96.00	1" Ice No Ice 1/2" Ice 6.70	5.83 4.71 5.51 6.21	0.09 0.14 0.21
AM-X-CD-14-65-00T-RET	A	From Leg	4.00	0.00	96.00	1" Ice No Ice	5.23 4.02	0.05

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral	Vert					
w/ Mount Pipe			0.00				1/2"	5.62	4.63	0.10
			2.00				Ice	6.01	5.26	0.15
AM-X-CD-14-65-00T-RET	B	From Leg	4.00	0.00	96.00		1" Ice	5.23	4.02	0.05
w/ Mount Pipe			0.00				No Ice	5.62	4.63	0.10
			2.00				1/2"	6.01	5.26	0.15
							Ice			
							1" Ice			
AM-X-CD-14-65-00T-RET	C	From Leg	4.00	0.00	96.00		No Ice	5.23	4.02	0.05
w/ Mount Pipe			0.00				1/2"	5.62	4.63	0.10
			2.00				Ice	6.01	5.26	0.15
							1" Ice			
GPS_A	C	From Leg	4.00	0.00	96.00		No Ice	0.26	0.26	0.00
			0.00				1/2"	0.32	0.32	0.00
			7.00				Ice	0.39	0.39	0.01
							1" Ice			
(2) TT19-08BP111-001	A	From Leg	4.00	0.00	96.00		No Ice	0.55	0.45	0.02
			0.00				1/2"	0.65	0.53	0.02
			2.00				Ice	0.75	0.63	0.03
							1" Ice			
(2) TT19-08BP111-001	B	From Leg	4.00	0.00	96.00		No Ice	0.55	0.45	0.02
			0.00				1/2"	0.65	0.53	0.02
			2.00				Ice	0.75	0.63	0.03
							1" Ice			
(2) TT19-08BP111-001	C	From Leg	4.00	0.00	96.00		No Ice	0.55	0.45	0.02
			0.00				1/2"	0.65	0.53	0.02
			2.00				Ice	0.75	0.63	0.03
							1" Ice			
DC6-48-60-18-8F	A	From Leg	4.00	0.00	96.00		No Ice	0.92	0.92	0.02
			0.00				1/2"	1.46	1.46	0.04
			2.00				Ice	1.64	1.64	0.06
							1" Ice			
RRUS-11	A	From Leg	4.00	0.00	96.00		No Ice	2.79	1.19	0.05
			0.00				1/2"	3.00	1.34	0.07
			2.00				Ice	3.21	1.50	0.09
							1" Ice			
RRUS-11	B	From Leg	4.00	0.00	96.00		No Ice	2.79	1.19	0.05
			0.00				1/2"	3.00	1.34	0.07
			2.00				Ice	3.21	1.50	0.09
							1" Ice			
RRUS-11	C	From Leg	4.00	0.00	96.00		No Ice	2.79	1.19	0.05
			0.00				1/2"	3.00	1.34	0.07
			2.00				Ice	3.21	1.50	0.09
							1" Ice			
RRUS 12 B2	A	From Leg	4.00	0.00	96.00		No Ice	3.14	1.28	0.05
			0.00				1/2"	3.36	1.43	0.07
			2.00				Ice	3.59	1.60	0.10
							1" Ice			
RRUS 12 B2	B	From Leg	4.00	0.00	96.00		No Ice	3.14	1.28	0.05
			0.00				1/2"	3.36	1.43	0.07
			2.00				Ice	3.59	1.60	0.10
							1" Ice			
RRUS 12 B2	C	From Leg	4.00	0.00	96.00		No Ice	3.14	1.28	0.05
			0.00				1/2"	3.36	1.43	0.07
			2.00				Ice	3.59	1.60	0.10
							1" Ice			
T-Arm Mount [TA 602-3]	C	None		0.00	96.00		No Ice	11.59	11.59	0.77
							1/2"	15.44	15.44	0.99
							Ice	19.29	19.29	1.21
							1" Ice			
**										
KS24019-L112A	A	From Leg	2.00	30.00	92.00		No Ice	0.14	0.14	0.01
			0.00				1/2"	0.20	0.20	0.01
			1.00				Ice	0.26	0.26	0.01
							1" Ice			
Side Arm Mount [SO 701-	A	None		0.00	92.00		No Ice	0.85	1.67	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
1]						1/2" Ice 1.14 1.43	2.34 3.01	0.08 0.09
** Side Arm Mount [SO 701-1]	A	None		0.00	87.00	No Ice 1/2" Ice 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
**						1" Ice		

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L1 160.00-117.33	137.81	1.083	29.01	97.204	A	0.000	97.204	97.204	100.00	0.000	0.000
					B	0.000	97.204		100.00	0.000	0.000
					C	0.000	97.204		100.00	0.000	0.000
L2 117.33-94.00	105.40	1.003	26.90	64.888	A	0.000	64.888	64.888	100.00	0.000	0.000
					B	0.000	64.888		100.00	0.000	0.000
					C	0.000	64.888		100.00	0.000	1.125
L3 94.00-82.50	88.19	0.953	25.56	35.268	A	0.000	35.268	35.268	100.00	0.000	0.000
					B	0.000	35.268		100.00	0.000	0.000
					C	0.000	35.268		100.00	0.000	5.887
L4 82.50-72.75	77.58	0.919	24.64	31.079	A	0.000	31.079	31.079	100.00	0.000	0.000
					B	0.000	31.079		100.00	0.000	0.000
					C	0.000	31.079		100.00	0.000	4.017
L5 72.75-56.00	64.26	0.871	23.35	57.139	A	0.000	57.139	57.139	100.00	0.000	0.000
					B	0.000	57.139		100.00	0.000	0.000
					C	0.000	57.139		100.00	0.000	9.196
L6 56.00-40.58	48.20	0.802	21.51	56.673	A	0.000	56.673	56.673	100.00	0.000	0.000
					B	0.000	56.673		100.00	0.000	0.000
					C	0.000	56.673		100.00	0.000	11.095
L7 40.58-31.50	36.01	0.738	19.79	34.515	A	0.000	34.515	34.515	100.00	0.000	0.000
					B	0.000	34.515		100.00	0.000	0.000
					C	0.000	34.515		100.00	0.000	7.003
L8 31.50-28.75	30.12	0.701	18.81	10.747	A	0.000	10.747	10.747	100.00	0.000	0.000
					B	0.000	10.747		100.00	0.000	0.000
					C	0.000	10.747		100.00	0.000	2.120
L9 28.75-11.00	19.77	0.7	18.77	72.339	A	0.000	72.339	72.339	100.00	0.000	0.000
					B	0.000	72.339		100.00	0.000	0.000
					C	0.000	72.339		100.00	0.000	11.310
L10 11.00-8.50	9.75	0.7	18.77	10.602	A	0.000	10.602	10.602	100.00	0.000	0.000
					B	0.000	10.602		100.00	0.000	0.000
					C	0.000	10.602		100.00	0.000	1.928
L11 8.50-0.00	4.23	0.7	18.77	36.810	A	0.000	36.810	36.810	100.00	0.000	0.000
					B	0.000	36.810		100.00	0.000	0.000
					C	0.000	36.810		100.00	0.000	6.553

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L1 160.00-	137.81	1.083	6.58	1.7305	109.511	A	0.000	109.511	109.511	100.00	0.000	0.000

