January 22,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 771237599081.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	M.ANTOINETTE	**Delivery location:**	40 MAIN ST NORTH STONINGTON, CT 06359
Service type:	FedEx Express Saver	**Delivery date:**	Jan 22, 2018 11:00
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	771237599081	**Ship date:**	Jan 17, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Michael Urgo - First Selectman
Town of North Stonington
40 Main Street
NORTH STONINGTON, CT 06359 US

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US

Reference
CT03XC111 CSC to1st Seleceman

Thank you for choosing FedEx.

January 22,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 771237629206.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	M.ANTOINETTE	**Delivery location:**	40 MAIN ST NORTH STONINGTON, CT 06359
Service type:	FedEx Express Saver	**Delivery date:**	Jan 22, 2018 11:00
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	771237629206	**Ship date:**	Jan 17, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Juliette Hodge - Zoning
Town of North Stonington
40 Main Street
NORTH STONINGTON, CT 06359 US

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US

Reference
CT03XC111 CSC to ZEO

Thank you for choosing FedEx.

January 22,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 771240503037.

Delivery Information:

Status:	Delivered	**Delivered to:**	Residence
Signed for by:	M.THOMAS	**Delivery location:**	11 DELL DR UNCASVILLE, CT 06382
Service type:	FedEx Express Saver	**Delivery date:**	Jan 22, 2018 11:24
Special Handling:	Deliver Weekday Residential Delivery Direct Signature Required		

Shipping Information:

Tracking number:	771240503037	**Ship date:**	Jan 17, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Ken Thomas
Wireless Solutions
11 Dell Drive
UNCASVILLE, CT 06382 US

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US

Reference
CT03XC111 CSC to Owner

Thank you for choosing FedEx.

4 Davis Road West, Suite 5 – Old Lyme, CT 06371

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

Re: Notice of Exempt Modification Application
227 Boom Bridge Road, North Stonington, CT 06359

Lat: N 41.42881
Long: W71.80911

January 15, 2018

Dear Ms. Bachman:

Sprint currently maintains 6 panel antenna at the 152' level of the above noted wireless tower. Sprint proposes to remove 3 existing panel antennas and replace with 3 new panel antennas (1 per sector) and add 9 remote radio units (3 per sector) at the 152' tower level as well as 4 new hybrid cables and 30 Antenna-RRH jumper cables, and finally new 2.5 MHz radio equipment in the existing radio cabinet on the existing slab. Sprint is performing a new high-performance upgrade for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

The Sprint installation was initially approved by North Stoning zoning of February 5, 1997. A Building permit for this construction was issued by the town on the same day.

Please accept this letter as notification to the Council, pursuant to R.C.S.A. Section 16-50j-73, for construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).
In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter is being sent to Mr. Michael A. Urgo the First Selectman for the Town of North Stonington, as well as Mx. Juliette Hodge, Zoning Director for the Town and Ken Thomas for Wireless Solutions LLC, the tower owner.
.
Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the site. Also included is documentation of the structural sufficiency of the tower with proposed modifications to accommodate the revised antenna configuration.

Existing Facility

The North Stonington facility is located at 227 Boom Bridge Road and is owned by for Wireless Solutions LLC, the Site coordinates are: N41.24881, W71.80911. The existing facility consists of a 180' Guyed Tower. Sprint currently operates wireless communications equipment on a platform on a concrete slab at the facility and has 6 antennas at a centerline of 152' feet on the tower.

Statutory Considerations

The planned modifications to the facility fall within the activities explicitly provided for in R.C.S.A. 16-50j-72(b)(2)

1. The height of the overall structure will be unaffected.

2. The proposed changes will not require an extension of the property boundaries.

3. The proposed additions will not increase the noise level at the existing facility by

six decibels or more, or to levels that exceed state and/or local criteria

4. The changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the Federal Communications Commission safety standard.

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

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

For the foregoing reasons, Sprint respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A Section §16-50j-72(b)(2).

Respectfully submitted,

Paul F. Sagristano

Paul F. Sagristano
Charles Cherundolo Consulting
917-841-0247
psagristano@lrivassoc.com

PFS/mtf

Additional Recipients:
Mr. Michael A. Urgo - First Selectman for the Town of North Stonington via Fed Ex
Ms. Juliette Hodge, Zoning Director for the Town via Fed Ex
Ken Thomas for Wireless Solutions LLC, the tower owner via Fed Ex

Map Number: 119

THIS MAP IS PREPARED FOR THE INVENTORY OF REAL PROPERTY FOUND WITHIN THESE JURISDICTION AND IS COMPILED FROM RECORDED DEEDS, PLATS, AND OTHER PUBLIC RECORDS AND DATA. USERS OF THIS MAP ARE HEREBY NOTIFIED THAT THE AFOREMENTIONED PUBLIC PRIMARY INFORMATION CONTAINED ON THIS MAP. THE TOWNS AND THE MAPPING COMPANIES ASSUME NO LEGAL RESPONSIBILITIES FOR THE INFORMATION CONTAINED ON THIS MAP.

NEGEO
New England Geosystems
www.negeosystems.com
282 Main Street Extension - C2
Middletown, CT 06457 • (203) 404 - 7129

Photography Dates:
March 24, 1996 (120 Series)
April 29, 1997 (449 Series)
December 16, 1997
(449 Series, 5-1, 5-3, 5-5)
Completion Date: April 28, 2000
Planimetric Update based on 2010 Photo

Revised Date: October 1, 2016

HORIZONTAL DATUM BASED ON THE CONNECTICUT STATE PLANE COORDINATE SYSTEM, NAD 83 (1986)

Town of North Stonington Connecticut

Planimetric Data and Property Maps 2016

1 inch = 200 Feet

0 100 200 400 600 800 1,000 Feet

0.1 0.05 0 0.1 Miles

- Property Line
- Property Line Along Water
- Parcel in Dispute
- Town Line
- State Line
- ROW / Easement
- Surveyed Wetland
- Parcel Hook and Sub Lot
- Building / Street No.
- Exempt Property
- Record Dimension
- Surveyed Dimension
- Surveyed Acreage
- Computed Acreage
- Wall / Fence
- Deciduous Tree
- Evergreen Tree
- Vegetation
- Water
- Swamps
- Roads, Driveways, Trails, Flat Areas and Structures

25 26 27
32 33 34 35 36 37
42 43 44 45 46 47 48 49
54 55 56 57 58 59 60 61
66 67 68 69 70 71 72 73
76 77 78 79 80 81 82
84 85 86 87 88 89 90
92 93 94 95 96 97 98
99 100 101 102 103 104 105
106 107 108 109 110 111 112
113 114 115 116 117 118 119
120 121 122 123 124
125 126

Map Number: 119

104 105 111 112 118 119 123 124 126

Map Produced: January 2017

ZONING REPORT
Site ID# 04-111A

Background Data

Search Area Number:	04
Date:	July 2, 1996
Property Owners Name:	David Lewis Trosalind
Site Address:	227 Boombridge Road, North Stonington, Connecticut 06359
Tax Map Number:	290 Lot 35
Property Type:	Communications Tower
Proposed Type of Antenna Installation:	Existing 170 foot guyed tower
Height of New Structure:	140 to 165 Feet
Proposed Equipment Location:	New exterior equipment shelter required.
Approving Agency:	Building Department
Contact Person:	Timothy York
Mailing Address	Town Hall, 40 Main Street, Stonington, CT 06359
Zoning Classification:	R-60 - Medium Density Residential District

---

Zoning Data

Antenna Use Defined: Yes

Antenna Use Permitted: Yes (as a Special permit use)

Dimensional Requirements:

Minimum Lot Size:	60,000SqFt
Minimum Lot Width:	200 Feet
Boundary Line Setback:	50 Feet
Minimum Side Yards:	25 Feet
Minimum Rear Yard:	25 Feet

Building Height:	3 Stories, 40 Feet
Lot Coverage:	10%
Floor Area per DU:	900 SqFt

Zoning Ordinance Analysis

The Table of Use Regulations (Section 403) of the Town of North Stonington Zoning Regulations identifies "Communication Tower" as a Special Permit use.

Section 404 establishes that Site Plans are required for all uses identifies in Section 403.4 (Commercial) - including the Special Permit Communication Tower use. The procedures, conditions and requirements for Site Plan approval are provided in Section 800.

Section 503.1 of the Zoning Regulations addresses height exemptions. This provision allows height standards to be exceeded for certain appurtenant structures. Communications towers are *not* included, and therefore do not benefit from this exemption provision.

Section 503.7 provides a fairly detailed section on earth station satellite dish antennae. Upon review of these provisions, it appears clear that the provisions were not originally intended, nor could they be interpreted to include communication towers.

The Special Permit provisions established in Section 701 reiterate the Site Plan requirement. Section 702.1 sets forth the general criteria that the Planning and Zoning Commission must address when reviewing an application for Special Permit approval. No special or specific criteria have been established for communication towers.

Finally, the site is not located within the Aquifer Protection Overlay Zone, the Village Preservation Overlay Zone, of the Seasonal Use Overlay Zone. Inclusion within these districts would trigger additional regulatory requirements.

Municipal Verification of Zoning Analysis

Mr. Timothy York, the Building Official for the Town of North Stonington indicated that co-location on the existing tower would only require the issuance of a zoning (building) permit. The Special Permit process only applies to the use, which is already established. Similarly, the Site Plan requirement found in the Special Permit procedure would also not apply because the antenna tower

already exists. Assuming that no modification to the footprint or height of the tower is proposed, the installation of additional antennas can be simply accomplished through the permit process in the Building Department.

Similarly, a new equipment shed, as an accessory structure, can be addresses by the same permit. Mr. York indicated that the original approval for the site provided for another shed that was never constructed.

Approval Procedure

Assuming that the interpretation of the Building Official is correct (written confirmation was not requested), the process to obtain approval for the new antenna would simply consist of the filing of a zoning permit application in accordance with Section 202.2 of the Zoning Regulations.

If Mr, York's interpretation is incorrect, the process would involve the submission of a Special Permit application (4 copies), including a Site Plan, list of neighboring property owners, other reports that may be required (such as a health & safety analysis, wind load analysis etc.) And the appropriate fee.

The Planning and Zoning Commission meets on the second Thursday of each month at 8:00 pm. Submissions are due on that date for the next meeting. A public hearing is required within 65 days of submission, and a decision within 65 days of the hearing.

Advice and Comment

Mr. Yorks interpretation seems substantial. It does not appear that the Special Permit/Site Plan process will be necessary for this site. The relative lack of regulatory hurdles, and the scarcity of neighbors surrounding the property highlight this site as one where installation may be possible quickly and easily.

Lease Summary Sheet
Hartford MTA

Site Name: 227 Boombridge Rd. / N. Stonington
Site Number: CT03XC111
Landlord: David and Rosalind Lewis C/O Wireless Solutions Inc.
Type of Build:: Co-location

Initial Lease Term:: 5 years
Renewal Terms: Four automatic, 5 years

Rent Binder Amount: (Option) $5,000.00/ Already paid to owner 6/4/96 / $250 FOR STRUCTURAL TESTING
Lease Amount: $21,600 initial year
Renewal Terms: 15% Increase per Term

Total Lease Cost: $596,768.18
(over 25 years)
Variations from Standard:

1) Standard SSLP Exhibits: Insurance (C), Monthly Rent (D), Subordination Non-Disturbance (E), Taxes (F).
2) Additional Provisions: (G)

*Standard Leased Space boxes indicating 300 square Ft. along with Standard language for Use.
*If SSLP decides to terminate we must give the owner 180 days notice instead of the standard 90.
*An Occupancy application will be completed and a $250 fee will be paid to the owner for feasibility testing.
*The option agreement lasts until Feb. 28, 1997.

Approval: _____ 12/2/96
Lou Sanser, Property Manager, Connecticut MTA — Date

Approval: _____ 12/3/96
John S. Stevens, Director E/O, Connecticut/Albany MTA — Date

Approval: Not Required
Kurt Bagwell, VP E/O East Region — Date

Search Area No: **04-111A** Submitted by: **Tom Lupia**
Search Area Name: **North Stonington** Date Submitted: **6/7/96**
Address: **227 Boombridge Rd.** Date Visited: **6/6/96**
North Stonington, CT. 06359
Who was seen? **George Brown & Timothy York**

Preliminary Zoning Information

Zoning Agency: **Town of North Stonington**
Zoning Contact Person: **Timothy York** Phone No. **203-535-0318**
Zoning Classification: **R-60**
Use Permitted? Yes: **X** No:
Zoning Comments: Type Of Proposal: **Existing tower.** Height: **170'** Area: **NA**

Zoning Code: Mr. Timothy York, building official of the Town of North Stonington explains that Sprint Spectrum may add its 9 panel antennas and cabinets with only a building permit.

Can we avoid a Special Permit? Yes : **X** No _____

Setbacks: **Mr. York explains the setbacks are not a problem since there is an existing tower.**

Hearings: **None required**

Dates: **None required.**

Written Decision/Appeal Period: **Building permit only---no appeal.**
Building Plan: **Building permit only.**

Advice/Comments: **This tower is not under the Connecticut State Siting Council.**

Special Observations:

DAY, BERRY & HOWARD

Counsellors at Law
Hartford, Stamford and Boston

CityPlace
Hartford
Connecticut 06103-3499
Telephone (860) 275-0100
Facsimile (860) 275-0343

SH

May 20, 1996

VIA OVERNIGHT DELIVERY

Mr. Ron Edgecomb
LCC
c/o Sprint Spectrum L.P.
450 Murdock Avenue
Meriden, CT 06450

Re: Sprint Spectrum LP - SSLP SAR NO. 04-111A
Site location: 227 Boombridge Road, North Stonington, CT
Current Owner: David B. Lewis and Rosaland M. Lewis

Dear Mr. Edgecomb:

Enclosed are the Title Report and the related documents for the above-referenced property.

Please feel free to call the contact persons listed on the Title Report if you have any questions.

Very truly yours,

Pina Salvatore
Legal Assistant

ps
Enclosures
cc: Mr. Joseph Puziewicz (w/encls.)

HART01-67261-1
86174-00000

SSLP SAR NO. 04-111A
DATE REPORT ORDERED: 5/16/96
DATE REPORT SUBMITTED: 5/21/96

TITLE REPORT

PROPERTY ADDRESS: 227 Boombridge Road, North Stonington, Connecticut

OWNER: David B. Lewis and Rosaland M. Lewis

GROUND LESSEE: N/A

ISSUES: Apparent tower for Wireless Solutions (See Map No. 1403) but no lease of record.

DEED IN: Date: February 15, 1956 Vol. 28 Pg. 99 **COPY OF DEED:** Obtained
Most current: Date: May 14, 1994 Vol. 32 Pg. 296
COPY OR SKETCH OF ASSESSOR'S MAP: Obtained
TYPE OF DEED: Warranty ___ QuitClaim _X_ Other (specify) Certificate of Devise
SEARCH DATES: From February 1956 through May 20, 1996 at 9:00 a.m.

LIST OF ENCUMBRANCES SINCE DATE OF DEED IN: See Exhibit A.

REAL PROPERTY TAXES: **LIST NO.:** 9410001533
Classified as Farm Forestry Open Space

Grand List of 10/1/94	Total Assessment $8,680	Total Tax $209.96 Paid In Full
First Half	Paid	
Second Half	Paid	
Grand List of 10/1/95	Total Assessment	Total Tax Not Yet Determined
First Half Due	Paid/Unpaid	
Second Half Due	Paid/Unpaid	

If Back Taxes are unpaid, provide details of Grand List, total assessment, tax and amounts due:

FIRE DISTRICT TAXES, SEWER USE CHARGES, BOROUGH TAXES, ETC.: (If applicable, please provide information on separate sheet) None

SPECIAL ASSESSMENTS: None found

SEWER ASSESSMENTS: None found

SPECIAL DISTRICT TAXES: None found

DIRECT ACCESS TO PUBLIC STREET: Yes

PROPERTY IS LOCATED IN INLANDS/WETLANDS AREA: No

ZONE: R-80

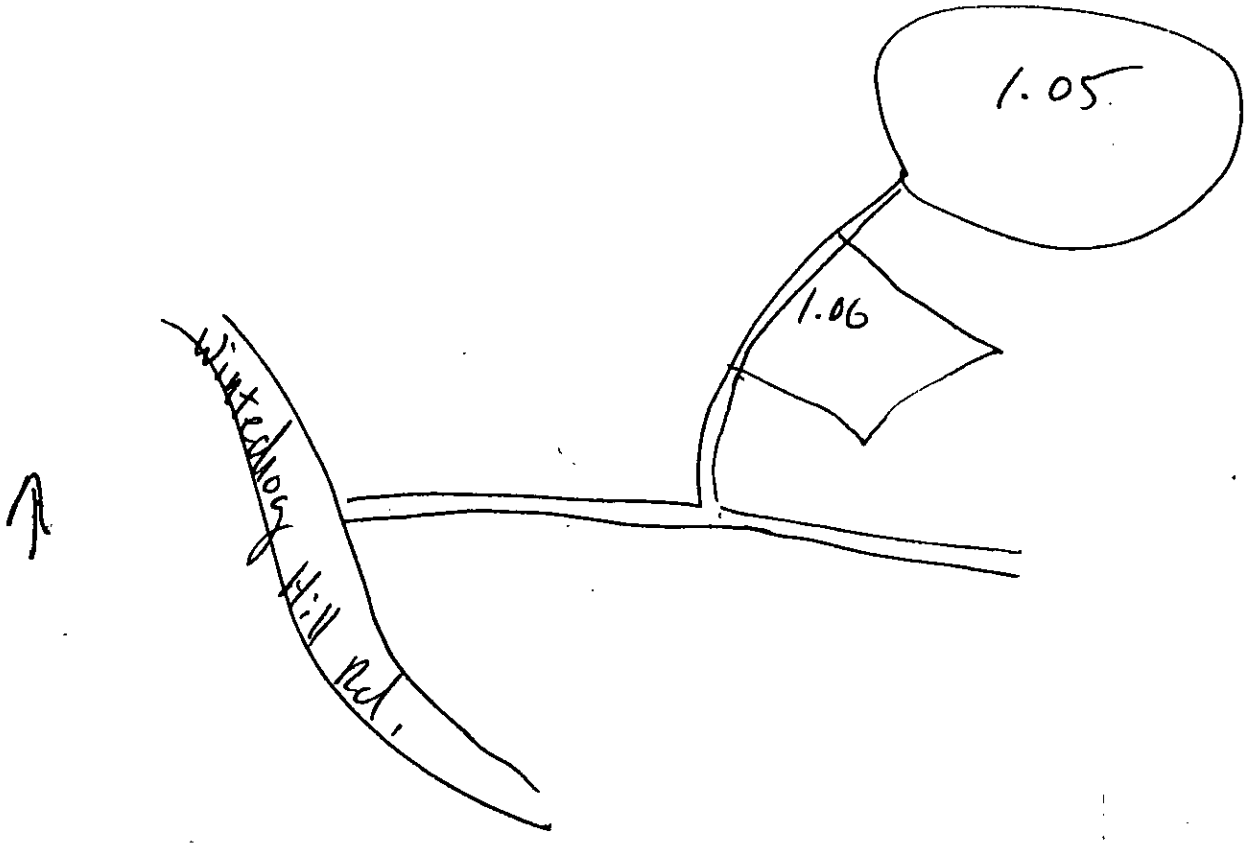
SPECIAL REQUIREMENTS (to be completed by DBH):

Obtain copy of Zoning Ordinances and Zoning Map: Zoning Ordinances have been ordered but not yet received; Yes as to Zoning Map

TITLE SEARCH PERFORMED BY: Lynn M. Clarke
DBH CONTACT PERSON: John C. Glezen (860-275-0128)/Pina Salvatore (860-275-0274)

EXHIBIT A

1. Easement to the Connecticut Light and Power Company dated and recorded November 29, 1995 in the North Stonington Land Records in Volume 107, Page 830.