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
117.33						B	0.000	109.511		100.00	0.000	0.000
						C	0.000	109.511		100.00	0.000	0.000
L2 117.33-94.00	105.40	1.003	6.10	1.6847	71.617	A	0.000	71.617	71.617	100.00	0.000	0.000
						B	0.000	71.617		100.00	0.000	0.000
						C	0.000	71.617		100.00	0.000	3.279
L3 94.00-82.50	88.19	0.953	5.80	1.6549	38.440	A	0.000	38.440	38.440	100.00	0.000	0.000
						B	0.000	38.440		100.00	0.000	0.000
						C	0.000	38.440		100.00	0.000	16.442
L4 82.50-72.75	77.58	0.919	5.59	1.6339	33.768	A	0.000	33.768	33.768	100.00	0.000	0.000
						B	0.000	33.768		100.00	0.000	0.000
						C	0.000	33.768		100.00	0.000	10.931
L5 72.75-56.00	64.26	0.871	5.30	1.6034	61.615	A	0.000	61.615	61.615	100.00	0.000	0.000
						B	0.000	61.615		100.00	0.000	0.000
						C	0.000	61.615		100.00	0.000	26.708
L6 56.00-40.58	48.20	0.802	4.88	1.5579	60.676	A	0.000	60.676	60.676	100.00	0.000	0.000
						B	0.000	60.676		100.00	0.000	0.000
						C	0.000	60.676		100.00	0.000	30.771
L7 40.58-31.50	36.01	0.738	4.49	1.5131	36.873	A	0.000	36.873	36.873	100.00	0.000	0.000
						B	0.000	36.873		100.00	0.000	0.000
						C	0.000	36.873		100.00	0.000	18.952
L8 31.50-28.75	30.12	0.701	4.26	1.4864	11.428	A	0.000	11.428	11.428	100.00	0.000	0.000
						B	0.000	11.428		100.00	0.000	0.000
						C	0.000	11.428		100.00	0.000	5.572
L9 28.75-11.00	19.77	0.7	4.26	1.4251	76.555	A	0.000	76.555	76.555	100.00	0.000	0.000
						B	0.000	76.555		100.00	0.000	0.000
						C	0.000	76.555		100.00	0.000	28.158
L10 11.00-8.50	9.75	0.7	4.26	1.3278	11.155	A	0.000	11.155	11.155	100.00	0.000	0.000
						B	0.000	11.155		100.00	0.000	0.000
						C	0.000	11.155		100.00	0.000	4.731
L11 8.50-0.00	4.23	0.7	4.26	1.2214	38.540	A	0.000	38.540	38.540	100.00	0.000	0.000
						B	0.000	38.540		100.00	0.000	0.000
						C	0.000	38.540		100.00	0.000	15.320

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 160.00-117.33	137.81	1.083	8.47	97.204	A	0.000	97.204	97.204	100.00	0.000	0.000
					B	0.000	97.204		100.00	0.000	0.000
					C	0.000	97.204		100.00	0.000	0.000
L2 117.33-94.00	105.40	1.003	7.86	64.888	A	0.000	64.888	64.888	100.00	0.000	0.000
					B	0.000	64.888		100.00	0.000	0.000
					C	0.000	64.888		100.00	0.000	1.125
L3 94.00-82.50	88.19	0.953	7.47	35.268	A	0.000	35.268	35.268	100.00	0.000	0.000
					B	0.000	35.268		100.00	0.000	0.000
					C	0.000	35.268		100.00	0.000	5.887
L4 82.50-72.75	77.58	0.919	7.20	31.079	A	0.000	31.079	31.079	100.00	0.000	0.000
					B	0.000	31.079		100.00	0.000	0.000
					C	0.000	31.079		100.00	0.000	4.017
L5 72.75-56.00	64.26	0.871	6.82	57.139	A	0.000	57.139	57.139	100.00	0.000	0.000
					B	0.000	57.139		100.00	0.000	0.000
					C	0.000	57.139		100.00	0.000	9.196
L6 56.00-40.58	48.20	0.802	6.28	56.673	A	0.000	56.673	56.673	100.00	0.000	0.000
					B	0.000	56.673		100.00	0.000	0.000
					C	0.000	56.673		100.00	0.000	11.095
L7 40.58-31.50	36.01	0.738	5.78	34.515	A	0.000	34.515	34.515	100.00	0.000	0.000
					B	0.000	34.515		100.00	0.000	0.000
					C	0.000	34.515		100.00	0.000	7.003
L8 31.50-28.75	30.12	0.701	5.49	10.747	A	0.000	10.747	10.747	100.00	0.000	0.000
					B	0.000	10.747		100.00	0.000	0.000
					C	0.000	10.747		100.00	0.000	2.120
L9 28.75-	19.77	0.7	5.48	72.339	A	0.000	72.339	72.339	100.00	0.000	0.000

Section Elevation ft	z ft	K _z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
11.00					B	0.000	72.339		100.00	0.000	0.000
L10 11.00-8.50	9.75	0.7	5.48	10.602	C	0.000	72.339		100.00	0.000	11.310
					A	0.000	10.602	10.602	100.00	0.000	0.000
					B	0.000	10.602		100.00	0.000	0.000
L11 8.50-0.00	4.23	0.7	5.48	36.810	C	0.000	10.602		100.00	0.000	1.928
					A	0.000	36.810	36.810	100.00	0.000	0.000
					B	0.000	36.810		100.00	0.000	0.000
					C	0.000	36.810		100.00	0.000	6.553

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
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	160 - 117.33	Pole	Max Tension	20	0.00	-0.00	-0.00
			Max. Compression	26	-21.73	0.07	0.02
			Max. Mx	20	-8.37	405.69	0.07
			Max. My	2	-8.38	0.04	404.71
			Max. Vy	20	-16.02	405.69	0.07
			Max. Vx	14	15.99	-0.01	-404.59
L2	117.33 - 94	Pole	Max. Torque	9			0.12
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.23	-0.29	-0.10
			Max. Mx	8	-17.87	-1040.78	-1.07
			Max. My	2	-17.90	1.08	1033.60
			Max. Vy	20	-27.99	1040.43	1.33
L3	94 - 82.5	Pole	Max. Vx	14	27.73	-1.33	-1033.27
			Max. Torque	11			0.52
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.81	0.65	-0.59
			Max. Mx	8	-19.38	-1211.98	-1.40
			Max. My	2	-19.41	1.47	1203.35
L4	82.5 - 72.75	Pole	Max. Vy	20	-29.11	1211.82	1.59
			Max. Vx	14	28.86	-1.53	-1203.09
			Max. Torque	11			0.52
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.64	3.11	-2.02
			Max. Mx	20	-24.16	1677.40	2.20
L5	72.75 - 56	Pole	Max. My	14	-24.18	-2.02	-1664.71
			Max. Vy	20	-31.72	1677.40	2.20
			Max. Vx	14	31.46	-2.02	-1664.71
			Max. Torque	17			-0.35
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.43	5.93	-3.65
L6	56 - 40.583	Pole	Max. Mx	20	-29.24	2231.79	2.85
			Max. My	14	-29.26	-2.54	-2214.77
			Max. Vy	20	-34.49	2231.79	2.85
			Max. Vx	14	34.24	-2.54	-2214.77
			Max. Torque	3			0.86
			Max Tension	1	0.00	0.00	0.00
L7	40.583 - 31.5	Pole	Max. Compression	26	-65.50	7.50	-4.55
			Max. Mx	20	-32.82	2549.57	3.18
			Max. My	14	-32.84	-2.81	-2530.22
			Max. Vy	20	-36.12	2549.57	3.18
			Max. Vx	14	35.87	-2.81	-2530.22
			Max. Torque	25			1.26
L8	31.5 - 28.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.89	10.21	-6.12
			Max. Mx	20	-42.04	3132.90	3.76
			Max. My	14	-42.05	-3.25	-3109.55
			Max. Vy	20	-39.01	3132.90	3.76
			Max. Vx	14	38.76	-3.25	-3109.55
L9	28.75 - 11	Pole	Max. Torque	25			2.02
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-79.70	10.67	-6.38
			Max. Mx	20	-43.41	3240.80	3.86
			Max. My	14	-43.42	-3.33	-3216.75
			Max. Vy	20	-39.46	3240.80	3.86
L10	11 - 8.5	Pole	Max. Vx	14	39.21	-3.33	-3216.75
			Max. Torque	25			2.16
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-90.39	13.63	-8.09
			Max. Mx	20	-51.50	3963.46	4.50
			Max. My	14	-51.51	-3.80	-3934.86
L10	11 - 8.5	Pole	Max. Vy	20	-41.97	3963.46	4.50
			Max. Vx	14	41.72	-3.80	-3934.86
			Max. Torque	25			2.89
L10	11 - 8.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-92.04	14.03	-8.32
			Max. Mx	20	-52.80	4068.88	4.59
			Max. My	14	-52.81	-3.87	-4039.64

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L11	8.5 - 0	Pole	Max. Vy	20	-42.36	4068.88	4.59
			Max. Vx	14	42.12	-3.87	-4039.64
			Max. Torque	25			3.02
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-96.89	15.27	-9.04
			Max. Mx	20	-56.67	4434.41	4.88
			Max. My	14	-56.67	-4.08	-4403.01
			Max. Vy	20	-43.64	4434.41	4.88
			Max. Vx	14	43.40	-4.08	-4403.01
			Max. Torque	25			3.47

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	96.89	-0.00	0.00
	Max. H _x	21	42.52	43.62	0.05
	Max. H _z	3	42.52	0.05	43.38
	Max. M _x	2	4401.22	0.05	43.38
	Max. M _z	8	4431.00	-43.62	-0.05
	Max. Torsion	25	3.47	21.85	37.59
	Min. Vert	21	42.52	43.62	0.05
	Min. H _x	9	42.52	-43.62	-0.05
	Min. H _z	15	42.52	-0.05	-43.38
	Min. M _x	14	-4403.01	-0.05	-43.38
	Min. M _z	20	-4434.41	43.62	0.05
	Min. Torsion	13	-3.46	-21.85	-37.59

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	47.24	-0.00	0.00	0.73	1.39	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	56.69	-0.05	-43.38	-4401.22	7.48	-3.14
0.9 Dead+1.6 Wind 0 deg - No Ice	42.52	-0.05	-43.38	-4363.65	7.00	-3.14
1.2 Dead+1.6 Wind 30 deg - No Ice	56.69	21.77	-37.54	-3808.82	-2210.08	-1.97
0.9 Dead+1.6 Wind 30 deg - No Ice	42.52	21.77	-37.54	-3776.25	-2191.47	-1.97
1.2 Dead+1.6 Wind 60 deg - No Ice	56.69	37.76	-21.65	-2195.29	-3834.96	-0.27
0.9 Dead+1.6 Wind 60 deg - No Ice	42.52	37.76	-21.65	-2176.61	-3802.36	-0.27
1.2 Dead+1.6 Wind 90 deg - No Ice	56.69	43.62	0.05	6.68	-4431.00	1.50
0.9 Dead+1.6 Wind 90 deg - No Ice	42.52	43.62	0.05	6.40	-4393.52	1.50
1.2 Dead+1.6 Wind 120 deg - No Ice	56.69	37.80	21.73	2207.08	-3840.72	2.86
0.9 Dead+1.6 Wind 120 deg - No Ice	42.52	37.80	21.73	2187.86	-3808.07	2.86
1.2 Dead+1.6 Wind 150 deg - No Ice	56.69	21.85	37.59	3816.37	-2220.08	3.46
0.9 Dead+1.6 Wind 150 deg - No Ice	42.52	21.85	37.59	3783.30	-2201.38	3.46
1.2 Dead+1.6 Wind 180 deg - No Ice	56.69	0.05	43.38	4403.01	-4.08	3.14
0.9 Dead+1.6 Wind 180 deg - No Ice	42.52	0.05	43.38	4364.99	-4.46	3.14
1.2 Dead+1.6 Wind 210 deg	56.69	-21.77	37.54	3810.62	2213.49	1.97

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
- No Ice						
0.9 Dead+1.6 Wind 210 deg - No Ice	42.52	-21.77	37.54	3777.59	2194.01	1.98
1.2 Dead+1.6 Wind 240 deg - No Ice	56.69	-37.76	21.65	2197.08	3838.37	0.28
0.9 Dead+1.6 Wind 240 deg - No Ice	42.52	-37.76	21.65	2177.95	3804.90	0.28
1.2 Dead+1.6 Wind 270 deg - No Ice	56.69	-43.62	-0.05	-4.88	4434.41	-1.49
0.9 Dead+1.6 Wind 270 deg - No Ice	42.52	-43.62	-0.05	-5.06	4396.06	-1.49
1.2 Dead+1.6 Wind 300 deg - No Ice	56.69	-37.80	-21.73	-2205.28	3844.12	-2.87
0.9 Dead+1.6 Wind 300 deg - No Ice	42.52	-37.80	-21.73	-2186.52	3810.61	-2.87
1.2 Dead+1.6 Wind 330 deg - No Ice	56.69	-21.85	-37.59	-3814.58	2223.48	-3.47
0.9 Dead+1.6 Wind 330 deg - No Ice	42.52	-21.85	-37.59	-3781.96	2203.92	-3.47
1.2 Dead+1.0 Ice+1.0 Temp	96.89	0.00	-0.00	9.04	15.27	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	96.89	-0.01	-8.68	-926.68	16.45	-1.25
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	96.89	4.35	-7.52	-800.83	-453.97	-0.75
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	96.89	7.55	-4.34	-457.94	-798.58	-0.06
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	96.89	8.72	0.01	10.12	-925.06	0.65
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	96.89	7.55	4.35	477.93	-799.52	1.19
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	96.89	4.37	7.52	820.15	-455.58	1.41
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	96.89	0.01	8.68	945.06	14.59	1.25
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	96.89	-4.35	7.52	819.22	485.01	0.75
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	96.89	-7.55	4.34	476.32	829.62	0.06
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	96.89	-8.72	-0.01	8.26	956.10	-0.65
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	96.89	-7.55	-4.35	-459.55	830.56	-1.19
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	96.89	-4.37	-7.52	-801.76	486.62	-1.41
Dead+Wind 0 deg - Service	47.24	-0.01	-7.92	-799.46	2.47	0.06
Dead+Wind 30 deg - Service	47.24	3.98	-6.85	-691.73	-400.61	0.00
Dead+Wind 60 deg - Service	47.24	6.89	-3.95	-398.45	-695.96	-0.05
Dead+Wind 90 deg - Service	47.24	7.97	0.01	1.80	-804.45	-0.09
Dead+Wind 120 deg - Service	47.24	6.90	3.97	401.76	-697.01	-0.11
Dead+Wind 150 deg - Service	47.24	3.99	6.86	694.27	-402.43	-0.10
Dead+Wind 180 deg - Service	47.24	0.01	7.92	800.95	0.37	-0.06
Dead+Wind 210 deg - Service	47.24	-3.98	6.85	693.22	403.44	-0.00
Dead+Wind 240 deg - Service	47.24	-6.89	3.95	399.94	698.80	0.05
Dead+Wind 270 deg - Service	47.24	-7.97	-0.01	-0.30	807.29	0.09
Dead+Wind 300 deg - Service	47.24	-6.90	-3.97	-400.27	699.85	0.11
Dead+Wind 330 deg - Service	47.24	-3.99	-6.86	-692.78	405.26	0.10