ASSESSORS MAP

23

Revised As of 6/10/96

Preliminary Zoning Review Work Sheet
(Connecticut Counties/Towns/Vilages)

Date: 6/14/96

Prepared By: K. SCHENKEWITZ

Site ID No.: 04-111-A

Site Address: 227 BOOMBRIDGE ROAD

Tax Map No.: 290 LOT 35

Owner's Name: DAVID LEWIS TROSALIND

Type of Proposed Antenna Installation: TOWER

Height: 100 FT

Proposed Equipment Location: Exterior - Slab Mounted - No Shelter

Drive to the Site: Yes ✓ No _____

Take Photographs: Yes ✓ No _____

1-800-621-2627 GUYED TOWER

Assessor's Office [Township]/Department of Assessment [County]:

Office Address:

Tax Map No: (if different from above) _____

Site Address: (if different from above) _____

Owner's Name: (if different from above) _____

Zoning District: R-60

Copy of Tax Map for Property: Yes ✓ No _____

Planning Department/Board Office: TOWN HALL

Office Address: 40 MAIN ST. NORTH STONINGTON 06359

Name of Contact Person: ROSALIND SCHOQUETTE

Telephone No.: 203-535-3891 Ext. _____

Fax No.: 203-535-4554

Zoning District Designation: Commercial: _____

Industrial: _____

Residential: R-60

Code Sections Applicable to Antennas:

700-703.8

Is approval by this Office necessary: Yes _____ No ✓

3 Copies of Application and Instructions: Yes _____ No ✓

Are there any site plan regulations applicable to the approval process: Yes _____ No ✓

What is the general process for obtaining approval from this Office: N/A

Is any environmental review necessary: NO

Does processing differ with this particular site: NO

Approximately how long does the process take: N/A Weeks N/A Months

When does the Planning Board meet:

Regularly Scheduled Meeting Dates and Time:

Mon: ____ Tues: ____ Wed: ____ Thurs: 1ST 2ND Fri: ____
OF EACH MONTH

Time: 8:00 P.M.

Obtain current schedule of meeting dates: Yes ✓ No ____

General Comments and Observations: PLANNING AND ZONING ARE ONE IN SAME.

Building Department: TOWN HALL

Office Address: 40 MAIN ST. NORTH STONINGTON CT. 06359

Name of Contact Person: TIM YORK

Telephone No.: ~~203~~ 860 535 0318 Ext. _____

Fax No.: ~~203~~ 860 535-4554

Zoning District Designation: Commercial: _____

Industrial: _____

Residential: R-60

Code Sections Applicable to Antennas:
SEC- 621 - 622 OF BOCA NATIONAL CODE 1990 VERSION

3 Copies of Application and Instructions: Yes ✓ No _____
~~SEE TOM LORA~~

What is the process for obtaining a building permit:
JUST FILL OUT APPLICATION - WIND LOAD CALCULATIONS

Is this antenna a permitted use (i.e. is it permitted without zoning board action): Yes ✓ No _____

If antenna requires Zoning Board action:

Does this antenna require a variance: Yes _____ No ✓

Does this antenna require a Special Use Permit: Yes _____ No ✓

Does this antenna require a Conditional Use Permit: Yes _____ No ✓

Are there any setback requirements: Yes _____ No ✓

Feet: _____

Are there any site plan regulations applicable to the approval process: Yes _____ No ✓

What are the fees for obtaining a building permit:
$8.00 PER THOUSAND.

General Comments and Observations:

Zoning Board Office: TOWN HALL

Office Address: 40 MAIN ST. NORTH STONINGTON CT. 06359

Name of Contact Person: ROSALIND SHOQUETTE

Telephone No.: 203-535-3891 Ext. _____

Fax No.: 203-535-4554

Zoning District Designation: Commercial: _____

Industrial: _____

Residential: R-60

Town/Village Code Sections Applicable to Antennas:
700 - 703.8

3 Copies of Application and Instructions: Yes N/A No _____

When does the Zoning Board meet:

Regularly Scheduled Meeting Dates and Time:

Mon: ____ Tues: ____ Wed: ____ Thurs: 1ST 2ND OF EACH MONTH Fri: ____

Time: 8:00 P.M.

Obtain current schedule of meeting dates: Yes ✓ No ____

How long does it take to get a hearing date from the date of filing an application:

Months N/A Weeks _____ Days _____

What are the filing fees to get a hearing: N/A

What is the process for obtaining Zoning Board approval: N/A

Is any Environmental Review necessary: NO

General Comments and Observations: AS LONG AS THERE IS ROOM ON THE TOWER YOU DO NOT NEED TO APPLY FOR PERMITS.

Town Clerk's Office: TOWN HALL

Office Address: 40 MAIN ST. NORTH STONINGTON CT. 06359

Obtain a copy of the Zoning Code: Yes ✓ No _____

Cost of the Zoning Code: $ 15.95

Obtain a copy of any Site Plan Regulations: Yes N/A No _____

Cost of the Site Plan Regulations: $ N/A

SPRINT SPECTRUM L.P. PROPERTY FILE - CLOSING CHECKLIST

Date: 7/17/98

Site #: CT03XC111

Address: 227 Boombridge Rd.
N. Stonington, CT

- ★ Any Agreement with Sprint and Owner's Signature
  - ★ PCS Agreement/License Agreement/Leases
  - _____ Access Agreement/Easement Agreement
  - _____ SLA (Site License Agreement) - You may have several.
  - _____ Lease Amendment
- _____ Anything with a Seal
- _____ Architect & Engineering Firm (A&E)/Name and Address

- ★ Attorney Title Review
- _____ Building Permit
- ★ Certificate of Insurance
- _____ Conditional Use/Zoning Permit
- _____ Executed Lease (Original)
- _____ Gap Coverage Endorsement
- ★ Lease Management Form
- ★ Lease Summary Sheet
- ★ Memorandum of Agreement
- _____ Rent Budget Summary
- _____ Subordination, Attornment, and Non-Disturbance Agreement
- I Title Commitment (w/endorsements)
- ★ Title/Deeds
- ★ Turnover Documents/Leave in Books
- ★ Zoning Resolutions/Municipal Decisions **NOTE: Do Not Pull Zoning Applications.**
- _____ 2-C Certificate/Survey - Must be signed and sealed.

NOTES/COMMENTS:

Smolen, Michael

To: Villee, Suzanne C.
Cc: Demke, Neldon; Cobane, Robert; Evans, Anne
Subject: RE: Milford, CT/ 111 Schoolhouse Road/ CT03XC171

Anne Evans is out on short term disability leave so I will need to research your claims as to what she has done. I have no recollection and would never have gotten involved in the review and approval of any plans as you have claimed. Any approval of plans must be handled by an Implementation Manager for the Connecticut TEAM. I know Rob Cobane would never hand us CD's and tell us they represent an as built survey unless and until he had the drawings wet stamped by a licensed surveyor after a site was completed. Sprint has suffered some very costly lessons by doing what you claim has been proposed be done.

First, Rob Cobane has to review and ascertain what needs to be done to get an accurate site exhibit for a lease. It is our usual custome unless a Lease/ License provides otherwise when such a request is received from a Landlord as is the case here that we request he hire the surveyor and deliver to us a stamped set of survey drawings which we must then have Implementation approve. Second, a SD Property Specialist and/or Lease Management can handle a request for an Amendment depending upon the scope of change that is involved in a request. Please send along a copy of the proposed Amendment and I will respond on if we can handle the task at hand or will need to go back/direct you to go back to Neldon Demke/Rosanne Martino/Rob Cobane for what needs to be done. Anne Evans did and does not have the authority nor qualifications to handle what it is claimed she was to review, approve and process for execution. The Ct. SD TEAM needs to get involved in this task to some degree, especially on the Lease/License replacement exhibits. .

In moving ahead constructively, please send any drawings you have to Mr. Rob Cobane for his review, comments and approvals. Please e-mail me the proposed Amendment so I can determine what Lease Management may have the authority to do and how I can get it done in a timely manner.

I await receipt of your e-mail transmittal.

Anne, when you get around to reading this, please get your file together and come in to see me. I would like to get an understanding of what you may have done and review if there are areas where there was a misunderstanding of what Lease Management is authorized to do in our Lease Management authority. It is apparent there is some confusion and misunderstanding as to your authority if the facts in this e-mail are correct.

From: Villee, Suzanne C.[SMTP:svillee@brfg.com]
Sent: Tuesday, October 05, 1999 9:16 AM
To: 'Karen Nielson/Sprint Mahwah'
Cc: Katsoris, Elizabeth A.; 'Mike Smollen/Sprint Mahwah'
Subject: RE: Milford, CT/ 111 Schoolhouse Road/ CT03XC171

Understandably, there appears to be some confusion as to the Amendment we have in hand for execution by Sprint Spectrum. Let me try to give you the history of this site as best I know it:

The PCS Site Agreement was negotiated and prepared by the Sprint NH region people, either with or without assistance from a local site acquisition company (unknown), back in 1996 on the then current form. Earlier this year, counsel to the Owner wrote to Sprint Spectrum and the request ended up, I believe, with Anne Evans in Mahwah. Owner wanted to add some provisions to the 1996 PCS Site Agreement. In turn, it was time to replace Exhibit A with as-built plans. The request was reviewed by Anne Evans and Mike Smollen and forwarded to BRF&G to draft. We used the standard provisions from the now current PCS Site Agreement. Thus the Amendment is no big deal and we are simply accommodating the reasonable request of the Owner - and taking our time doing so.

Needless to say, NST memos and lease summary checklists were not required when the original PCS Site Agreement was executed. Thus, the question is what all you need to get the amendment signed by Don. We have prepared a NST memo just in case and, with some assistance from you, can complete the lease summary checklist as well. Just let us know how we can get this amendment signed (mostly to get it off our desks since it is neutral to us).

Please note that what Anne Evans sent as "as-built plans" via her correspondence from May of this year do not appear to be as-built plans. Instead, they appear to be construction drawings dating from February 1997. If we do not have as-builts yet we can either drop that piece of the Amendment or attach the construction drawings as an improvement to the sketch on the original PCS Site Agreement from 1996. As you wish.

We look forward to helping you all wrap this little matter up - but it should not take a lot of energy or time to do so.

Suzanne.

P.S. Both the Amendment and the NST memorandum are available electronically in case you wish to see them.

ACORD CERTIFICATE OF LIABILITY INSURANCE 07/01/97

DATE (MM/DD/YY) 12/12/96

PRODUCER 71
Lockton Companies
P.O. Box 419351
Kansas City Mo 64141-6351
(913) 676-9000

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED 4256
SPRINT SPECTRUM L.P.
C/O RISK MANAGEMENT DEPT.
2330 SHAWNEE MISSION PARKWAY
WESTWOOD, KS 66205

COMPANIES AFFORDING COVERAGE

COMPANY A: CONTINENTAL CASUALTY CO. (A XV)

COMPANY B: TRANSPORTATION COMPANY (A XV)

COMPANY C: **WORK COMP. COVERAGE NOT

COMPANY D: **APPLICABLE IN MONOPOLISTIC

COMPANY E: **STATES

COVERAGES

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS		
A	[X] GENERAL LIABILITY [X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS MADE [X] OCCUR [ ] OWNER'S & CONTRACTOR'S PROT	GL161780900	07/01/96	07/01/97	GENERAL AGGREGATE PRODUCTS - COMP/OP AGG PERSONAL & ADV INJURY EACH OCCURRENCE FIRE DAMAGE (Any one fire) MED EXP (Any one person)	$ $ $ $ $ $	1,000,000 5,000,000 1,000,000 1,000,000 250,000 EXCLUDED
A	[X] AUTOMOBILE LIABILITY [X] ANY AUTO [ ] ALL OWNED AUTOS [ ] SCHEDULED AUTOS [X] HIRED AUTOS [X] NON-OWNED AUTOS	BUA 161780928 (AOS) BUA 161780914 (TX)	07/01/96	07/01/97	COMBINED SINGLE LIMIT BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE	$ $ $ $	1,000,000 XXXXXXXXX XXXXXXXXX XXXXXXXXX
	[ ] GARAGE LIABILITY [ ] ANY AUTO	NOT APPLICABLE			AUTO ONLY - EA ACCIDENT OTHER THAN AUTO ONLY: EACH ACCIDENT AGGREGATE	$ $ $	
	[ ] EXCESS LIABILITY [ ] UMBRELLA FORM [ ] OTHER THAN UMBRELLA FORM	NOT APPLICABLE			EACH OCCURRENCE AGGREGATE	$ $	XXXXXXXXX XXXXXXXXX
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY THE PROPRIETOR/ PARTNERS/EXECUTIVE OFFICERS ARE: [ ] INCL [ ] EXCL	WC 161780895**	07/01/96	07/01/97	[X] WC STATUTORY LIMITS [ ] OTHER EL EACH ACCIDENT EL DISEASE - POLICY LIMIT EL DISEASE - EA EMPLOYEE	$ $ $ $	1,000,000 1,000,000 1,000,000
	OTHER						

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS
RE: 227 BOOMRIDGE ROAD, NO. STONINGTON, CT.

CERTIFICATE HOLDER

195432
DAVID B. & ROSALIND M. LEWIS
C/O WIRELESS SOLUTIONS LLC
P.O. BOX 133
COLCHESTER, CT 06415

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

FILE 11 NORTH STONINGTON FAA

Sprint PCS

To: Larry Woods

From: Diane Lawrence, Project Coordinator DRL

Date: November 11, 1996

RE: Site # CTO3XC111 (North Stonington)

Larry,

This is to confirm that I have pre-screened the above mentioned site using the Airspace software with coordinates provided to me by Steve Crotty, RF Manager. The results show that there are no apparent FAA/FCC compliance issues with this site. If you should have any further questions, please do not hesitate to contact me.

#111

ZONING PERMIT

****
****

DATE: 2-5-97 PERMIT NO#: 97-12

This permit is hereby granted to Wireless Solutions LTD.
of 273 Boombridge Road N. Stonington CT
for the purpose of: Construction of a 8'x11' concrete slab on which will be montied communications equipment. Slab to be Surrounded by by a 15'x 20' fenced enclosure.
In compliance with the provisions of the North Stonington

Zoning Regulations:

PROPERTY LOCATION: 403.4
ASSESSOR'S MAP: 290 LOT: 35

SPECIAL CONDITIONS OR STIPULATIONS:
The owner of the pad, gear, and fenced enclosure the property of Sprint Spectrum. LP. See attached plot Plan. also site Plan on file for Sprint spectrum - Filed 2-6-97
In accordance with the application dated: 2-5-97
This permit expires one year from this date: 2-5-97

George C Brown 2-5-97
ZONING ENFORCEMENT OFFICER DATE

ZONING FEE: $35.00 PAID: $35.00

Sprint

Sprint PCS

Engineering and Operations
9 Barnes Industrial Road
Wallingford, Connecticut 06492

Telephone: 203 294 5600
Fax: 203 294 5647

February 6, 1997

Scott Chasse
Sprint PCS
9 Barnes Industrial Road
Wallingford, CT. 06492

RE: Building Permit For Site CT03XC111
273 Boombridge Road, North Stonington, CT.

Dear Scott,

Enclosed is the work permit for the above referenced site issued by the Town of North Stonington. The work permit needs to be displayed at the work site during construction.

I'm requesting that you have Bechtel remind their contractors that even though they did not obtain the building permit, they are still responsible for notification of impending inspections as required by the municipality. The name of the building official for this job is Tim York, phone no. 860-535-0318. He is a part time building official so you may have to leave a message on voice mail and he will return your call.

If you have any questions or require additional information, please contact me at 203-294-5609.

Sincerely,

Mike Evanchick
Construction Manager

Town of North Stonington

Building Permit

Date: Feb 5 1997 Permit Number: 97-02

Expiration Date of Permit: Feb 5 1998

Number of Stories: 0 W
(proposed use)

Location: 227 Boom bridge Rd

Zoning District: R-80

Subdivision: _____ Lot: _____ Map: _____

I HEREBY CERTIFY THAT THE PROPOSED WORK IS AUTHORIZED BY THE OWNER OF RECORD AND I HAVE BEEN AUTHORIZED BY THE OWNER TO MAKE THIS APPLICATION AS HIS OR HER AUTHORIZED AGENT.