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-47.24	0.00	0.00	47.24	-0.00	0.000%
2	-0.05	-56.69	-43.38	0.05	56.69	43.38	0.004%
3	-0.05	-42.52	-43.38	0.05	42.52	43.38	0.003%
4	21.77	-56.69	-37.54	-21.77	56.69	37.54	0.000%
5	21.77	-42.52	-37.54	-21.77	42.52	37.54	0.000%
6	37.76	-56.69	-21.65	-37.76	56.69	21.65	0.000%
7	37.76	-42.52	-21.65	-37.76	42.52	21.65	0.000%
8	43.63	-56.69	0.05	-43.62	56.69	-0.05	0.009%
9	43.63	-42.52	0.05	-43.62	42.52	-0.05	0.007%
10	37.80	-56.69	21.73	-37.80	56.69	-21.73	0.000%
11	37.80	-42.52	21.73	-37.80	42.52	-21.73	0.000%
12	21.85	-56.69	37.59	-21.85	56.69	-37.59	0.000%
13	21.85	-42.52	37.59	-21.85	42.52	-37.59	0.000%
14	0.05	-56.69	43.38	-0.05	56.69	-43.38	0.004%
15	0.05	-42.52	43.38	-0.05	42.52	-43.38	0.003%
16	-21.77	-56.69	37.54	21.77	56.69	-37.54	0.000%
17	-21.77	-42.52	37.54	21.77	42.52	-37.54	0.000%
18	-37.76	-56.69	21.65	37.76	56.69	-21.65	0.000%
19	-37.76	-42.52	21.65	37.76	42.52	-21.65	0.000%
20	-43.63	-56.69	-0.05	43.62	56.69	0.05	0.009%
21	-43.63	-42.52	-0.05	43.62	42.52	0.05	0.007%
22	-37.80	-56.69	-21.73	37.80	56.69	21.73	0.000%
23	-37.80	-42.52	-21.73	37.80	42.52	21.73	0.000%
24	-21.85	-56.69	-37.59	21.85	56.69	37.59	0.000%
25	-21.85	-42.52	-37.59	21.85	42.52	37.59	0.000%
26	0.00	-96.89	0.00	-0.00	96.89	0.00	0.001%
27	-0.01	-96.89	-8.68	0.01	96.89	8.68	0.000%
28	4.35	-96.89	-7.52	-4.35	96.89	7.52	0.000%
29	7.55	-96.89	-4.34	-7.55	96.89	4.34	0.000%
30	8.72	-96.89	0.01	-8.72	96.89	-0.01	0.000%
31	7.56	-96.89	4.35	-7.55	96.89	-4.35	0.000%
32	4.37	-96.89	7.52	-4.37	96.89	-7.52	0.000%
33	0.01	-96.89	8.68	-0.01	96.89	-8.68	0.000%
34	-4.35	-96.89	7.52	4.35	96.89	-7.52	0.000%
35	-7.55	-96.89	4.34	7.55	96.89	-4.34	0.000%
36	-8.72	-96.89	-0.01	8.72	96.89	0.01	0.000%
37	-7.56	-96.89	-4.35	7.55	96.89	4.35	0.000%
38	-4.37	-96.89	-7.52	4.37	96.89	7.52	0.000%
39	-0.01	-47.24	-7.92	0.01	47.24	7.92	0.002%
40	3.98	-47.24	-6.86	-3.98	47.24	6.85	0.002%
41	6.89	-47.24	-3.95	-6.89	47.24	3.95	0.002%
42	7.97	-47.24	0.01	-7.97	47.24	-0.01	0.002%
43	6.90	-47.24	3.97	-6.90	47.24	-3.97	0.002%
44	3.99	-47.24	6.86	-3.99	47.24	-6.86	0.002%
45	0.01	-47.24	7.92	-0.01	47.24	-7.92	0.002%
46	-3.98	-47.24	6.86	3.98	47.24	-6.85	0.002%
47	-6.89	-47.24	3.95	6.89	47.24	-3.95	0.002%
48	-7.97	-47.24	-0.01	7.97	47.24	0.01	0.002%
49	-6.90	-47.24	-3.97	6.90	47.24	3.97	0.002%
50	-3.99	-47.24	-6.86	3.99	47.24	6.86	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	14	0.00004601	0.00009190
3	Yes	14	0.00003105	0.00007566
4	Yes	18	0.00000001	0.00007971
5	Yes	17	0.00000001	0.00014987
6	Yes	18	0.00000001	0.00008070
7	Yes	18	0.00000001	0.00005801
8	Yes	13	0.00011309	0.00012203
9	Yes	13	0.00007766	0.00010959
10	Yes	18	0.00000001	0.00008170
11	Yes	18	0.00000001	0.00005870
12	Yes	18	0.00000001	0.00008005

13	Yes	18	0.00000001	0.00005751
14	Yes	14	0.00004601	0.00007817
15	Yes	14	0.00003105	0.00006542
16	Yes	18	0.00000001	0.00008110
17	Yes	18	0.00000001	0.00005832
18	Yes	18	0.00000001	0.00008031
19	Yes	18	0.00000001	0.00005769
20	Yes	13	0.00011309	0.00010899
21	Yes	13	0.00007765	0.00010057
22	Yes	18	0.00000001	0.00008042
23	Yes	18	0.00000001	0.00005774
24	Yes	18	0.00000001	0.00008185
25	Yes	18	0.00000001	0.00005884
26	Yes	9	0.00000001	0.00004120
27	Yes	16	0.00000001	0.00008787
28	Yes	16	0.00000001	0.00009584
29	Yes	16	0.00000001	0.00009612
30	Yes	16	0.00000001	0.00008794
31	Yes	16	0.00000001	0.00009755
32	Yes	16	0.00000001	0.00009725
33	Yes	16	0.00000001	0.00008906
34	Yes	16	0.00000001	0.00009896
35	Yes	16	0.00000001	0.00009904
36	Yes	16	0.00000001	0.00008975
37	Yes	16	0.00000001	0.00009808
38	Yes	16	0.00000001	0.00009803
39	Yes	13	0.00000001	0.00002611
40	Yes	13	0.00000001	0.00004503
41	Yes	13	0.00000001	0.00004618
42	Yes	13	0.00000001	0.00002638
43	Yes	13	0.00000001	0.00004350
44	Yes	13	0.00000001	0.00004735
45	Yes	13	0.00000001	0.00002615
46	Yes	13	0.00000001	0.00004503
47	Yes	13	0.00000001	0.00004444
48	Yes	13	0.00000001	0.00002646
49	Yes	13	0.00000001	0.00004801
50	Yes	13	0.00000001	0.00004360

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 117.33	20.227	48	1.14	0.00
L2	122 - 94	11.627	48	0.96	0.00
L3	94 - 82.5	6.635	48	0.71	0.00
L4	88 - 72.75	5.780	48	0.65	0.00
L5	72.75 - 56	3.866	48	0.52	0.00
L6	56 - 40.583	2.292	48	0.37	0.00
L7	47 - 31.5	1.650	48	0.31	0.00
L8	31.5 - 28.75	0.762	48	0.23	0.00
L9	28.75 - 11	0.636	48	0.21	0.00
L10	11 - 8.5	0.096	48	0.08	0.00
L11	8.5 - 0	0.058	48	0.07	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
159.00	APXV9ERR18-C-A20 w/ Mount Pipe	48	19.990	1.13	0.00	54225
155.00	800MHz 2X50W RRH W/FILTER	48	19.043	1.12	0.00	54225
142.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	48	16.005	1.07	0.00	15062
130.00	APXV18-206517S-ACU w/ Mount Pipe	48	13.318	1.02	0.00	9037

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
116.00	(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	48	10.429	0.91	0.00	6564
96.00	(2) 7770.00 w/ Mount Pipe	48	6.936	0.73	0.00	5269
92.00	KS24019-L112A	48	6.342	0.69	0.00	6103
87.00	Side Arm Mount [SO 701-1]	48	5.643	0.64	0.00	8333

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 117.33	111.185	20	6.26	0.00
L2	122 - 94	63.925	20	5.30	0.00
L3	94 - 82.5	36.475	20	3.89	0.00
L4	88 - 72.75	31.776	20	3.59	0.00
L5	72.75 - 56	21.253	20	2.89	0.00
L6	56 - 40.583	12.596	20	2.04	0.00
L7	47 - 31.5	9.070	20	1.70	0.00
L8	31.5 - 28.75	4.188	20	1.25	0.00
L9	28.75 - 11	3.497	20	1.15	0.00
L10	11 - 8.5	0.529	20	0.45	0.00
L11	8.5 - 0	0.319	20	0.36	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
159.00	APXV9ERR18-C-A20 w/ Mount Pipe	20	109.883	6.24	0.00	10066
155.00	800MHz 2X50W RRH W/FILTER	20	104.680	6.17	0.00	10066
142.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	20	87.984	5.92	0.00	2793
130.00	APXV18-206517S-ACU w/ Mount Pipe	20	73.215	5.59	0.00	1673
116.00	(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	20	57.334	5.03	0.00	1211
96.00	(2) 7770.00 w/ Mount Pipe	20	38.134	3.99	0.00	967
92.00	KS24019-L112A	20	34.867	3.79	0.00	1118
87.00	Side Arm Mount [SO 701-1]	20	31.023	3.55	0.00	1524

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	160 - 117.33 (1)	TP30.46x22.35x0.2188	42.67	0.00	0.0	20.680 7	-8.37	1268.11	0.007
L2	117.33 - 94 (2)	TP34.455x29.1348x0.281 3	28.00	0.00	0.0	30.954 0	-17.87	2001.25	0.009
L3	94 - 82.5 (3)	TP36.64x34.455x0.3821	11.50	0.00	0.0	43.319 0	-19.38	2342.22	0.008
L4	82.5 - 72.75 (4)	TP37.9423x34.8309x0.37 5	15.25	0.00	0.0	45.362 5	-24.16	3187.04	0.008
L5	72.75 - 56 (5)	TP41.1383x37.9423x0.44 82	16.75	0.00	0.0	58.724 2	-29.24	3349.64	0.009
L6	56 - 40.583 (6)	TP44.08x41.1383x0.6042	15.42	0.00	0.0	82.198 4	-32.82	3750.89	0.009
L7	40.583 - 31.5 (7)	TP45.0389x41.6472x0.69 15	15.50	0.00	0.0	98.743 8	-42.04	4288.66	0.010

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio P _u φP _n
L8	31.5 - 28.75 (8)	TP45.5593x45.0389x0.73 53	2.75	0.00	0.0	106.13 40	-43.41	4609.63	0.009
L9	28.75 - 11 (9)	TP48.9183x45.5593x0.61 72	17.75	0.00	0.0	95.997 5	-51.50	4732.20	0.011
L10	11 - 8.5 (10)	TP49.3914x48.9183x0.69 8	2.50	0.00	0.0	109.44 60	-52.80	5388.94	0.010
L11	8.5 - 0 (11)	TP51x49.3914x0.5706	8.50	0.00	0.0	92.653 9	-56.67	5005.51	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{rx} kip-ft	Ratio M _{ux} φM _{rx}	M _{uy} kip-ft	φM _{ry} kip-ft	Ratio M _{uy} φM _{ry}
L1	160 - 117.33 (1)	TP30.46x22.35x0.2188	405.69	758.70	0.535	0.00	758.70	0.000
L2	117.33 - 94 (2)	TP34.455x29.1348x0.281 3	1040.78	1392.87	0.747	0.00	1392.87	0.000
L3	94 - 82.5 (3)	TP36.64x34.455x0.3821	1211.97	1675.40	0.723	0.00	1675.40	0.000
L4	82.5 - 72.75 (4)	TP37.9423x34.8309x0.37 5	1677.40	2434.22	0.689	0.00	2434.22	0.000
L5	72.75 - 56 (5)	TP41.1383x37.9423x0.44 82	2231.79	2768.24	0.806	0.00	2768.24	0.000
L6	56 - 40.583 (6)	TP44.08x41.1383x0.6042	2549.57	3208.37	0.795	0.00	3208.37	0.000
L7	40.583 - 31.5 (7)	TP45.0389x41.6472x0.69 15	3132.90	3845.43	0.815	0.00	3845.43	0.000
L8	31.5 - 28.75 (8)	TP45.5593x45.0389x0.73 53	3240.80	4174.30	0.776	0.00	4174.30	0.000
L9	28.75 - 11 (9)	TP48.9183x45.5593x0.61 72	3963.47	4634.26	0.855	0.00	4634.26	0.000
L10	11 - 8.5 (10)	TP49.3914x48.9183x0.69 8	4068.88	5312.11	0.766	0.00	5312.11	0.000
L11	8.5 - 0 (11)	TP51x49.3914x0.5706	4434.41	5125.32	0.865	0.00	5125.32	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u K	φV _n K	Ratio V _u φV _n	Actual T _u kip-ft	φT _n kip-ft	Ratio T _u φT _n
L1	160 - 117.33 (1)	TP30.46x22.35x0.2188	16.02	634.06	0.025	0.12	1538.40	0.000
L2	117.33 - 94 (2)	TP34.455x29.1348x0.281 3	27.99	1000.63	0.028	0.44	2824.29	0.000
L3	94 - 82.5 (3)	TP36.64x34.455x0.3821	29.11	1171.11	0.025	0.38	3397.18	0.000
L4	82.5 - 72.75 (4)	TP37.9423x34.8309x0.37 5	31.72	1593.52	0.020	0.16	4935.83	0.000
L5	72.75 - 56 (5)	TP41.1383x37.9423x0.44 82	34.49	1674.82	0.021	0.17	5613.13	0.000
L6	56 - 40.583 (6)	TP44.08x41.1383x0.6042	36.12	1875.45	0.019	0.38	6505.57	0.000
L7	40.583 - 31.5 (7)	TP45.0389x41.6472x0.69 15	39.01	2144.33	0.018	0.77	7797.32	0.000
L8	31.5 - 28.75 (8)	TP45.5593x45.0389x0.73 53	39.46	2304.81	0.017	0.83	8464.17	0.000
L9	28.75 - 11 (9)	TP48.9183x45.5593x0.61 72	41.97	2366.10	0.018	1.20	9396.83	0.000
L10	11 - 8.5 (10)	TP49.3914x48.9183x0.69 8	42.36	2694.47	0.016	1.26	10771.25	0.000
L11	8.5 - 0 (11)	TP51x49.3914x0.5706	43.64	2502.76	0.017	1.49	10392.58	0.000

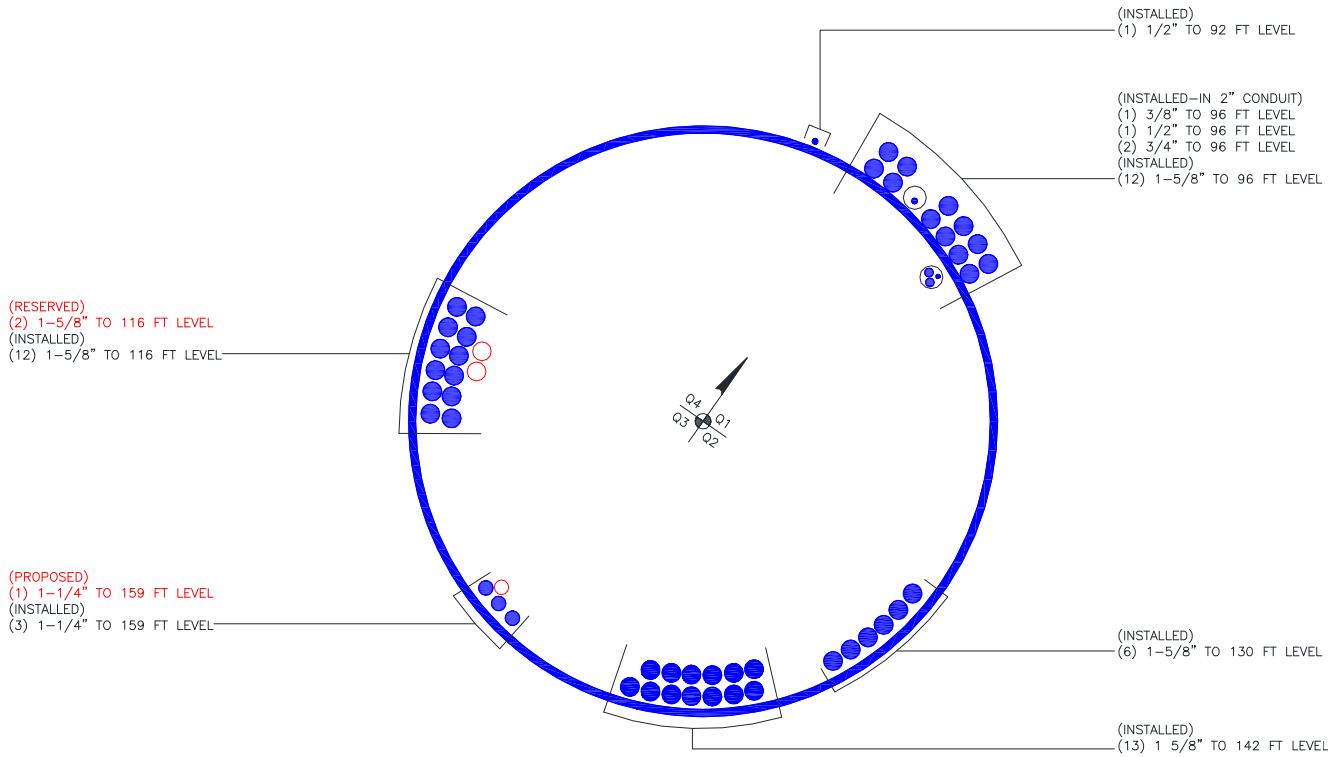
Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L1	160 - 117.33 (1)	0.007	0.535	0.000	0.025	0.000	0.542	1.000	4.8.2 ✓
L2	117.33 - 94 (2)	0.009	0.747	0.000	0.028	0.000	0.757	1.000	4.8.2 ✓
L3	94 - 82.5 (3)	0.008	0.723	0.000	0.025	0.000	0.732	1.000	4.8.2 ✓
L4	82.5 - 72.75 (4)	0.008	0.689	0.000	0.020	0.000	0.697	1.000	4.8.2 ✓
L5	72.75 - 56 (5)	0.009	0.806	0.000	0.021	0.000	0.815	1.000	4.8.2 ✓
L6	56 - 40.583 (6)	0.009	0.795	0.000	0.019	0.000	0.804	1.000	4.8.2 ✓
L7	40.583 - 31.5 (7)	0.010	0.815	0.000	0.018	0.000	0.825	1.000	4.8.2 ✓
L8	31.5 - 28.75 (8)	0.009	0.776	0.000	0.017	0.000	0.786	1.000	4.8.2 ✓
L9	28.75 - 11 (9)	0.011	0.855	0.000	0.018	0.000	0.866	1.000	4.8.2 ✓
L10	11 - 8.5 (10)	0.010	0.766	0.000	0.016	0.000	0.776	1.000	4.8.2 ✓
L11	8.5 - 0 (11)	0.011	0.865	0.000	0.017	0.000	0.877	1.000	4.8.2 ✓