Signature of Authorized Agent: _____

Address: _____

_____ License Number: _____

Area in Square Feet: N/A

Estimated Cost of Construction: 82,000 Permit Fee: $656

Owner: David Lewis

Address: 273 Boom bridge Rd

Building Official: _____ Date: 2/5/97

Copy Distribution

White - Applicant Canary - File Pink - Assessor

EBI Consulting
environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT03XC111

227 Boombridge Road
227 Boombridge Road
North Stonington, CT 06359

December 16, 2017

EBI Project Number: 6217005712

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	9.10 %

EBI Consulting
environmental | engineering | due diligence

December 16, 2017

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

Emissions Analysis for Site: **CT03XC111 – 227 Boombridge Road**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **227 Boombridge Road, North Stonington, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **227 Boombridge Road, North Stonington, 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 **KMW ETCR-654L12H6** 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 **152 feet** above ground level (AGL) for **Sector A**, **152 feet** above ground level (AGL) for **Sector B** and **152 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:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6
Gain:	13.35 / 15.25/ 15.05 dBd	Gain:	13.35 / 15.25/ 15.05 dBd	Gain:	13.35 / 15.25/ 15.05 dBd
Height (AGL):	**152 feet**	Height (AGL):	**152 feet**	Height (AGL):	**152 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)
Channel Count	18	Channel Count	18	Channel Count	18
Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts
ERP (W):	11,775.31	ERP (W):	11,775.31	ERP (W):	11,775.31
Antenna A1 MPE%	**2.15 %**	Antenna B1 MPE%	**2.15 %**	Antenna C1 MPE%	**2.15 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**2.15 %**
AT&T	1.14 %
Nextel (decommissioned)	0.22 %
T-Mobile	3.73 %
Verizon Wireless	1.86 %
Site Total MPE %:	**9.10 %**

SPRINT Sector A Total:	2.15 %
SPRINT Sector B Total:	2.15 %
SPRINT Sector C Total:	2.15 %
Site Total:	9.10 %

SPRINT _ Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	432.54	152	0.73	850 MHz	567	0.13%
Sprint 850 MHz LTE	2	432.54	152	1.46	850 MHz	567	0.26%
Sprint 1900 MHz (PCS) CDMA	5	535.94	152	4.52	1900 MHz (PCS)	1000	0.45%
Sprint 1900 MHz (PCS) LTE	2	1,339.86	152	4.52	1900 MHz (PCS)	1000	0.45%
Sprint 2500 MHz (BRS) LTE	8	639.78	152	8.63	2500 MHz (BRS)	1000	0.86%
						Total:	**2.15%**

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:	2.15 %
Sector B:	2.15 %
Sector C:	2.15 %
SPRINT Maximum Total (per sector):	2.15 %
Site Total:	9.10 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **9.10 %** 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.

MASER CONSULTING
— CONNECTICUT —

331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
T: 732.383.1950
www.maserconsulting.com

Sprint®

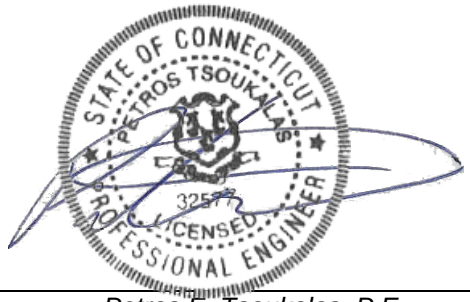
Revision 0

Guy Tower Feasibility Study

Site Name: *227 Boom Bridge Road*
Site ID: *CT03XC111*

Site Address: *227 Boom Bridge Road*
North Stonington, CT 06359
New London County
Maser Project Number: *17924001A*
September 29, 2017

Analysis Type	*Guy Tower*	*Foundation*
Pass/Fail	*Pass*	*Adequate*
Mount Utilization	*99.8 %*	*N/A*



Petros E. Tsoukalas, P.E.
Connecticut Professional Engineer
PE License # 32577

Objective:

The objective of this report is to determine the capacity of the existing 180' lattice guyed tower structure at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

Introduction:

Maser Consulting Connecticut has performed limited field observations on August 14, 2017 to visually verify the existing condition of the structure from grade and to locate and quantify the existing wireless appurtenances where possible. Maser Consulting Connecticut has reviewed the following documents in completing this report:

- RFDS 45738 provided by Sprint, dated March 13, 2017 for DO Macro Upgrade.
- Construction Drawings prepared by Maser Consulting Connecticut project# 17924001A dated, September 11, 2017.
- Previous Structural Analysis report prepared by EBI Consulting job# 81150090 dated, February 13, 2015.

The existing **SPRINT** equipment is supported on an existing 180' lattice guyed tower structure. The primary tower structure is constructed of pipe legs with piped diagonals and horizontals. The existing **SPRINT** equipment is supported on an existing antenna support mounts constructed of structural steel antenna support pipes supported by pipes at a centerline of approximately 152'-0" above ground level. This report is based only upon this information, as well as the information obtained in the field.

Discrete and Linear Appurtenances:

Maser Consulting Connecticut understands the existing & proposed **SPRINT** loading to be as follows:

- *(3) Spare Panel Antennas (Existing)*
- **(3) KMW ETCR-654L12H6 Panel Antennas (Proposed per RFDS)**
- *(3) ALU 1900 RRH (Relocated)*
- **(3) ALU TD-RRH8X20-25 (Proposed per RFDS)**
- **(3) ALU RRH-2X50-800 (Proposed per RFDS)**
- **(4) Hybrid Cables**

The overall antenna loading is found in the Appendix A of this report.

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2016 Connecticut State Building Code, Incorporating The 2012 IBC
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Exposure Category – C
    - Structure Class – II
    - Topographic Category – 1
    - ASCE 7-10 Ultimate Wind Speed 136mph- Nominal Wind Speed 105mph

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing guyed lattice structure is structurally adequate to support the existing and proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure are deemed to be negligible or acceptable, then the proposed equipment can be installed as intended. Tower Numerics, tnx Tower, a tower analysis and design program, designed specifically for the telecommunications industry and for all applicable codes and standards was used for this structural analysis.

The following assumptions were utilized in this report:

- Structural Steel Main Legs are constructed of A572-50 Grade Steel.
- Structural Steel Pipe Diagonals and Girts are constructed of A53- Grade B 42ksi Steel
- Structural Steel Angle and Plate members are constructed of A36 Grade.
- Structural Bolts are assumed to be A325N grade.
- Tower is installed to plumb and is maintained properly without any structural deficiencies or deteriorations to the original design.
- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes, prior to the proposed modifications listed within this report.
- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct. It is responsibility of the contractor to check if the existing structural members from previous structural analysis report, match to the tower structure in the field.
- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.
- Proposed equipment and locations should not deviate from the proposed locations noted herein and shown on the associated Maser Consulting Connecticut final Construction Drawings.

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

The existing guyed tower was analyzed for the loading in the applicable codes and standards. The tower has been determined to be structurally **ADEQUATE** to support the proposed and existing antennas, based upon the aforementioned assumptions.

The lattice tower has been determined to be stressed to a maximum of **99.8%** of its structural capacity with the maximum usage occurring at the diagonal bolts at 80-100' elevation. The tower legs are determined to be

stressed to a maximum usage of **78.6%** of their structural capacity at 20'-40' elevation.

Foundation Reactions Comparison

	Foundation Capacity (kips)	Current Forces (kips)	Pass/Fail (Utilization %)
Mast Axial	222.75	173.63	Pass **(77.95%)**
Mast Shear	3.645	2.84	Pass **(77.91%)**

Anchor Reactions Comparison

	Foundation Capacity (kips)	Current Forces (kips)	Pass/Fail (Utilization %)
Inner Anchor Uplift	27.81	21.07	Pass (75.76 %)
Inner Anchor Shear	38.61	29.49	Pass (76.38 %)
Inner Anchor Resultant	47.52	36.25	Pass (76.28 %)
Middle Anchor Uplift	42.795	25.88	Pass (60.47 %)
Middle Anchor Shear	41.175	24.90	Pass (60.47 %)
Middle Anchor Resultant	59.4	35.92	Pass (60.47 %)
Outer Anchor Uplift	19.71	11.09	Pass (56.27 %)
Outer Anchor Shear	20.655	11.4	Pass (55.19 %)
Outer Anchor Resultant	28.485	15.91	Pass (55.85 %)

*Based on calculations provided in the referenced structural analysis and multiplied by a factor of 1.35 per section 15.5.1 of the TIA-222G.

The foundation in comparison with the capacities from the previous structural analysis referenced above is observed to be **ADEQUATE**. Therefore, the proposed **SPRINT** installation **CAN** be placed as intended.

It should be noted that due to a lack of information Maser Consulting Connecticut did not perform an analysis on the foundation, but a comparison of the capacities summarized in previous analysis with the current forces has been determined. If information is provided then this report can be amended. The conclusions reached by Maser Consulting Connecticut in this evaluation are only applicable for the existing structural members supporting the proposed **SPRINT** telecommunications installation described herein.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.

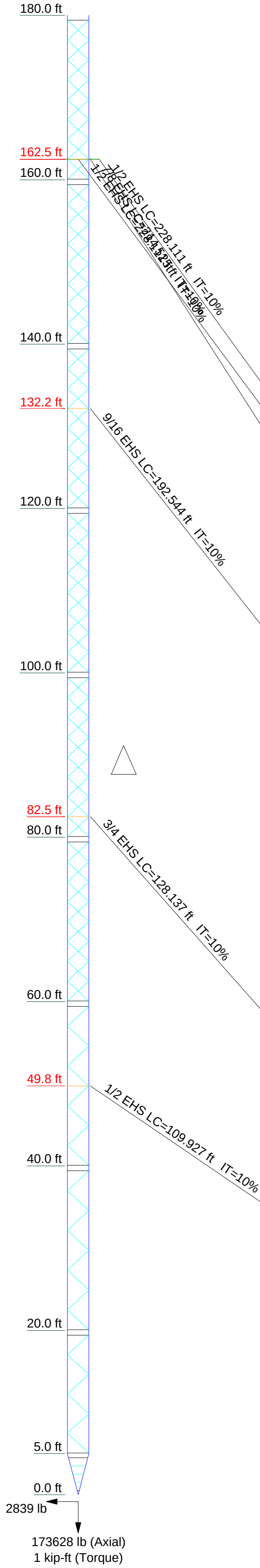
Sincerely,
Maser Consulting Connecticut

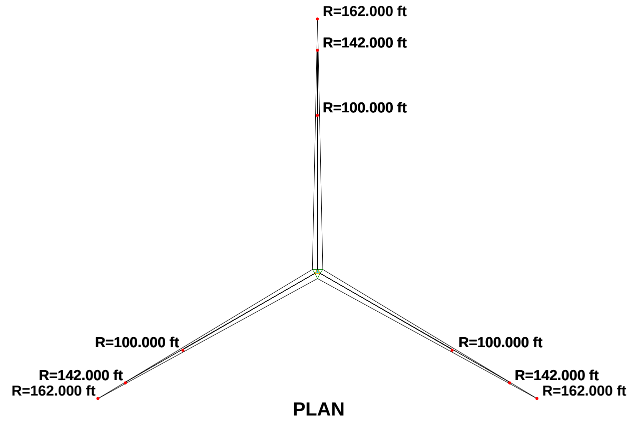
Petros E. Tsoukalas, P.E.
Telecommunications Discipline Leader
\\maserconsulting.com\luj\Projects\2017\17924000A\17924001A\Structural\Tower Analysis\Rev 0\Word\CT03XC111.227 Boombridge Road.Tower Analysis.Rev 0.Word.doc

APPENDIX A

APPENDIX A

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Bottom Girts	Horizontals	Top Guy Pull-Offs	Face Width (ft)	# Panels @ (ft)	Weight (lb)
T1	ROHN 2.5 X-STR	A572-50	L2x2x1/4	A36	L2x2x1/4	L2x2x1/4	N.A.	2L2x2x1/4x3/8	3.42	64 @ 2.40885	1712.3
T2			ROHN TS1.5x11 ga	A53-B-42	ROHN TS1.5x11 ga	ROHN TS1.5x11 ga		N.A.			907.5
T3			ROHN TS1.5x16 ga		ROHN TS1.5x16 ga	ROHN TS1.5x16 ga		4x3/8			765.9
T4			ROHN TS1.5x11 ga		ROHN TS1.5x11 ga	ROHN TS1.5x11 ga		N.A.			907.5
T5			ROHN TS1.5x16 ga		ROHN TS1.5x16 ga	ROHN TS1.5x16 ga		2L2x2x1/4x3/8			779.2
T6			ROHN TS1.5x11 ga		ROHN TS1.5x11 ga	ROHN TS1.5x11 ga		N.A.			907.5
T7			ROHN TS1.5x16 ga		ROHN TS1.5x16 ga	ROHN TS1.5x16 ga		4x3/8			654.6
T8								N.A.			602.2
T9						L3x3x1/2				6 @ 2.37847	544.9
T10			N.A.	N.A.	A	A	A			5 @ 1	293.0
											8074.5





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION
Rohn 6'x15' Boom Gate (3) (ATT)	177
P65-17-XLH-RR w/8ft mount pipe (ATT)	177
P65-17-XLH-RR w/8ft mount pipe (ATT)	177
Powerwave 7770 w/5ft mount pipe (ATT)	177
(2) ETB19G8-12UB / E15Z01P03 (ATT)	177
SBNH-1D6565C (ATT)	177
P65-17-XLH-RR w/8ft mount pipe (ATT)	177
Powerwave 7770 w/5ft mount pipe (ATT)	177
(2) ETB19G8-12UB / E15Z01P03 (ATT)	177
DB874H120 (ATT)	177
P65-17-XLH-RR w/8ft mount pipe (ATT)	177
Powerwave 7770 w/5ft mount pipe (ATT)	177
ETB19G8-12UB / E15Z01P03 (ATT)	177
(2) LGP21401 (ATT)	177
DC6-48-06-18-8F (ATT)	177
(2) RRUS-11 (ATT)	177
(2) RRUS-11 (ATT)	177
(2) RRUS-11 (ATT)	177
Pirod 15' T-Frame Sector Mount (1) (Sprint)	152
DB980H90E-M w/Mount Pipe (Sprint)	152
ETCR-654L12H6 W/Pipe Mount (Sprint)	152
TD-RRH8x20-25 (Sprint)	152
RRH-2X50-800 (Sprint)	152
ALU RRH-4X45-1900 (Sprint)	152 - 15
Pirod 15' T-Frame Sector Mount (1) (Sprint)	152
DB980H90E-M w/Mount Pipe (Sprint)	152
ETCR-654L12H6 W/Pipe Mount (Sprint)	152
TD-RRH8x20-25 (Sprint)	152
RRH-2X50-800 (Sprint)	152
ALU RRH-4X45-1900 (Sprint)	152 - 15
Pirod 15' T-Frame Sector Mount (1) (Sprint)	152
DB980H90E-M w/Mount Pipe (Sprint)	152
ETCR-654L12H6 W/Pipe Mount (Sprint)	152
TD-RRH8x20-25 (Sprint)	152
RRH-2X50-800 (Sprint)	152
ALU RRH-4X45-1900 (Sprint)	152 - 15

TYPE	ELEVATION
Pirod 15' T-Frame Sector Mount (1) (Verizon)	136
BXA-70063-6CF-EDIN W/M PIPE (Verizon)	136
BXA-171085-8BF W/M PIPE (Verizon)	136
LPA-80080/4CF W/M PIPE (Verizon)	136
LPA-80080/4CF W/M PIPE (Verizon)	136
FRS FD9R6004 Diplexer (Verizon)	136
Pirod 15' T-Frame Sector Mount (1) (Verizon)	136
BXA-70063-6CF-EDIN W/M PIPE (Verizon)	136
BXA-171085-8BF W/M PIPE (Verizon)	136
LPA-80080/4CF W/M PIPE (Verizon)	136
LPA-80080/4CF W/M PIPE (Verizon)	136
FRS FD9R6004 Diplexer (Verizon)	136
Pirod 15' T-Frame Sector Mount (1) (Verizon)	136
BXA-70063-6CF-EDIN W/M PIPE (Verizon)	136
BXA-171085-8BF W/M PIPE (Verizon)	136
LPA-80080/4CF W/M PIPE (Verizon)	136
LPA-80080/4CF W/M PIPE (Verizon)	136
FRS FD9R6004 Diplexer (Verizon)	136
AIR 21 B4A B2P W/Mount Pipe (T-Mobile)	120
UMTS DD B4 (T-Mobile)	120
KRC 118 57/1B4/B12P W/M Pipe (T-Mobile)	120
RRUS11 B12 (T-Mobile)	120
Pirod 4' Side Mount Standoff (1) (T-Mobile)	120
AIR 21 B4A B2P W/Mount Pipe (T-Mobile)	120
UMTS DD B4 (T-Mobile)	120
KRC 118 57/1B4/B12P W/M Pipe (T-Mobile)	120
RRUS11 B12 (T-Mobile)	120
Pirod 4' Side Mount Standoff (1) (T-Mobile)	120
AIR 21 B4A B2P W/Mount Pipe (T-Mobile)	120
UMTS DD B4 (T-Mobile)	120
KRC 118 57/1B4/B12P W/M Pipe (T-Mobile)	120
RRUS11 B12 (T-Mobile)	120
Pirod 4' Side Mount Standoff (1) (T-Mobile)	120
1' Standoff (Sprint)	98
GPS (Sprint)	98

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L4x4x1/4		

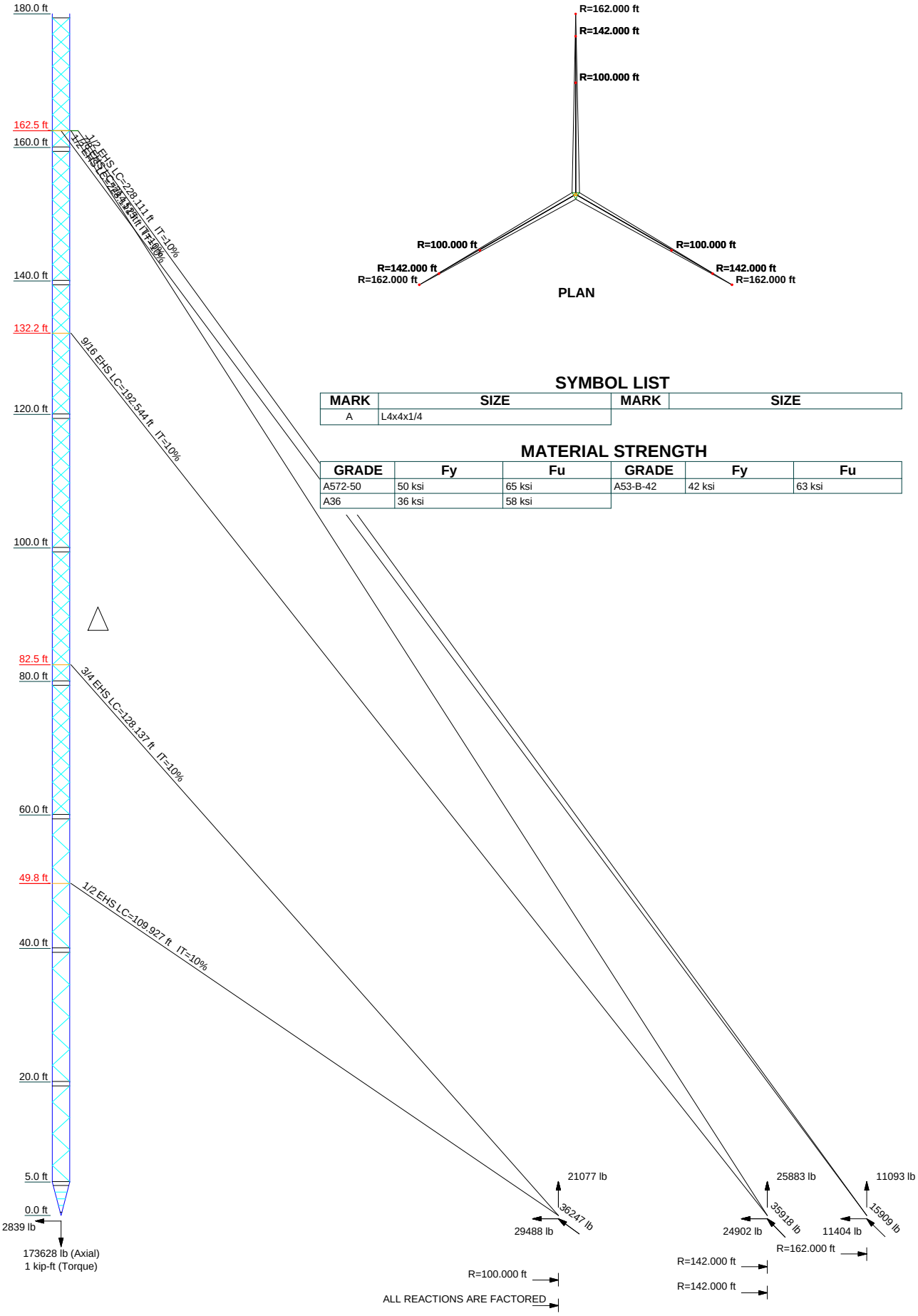
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-42	42 ksi	63 ksi
A36	36 ksi	58 ksi			

Maser Consulting P.A
400 Valley Road
Mt Arlington, NJ
Phone: 973.398.3110
FAX: 973.398.3199

Job: ***Structural Analysis of Guyed Tower***		
Project: ***17924001A***		
Client: Cherundolo	Drawn by: gpenumatsa	App'd:
Code: TIA-222-G	Date: 09/27/17	Scale: NTS
Path: [illegible]		Dwg No. E-1

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs						ROHN 2.5 X-STR				
Leg Grade						A572-50				
Diagonals	N.A.		ROHN TS1.5x16 ga		ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	L2x2x1/4
Diagonal Grade	N.A.					A53-B-42				A36
Top Girts	A		ROHN TS1.5x16 ga		ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	L2x2x1/4
Bottom Girts	A	L3x3x1/2	ROHN TS1.5x16 ga		ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	L2x2x1/4
Horizontals	A					N.A.				
Top Guy Pull-Offs		N.A.		4x3/8	N.A.	2L2x2x1/4x3/8	N.A.	4x3/8	N.A.	2L2x2x1/4x3/8
Face Width (ft)						64 @ 2.40885				3.42
# Panels @ (ft)	5 @ 1	6 @ 2.37847								
Weight (lb)	293.0	544.9	602.2	654.6	907.5	779.2	907.5	765.9	907.5	1712.3



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L4x4x1/4		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-42	42 ksi	63 ksi
A36	36 ksi	58 ksi			

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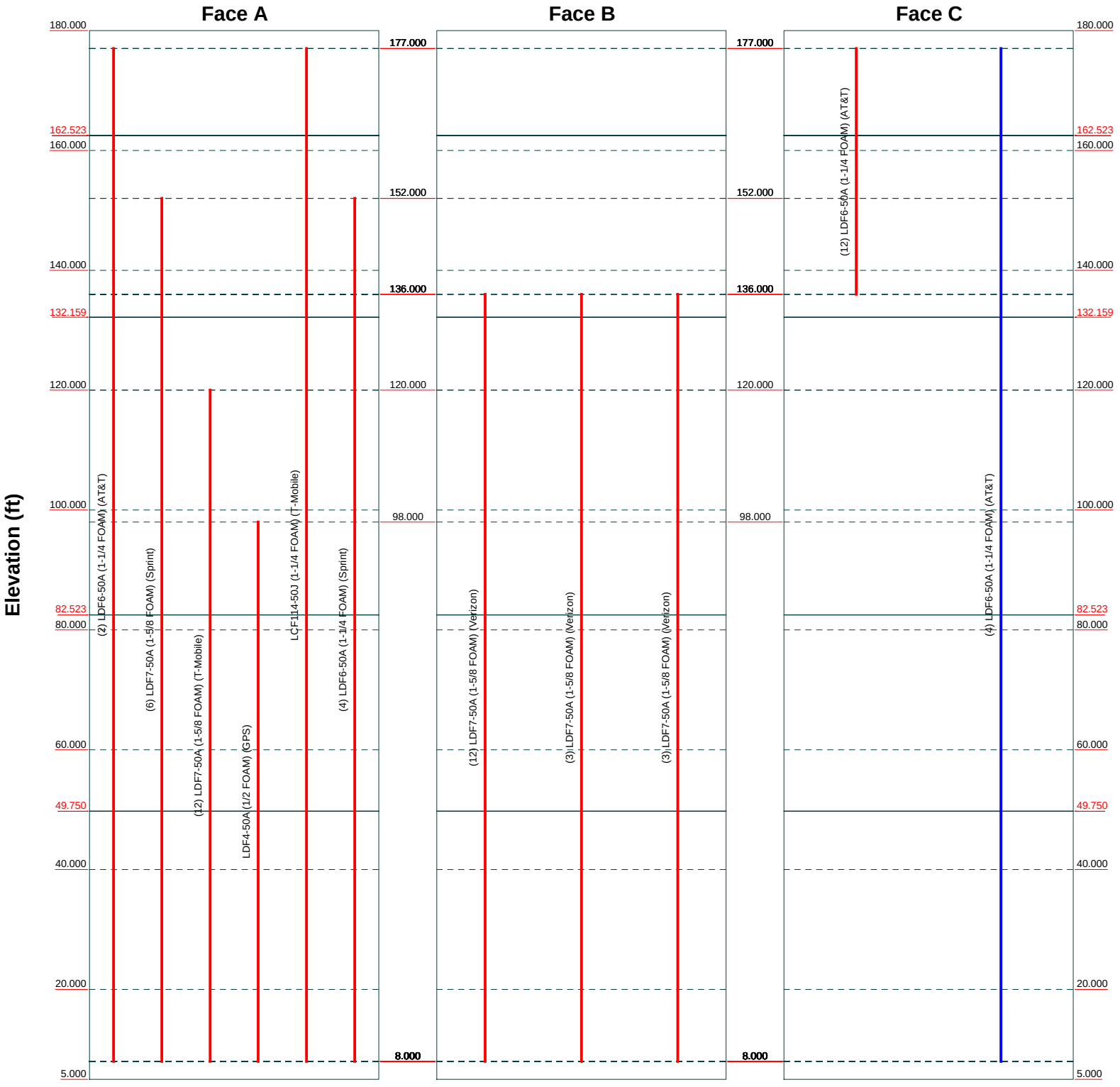
Job: **Structural Analysis of Guyed Tower**		
Project: ***17924001A***		
Client: Cherundolo	Drawn by: gpenumatsa	App'd:
Code: TIA-222-G	Date: 09/27/17	Scale: NTS
Path: R:\All Offices\Mt Arlington\Projects\2017\17924000\17924001A\Structural\Tower Analysis\TNXIC T03XC111.eri		Dwg No. E-1

Feed Line Distribution Chart
5' - 180'

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



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Job: ***Structural Analysis of Guyed Tower***			
Project: ***17924001A***			
Client: Cherundolo	Drawn by: gpenumatsa	App'd:	
Code: TIA-222-G	Date: 09/27/17	Scale: NTS	
Path: R:\All\Offices\MtArlington\Projects\2017\17924000A\17924001A\Structural\Tower Analysis\TNX\CT03XC111.eri		Dwg No. E-7	

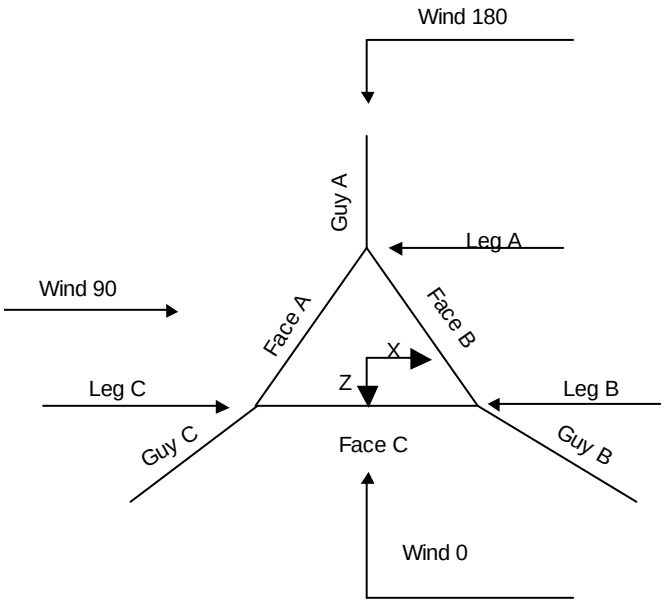
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 180.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 3.420 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

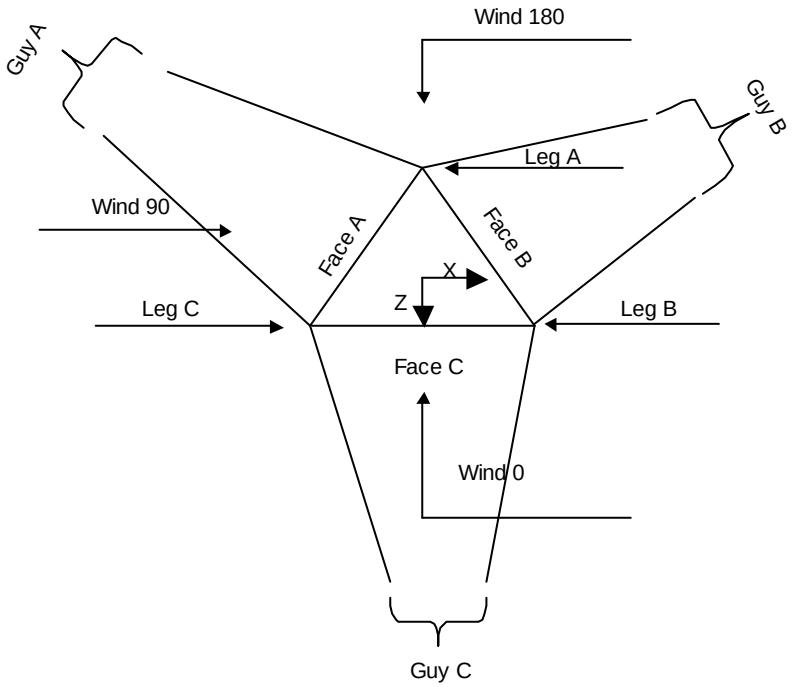
Tower is located in New London County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 105.0 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50.0 mph is used in combination with ice.
Deflections calculated using a wind speed of 60.0 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	180.000-160.000			3.420	1	20.000
T2	160.000-140.000			3.420	1	20.000
T3	140.000-120.000			3.420	1	20.000
T4	120.000-100.000			3.420	1	20.000
T5	100.000-80.000			3.420	1	20.000
T6	80.000-60.000			3.420	1	20.000
T7	60.000-40.000			3.420	1	20.000
T8	40.000-20.000			3.420	1	20.000
T9	20.000-5.000			3.420	1	15.000
T10	5.000-0.000			3.420	1	5.000

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.000-160.000	2.409	X Brace	No	No	7.375	1.375
T2	160.000-140.000	2.409	X Brace	No	No	7.375	1.375
T3	140.000-120.000	2.409	X Brace	No	No	7.375	1.375
T4	120.000-100.000	2.409	X Brace	No	No	7.375	1.375
T5	100.000-80.000	2.409	X Brace	No	No	7.375	1.375
T6	80.000-60.000	2.409	X Brace	No	No	7.375	1.375
T7	60.000-40.000	2.409	K Brace Right	No	No	7.375	1.375
T8	40.000-20.000	2.409	K Brace Right	No	No	7.375	1.375
T9	20.000-5.000	2.378	K Brace Right	No	No	7.375	1.375
T10	5.000-0.000	1.000	X Brace	No	Yes	6.000	6.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.000-160.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T2 160.000-140.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T3 140.000-120.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T4 120.000-100.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 100.000-80.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T6 80.000-60.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T7 60.000-40.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T8 40.000-20.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T9 20.000-5.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 5.000-0.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe		A53-B-42 (42 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180.000-160.000	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T2 160.000-140.000	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T3 140.000-120.000	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T4 120.000-100.000	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5	Pipe	ROHN TS1.5x16 ga	A53-B-42	Pipe	ROHN TS1.5x16 ga	A53-B-42

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
100.000-80.000			(42 ksi)			(42 ksi)
T6 80.000-60.000	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T7 60.000-40.000	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T8 40.000-20.000	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T9 20.000-5.000	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Single Angle	L3x3x1/2	A36 (36 ksi)
T10 5.000-0.000	Single Angle	L4x4x1/4	A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T10 5.000-0.000	None	Single Angle		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T10 5.000-0.000	Single Angle	L4x4x1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 180.000-160.000	1.210	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T2 160.000-140.000	1.210	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T3 140.000-120.000	1.210	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T4	1.210	0.375	A36	1	1	1	36.000	36.000	36.000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
120.000-100.000			(36 ksi)						
T5	1.210	0.375	A36	1	1	1	36.000	36.000	36.000
100.000-80.000			(36 ksi)						
T6	1.210	0.375	A36	1	1	1	36.000	36.000	36.000
80.000-60.000			(36 ksi)						
T7	0.740	0.375	A36	1	1	1	36.000	36.000	36.000
60.000-40.000			(36 ksi)						
T8	0.740	0.375	A36	1	1	1	36.000	36.000	36.000
40.000-20.000			(36 ksi)						
T9	0.600	0.375	A36	1	1	1	36.000	36.000	36.000
20.000-5.000			(36 ksi)						
T10	0.000	0.000	A36	1	1	1	36.000	36.000	36.000
5.000-0.000			(36 ksi)						

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	No	No	1	1	1	1	1	1	1	1
180.000-160.000				1	1	1	1	1	1	1
T2	No	No	1	1	1	1	1	1	1	1
160.000-140.000				1	1	1	1	1	1	1
T3	No	No	1	1	1	1	1	1	1	1
140.000-120.000				1	1	1	1	1	1	1
T4	No	No	1	1	1	1	1	1	1	1
120.000-100.000				1	1	1	1	1	1	1
T5	No	No	1	1	1	1	1	1	1	1
100.000-80.000				1	1	1	1	1	1	1
T6	No	No	1	1	1	1	1	1	1	1
80.000-60.000				1	1	1	1	1	1	1
T7	No	No	1	1	1	1	1	1	1	1
60.000-40.000				1	1	1	1	1	1	1
T8	No	No	1	1	1	1	1	1	1	1
40.000-20.000				1	1	1	1	1	1	1
T9	No	No	1	1	1	1	1	1	1	1
20.000-5.000				1	1	1	1	1	1	1
T10	No	No	0.2	1	1	1	1	1	1	1
5.000-0.000				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 180.000-160.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 160.000-140.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 140.000-120.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 120.000-100.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 100.000-80.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 80.000-60.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 60.000-40.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 40.000-20.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 20.000-5.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 5.000-0.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.000-160.000	Flange	0.750 A325N	0	0.625 A325N	1	0.625 A325N	1	0.625 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T2 160.000-140.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T3 140.000-120.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T4 120.000-100.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T5 100.000-80.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T6 80.000-60.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T7 60.000-40.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T8 40.000-20.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T9 20.000-5.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.625 A325N	2	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T10 5.000-0.000	Flange	0.750 A325N	4	0.500 A325N	0	0.500 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
162.523	EHS	A	1/2	2690.000	10%	21000.000	0.517	227.922	162.000	0.000	0.000	100%
		B	1/2	2690.000	10%	21000.000	0.517	227.922	162.000	0.000	0.000	100%
		C	1/2	2690.000	10%	21000.000	0.517	227.922	162.000	0.000	0.000	100%
132.159	EHS	A	9/16	3500.000	10%	21000.000	0.671	192.382	142.000	0.000	0.000	100%
		B	9/16	3500.000	10%	21000.000	0.671	192.382	142.000	0.000	0.000	100%
		C	9/16	3500.000	10%	21000.000	0.671	192.382	142.000	0.000	0.000	100%
82.5234	EHS	A	3/4	5830.000	10%	19000.000	1.155	128.021	100.000	0.000	0.000	100%
		B	3/4	5830.000	10%	19000.000	1.155	128.021	100.000	0.000	0.000	100%
		C	3/4	5830.000	10%	19000.000	1.155	128.021	100.000	0.000	0.000	100%
162.523	EHS	A	7/8	7970.000	10%	19000.000	1.581	214.333	142.000	0.000	0.000	100%
		B	7/8	7970.000	10%	19000.000	1.581	214.333	142.000	0.000	0.000	100%
		C	7/8	7970.000	10%	19000.000	1.581	214.333	142.000	0.000	0.000	100%
49.75	EHS	A	1/2	2690.000	10%	21000.000	0.517	109.835	100.000	0.000	0.000	100%
		B	1/2	2690.000	10%	21000.000	0.517	109.835	100.000	0.000	0.000	100%
		C	1/2	2690.000	10%	21000.000	0.517	109.835	100.000	0.000	0.000	100%