Section Capacity Table

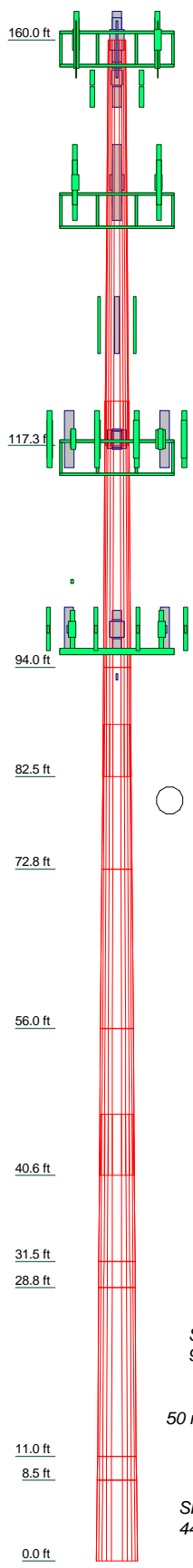
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
L1	160 - 117.33	Pole	TP30.46x22.35x0.2188	1	-8.37	1268.11	54.2	Pass	
L2	117.33 - 94	Pole	TP34.455x29.1348x0.2813	2	-17.87	2001.25	75.7	Pass	
L3	94 - 82.5	Pole	TP36.64x34.455x0.3821	3	-19.38	2342.22	73.2	Pass	
L4	82.5 - 72.75	Pole	TP37.9423x34.8309x0.375	4	-24.16	3187.04	69.7	Pass	
L5	72.75 - 56	Pole	TP41.1383x37.9423x0.4482	5	-29.24	3349.64	81.5	Pass	
L6	56 - 40.583	Pole	TP44.08x41.1383x0.6042	6	-32.82	3750.89	80.4	Pass	
L7	40.583 - 31.5	Pole	TP45.0389x41.6472x0.6915	7	-42.04	4288.66	82.5	Pass	
L8	31.5 - 28.75	Pole	TP45.5593x45.0389x0.7353	8	-43.41	4609.63	78.6	Pass	
L9	28.75 - 11	Pole	TP48.9183x45.5593x0.6172	9	-51.50	4732.20	86.6	Pass	
L10	11 - 8.5	Pole	TP49.3914x48.9183x0.698	10	-52.80	5388.94	77.6	Pass	
L11	8.5 - 0	Pole	TP51x49.3914x0.5706	11	-56.67	5005.51	87.7	Pass	
							Summary		
							Pole (L11)	87.7	Pass
							RATING =	87.7	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Section	1	2	3	4	5	6	7	8	9	10	11
Length (ft)	42.67	28.00	11.50	15.25	16.75	15.42	15.50	2.75	17.75	2.50	8.50
Number of Sides	12	12	12	12	12	12	12	12	12	12	12
Thickness (in)	0.2188	0.2813	0.3821	0.3750	0.4482	0.6042	0.6915	0.7353	0.6172	0.5706	0.5706
Socket Length (ft)	4.67		5.50			6.42					
Top Dia (in)	22.3500	29.1348	34.4550	34.8309	37.9423	41.1383	44.0389	45.5593	45.5593	48.9183	49.3914
Bot Dia (in)	30.4600	34.4550	36.6400	37.9423	41.1383	44.0800	45.0389	45.5593	48.9183	49.3914	51.0000
Grade	A572-65	A572-65	Reinf 47.68 ksi	A572-65	Reinf 50.30 ksi	Reinf 40.24 ksi	Reinf 38.30 ksi	Reinf 43.47 ksi	Reinf 43.47 ksi	Reinf 43.47 ksi	Reinf 43.47 ksi
Weight (K)	2.7	2.7	1.7	2.3	3.2	4.3	5.0	1.0	5.6	0.9	2.6



DESIGNED APPURTENANCE LOADING

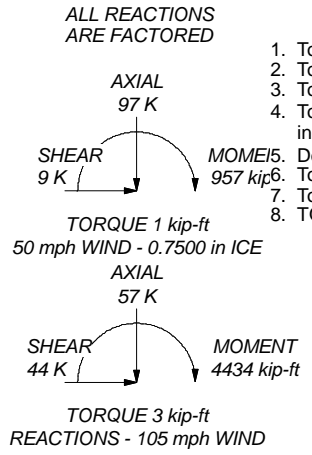
TYPE	ELEVATION	TYPE	ELEVATION
APXV9ERR18-C-A20 w/ Mount Pipe	159	(2) LPA-80080-4CF-EDIN-0 w/ Mount Pipe	116
APXVSPP18-C-A20 w/ Mount Pipe	159	(2) LPA-80063-4CF-EDIN-5 w/ Mount Pipe	116
APXVSP18-C-A20 w/ Mount Pipe	159	(2) LPA-80063-4CF-EDIN-5 w/ Mount Pipe	116
APXVTM14-C-120 w/ Mount Pipe	159	(2) SBNHH-1D65B w/ Mount Pipe	116
APXVTM14-C-120 w/ Mount Pipe	159	(2) SBNHH-1D65B w/ Mount Pipe	116
APXVTM14-C-120 w/ Mount Pipe	159	(2) SBNHH-1D65B w/ Mount Pipe	116
TD-RRH8x20-25	159	RRH2X60-PCS	116
TD-RRH8x20-25	159	RRH2X60-PCS	116
TD-RRH8x20-25	159	RRH2X60-PCS	116
Platform Mount [LP 602-1]	159	B13 RRH 4X30	116
(2) 2.375" OD x 6' Mount Pipe	159	B13 RRH 4X30	116
(2) 2.375" OD x 6' Mount Pipe	159	B13 RRH 4X30	116
(2) 2.375" OD x 6' Mount Pipe	159	B13 RRH 4X30	116
800MHz 2X50W RRH W/FILTER	155	DB-T1-6Z-8AB-0Z	116
800MHz 2X50W RRH W/FILTER	155	DB-T1-6Z-8AB-0Z	116
800MHz 2X50W RRH W/FILTER	155	B66A RRH4X45	116
PCS 1900MHz 4x45W-65MHz	155	B66A RRH4X45	116
PCS 1900MHz 4x45W-65MHz	155	B66A RRH4X45	116
PCS 1900MHz 4x45W-65MHz	155	B66A RRH4X45	116
Side Arm Mount [SO 102-3]	155	Platform Mount [LP 303-1]	116
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	142	(2) 7770.00 w/ Mount Pipe	96
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	142	(2) 7770.00 w/ Mount Pipe	96
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	142	AM-X-CD-14-65-00T-RET w/ Mount Pipe	96
LNX-6515DS-VTM w/ Mount Pipe	142	AM-X-CD-14-65-00T-RET w/ Mount Pipe	96
LNX-6515DS-VTM w/ Mount Pipe	142	AM-X-CD-14-65-00T-RET w/ Mount Pipe	96
LNX-6515DS-VTM w/ Mount Pipe	142	GPS_A	96
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	142	(2) TT19-08BP111-001	96
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	142	(2) TT19-08BP111-001	96
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	142	(2) TT19-08BP111-001	96
KRY 112 144/1	142	DC6-48-60-18-8F	96
KRY 112 144/1	142	RRUS-11	96
KRY 112 144/1	142	RRUS-11	96
RRUS 11 B12	142	RRUS 12 B2	96
RRUS 11 B12	142	RRUS 12 B2	96
RRUS 11 B12	142	RRUS 12 B2	96
Platform Mount [LP 602-1]	142	T-Arm Mount [TA 602-3]	96
APXV18-206517S-ACU w/ Mount Pipe	130	KS24019-L112A	92
APXV18-206517S-ACU w/ Mount Pipe	130	Side Arm Mount [SO 701-1]	92
APXV18-206517S-ACU w/ Mount Pipe	130	Side Arm Mount [SO 701-1]	87
Pipe Mount [PM 601-3]	130		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	Reinf 38.30 ksi	38 ksi	48 ksi
Reinf 47.68 ksi	48 ksi	60 ksi	Reinf 43.47 ksi	43 ksi	55 ksi
Reinf 50.30 ksi	50 ksi	63 ksi	Reinf 43.42 ksi	43 ksi	55 ksi
Reinf 40.24 ksi	40 ksi	51 ksi	Reinf 47.64 ksi	48 ksi	60 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 105 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 RATING: 87.7%