Guy Data*(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
162.523	Torque Arm	6.830	0.000	Channel	A36 (36 ksi)	Channel	C12x20.7
132.159	Corner						
82.5234	Corner						
162.523	Corner						
49.75	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
162.523	A36 (36 ksi)	Solid Round				A572-50 (50 ksi)	Double Angle	
132.159	A36 (36 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	4x3/8
82.523	A36 (36 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Double Angle	2L2x2x1/4x3/8
162.523	A36 (36 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Double Angle	2L2x2x1/4x3/8
49.750	A36 (36 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	4x3/8

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
162.523	117.835	117.835	117.835		4.920 3.8 sec/pulse	4.920 3.8 sec/pulse	4.920 3.8 sec/pulse	
132.159	129.089	129.089	129.089		3.507 3.2 sec/pulse	3.507 3.2 sec/pulse	3.507 3.2 sec/pulse	
82.5234	147.864	147.864	147.864		1.612 2.2 sec/pulse	1.612 2.2 sec/pulse	1.612 2.2 sec/pulse	
162.523	338.860	338.860	338.860		4.489 3.7 sec/pulse	4.489 3.7 sec/pulse	4.489 3.7 sec/pulse	
49.75	56.785	56.785	56.785		1.155 1.9 sec/pulse	1.155 1.9 sec/pulse	1.155 1.9 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
162.523	No	No	1	1	1	1	1	1
132.159	No	No			1	1	1	1
82.5234	No	No			1	1	1	1
162.523	No	No			1	1	1	1
49.75	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
162.523	0.000 A325N	0	0.000	1	0.750 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
132.159	0.750 A325N	2	0.000	0.75	0.750 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
82.5234	0.625 A325N	0	0.000	0.75	0.750 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
162.523	0.625 A325N	0	0.000	0.75	0.750 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
49.75	0.625 A325N	0	0.000	0.75	0.750 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
162.523	A	81.262	29.065	6.591	1.641
	B	81.262	29.065	6.591	1.641
	C	81.262	29.065	6.591	1.641
132.159	A	66.079	27.827	6.310	1.608
	B	66.079	27.827	6.310	1.608
	C	66.079	27.827	6.310	1.608
82.5234	A	41.262	25.200	5.714	1.534
	B	41.262	25.200	5.714	1.534
	C	41.262	25.200	5.714	1.534
162.523	A	81.262	29.065	6.591	1.641
	B	81.262	29.065	6.591	1.641
	C	81.262	29.065	6.591	1.641
49.75	A	24.875	22.653	5.137	1.458
	B	24.875	22.653	5.137	1.458
	C	24.875	22.653	5.137	1.458

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top / Bottom lb	F_x lb	F_y lb	F_z lb	M_x kip-ft	M_y kip-ft	M_z kip-ft
162.523	A	45.437	2773.952 2690.000	-40.892	2005.309	-1916.213	-3.954	6.624	-6.848
	A	45.437	2773.952 2690.000	40.892	2005.309	-1916.213	-3.954	-6.624	6.848
	B	45.437	2773.952 2690.000	1679.935	2005.309	922.693	7.908	6.624	0.000
	B	45.437	2773.952 2690.000	1639.043	2005.309	993.520	-3.954	-6.624	-6.848
	C	45.437	2773.952 2690.000	-1639.043	2005.309	993.520	-3.954	6.624	6.848
	C	45.437	2773.952 2690.000	-1679.935	2005.309	922.693	7.908	-6.624	0.000
			Sum:	0.000	12031.854	0.000	-0.000	0.000	0.000

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	kip-ft	kip-ft	kip-ft
132.159	A	43.345	3588.602 3500.000	0.000	2497.223	-2577.197	-4.931	0.000	0.000
	B	43.345	3588.602 3500.000	2231.918	2497.223	1288.598	2.465	0.000	-4.270
	C	43.345	3588.602 3500.000	-2231.918	2497.223	1288.598	2.465	-0.000	4.270
			Sum:	0.000	7491.668	-0.000	0.000	0.000	0.000
82.5234	A	40.093	5925.227 5830.000	0.000	3859.201	-4496.097	-7.620	0.000	0.000
	B	40.093	5925.227 5830.000	3893.734	3859.201	2248.048	3.810	0.000	-6.599
	C	40.093	5925.227 5830.000	-3893.734	3859.201	2248.048	3.810	-0.000	6.599
			Sum:	0.000	11577.603	-0.000	0.000	0.000	0.000
162.523	A	49.253	8226.709 7970.000	0.000	6304.463	-5285.120	-12.448	0.000	0.000
	B	49.253	8226.709 7970.000	4577.048	6304.463	2642.560	6.224	0.000	-10.781
	C	49.253	8226.709 7970.000	-4577.048	6304.463	2642.560	6.224	-0.000	10.781
			Sum:	0.000	18913.388	-0.000	0.000	0.000	0.000
49.75	A	26.909	2715.699 2690.000	0.000	1251.597	-2410.088	-2.471	0.000	0.000
	B	26.909	2715.699 2690.000	2087.197	1251.597	1205.044	1.236	0.000	-2.140
	C	26.909	2715.699 2690.000	-2087.197	1251.597	1205.044	1.236	0.000	2.140
			Sum:	0.000	3754.792	-0.000	0.000	0.000	0.000

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	kip-ft	kip-ft	kip-ft
162.523	A	45.437	5742.670 4962.018	-79.779	4358.416	-3738.463	-8.593	12.924	-14.884
	A	45.437	5742.670 4962.018	79.779	4358.416	-3738.463	-8.593	-12.924	14.884
	B	45.437	5742.670 4962.018	3277.493	4358.416	1800.141	17.187	12.924	0.000
	B	45.437	5742.670 4962.018	3197.714	4358.416	1938.322	-8.593	-12.924	-14.884
	C	45.437	5742.670 4962.018	-3197.714	4358.416	1938.322	-8.593	12.924	14.884
	C	45.437	5742.670 4962.018	-3277.493	4358.416	1800.141	17.187	-12.924	0.000
			Sum:	0.000	26150.498	0.000	-0.000	0.000	0.000
132.159	A	43.345	6153.757 5502.569	0.000	4472.633	-4226.616	-8.831	0.000	0.000
	B	43.345	6153.757 5502.569	3660.356	4472.633	2113.308	4.416	0.000	-7.648
	C	43.345	6153.757	-3660.356	4472.633	2113.308	4.416	-0.000	7.648

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	kip-ft	kip-ft	kip-ft
			5502.569						
			Sum:	0.000	13417.898	-0.000	0.000	0.000	0.000
82.5234	A	40.093	7451.408	0.000	5001.466	-5523.479	-9.876	0.000	0.000
			7003.400						
	B	40.093	7451.408	4783.473	5001.466	2761.740	4.938	0.000	-8.553
			7003.400						
	C	40.093	7451.408	-4783.473	5001.466	2761.740	4.938	-0.000	8.553
			7003.400						
			Sum:	0.000	15004.398	-0.000	0.000	0.000	0.000
162.523	A	49.253	11146.904	0.000	8744.967	-6912.238	-17.267	0.000	0.000
			10071.093						
	B	49.253	11146.904	5986.174	8744.967	3456.119	8.634	0.000	-14.954
			10071.093						
	C	49.253	11146.904	-5986.174	8744.967	3456.119	8.634	-0.000	14.954
			10071.093						
			Sum:	0.000	26234.900	-0.000	0.000	0.000	0.000
49.75	A	26.909	4053.105	0.000	2008.518	-3520.443	-3.966	0.000	0.000
			3854.078						
	B	26.909	4053.105	3048.793	2008.518	1760.221	1.983	0.000	-3.435
			3854.078						
	C	26.909	4053.105	-3048.793	2008.518	1760.221	1.983	-0.000	3.435
			3854.078						
			Sum:	0.000	6025.555	-0.000	0.000	0.000	0.000

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	kip-ft	kip-ft	kip-ft
162.523	A	45.437	2773.952	-40.892	2005.309	-1916.213	-3.954	6.624	-6.848
			2690.000						
	A	45.437	2773.952	40.892	2005.309	-1916.213	-3.954	-6.624	6.848
			2690.000						
	B	45.437	2773.952	1679.935	2005.309	922.693	7.908	6.624	0.000
			2690.000						
	B	45.437	2773.952	1639.043	2005.309	993.520	-3.954	-6.624	-6.848
			2690.000						
	C	45.437	2773.952	-1639.043	2005.309	993.520	-3.954	6.624	6.848
			2690.000						
	C	45.437	2773.952	-1679.935	2005.309	922.693	7.908	-6.624	0.000
			2690.000						
			Sum:	0.000	12031.854	0.000	-0.000	0.000	0.000
132.159	A	43.345	3588.602	0.000	2497.223	-2577.197	-4.931	0.000	0.000
			3500.000						
	B	43.345	3588.602	2231.918	2497.223	1288.598	2.465	0.000	-4.270
			3500.000						
	C	43.345	3588.602	-2231.918	2497.223	1288.598	2.465	-0.000	4.270
			3500.000						
			Sum:	0.000	7491.668	-0.000	0.000	0.000	0.000
82.5234	A	40.093	5925.227	0.000	3859.201	-4496.097	-7.620	0.000	0.000
			5830.000						
	B	40.093	5925.227	3893.734	3859.201	2248.048	3.810	0.000	-6.599

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	kip-ft	kip-ft	kip-ft
			5830.000						
	C	40.093	5925.227	-3893.734	3859.201	2248.048	3.810	-0.000	6.599
			5830.000						
			Sum:	0.000	11577.603	-0.000	0.000	0.000	0.000
162.523	A	49.253	8226.709	0.000	6304.463	-5285.120	-12.448	0.000	0.000
			7970.000						
	B	49.253	8226.709	4577.048	6304.463	2642.560	6.224	0.000	-10.781
			7970.000						
	C	49.253	8226.709	-4577.048	6304.463	2642.560	6.224	-0.000	10.781
			7970.000						
			Sum:	0.000	18913.388	-0.000	0.000	0.000	0.000
49.75	A	26.909	2715.699	0.000	1251.597	-2410.088	-2.471	0.000	0.000
			2690.000						
	B	26.909	2715.699	2087.197	1251.597	1205.044	1.236	0.000	-2.140
			2690.000						
	C	26.909	2715.699	-2087.197	1251.597	1205.044	1.236	0.000	2.140
			2690.000						
			Sum:	0.000	3754.792	-0.000	0.000	0.000	0.000

Guy-Tensioning Information

Guy Elevation		H	V	Temperature At Time Of Tensioning: 0 F Initial Tension	0 F Intercept	20 F Initial Tension	20 F Intercept	40 F Initial Tension	40 F Intercept	60 F Initial Tension	60 F Intercept	80 F Initial Tension	80 F Intercept	100 F Initial Tension	100 F Intercept	120 F Initial Tension	120 F Intercept
ft		ft	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft
162.523	A	160.06	162.52	3257	4.07	3066	4.32	2877	4.60	2690	4.92	2507	5.27	2327	5.68	2152	6.13
	B	160.06	162.52	3257	4.07	3066	4.32	2877	4.60	2690	4.92	2507	5.27	2327	5.68	2152	6.13
	C	160.06	162.52	3257	4.07	3066	4.32	2877	4.60	2690	4.92	2507	5.27	2327	5.68	2152	6.13
132.159	A	140.03	132.16	4303	2.86	4033	3.05	3765	3.26	3500	3.51	3239	3.79	2983	4.11	2733	4.48
	B	140.03	132.16	4303	2.86	4033	3.05	3765	3.26	3500	3.51	3239	3.79	2983	4.11	2733	4.48
	C	140.03	132.16	4303	2.86	4033	3.05	3765	3.26	3500	3.51	3239	3.79	2983	4.11	2733	4.48
82.5234	A	98.03	82.52	7254	1.30	6777	1.39	6302	1.49	5830	1.61	5362	1.75	4899	1.92	4443	2.11
	B	98.03	82.52	7254	1.30	6777	1.39	6302	1.49	5830	1.61	5362	1.75	4899	1.92	4443	2.11
	C	98.03	82.52	7254	1.30	6777	1.39	6302	1.49	5830	1.61	5362	1.75	4899	1.92	4443	2.11
162.523	A	140.03	162.52	9349	3.83	8886	4.03	8426	4.25	7970	4.49	7519	4.75	7074	5.05	6635	5.38
	B	140.03	162.52	9349	3.83	8886	4.03	8426	4.25	7970	4.49	7519	4.75	7074	5.05	6635	5.38
	C	140.03	162.52	9349	3.83	8886	4.03	8426	4.25	7970	4.49	7519	4.75	7074	5.05	6635	5.38
49.75	A	98.03	49.75	3645	0.85	3325	0.93	3006	1.03	2690	1.15	2377	1.31	2070	1.50	1773	1.75
	B	98.03	49.75	3645	0.85	3325	0.93	3006	1.03	2690	1.15	2377	1.31	2070	1.50	1773	1.75
	C	98.03	49.75	3645	0.85	3325	0.93	3006	1.03	2690	1.15	2377	1.31	2070	1.50	1773	1.75

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF6-50A (1-1/4 FOAM) (AT&T)	A	No	Ar (CaAa)	177.000 - 8.000	2.500	0.18	2	2	1.550	1.550		0.660
LDF6-50A (1-1/4 FOAM) (AT&T)	C	No	Ar (CaAa)	177.000 - 136.000	0.000	0.18	12	6	1.000 1.550	1.550		0.660
LDF7-50A	A	No	Ar (CaAa)	152.000 - 8.000	0.000	0.15	6	6	1.980	1.980		0.820

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(1-5/8 FOAM) (Sprint)												
LDF7-50A (1-5/8 FOAM) (Verizon)	B	No	Ar (CaAa)	136.000 - 8.000	0.000	0	12	6	0.500 1.000	1.980		0.820
LDF7-50A (1-5/8 FOAM) (Verizon)	B	No	Ar (CaAa)	136.000 - 8.000	0.000	0.28	3	3	0.500	1.980		0.820
LDF7-50A (1-5/8 FOAM) (Verizon)	B	No	Ar (CaAa)	136.000 - 8.000	0.000	0.28	3	3	0.500	1.980		0.820
LDF7-50A (1-5/8 FOAM) (T-Mobile)	A	No	Ar (CaAa)	120.000 - 8.000	0.000	0.1	12	6	0.000 1.980	1.980		0.820
LDF4-50A (1/2 FOAM) (GPS)	A	No	Ar (CaAa)	98.000 - 8.000	0.000	0.4	1	1	0.630	0.630		0.150
LCF114-50J (1-1/4 FOAM) (T-Mobile)	A	No	Ar (CaAa)	177.000 - 8.000	0.000	0.15	1	1	1.500 0.000	1.570		0.700
LDF6-50A (1-1/4 FOAM) (Sprint)	A	No	Ar (CaAa)	152.000 - 8.000	1.500	0	4	4	1.000 0.500	1.000		0.660

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight plf
LDF6-50A (1-1/4 FOAM) (AT&T)	C	No	CaAa (In Face)	177.000 - 8.000	0.000	0.5	4	No Ice 1/2" Ice 1" Ice	0.155 0.255 0.355	0.660 1.912 3.775

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	180.000-160.000	A	0.000	0.000	7.939	0.000	34.340
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	42.160	0.000	179.520
T2	160.000-140.000	A	0.000	0.000	28.396	0.000	131.120
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	49.600	0.000	211.200
T3	140.000-120.000	A	0.000	0.000	41.100	0.000	191.600
		B	0.000	0.000	57.024	0.000	236.160
		C	0.000	0.000	19.840	0.000	84.480
T4	120.000-100.000	A	0.000	0.000	88.620	0.000	388.400
		B	0.000	0.000	71.280	0.000	295.200
		C	0.000	0.000	12.400	0.000	52.800
T5	100.000-80.000	A	0.000	0.000	89.754	0.000	391.100
		B	0.000	0.000	71.280	0.000	295.200
		C	0.000	0.000	12.400	0.000	52.800
T6	80.000-60.000	A	0.000	0.000	89.880	0.000	391.400

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B	0.000	0.000	71.280	0.000	295.200
		C	0.000	0.000	12.400	0.000	52.800
T7	60.000-40.000	A	0.000	0.000	89.880	0.000	391.400
		B	0.000	0.000	71.280	0.000	295.200
		C	0.000	0.000	12.400	0.000	52.800
T8	40.000-20.000	A	0.000	0.000	89.880	0.000	391.400
		B	0.000	0.000	71.280	0.000	295.200
		C	0.000	0.000	12.400	0.000	52.800
T9	20.000-5.000	A	0.000	0.000	53.928	0.000	234.840
		B	0.000	0.000	42.768	0.000	177.120
		C	0.000	0.000	7.440	0.000	31.680
T10	5.000-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	180.000-160.000	A	1.767	0.000	0.000	29.152	0.000	370.308
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	76.272	0.000	1459.981
T2	160.000-140.000	A	1.745	0.000	0.000	89.958	0.000	1233.780
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	89.234	0.000	1699.711
T3	140.000-120.000	A	1.720	0.000	0.000	126.645	0.000	1746.960
		B		0.000	0.000	86.247	0.000	1405.401
		C		0.000	0.000	49.676	0.000	833.835
T4	120.000-100.000	A	1.692	0.000	0.000	170.694	0.000	2688.704
		B		0.000	0.000	107.235	0.000	1734.268
		C		0.000	0.000	39.471	0.000	609.735
T5	100.000-80.000	A	1.658	0.000	0.000	176.782	0.000	2732.101
		B		0.000	0.000	106.559	0.000	1707.906
		C		0.000	0.000	38.933	0.000	594.787
T6	80.000-60.000	A	1.617	0.000	0.000	176.164	0.000	2685.775
		B		0.000	0.000	105.731	0.000	1675.854
		C		0.000	0.000	38.274	0.000	576.485
T7	60.000-40.000	A	1.564	0.000	0.000	174.336	0.000	2613.845
		B		0.000	0.000	104.656	0.000	1634.553
		C		0.000	0.000	37.418	0.000	552.689
T8	40.000-20.000	A	1.486	0.000	0.000	171.679	0.000	2510.665
		B		0.000	0.000	103.094	0.000	1575.199
		C		0.000	0.000	36.172	0.000	518.060
T9	20.000-5.000	A	1.361	0.000	0.000	100.464	0.000	1409.601
		B		0.000	0.000	60.361	0.000	889.270
		C		0.000	0.000	20.508	0.000	277.605
T10	5.000-0.000	A	1.159	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	180.000-160.000	-1.621	1.449	-0.956	0.559
T2	160.000-140.000	-1.895	0.832	-1.319	0.257
T3	140.000-120.000	0.014	-0.644	-0.611	-0.295
T4	120.000-100.000	-0.157	-1.222	-0.608	-0.525
T5	100.000-80.000	-0.159	-1.243	-0.594	-0.598
T6	80.000-60.000	-0.160	-1.251	-0.610	-0.634
T7	60.000-40.000	-0.164	-1.285	-0.695	-0.738
T8	40.000-20.000	-0.166	-1.296	-0.700	-0.770
T9	20.000-5.000	-0.160	-1.248	-0.657	-0.765
T10	5.000-0.000	0.000	0.000	0.000	0.000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	LDF6-50A (1-1/4 FOAM)	160.00 - 177.00	0.6000	0.2562
T1	2	LDF6-50A (1-1/4 FOAM)	160.00 - 177.00	0.6000	0.2562
T1	9	LCF114-50J (1-1/4 FOAM)	160.00 - 177.00	0.6000	0.2562
T1	10	LDF6-50A (1-1/4 FOAM)	160.00 - 177.00	0.6000	0.2562
T2	1	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.3197
T2	2	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.3197
T2	3	LDF7-50A (1-5/8 FOAM)	140.00 - 152.00	0.6000	0.3197
T2	9	LCF114-50J (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.3197
T2	10	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.3197
T2	11	LDF6-50A (1-1/4 FOAM)	140.00 - 152.00	0.6000	0.3197
T3	1	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.2982
T3	2	LDF6-50A (1-1/4 FOAM)	136.00 - 140.00	0.6000	0.2982
T3	3	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.2982
T3	4	LDF7-50A (1-5/8 FOAM)	120.00 - 136.00	0.6000	0.2982
T3	5	LDF7-50A (1-5/8 FOAM)	120.00 - 136.00	0.6000	0.2982
T3	6	LDF7-50A (1-5/8 FOAM)	120.00 - 136.00	0.6000	0.2982
T3	9	LCF114-50J (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.2982
T3	10	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.2982
T3	11	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.2982
T4	1	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.3313

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	3	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	4	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	5	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	6	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	7	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	9	LCF114-50J (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	10	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	11	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.3313
T5	1	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	3	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	4	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	5	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	6	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	7	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	8	LDF4-50A (1/2 FOAM)	80.00 - 98.00	0.6000	0.3193
T5	9	LCF114-50J (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	10	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	11	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.3193
T6	1	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	3	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	4	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	5	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	6	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	7	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	8	LDF4-50A (1/2 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	9	LCF114-50J (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	10	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	11	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.3475
T7	1	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	3	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	4	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	5	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	6	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	7	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	8	LDF4-50A (1/2 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	9	LCF114-50J (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	10	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	11	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.5055
T8	1	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	3	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	4	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	5	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	6	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	7	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	8	LDF4-50A (1/2 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	9	LCF114-50J (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	10	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	11	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.5435
T9	1	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	3	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	4	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	5	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	6	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	7	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.5442

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	8	LDF4-50A (1/2 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	9	LCF114-50J (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	10	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	11	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.5442

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Rohn 6'x15' Boom Gate (3)	A	None		0.000	177.000	No Ice	53.200	53.200	1790.000
(AT&T)						1/2" Ice	63.300	63.300	2230.000
						1" Ice	73.400	73.400	2670.000
P65-17-XLH-RR w/8ft mount pipe	A	From Leg	4.750 0.000	0.000	177.000	No Ice 1/2" Ice	11.467 12.083	8.700 10.112	99.200 182.359
(AT&T)			0.000			1" Ice	12.707	11.377	275.183
P65-17-XLH-RR w/8ft mount pipe	A	From Leg	4.750 3.000	0.000	177.000	No Ice 1/2" Ice	11.467 12.083	8.700 10.112	99.200 182.359
(AT&T)			0.000			1" Ice	12.707	11.377	275.183
Powerwave 7770 w/5ft mount pipe	A	From Leg	4.750 -3.000	0.000	177.000	No Ice 1/2" Ice	5.607 5.992	4.116 4.769	45.250 91.165
(AT&T)			0.000			1" Ice	6.384	5.432	143.354
(2) ETB19G8-12UB / E15Z01P03	A	From Leg	4.700 0.000	0.000	177.000	No Ice 1/2" Ice	0.909 1.038	0.424 0.528	15.900 22.428
(AT&T)			0.000			1" Ice	1.176	0.639	30.811
SBNH-1D6565C	B	From Leg	4.750	0.000	177.000	No Ice	11.445	9.596	86.200
(AT&T)			0.000 0.000			1/2" Ice 1" Ice	12.064 12.689	11.017 12.290	173.166 269.888
P65-17-XLH-RR w/8ft mount pipe	B	From Leg	4.750 3.000	0.000	177.000	No Ice 1/2" Ice	11.467 12.083	8.700 10.112	99.200 182.359
(AT&T)			0.000			1" Ice	12.707	11.377	275.183
Powerwave 7770 w/5ft mount pipe	B	From Leg	4.750 -3.000	0.000	177.000	No Ice 1/2" Ice	5.607 5.992	4.116 4.769	45.250 91.165
(AT&T)			0.000			1" Ice	6.384	5.432	143.354
(2) ETB19G8-12UB / E15Z01P03	B	From Leg	4.700 0.000	0.000	177.000	No Ice 1/2" Ice	0.909 1.038	0.424 0.528	15.900 22.428
(AT&T)			0.000			1" Ice	1.176	0.639	30.811
DB874H120	C	From Leg	4.750	0.000	177.000	No Ice	5.486	3.665	32.250
(AT&T)			0.000 0.000			1/2" Ice 1" Ice	5.876 6.273	4.278 4.902	76.934 127.534
P65-17-XLH-RR w/8ft mount pipe	C	From Leg	4.750 3.000	0.000	177.000	No Ice 1/2" Ice	11.467 12.083	8.700 10.112	99.200 182.359
(AT&T)			0.000			1" Ice	12.707	11.377	275.183
Powerwave 7770 w/5ft mount pipe	C	From Leg	4.750 -3.000	0.000	177.000	No Ice 1/2" Ice	5.607 5.992	4.116 4.769	45.250 91.165
(AT&T)			0.000			1" Ice	6.384	5.432	143.354
ETB19G8-12UB / E15Z01P03	C	From Leg	4.700 0.000	0.000	177.000	No Ice 1/2" Ice	0.909 1.038	0.424 0.528	15.900 22.428
(AT&T)			0.000			1" Ice	1.176	0.639	30.811
(2) LGP21401	C	From Leg	4.750	0.000	177.000	No Ice	1.656	0.445	35.000
(AT&T)			0.000			1/2" Ice	1.816	0.542	45.888

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.000			1" Ice	1.984	0.647	59.037
DC6-48-06-18-8F	C	From Leg	0.500	0.000	177.000	No Ice	1.201	1.201	32.000
(AT&T)			0.000			1/2" Ice	1.877	1.877	53.813
			0.000			1" Ice	2.088	2.088	78.477
(2) RRUS-11	A	From Leg	4.750	0.000	177.000	No Ice	2.522	1.020	55.000
(AT&T)			0.000			1/2" Ice	2.719	1.158	74.320
			0.000			1" Ice	2.923	1.304	96.557
(2) RRUS-11	B	From Leg	4.750	0.000	177.000	No Ice	2.522	1.020	55.000
(AT&T)			0.000			1/2" Ice	2.719	1.158	74.320
			0.000			1" Ice	2.923	1.304	96.557
(2) RRUS-11	C	From Leg	4.750	0.000	177.000	No Ice	2.522	1.020	55.000
(AT&T)			0.000			1/2" Ice	2.719	1.158	74.320
			0.000			1" Ice	2.923	1.304	96.557
Pirod 15' T-Frame Sector	A	From Leg	0.000	0.000	152.000	No Ice	15.000	15.000	500.000
Mount (1)			0.000			1/2" Ice	20.600	20.600	650.000
(Sprint)			0.000			1" Ice	26.200	26.200	800.000
DB980H90E-M w/Mount	A	From Leg	3.500	0.000	152.000	No Ice	4.274	3.857	34.050
Pipe			-3.000			1/2" Ice	4.861	4.946	72.667
(Sprint)			0.000			1" Ice	5.372	5.750	117.824
ETCR-654L12H6 W/Pipe	A	From Leg	3.500	0.000	152.000	No Ice	6.653	5.032	77.900
Mount			3.000			1/2" Ice	7.136	5.892	133.313
(Sprint)			0.000			1" Ice	7.598	6.627	195.472
TD-RRH8x20-25	A	From Leg	3.000	0.000	152.000	No Ice	4.030	1.526	76.200
(Sprint)			1.000			1/2" Ice	4.281	1.705	103.251
			0.000			1" Ice	4.540	1.891	133.822
RRH-2X50-800	A	From Leg	3.000	0.000	152.000	No Ice	1.733	1.333	69.100
(Sprint)			-1.000			1/2" Ice	1.898	1.481	86.535
			0.000			1" Ice	2.070	1.637	106.693
ALU RRH-4X45-1900	A	From Leg	3.000	0.000	15.000 -	No Ice	2.500	2.500	69.500
(Sprint)			0.000		152.000	1/2" Ice	2.709	2.709	95.231
			0.000			1" Ice	2.926	2.926	124.333
Pirod 15' T-Frame Sector	B	From Leg	0.000	0.000	152.000	No Ice	15.000	15.000	500.000
Mount (1)			0.000			1/2" Ice	20.600	20.600	650.000
(Sprint)			0.000			1" Ice	26.200	26.200	800.000
DB980H90E-M w/Mount	B	From Leg	3.500	0.000	152.000	No Ice	4.274	3.857	34.050
Pipe			-3.000			1/2" Ice	4.861	4.946	72.667
(Sprint)			0.000			1" Ice	5.372	5.750	117.824
ETCR-654L12H6 W/Pipe	B	From Leg	3.500	0.000	152.000	No Ice	6.653	5.032	77.900
Mount			3.000			1/2" Ice	7.136	5.892	133.313
(Sprint)			0.000			1" Ice	7.598	6.627	195.472
TD-RRH8x20-25	B	From Leg	3.000	0.000	152.000	No Ice	4.030	1.526	76.200
(Sprint)			1.000			1/2" Ice	4.281	1.705	103.251
			0.000			1" Ice	4.540	1.891	133.822
RRH-2X50-800	B	From Leg	3.000	0.000	152.000	No Ice	1.733	1.333	69.100
(Sprint)			-1.000			1/2" Ice	1.898	1.481	86.535
			0.000			1" Ice	2.070	1.637	106.693
ALU RRH-4X45-1900	B	From Leg	3.000	0.000	15.000 -	No Ice	2.500	2.500	69.500
(Sprint)			0.000		152.000	1/2" Ice	2.709	2.709	95.231
			0.000			1" Ice	2.926	2.926	124.333
Pirod 15' T-Frame Sector	C	From Leg	0.000	0.000	152.000	No Ice	15.000	15.000	500.000
Mount (1)			0.000			1/2" Ice	20.600	20.600	650.000
(Sprint)			0.000			1" Ice	26.200	26.200	800.000
DB980H90E-M w/Mount	C	From Leg	3.500	0.000	152.000	No Ice	4.274	3.857	34.050
Pipe			-3.000			1/2" Ice	4.861	4.946	72.667
(Sprint)			0.000			1" Ice	5.372	5.750	117.824
ETCR-654L12H6 W/Pipe	C	From Leg	3.500	0.000	152.000	No Ice	6.653	5.032	77.900
Mount			3.000			1/2" Ice	7.136	5.892	133.313

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Sprint)			0.000			1" Ice	7.598	6.627	195.472
TD-RRH8x20-25	C	From Leg	3.000	0.000	152.000	No Ice	4.030	1.526	76.200
(Sprint)			1.000			1/2" Ice	4.281	1.705	103.251
			0.000			1" Ice	4.540	1.891	133.822
RRH-2X50-800	C	From Leg	3.000	0.000	152.000	No Ice	1.733	1.333	69.100
(Sprint)			-1.000			1/2" Ice	1.898	1.481	86.535
			0.000			1" Ice	2.070	1.637	106.693
ALU RRH-4X45-1900	C	From Leg	3.000	0.000	15.000 -	No Ice	2.500	2.500	69.500
(Sprint)			0.000		152.000	1/2" Ice	2.709	2.709	95.231
			0.000			1" Ice	2.926	2.926	124.333
Pirod 15' T-Frame Sector	A	From Leg	2.000	0.000	136.000	No Ice	15.000	15.000	500.000
Mount (1)			0.000			1/2" Ice	20.600	20.600	650.000
(Verizon)			0.000			1" Ice	26.200	26.200	800.000
BXA-70063-6CF-EDIN W/M	A	From Leg	3.000	0.000	136.000	No Ice	7.826	5.821	56.550
PIPE			-1.000			1/2" Ice	8.386	6.986	117.530
(Verizon)			0.000			1" Ice	8.907	7.865	186.250
BXA-171085-8BF W/M	A	From Leg	3.000	0.000	136.000	No Ice	2.953	3.056	29.408
PIPE			1.000			1/2" Ice	3.274	3.612	59.186
(Verizon)			0.000			1" Ice	3.593	4.184	94.252
LPA-80080/4CF W/M PIPE	A	From Leg	3.000	0.000	136.000	No Ice	2.670	6.316	41.208
(Verizon)			-4.000			1/2" Ice	2.987	6.898	85.443
			0.000			1" Ice	3.313	7.496	135.452
LPA-80080/4CF W/M PIPE	A	From Leg	3.000	0.000	136.000	No Ice	2.670	6.316	41.208
(Verizon)			4.000			1/2" Ice	2.987	6.898	85.443
			0.000			1" Ice	3.313	7.496	135.452
FRS FD9R6004 Diplexer	A	From Leg	3.000	0.000	136.000	No Ice	0.370	0.080	2.600
(Verizon)			0.000			1/2" Ice	0.450	0.140	4.900
			0.000			1" Ice	0.530	0.200	7.200
Pirod 15' T-Frame Sector	B	From Leg	2.000	0.000	136.000	No Ice	15.000	15.000	500.000
Mount (1)			0.000			1/2" Ice	20.600	20.600	650.000
(Verizon)			0.000			1" Ice	26.200	26.200	800.000
BXA-70063-6CF-EDIN W/M	B	From Leg	3.000	0.000	136.000	No Ice	7.826	5.821	56.550
PIPE			-1.000			1/2" Ice	8.386	6.986	117.530
(Verizon)			0.000			1" Ice	8.907	7.865	186.250
BXA-171085-8BF W/M	B	From Leg	3.000	0.000	136.000	No Ice	2.953	3.056	29.408
PIPE			1.000			1/2" Ice	3.274	3.612	59.186
(Verizon)			0.000			1" Ice	3.593	4.184	94.252
LPA-80080/4CF W/M PIPE	B	From Leg	3.000	0.000	136.000	No Ice	2.670	6.316	41.208
(Verizon)			-4.000			1/2" Ice	2.987	6.898	85.443
			0.000			1" Ice	3.313	7.496	135.452
LPA-80080/4CF W/M PIPE	B	From Leg	3.000	0.000	136.000	No Ice	2.670	6.316	41.208
(Verizon)			4.000			1/2" Ice	2.987	6.898	85.443
			0.000			1" Ice	3.313	7.496	135.452
FRS FD9R6004 Diplexer	B	From Leg	3.000	0.000	136.000	No Ice	0.370	0.080	2.600
(Verizon)			0.000			1/2" Ice	0.450	0.140	4.900
			0.000			1" Ice	0.530	0.200	7.200
Pirod 15' T-Frame Sector	C	From Leg	2.000	0.000	136.000	No Ice	15.000	15.000	500.000
Mount (1)			0.000			1/2" Ice	20.600	20.600	650.000
(Verizon)			0.000			1" Ice	26.200	26.200	800.000
BXA-70063-6CF-EDIN W/M	C	From Leg	3.000	0.000	136.000	No Ice	7.826	5.821	56.550
PIPE			-1.000			1/2" Ice	8.386	6.986	117.530
(Verizon)			0.000			1" Ice	8.907	7.865	186.250
BXA-171085-8BF W/M	C	From Leg	3.000	0.000	136.000	No Ice	2.953	3.056	29.408
PIPE			1.000			1/2" Ice	3.274	3.612	59.186
(Verizon)			0.000			1" Ice	3.593	4.184	94.252
LPA-80080/4CF W/M PIPE	C	From Leg	3.000	0.000	136.000	No Ice	2.670	6.316	41.208
(Verizon)			-4.000			1/2" Ice	2.987	6.898	85.443