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

Job: 160-Ft Monopole / Pond Meadow
 Project: 37516-2880.004 / BU# 876339
 Client: Crown Castle Drawn by: Robert Koors App'd:
 Code: TIA-222-G Date: 06/20/17 Scale: NTS
 Path: Dwg No. E-1

v4.4 - Effective 7-12-13

Asymmetric Anchor Rod Analysis

Moment =	4434	k-ft	TIA Ref.	G	Location =	Base Plate
Axial =	57.0	kips	ASIF =	N/A	η =	0.50 for BP, Rev. G Sect. 4.9.9
Shear =	44.0	kips	Max Ratio =	105.0%	Threads =	N/A for FP, Rev. G
Anchor Qty =	25					

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

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in ²	Area, in ²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.250	#18J A615 Gr 75	75	100	0.0	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
2	2.250	#18J A615 Gr 75	75	100	22.5	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
3	2.250	#18J A615 Gr 75	75	100	45.0	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
4	2.250	#18J A615 Gr 75	75	100	67.5	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
5	2.250	#18J A615 Gr 75	75	100	90.0	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
6	2.250	#18J A615 Gr 75	75	100	112.5	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
7	2.250	#18J A615 Gr 75	75	100	135.0	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
8	2.250	#18J A615 Gr 75	75	100	157.5	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
9	2.250	#18J A615 Gr 75	75	100	180.0	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
10	2.250	#18J A615 Gr 75	75	100	202.5	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
11	2.250	#18J A615 Gr 75	75	100	225.0	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
12	2.250	#18J A615 Gr 75	75	100	247.5	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
13	2.250	#18J A615 Gr 75	75	100	270.0	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
14	2.250	#18J A615 Gr 75	75	100	292.5	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
15	2.250	#18J A615 Gr 75	75	100	315.0	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
16	2.250	#18J A615 Gr 75	75	100	337.5	59.30	0.00	3.98	150.83	145.77	154.73	0.00	260.00	59.5%
17	2.000	A193 Gr B7	105	125	15.0	65.80	0.00	3.14	131.89	127.90	134.97	0.00	250.00	54.0%
18	2.000	A193 Gr B7	105	125	45.0	65.80	0.00	3.14	131.89	127.90	134.97	0.00	250.00	54.0%
19	2.000	A193 Gr B7	105	125	135.0	65.80	0.00	3.14	131.89	127.90	134.97	0.00	250.00	54.0%
20	2.000	A193 Gr B7	105	125	165.0	65.80	0.00	3.14	131.89	127.90	134.97	0.00	250.00	54.0%
21	2.000	A193 Gr B7	105	125	255.0	65.80	0.00	3.14	131.89	127.90	134.97	0.00	250.00	54.0%
22	2.000	A193 Gr B7	105	125	285.0	65.80	0.00	3.14	131.89	127.90	134.97	0.00	250.00	54.0%
23	1.750	F1554 Gr 105	105	125	105.0	67.80	0.00	2.41	104.00	100.94	106.36	0.00	190.00	56.0%
24	1.750	F1554 Gr 105	105	125	225.0	67.80	0.00	2.41	104.00	100.94	106.36	0.00	190.00	56.0%
25	1.750	F1554 Gr 105	105	125	345.0	67.80	0.00	2.41	104.00	100.94	106.36	0.00	190.00	56.0%

89.75

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#: 876339
Site Name:
App #:
Pole Manufacturer: <i>Other</i>

Anchor Rod Data

Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	59.3	in

Plate Data

Diam:	65.3	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	10.25	in

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

Pole Data

Diam:	51	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	2931.4	ft-kips
Axial, Pu:	40.4	kips
Shear, Vu:	31.2	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

Reactions adjusted to account for post installed anchor rods.

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

Anchor Rod Results

Max Rod (Cu+ Vu/η): 154.7 Kips
 Allowable Axial, Φ*Fu*Anet: 260.0 Kips
 Anchor Rod Stress Ratio: 59.5% **Pass**

Rigid
AISC LRFD
φ*Tn

Base Plate Results

Base Plate Stress: 20.2 ksi
 Allowable Plate Stress: 54.0 ksi
 Base Plate Stress Ratio: 37.4% **Pass**

Flexural Check

Rigid
AISC LRFD
φ*Fy
Y.L. Length: 30.26

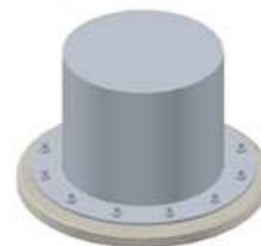
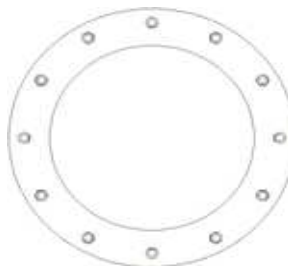
n/a

Stiffener Results

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

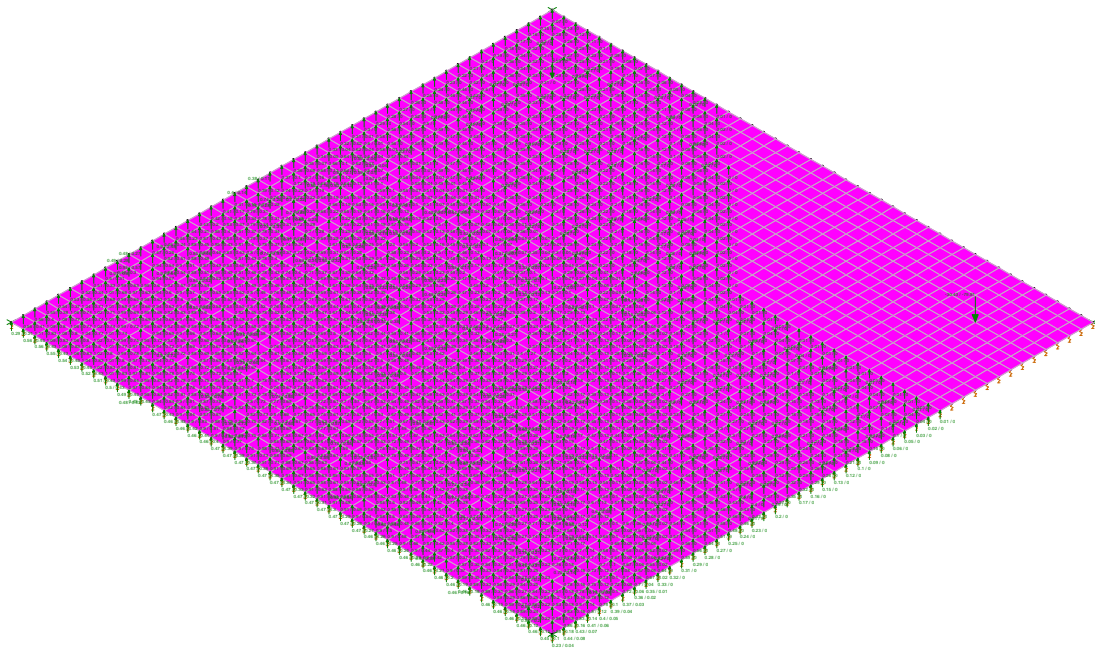
Pole Results

Pole Punching Shear Check: n/a



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

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



Paul J. Ford and Company	BU 876339	SK - 1
RMK		June 20, 2017 at 12:14 PM
37517-2315.001.7805		37517-2315.001.7805_Composite ...