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.000			1" Ice	3.313	7.496	135.452
LPA-80080/4CF W/M PIPE	C	From Leg	3.000	0.000	136.000	No Ice	2.670	6.316	41.208
(Verizon)			4.000			1/2" Ice	2.987	6.898	85.443
			0.000			1" Ice	3.313	7.496	135.452
FRS FD9R6004 Diplexer	C	From Leg	3.000	0.000	136.000	No Ice	0.370	0.080	2.600
(Verizon)			0.000			1/2" Ice	0.450	0.140	4.900
			0.000			1" Ice	0.530	0.200	7.200
GPS	A	From Leg	1.000	0.000	98.000	No Ice	0.257	0.310	24.867
(Sprint)			0.000			1/2" Ice	0.369	0.444	30.019
			0.000			1" Ice	0.494	0.595	36.751
1' Standoff	A	From Leg	1.000	0.000	98.000	No Ice	1.000	1.000	100.000
(Sprint)			0.000			1/2" Ice	2.000	2.000	150.000
			0.000			1" Ice	3.000	3.000	200.000
AIR 21 B4A B2P W/Mount	A	From Leg	3.000	0.000	120.000	No Ice	6.366	5.722	147.900
Pipe			1.500			1/2" Ice	6.846	6.574	205.399
(T-Mobile)			0.000			1" Ice	7.305	7.298	269.688
UMTS DD B4	A	From Leg	3.000	0.000	120.000	No Ice	1.840	2.450	40.000
(T-Mobile)			0.000			1/2" Ice	2.040	2.670	52.000
			0.000			1" Ice	2.240	2.890	64.000
KRC 118 57/1B4/B12P W/M	A	From Leg	3.000	0.000	120.000	No Ice	7.935	6.738	142.900
Pipe			-1.500			1/2" Ice	8.425	7.611	212.538
(T-Mobile)			0.000			1" Ice	8.898	8.360	289.448
RRUS11 B12	A	From Leg	1.500	0.000	120.000	No Ice	2.833	1.182	50.700
(T-Mobile)			0.000			1/2" Ice	3.043	1.330	71.570
			0.000			1" Ice	3.259	1.485	95.487
Pirod 4' Side Mount Standoff	A	From Leg	1.500	0.000	120.000	No Ice	2.720	2.720	50.000
(1)			0.000			1/2" Ice	4.910	4.910	89.000
(T-Mobile)			0.000			1" Ice	7.100	7.100	128.000
AIR 21 B4A B2P W/Mount	B	From Leg	3.000	0.000	120.000	No Ice	6.366	5.722	147.900
Pipe			1.500			1/2" Ice	6.846	6.574	205.399
(T-Mobile)			0.000			1" Ice	7.305	7.298	269.688
UMTS DD B4	B	From Leg	3.000	0.000	120.000	No Ice	1.840	2.450	40.000
(T-Mobile)			0.000			1/2" Ice	2.040	2.670	52.000
			0.000			1" Ice	2.240	2.890	64.000
KRC 118 57/1B4/B12P W/M	B	From Leg	3.000	0.000	120.000	No Ice	7.935	6.738	142.900
Pipe			-1.500			1/2" Ice	8.425	7.611	212.538
(T-Mobile)			0.000			1" Ice	8.898	8.360	289.448
RRUS11 B12	B	From Leg	1.500	0.000	120.000	No Ice	2.833	1.182	50.700
(T-Mobile)			0.000			1/2" Ice	3.043	1.330	71.570
			0.000			1" Ice	3.259	1.485	95.487
Pirod 4' Side Mount Standoff	B	From Leg	1.500	0.000	120.000	No Ice	2.720	2.720	50.000
(1)			0.000			1/2" Ice	4.910	4.910	89.000
(T-Mobile)			0.000			1" Ice	7.100	7.100	128.000
AIR 21 B4A B2P W/Mount	C	From Leg	3.000	0.000	120.000	No Ice	6.366	5.722	147.900
Pipe			1.500			1/2" Ice	6.846	6.574	205.399
(T-Mobile)			0.000			1" Ice	7.305	7.298	269.688
UMTS DD B4	C	From Leg	3.000	0.000	120.000	No Ice	1.840	2.450	40.000
(T-Mobile)			0.000			1/2" Ice	2.040	2.670	52.000
			0.000			1" Ice	2.240	2.890	64.000
KRC 118 57/1B4/B12P W/M	C	From Leg	3.000	0.000	120.000	No Ice	7.935	6.738	142.900
Pipe			-1.500			1/2" Ice	8.425	7.611	212.538
(T-Mobile)			0.000			1" Ice	8.898	8.360	289.448
RRUS11 B12	C	From Leg	1.500	0.000	120.000	No Ice	2.833	1.182	50.700
(T-Mobile)			0.000			1/2" Ice	3.043	1.330	71.570
			0.000			1" Ice	3.259	1.485	95.487
Pirod 4' Side Mount Standoff	C	From Leg	1.500	0.000	120.000	No Ice	2.720	2.720	50.000
(1)			0.000			1/2" Ice	4.910	4.910	89.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(T-Mobile)			0.000			1" Ice	7.100	7.100	128.000

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	170.000	1.415	33.95	73.192	A	14.075	9.583	9.583	40.51	7.939	0.000
180.000-160.0			1		B	14.075	9.583		40.51	0.000	0.000
00					C	14.075	9.583		40.51	42.160	0.000
T2	150.000	1.378	33.06	73.192	A	1.210	18.805	9.583	47.88	28.396	0.000
160.000-140.0			8		B	1.210	18.805		47.88	0.000	0.000
00					C	1.210	18.805		47.88	49.600	0.000
T3	130.000	1.337	32.08	73.192	A	2.350	18.805	9.583	45.30	41.100	0.000
140.000-120.0			7		B	2.350	18.805		45.30	57.024	0.000
00					C	2.350	18.805		45.30	19.840	0.000
T4	110.000	1.291	30.97	73.192	A	1.210	18.805	9.583	47.88	88.620	0.000
120.000-100.0			8		B	1.210	18.805		47.88	71.280	0.000
00					C	1.210	18.805		47.88	12.400	0.000
T5	90.000	1.238	29.69	73.192	A	1.780	18.805	9.583	46.56	89.754	0.000
100.000-80.00			7		B	1.780	18.805		46.56	71.280	0.000
0					C	1.780	18.805		46.56	12.400	0.000
T6	70.000	1.174	28.16	73.192	A	1.210	18.805	9.583	47.88	89.880	0.000
80.000-60.000			6		B	1.210	18.805		47.88	71.280	0.000
					C	1.210	18.805		47.88	12.400	0.000
T7	50.000	1.094	26.24	73.192	A	1.880	14.622	9.583	58.08	89.880	0.000
60.000-40.000			0		B	1.880	14.622		58.08	71.280	0.000
					C	1.880	14.622		58.08	12.400	0.000
T8	30.000	0.982	23.56	73.192	A	0.740	14.622	9.583	62.39	89.880	0.000
40.000-20.000			5		B	0.740	14.622		62.39	71.280	0.000
					C	0.740	14.622		62.39	12.400	0.000
T9	12.500	0.85	20.39	54.894	A	1.455	10.739	7.188	58.94	53.928	0.000
20.000-5.000			2		B	1.455	10.739		58.94	42.768	0.000
					C	1.455	10.739		58.94	7.440	0.000
T10	2.500	0.85	20.39	9.816	A	2.850	2.576	2.576	47.47	0.000	0.000
5.000-0.000			2		B	2.850	2.576		47.47	0.000	0.000
					C	2.850	2.576		47.47	0.000	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.000	1.415	7.699	1.767	79.082	A	14.075	44.748	21.365	36.32	29.152	0.000
180.000-160.000						B	14.075	44.748		36.32	0.000	0.000
						C	14.075	44.748		36.32	76.272	0.000
T2	150.000	1.378	7.498	1.745	79.009	A	1.210	52.537	21.218	39.48	89.958	0.000
160.000-140.000						B	1.210	52.537		39.48	0.000	0.000
						C	1.210	52.537		39.48	89.234	0.000
T3	130.000	1.337	7.276	1.720	78.926	A	2.350	53.038	21.053	38.01	126.645	0.000
140.000-120.000						B	2.350	53.038		38.01	86.247	0.000
						C	2.350	53.038		38.01	49.676	0.000
T4	110.000	1.291	7.025	1.692	78.831	A	1.210	51.507	20.863	39.58	170.694	0.000
120.000-100.000						B	1.210	51.507		39.58	107.235	0.000
						C	1.210	51.507		39.58	39.471	0.000
T5	90.000	1.238	6.734	1.658	78.719	A	1.780	51.802	20.639	38.52	176.782	0.000
100.000-80.000						B	1.780	51.802		38.52	106.559	0.000
						C	1.780	51.802		38.52	38.933	0.000
T6	70.000	1.174	6.387	1.617	78.582	A	1.210	50.062	20.364	39.72	176.164	0.000
80.000-60.000						B	1.210	50.062		39.72	105.731	0.000
						C	1.210	50.062		39.72	38.274	0.000
T7	50.000	1.094	5.950	1.564	78.404	A	1.880	36.889	20.008	51.61	174.336	0.000
60.000-40.000						B	1.880	36.889		51.61	104.656	0.000
						C	1.880	36.889		51.61	37.418	0.000
T8	30.000	0.982	5.343	1.486	78.144	A	0.740	34.933	19.488	54.63	171.679	0.000
40.000-20.000						B	0.740	34.933		54.63	103.094	0.000
						C	0.740	34.933		54.63	36.172	0.000
T9 20.000-5.000	12.500	0.85	4.624	1.361	58.297	A	1.455	25.119	13.994	52.66	100.464	0.000
						B	1.455	25.119		52.66	60.361	0.000
						C	1.455	25.119		52.66	20.508	0.000
T10 5.000-0.000	2.500	0.85	4.624	1.159	10.837	A	2.850	6.304	4.652	50.83	0.000	0.000
						B	2.850	6.304		50.83	0.000	0.000
						C	2.850	6.304		50.83	0.000	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.000	1.415	11.08	73.192	A	14.075	9.583	9.583	40.51	7.939	0.000
180.000-160.0			6		B	14.075	9.583		40.51	0.000	0.000
00					C	14.075	9.583		40.51	42.160	0.000
T2	150.000	1.378	10.79	73.192	A	1.210	18.805	9.583	47.88	28.396	0.000
160.000-140.0			8		B	1.210	18.805		47.88	0.000	0.000
00					C	1.210	18.805		47.88	49.600	0.000
T3	130.000	1.337	10.47	73.192	A	2.350	18.805	9.583	45.30	41.100	0.000
140.000-120.0			7		B	2.350	18.805		45.30	57.024	0.000
00					C	2.350	18.805		45.30	19.840	0.000
T4	110.000	1.291	10.11	73.192	A	1.210	18.805	9.583	47.88	88.620	0.000
120.000-100.0			5		B	1.210	18.805		47.88	71.280	0.000
00					C	1.210	18.805		47.88	12.400	0.000
T5	90.000	1.238	9.697	73.192	A	1.780	18.805	9.583	46.56	89.754	0.000
100.000-80.00					B	1.780	18.805		46.56	71.280	0.000
0					C	1.780	18.805		46.56	12.400	0.000
T6	70.000	1.174	9.197	73.192	A	1.210	18.805	9.583	47.88	89.880	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
80.000-60.000					B	1.210	18.805		47.88	71.280	0.000
					C	1.210	18.805		47.88	12.400	0.000
T7	50.000	1.094	8.568	73.192	A	1.880	14.622	9.583	58.08	89.880	0.000
60.000-40.000					B	1.880	14.622		58.08	71.280	0.000
					C	1.880	14.622		58.08	12.400	0.000
T8	30.000	0.982	7.695	73.192	A	0.740	14.622	9.583	62.39	89.880	0.000
40.000-20.000					B	0.740	14.622		62.39	71.280	0.000
					C	0.740	14.622		62.39	12.400	0.000
T9	12.500	0.85	6.659	54.894	A	1.455	10.739	7.188	58.94	53.928	0.000
20.000-5.000					B	1.455	10.739		58.94	42.768	0.000
					C	1.455	10.739		58.94	7.440	0.000
T10	2.500	0.85	6.659	9.816	A	2.850	2.576	2.576	47.47	0.000	0.000
5.000-0.000					B	2.850	2.576		47.47	0.000	0.000
					C	2.850	2.576		47.47	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	269.444	1232.122	A	0.323	2.236	33.95	1	1	19.887	2150.772	107.539	C
180.000-160.0		TA	B	0.323	2.236	1	1	1	19.887			
00		424.613	C	0.323	2.236		1	1	19.887			
T2	397.904	851.888	A	0.273	2.369	33.06	1	1	12.326	2136.142	106.807	C
160.000-140.0			B	0.273	2.369	8	1	1	12.326			
00			C	0.273	2.369		1	1	12.326			
T3	567.824	710.341	A	0.289	2.326	32.08	1	1	13.550	2789.837	139.492	C
140.000-120.0			B	0.289	2.326	7	1	1	13.550			
00			C	0.289	2.326		1	1	13.550			
T4	791.984	851.888	A	0.273	2.369	30.97	1	1	12.326	3491.010	174.550	C
120.000-100.0			B	0.273	2.369	8	1	1	12.326			
00			C	0.273	2.369		1	1	12.326			
T5	794.684	723.607	A	0.281	2.347	29.69	1	1	12.937	3393.169	169.658	C
100.000-80.00			B	0.281	2.347	7	1	1	12.937			
0			C	0.281	2.347		1	1	12.937			
T6	794.984	851.888	A	0.273	2.369	28.16	1	1	12.326	3192.238	159.612	C
80.000-60.000			B	0.273	2.369	6	1	1	12.326			
			C	0.273	2.369		1	1	12.326			
T7	773.394	620.578	A	0.225	2.513	26.24	1	1	10.352	2902.916	145.146	C
60.000-40.000			B	0.225	2.513	0	1	1	10.352			
			C	0.225	2.513		1	1	10.352			
T8	773.394	568.209	A	0.21	2.563	23.56	1	1	9.166	2556.456	127.823	C
40.000-20.000			B	0.21	2.563	5	1	1	9.166			
			C	0.21	2.563		1	1	9.166			
T9	471.203	517.299	A	0.222	2.524	20.39	1	1	7.670	1418.508	94.567	C
20.000-5.000			B	0.222	2.524	2	1	1	7.670			
			C	0.222	2.524		1	1	7.670			
T10	0.000	292.995	A	0.553	1.841	20.39	1	1	4.691	149.692	29.938	C
5.000-0.000			B	0.553	1.841	2	1	1	4.691			
			C	0.553	1.841		1	1	4.691			
Sum Weight:	5634.817	8074.484								24180.740		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	269.444	1232.122	A	0.323	2.236	33.95	0.8	1	17.072	1969.123	98.456	C
180.000-160.0		TA	B	0.323	2.236	1	0.8	1	17.072			
00		424.613	C	0.323	2.236		0.8	1	17.072			
T2	397.904	851.888	A	0.273	2.369	33.06	0.8	1	12.084	2120.028	106.001	C
160.000-140.0			B	0.273	2.369	8	0.8	1	12.084			
00			C	0.273	2.369		0.8	1	12.084			
T3	567.824	710.341	A	0.289	2.326	32.08	0.8	1	13.080	2760.026	138.001	C
140.000-120.0			B	0.289	2.326	7	0.8	1	13.080			
00			C	0.289	2.326		0.8	1	13.080			
T4	791.984	851.888	A	0.273	2.369	30.97	0.8	1	12.084	3475.914	173.796	C
120.000-100.0			B	0.273	2.369	8	0.8	1	12.084			
00			C	0.273	2.369		0.8	1	12.084			
T5	794.684	723.607	A	0.281	2.347	29.69	0.8	1	12.581	3372.077	168.604	C
100.000-80.00			B	0.281	2.347	7	0.8	1	12.581			
0			C	0.281	2.347		0.8	1	12.581			
T6	794.984	851.888	A	0.273	2.369	28.16	0.8	1	12.084	3178.513	158.926	C
80.000-60.000			B	0.273	2.369	6	0.8	1	12.084			
			C	0.273	2.369		0.8	1	12.084			
T7	773.394	620.578	A	0.225	2.513	26.24	0.8	1	9.976	2881.839	144.092	C
60.000-40.000			B	0.225	2.513	0	0.8	1	9.976			
			C	0.225	2.513		0.8	1	9.976			
T8	773.394	568.209	A	0.21	2.563	23.56	0.8	1	9.018	2548.857	127.443	C
40.000-20.000			B	0.21	2.563	5	0.8	1	9.018			
			C	0.21	2.563		0.8	1	9.018			
T9	471.203	517.299	A	0.222	2.524	20.39	0.8	1	7.379	1405.778	93.719	C
20.000-5.000			B	0.222	2.524	2	0.8	1	7.379			
			C	0.222	2.524		0.8	1	7.379			
T10	0.000	292.995	A	0.553	1.841	20.39	0.8	1	4.121	131.505	26.301	C
5.000-0.000			B	0.553	1.841	2	0.8	1	4.121			
			C	0.553	1.841		0.8	1	4.121			
Sum Weight:	5634.817	8074.484								23843.660		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	269.444	1232.122	A	0.323	2.236	33.95	0.85	1	17.776	2014.535	100.727	C
180.000-160.0		TA	B	0.323	2.236	1	0.85	1	17.776			
00		424.613	C	0.323	2.236		0.85	1	17.776			
T2	397.904	851.888	A	0.273	2.369	33.06	0.85	1	12.144	2124.056	106.203	C
160.000-140.0			B	0.273	2.369	8	0.85	1	12.144			
00			C	0.273	2.369		0.85	1	12.144			
T3	567.824	710.341	A	0.289	2.326	32.08	0.85	1	13.197	2767.479	138.374	C
140.000-120.0			B	0.289	2.326	7	0.85	1	13.197			
00			C	0.289	2.326		0.85	1	13.197			
T4	791.984	851.888	A	0.273	2.369	30.97	0.85	1	12.144	3479.688	173.984	C
120.000-100.0			B	0.273	2.369	8	0.85	1	12.144			
00			C	0.273	2.369		0.85	1	12.144			
T5	794.684	723.607	A	0.281	2.347	29.69	0.85	1	12.670	3377.350	168.868	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
100.000-80.00			B	0.281	2.347	7	0.85	1	12.670			
0			C	0.281	2.347		0.85	1	12.670			
T6	794.984	851.888	A	0.273	2.369	28.16	0.85	1	12.144	3181.944	159.097	C
80.000-60.000			B	0.273	2.369	6	0.85	1	12.144			
			C	0.273	2.369		0.85	1	12.144			
T7	773.394	620.578	A	0.225	2.513	26.24	0.85	1	10.070	2887.109	144.355	C
60.000-40.000			B	0.225	2.513	0	0.85	1	10.070			
			C	0.225	2.513		0.85	1	10.070			
T8	773.394	568.209	A	0.21	2.563	23.56	0.85	1	9.055	2550.757	127.538	C
40.000-20.000			B	0.21	2.563	5	0.85	1	9.055			
			C	0.21	2.563		0.85	1	9.055			
T9	471.203	517.299	A	0.222	2.524	20.39	0.85	1	7.452	1408.961	93.931	C
20.000-5.000			B	0.222	2.524	2	0.85	1	7.452			
			C	0.222	2.524		0.85	1	7.452			
T10	0.000	292.995	A	0.553	1.841	20.39	0.85	1	4.264	136.052	27.210	C
5.000-0.000			B	0.553	1.841	2	0.85	1	4.264			
			C	0.553	1.841		0.85	1	4.264			
Sum Weight:	5634.817	8074.484								23927.930		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1953.966	4165.433	A	0.744	1.785	7.699	1	1	51.247	775.400	38.770	C
180.000-160.0		TA	B	0.744	1.785		1	1	51.247			
00		1049.377	C	0.744	1.785		1	1	51.247			
T2	3056.268	2974.305	A	0.68	1.776	7.498	1	1	42.582	847.226	42.361	C
160.000-140.0			B	0.68	1.776		1	1	42.582			
00			C	0.68	1.776		1	1	42.582			
T3	4107.959	2911.681	A	0.702	1.776	7.276	1	1	44.923	977.737	48.887	C
140.000-120.0			B	0.702	1.776		1	1	44.923			
00			C	0.702	1.776		1	1	44.923			
T4	5153.310	2878.495	A	0.669	1.777	7.025	1	1	41.369	988.447*	49.422	C
120.000-100.0			B	0.669	1.777		1	1	41.369			
00			C	0.669	1.777		1	1	41.369			
T5	5154.031	2816.207	A	0.681	1.776	6.734	1	1	42.606	946.212*	47.311	C
100.000-80.00			B	0.681	1.776		1	1	42.606			
0			C	0.681	1.776		1	1	42.606			
T6	5055.684	2747.378	A	0.652	1.781	6.387	1	1	39.702	895.887*	44.794	C
80.000-60.000			B	0.652	1.781		1	1	39.702			
			C	0.652	1.781		1	1	39.702			
T7	4872.840	1946.407	A	0.494	1.907	5.950	1	1	26.734	832.727*	41.636	C
60.000-40.000			B	0.494	1.907		1	1	26.734			
			C	0.494	1.907		1	1	26.734			
T8	4673.689	1698.495	A	0.457	1.963	5.343	1	1	23.600	745.345*	37.267	C
40.000-20.000			B	0.457	1.963		1	1	23.600			
			C	0.457	1.963		1	1	23.600			
T9	2630.893	1335.567	A	0.456	1.964	4.624	1	1	17.855	481.173*	32.078	C
20.000-5.000			B	0.456	1.964		1	1	17.855			
			C	0.456	1.964		1	1	17.855			
T10	0.000	632.621	A	0.845	1.856	4.624	1	1	8.654	63.126	12.625	C
5.000-0.000			B	0.845	1.856		1	1	8.654			