(Global) Model Settings

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

Hot Rolled Steel Code	None
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	ACI 318-05
Masonry Code	None
Aluminum Code	None - Building

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



(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Concrete Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (1/E...)	Density[k/ft...]	f'c[ksi]	Lambda	Flex Steel[...]	Shear Stee...
1	Conc3000NW	3156	1372	.15	.6	.145	3	1	60	60
2	Conc3500NW	3409	1482	.15	.6	.145	3.5	1	60	60
3	Conc4000NW	3644	1584	.15	.6	.145	4	1	60	60
4	Conc3000LW	2085	907	.15	.6	.11	3	.75	60	60
5	Conc3500LW	2252	979	.15	.6	.11	3.5	.75	60	60
6	Conc4000LW	2408	1047	.15	.6	.11	4	.75	60	60

Load Combinations

	Description	Sol..	PD..	SR..	BLC Fact..	BLC Fact..	BLC Fact..	BLC Fact..	BLC Fact..	BLC Fact..	BLC Fact..	BLC Fact..	BLC Fact..	BLC Fact..
1	1.2 Dead ...	Yes	Y		1	1.2	2	1						
2	0.9 Dead+...	Yes	Y		1	.9	2	1						
3	1.2 Dead ...	Yes	Y		1	1.2	3	1						
4	0.9 Dead+...	Yes	Y		1	.9	3	1						

(W) RISA-3D Plate Forces		(U) RISA-3D Plate Forces	
Comp (1.2)	Tension (0.9)	Comp (1.2)	Tension (0.9)
30.769	7.071		
30.252	7.308		
30.665	7.129		
31.765	6.642		
33.415	5.903		
35.548	4.93		
38.144	3.718		
41.212	2.242		
44.782	0.461		
48.907	-1.685		
53.657	-4.272		
59.129	-7.41		
65.464	-11.258		
72.878	-16.061		
81.734	-22.231		
92.682	-30.5		
106.959	-42.232		
126.852	-59.913		
156.727	-88.18		
202.102	-132.87		
264.261	-195.437		
331.088	-263.433		
376.319	-309.682		
376.319	-309.682		
331.088	-263.433		
264.261	-195.437		
202.102	-132.87		
156.727	-88.18		
126.852	-59.913		
106.959	-42.232		
92.682	-30.5		
81.734	-22.231		
72.878	-16.061		
65.464	-11.258		
59.129	-7.41		
53.657	-4.272		
48.907	-1.685		
44.782	0.461		
41.212	2.242		
38.144	3.718		
35.548	4.93		
33.415	5.903		
31.765	6.642		
30.665	7.129		
30.252	7.308		
30.769	7.071		
4710.622	-2279.52	0	0 k-ft
2355.311	-1139.76	0	0 k-ft

Anchor Spring Constant		Soil Weight	
Ag =	2.663 in ²	Height Above Grade =	0.5 ft
E =	29000 ksi	Soil Unit Weight =	100 pcf
Lu =	25 ft	Apply Soil Weight =	Center Point
k = An*E / Lu = 257.42 k/in		Volume =	1962.06 ft ³
Soil Spring Constant		Weight =	196.21 kips
Subgrade Modulus =	50 lb/in ³	Weight per Sq. Ft =	400 psf
k =	86.4 k/ft ³		

Foundation Weight		Pad/Mat Analysis	
Number Sides =	Round	Thickness	3.67 ft
Pier Width/Diameter =	7 ft	Width	23 ft
Pier Height =	4.5 ft	f'c	4 ksi
Pad Thickness =	3.67 ft	Top Bar Quantity	24
Pad Width =	23 ft	Top Bar Size #	11
Pad Length =	23 ft	Top Clear Spacing	3 in
Concrete Density =	150 pcf	Bot Bar Quantity	24
Volume =	173.1803 ft ³	Bot Bar Size #	11
Weight =	25.97704 kips	Bot Clear Spacing	3 in
Applied Reactions for RISA 3D		As,min	21.879072 in ²
TNX Moment =	4434 k-ft	As, compression	37.44 in ²
TNX Axial =	57 kips	d,compression	38.925 in
TNX Shear =	44 kips	a	28.7 #DIV/0! in
Total Unfactored Axial =	269.68 kips	c	12.3 #DIV/0! in
Side Bending Moment =	4793.48 k-ft	c/d	0.316 #DIV/0!
Corner Bending Moment (Mx) =	3389.5 k-ft	Ø	0.900 #DIV/0!
Corner Bending Moment (Mz) =	3389.5 k-ft	ØMn,compression	6356 #DIV/0! k-ft
Tension from Anchors (Tension side only)		Mu	1139.8 863.5 k-ft
Load (kips)	Distance to Center (ft)	Ratio =	17.9% #DIV/0!
1	49.58 9	As, Tension	37.44 in ²
2	49.58 9	d,tension	38.925 in
3		a	28.7 #DIV/0! in
4		c	12.3 #DIV/0! in
5		c/d	0.316 #DIV/0!
6		Ø	0.900 #DIV/0!
Pole/Pier Diameter =	7 inches	ØMn,tension	6356 #DIV/0! k-ft
Bending Moment = Σ P*(D-d) =	10362.22 k-in	Mu	2355.3 0.0 k-ft
Bending Moment (Tension) =	863.5 k-ft	Ratio =	37.1% #DIV/0!
Anchor Capacity		Bearing Check	
Max Tension from RISA =	79.81 kips	Max Bearing Load =	1.11 kip
Anchor Type =	Rock Anchor	Plate Width =	0.5 ft
Fu =	150 ksi	Plate Length =	0.5 ft
An =	2.6 in ²	Ult. Bearing Capacity =	30 ksf
Capacity (Kips) = 0.8*Fu*An =	253	Bearing Pressure =	4.44 ksf
Ratio = 79.81 / 253 =	31.5%	Ratio =	19.7%

(per linear ft of plate)
(Divide by 2 for a 0.5 ft plate)



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

SPRINT Existing Facility

Site ID: CT03XC155

Pond Meadow Rd. Stable
782 Old Clinton Road
Westbrook, CT 06498

July 26, 2017

EBI Project Number: 6217003224

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	13.60 %



July 26, 2017

SPRINT

Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Emissions Analysis for Site: **CT03XC155 – Pond Meadow Rd. Stable**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **782 Old Clinton Road, Westbrook, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 850 MHz Band is approximately $567 \mu\text{W}/\text{cm}^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **782 Old Clinton Road, Westbrook, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.
- 4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.



- 6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antennas used in this modeling are the **RFS APXVSP18-C-A20** and **RFS APXVTM14-C-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antenna mounting height centerlines of the proposed antennas are **160 feet** above ground level (AGL) for **Sector A**, **160 feet** above ground level (AGL) for **Sector B** and **160 feet** above ground level (AGL) for Sector C.
- 10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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



SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVSPPI18-C-A20	Make / Model:	RFS APXVSPPI18-C-A20	Make / Model:	RFS APXVSPPI18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	1.29 %	Antenna B1 MPE%	1.29 %	Antenna C1 MPE%	1.29 %
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	160 feet	Height (AGL):	160 feet	Height (AGL):	160 feet
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	0.94 %	Antenna B2 MPE%	0.94 %	Antenna C2 MPE%	0.94 %

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	2.24 %
Nextel	0.27 %
T-Mobile	2.08 %
MetroPCS	0.44 %
Verizon Wireless	4.43 %
AT&T	4.14 %
Site Total MPE %:	13.60 %

SPRINT Sector A Total:	2.24 %
SPRINT Sector B Total:	2.24 %
SPRINT Sector C Total:	2.24 %
Site Total:	13.60 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	160	0.66	850 MHz	567	0.12%
Sprint 850 MHz LTE	2	437.55	160	1.33	850 MHz	567	0.23%
Sprint 1900 MHz (PCS) CDMA	5	622.47	160	4.72	1900 MHz (PCS)	1000	0.47%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	160	4.72	1900 MHz (PCS)	1000	0.47%
Sprint 2500 MHz (BRS) LTE	8	778.09	160	9.44	2500 MHz (BRS)	1000	0.94%
						Total:	2.24%



Summary

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

The anticipated maximum composite contributions from the SPRINT facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	2.24 %
Sector B:	2.24 %
Sector C:	2.24 %
SPRINT Maximum Total (per sector):	2.24 %
Site Total:	13.60 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **13.60 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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