Section Elevation (ft)	Add Weight (lb)	Self Weight (lb)	Face	e	C_F	q_z (psf)	D_F	D_R	A_E (ft^2)	F (lb)	w (plf)	Ctrl. Face
Sum Weight:	36658.639	25585.023	C	0.845	1.856 *2.1A_g limit		1	1	8.654	7553.278		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation (ft)	Add Weight (lb)	Self Weight (lb)	Face	e	C_F	q_z (psf)	D_F	D_R	A_E (ft^2)	F (lb)	w (plf)	Ctrl. Face
T1	1953.966	4165.433	A	0.744	1.785	7.699	0.8	1	48.432	742.515	37.126	C
180.000-160.0		TA	B	0.744	1.785		0.8	1	48.432			
00		1049.377	C	0.744	1.785		0.8	1	48.432			
T2	3056.268	2974.305	A	0.68	1.776	7.498	0.8	1	42.340	844.486	42.224	C
160.000-140.0			B	0.68	1.776		0.8	1	42.340			
00			C	0.68	1.776		0.8	1	42.340			
T3	4107.959	2911.681	A	0.702	1.776	7.276	0.8	1	44.453	972.574	48.629	C
140.000-120.0			B	0.702	1.776		0.8	1	44.453			
00			C	0.702	1.776		0.8	1	44.453			
T4	5153.310	2878.495	A	0.669	1.777	7.025	0.8	1	41.127	988.447*	49.422	C
120.000-100.0			B	0.669	1.777		0.8	1	41.127			
00			C	0.669	1.777		0.8	1	41.127			
T5	5154.031	2816.207	A	0.681	1.776	6.734	0.8	1	42.250	946.212*	47.311	C
100.000-80.00			B	0.681	1.776		0.8	1	42.250			
0			C	0.681	1.776		0.8	1	42.250			
T6	5055.684	2747.378	A	0.652	1.781	6.387	0.8	1	39.460	895.887*	44.794	C
80.000-60.000			B	0.652	1.781		0.8	1	39.460			
			C	0.652	1.781		0.8	1	39.460			
T7	4872.840	1946.407	A	0.494	1.907	5.950	0.8	1	26.358	832.727*	41.636	C
60.000-40.000			B	0.494	1.907		0.8	1	26.358			
			C	0.494	1.907		0.8	1	26.358			
T8	4673.689	1698.495	A	0.457	1.963	5.343	0.8	1	23.452	745.345*	37.267	C
40.000-20.000			B	0.457	1.963		0.8	1	23.452			
			C	0.457	1.963		0.8	1	23.452			
T9	2630.893	1335.567	A	0.456	1.964	4.624	0.8	1	17.564	481.173*	32.078	C
20.000-5.000			B	0.456	1.964		0.8	1	17.564			
			C	0.456	1.964		0.8	1	17.564			
T10	0.000	632.621	A	0.845	1.856	4.624	0.8	1	8.084	58.969	11.794	C
5.000-0.000			B	0.845	1.856		0.8	1	8.084			
			C	0.845	1.856		0.8	1	8.084			
Sum Weight:	36658.639	25585.023			*2.1A_g limit					7508.333		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation (ft)	Add Weight (lb)	Self Weight (lb)	Face	e	C_F	q_z (psf)	D_F	D_R	A_E (ft^2)	F (lb)	w (plf)	Ctrl. Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1953.966	4165.433	A	0.744	1.785	7.699	0.85	1	49.136	750.736	37.537	C
180.000-160.0		TA	B	0.744	1.785		0.85	1	49.136			
00		1049.377	C	0.744	1.785		0.85	1	49.136			
T2	3056.268	2974.305	A	0.68	1.776	7.498	0.85	1	42.400	845.171	42.259	C
160.000-140.0			B	0.68	1.776		0.85	1	42.400			
00			C	0.68	1.776		0.85	1	42.400			
T3	4107.959	2911.681	A	0.702	1.776	7.276	0.85	1	44.570	973.865	48.693	C
140.000-120.0			B	0.702	1.776		0.85	1	44.570			
00			C	0.702	1.776		0.85	1	44.570			
T4	5153.310	2878.495	A	0.669	1.777	7.025	0.85	1	41.188	988.447*	49.422	C
120.000-100.0			B	0.669	1.777		0.85	1	41.188			
00			C	0.669	1.777		0.85	1	41.188			
T5	5154.031	2816.207	A	0.681	1.776	6.734	0.85	1	42.339	946.212*	47.311	C
100.000-80.00			B	0.681	1.776		0.85	1	42.339			
0			C	0.681	1.776		0.85	1	42.339			
T6	5055.684	2747.378	A	0.652	1.781	6.387	0.85	1	39.520	895.887*	44.794	C
80.000-60.000			B	0.652	1.781		0.85	1	39.520			
			C	0.652	1.781		0.85	1	39.520			
T7	4872.840	1946.407	A	0.494	1.907	5.950	0.85	1	26.452	832.727*	41.636	C
60.000-40.000			B	0.494	1.907		0.85	1	26.452			
			C	0.494	1.907		0.85	1	26.452			
T8	4673.689	1698.495	A	0.457	1.963	5.343	0.85	1	23.489	745.345*	37.267	C
40.000-20.000			B	0.457	1.963		0.85	1	23.489			
			C	0.457	1.963		0.85	1	23.489			
T9	2630.893	1335.567	A	0.456	1.964	4.624	0.85	1	17.637	481.173*	32.078	C
20.000-5.000			B	0.456	1.964		0.85	1	17.637			
			C	0.456	1.964		0.85	1	17.637			
T10	0.000	632.621	A	0.845	1.856	4.624	0.85	1	8.227	60.008	12.002	C
5.000-0.000			B	0.845	1.856		0.85	1	8.227			
			C	0.845	1.856		0.85	1	8.227			
Sum Weight:	36658.639	25585.023			*2.1A_g limit					7519.569		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	269.444	1232.122	A	0.323	2.236	11.08	1	1	19.887	702.293	35.115	C
180.000-160.0		TA	B	0.323	2.236	6	1	1	19.887			
00		424.613	C	0.323	2.236		1	1	19.887			
T2	397.904	851.888	A	0.273	2.369	10.79	1	1	12.326	697.516	34.876	C
160.000-140.0			B	0.273	2.369	8	1	1	12.326			
00			C	0.273	2.369		1	1	12.326			
T3	567.824	710.341	A	0.289	2.326	10.47	1	1	13.550	910.967	45.548	C
140.000-120.0			B	0.289	2.326	7	1	1	13.550			
00			C	0.289	2.326		1	1	13.550			
T4	791.984	851.888	A	0.273	2.369	10.11	1	1	12.326	1139.922	56.996	C
120.000-100.0			B	0.273	2.369	5	1	1	12.326			
00			C	0.273	2.369		1	1	12.326			
T5	794.684	723.607	A	0.281	2.347	9.697	1	1	12.937	1107.973	55.399	C
100.000-80.00			B	0.281	2.347		1	1	12.937			
0			C	0.281	2.347		1	1	12.937			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T6	794.984	851.888	A	0.273	2.369	9.197	1	1	12.326	1042.363	52.118	C
80.000-60.000			B	0.273	2.369		1	1	12.326			
			C	0.273	2.369		1	1	12.326			
T7	773.394	620.578	A	0.225	2.513	8.568	1	1	10.352	947.891	47.395	C
60.000-40.000			B	0.225	2.513		1	1	10.352			
			C	0.225	2.513		1	1	10.352			
T8	773.394	568.209	A	0.21	2.563	7.695	1	1	9.166	834.761	41.738	C
40.000-20.000			B	0.21	2.563		1	1	9.166			
			C	0.21	2.563		1	1	9.166			
T9	471.203	517.299	A	0.222	2.524	6.659	1	1	7.670	463.186	30.879	C
20.000-5.000			B	0.222	2.524		1	1	7.670			
			C	0.222	2.524		1	1	7.670			
T10	0.000	292.995	A	0.553	1.841	6.659	1	1	4.691	48.879	9.776	C
5.000-0.000			B	0.553	1.841		1	1	4.691			
			C	0.553	1.841		1	1	4.691			
Sum Weight:	5634.817	8074.484								7895.752		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	269.444	1232.122	A	0.323	2.236	11.08	0.8	1	17.072	642.979	32.149	C
180.000-160.0		TA	B	0.323	2.236	6	0.8	1	17.072			
00		424.613	C	0.323	2.236		0.8	1	17.072			
T2	397.904	851.888	A	0.273	2.369	10.79	0.8	1	12.084	692.254	34.613	C
160.000-140.0			B	0.273	2.369	8	0.8	1	12.084			
00			C	0.273	2.369		0.8	1	12.084			
T3	567.824	710.341	A	0.289	2.326	10.47	0.8	1	13.080	901.233	45.062	C
140.000-120.0			B	0.289	2.326	7	0.8	1	13.080			
00			C	0.289	2.326		0.8	1	13.080			
T4	791.984	851.888	A	0.273	2.369	10.11	0.8	1	12.084	1134.992	56.750	C
120.000-100.0			B	0.273	2.369	5	0.8	1	12.084			
00			C	0.273	2.369		0.8	1	12.084			
T5	794.684	723.607	A	0.281	2.347	9.697	0.8	1	12.581	1101.087	55.054	C
100.000-80.00			B	0.281	2.347		0.8	1	12.581			
0			C	0.281	2.347		0.8	1	12.581			
T6	794.984	851.888	A	0.273	2.369	9.197	0.8	1	12.084	1037.882	51.894	C
80.000-60.000			B	0.273	2.369		0.8	1	12.084			
			C	0.273	2.369		0.8	1	12.084			
T7	773.394	620.578	A	0.225	2.513	8.568	0.8	1	9.976	941.009	47.050	C
60.000-40.000			B	0.225	2.513		0.8	1	9.976			
			C	0.225	2.513		0.8	1	9.976			
T8	773.394	568.209	A	0.21	2.563	7.695	0.8	1	9.018	832.280	41.614	C
40.000-20.000			B	0.21	2.563		0.8	1	9.018			
			C	0.21	2.563		0.8	1	9.018			
T9	471.203	517.299	A	0.222	2.524	6.659	0.8	1	7.379	459.030	30.602	C
20.000-5.000			B	0.222	2.524		0.8	1	7.379			
			C	0.222	2.524		0.8	1	7.379			
T10	0.000	292.995	A	0.553	1.841	6.659	0.8	1	4.121	42.940	8.588	C
5.000-0.000			B	0.553	1.841		0.8	1	4.121			
			C	0.553	1.841		0.8	1	4.121			
Sum Weight:	5634.817	8074.484								7785.685		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	269.444	1232.122	A	0.323	2.236	11.08	0.85	1	17.776	657.807	32.890	C
180.000-160.0		TA	B	0.323	2.236	6	0.85	1	17.776			
00		424.613	C	0.323	2.236		0.85	1	17.776			
T2	397.904	851.888	A	0.273	2.369	10.79	0.85	1	12.144	693.569	34.678	C
160.000-140.0			B	0.273	2.369	8	0.85	1	12.144			
00			C	0.273	2.369		0.85	1	12.144			
T3	567.824	710.341	A	0.289	2.326	10.47	0.85	1	13.197	903.666	45.183	C
140.000-120.0			B	0.289	2.326	7	0.85	1	13.197			
00			C	0.289	2.326		0.85	1	13.197			
T4	791.984	851.888	A	0.273	2.369	10.11	0.85	1	12.144	1136.225	56.811	C
120.000-100.0			B	0.273	2.369	5	0.85	1	12.144			
00			C	0.273	2.369		0.85	1	12.144			
T5	794.684	723.607	A	0.281	2.347	9.697	0.85	1	12.670	1102.808	55.140	C
100.000-80.00			B	0.281	2.347		0.85	1	12.670			
0			C	0.281	2.347		0.85	1	12.670			
T6	794.984	851.888	A	0.273	2.369	9.197	0.85	1	12.144	1039.002	51.950	C
80.000-60.000			B	0.273	2.369		0.85	1	12.144			
			C	0.273	2.369		0.85	1	12.144			
T7	773.394	620.578	A	0.225	2.513	8.568	0.85	1	10.070	942.729	47.136	C
60.000-40.000			B	0.225	2.513		0.85	1	10.070			
			C	0.225	2.513		0.85	1	10.070			
T8	773.394	568.209	A	0.21	2.563	7.695	0.85	1	9.055	832.900	41.645	C
40.000-20.000			B	0.21	2.563		0.85	1	9.055			
			C	0.21	2.563		0.85	1	9.055			
T9	471.203	517.299	A	0.222	2.524	6.659	0.85	1	7.452	460.069	30.671	C
20.000-5.000			B	0.222	2.524		0.85	1	7.452			
			C	0.222	2.524		0.85	1	7.452			
T10	0.000	292.995	A	0.553	1.841	6.659	0.85	1	4.264	44.425	8.885	C
5.000-0.000			B	0.553	1.841		0.85	1	4.264			
			C	0.553	1.841		0.85	1	4.264			
Sum Weight:	5634.817	8074.484								7813.202		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques kip-ft
Leg Weight	4149.540			
Bracing Weight	3495.888			
Total Member Self-Weight	7645.428			
Gusset Weight	429.057			
Guy Weight	2724.805			
Total Weight	24870.088			
Wind 0 deg - No Ice		19.244	-33440.543	-0.186
Wind 30 deg - No Ice		16611.632	-28751.043	-1.077

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques kip-ft
Wind 60 deg - No Ice		28679.967	-16568.398	-1.700
Wind 90 deg - No Ice		33189.932	-19.244	-1.869
Wind 120 deg - No Ice		28952.642	16703.605	-1.518
Wind 150 deg - No Ice		16578.300	28731.798	-0.792
Wind 180 deg - No Ice		-19.244	33103.464	0.158
Wind 210 deg - No Ice		-16611.632	28751.043	1.077
Wind 240 deg - No Ice		-28971.886	16736.938	1.704
Wind 270 deg - No Ice		-33189.932	19.244	1.869
Wind 300 deg - No Ice		-28660.722	-16535.066	1.542
Wind 330 deg - No Ice		-16578.300	-28731.798	0.792
Member Ice	17510.538			
Gusset Ice	492.504			
Guy Ice	14371.644			
Total Weight Ice	102614.678			
Wind 0 deg - Ice		8.357	-10997.585	-0.276
Wind 30 deg - Ice		5491.939	-9499.173	-0.439
Wind 60 deg - Ice		9494.230	-5483.557	-0.487
Wind 90 deg - Ice		10969.404	-8.357	-0.405
Wind 120 deg - Ice		9524.796	5491.555	-0.211
Wind 150 deg - Ice		5477.465	9490.817	0.035
Wind 180 deg - Ice		-8.357	10952.640	0.273
Wind 210 deg - Ice		-5491.939	9499.173	0.439
Wind 240 deg - Ice		-9533.153	5506.029	0.487
Wind 270 deg - Ice		-10969.404	8.357	0.405
Wind 300 deg - Ice		-9485.873	-5469.083	0.214
Wind 330 deg - Ice		-5477.465	-9490.817	-0.035
Total Weight	24870.088			
Wind 0 deg - Service		6.284	-10919.361	-0.061
Wind 30 deg - Service		5424.206	-9388.096	-0.352
Wind 60 deg - Service		9364.887	-5410.089	-0.555
Wind 90 deg - Service		10837.529	-6.284	-0.610
Wind 120 deg - Service		9453.924	5454.238	-0.496
Wind 150 deg - Service		5413.322	9381.812	-0.259
Wind 180 deg - Service		-6.284	10809.294	0.052
Wind 210 deg - Service		-5424.206	9388.096	0.352
Wind 240 deg - Service		-9460.208	5465.122	0.556
Wind 270 deg - Service		-10837.529	6.284	0.610
Wind 300 deg - Service		-9358.603	-5399.205	0.504
Wind 330 deg - Service		-5413.322	-9381.812	0.259

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy

Comb. No.	Description
11	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	180 - 160	Leg	Max Tension	4	27635.692	-0.037	0.025
			Max. Compression	10	-32278.828	-0.156	0.082
			Max. Mx	11	-26473.290	1.270	-0.230
			Max. My	2	-28851.504	-0.045	1.420
			Max. Vy	11	3270.460	1.212	0.078
			Max. Vx	2	3607.857	-0.045	1.420
		Diagonal	Max Tension	3	3802.214	0.000	0.000
			Max. Compression	10	-6062.812	0.000	0.000
			Max. Mx	8	-2492.660	-0.040	-0.003
			Max. My	13	-2501.750	0.000	-0.008
			Max. Vy	23	-26.148	0.030	0.001
			Max. Vx	13	3.871	0.000	0.000
		Top Girt	Max Tension	4	405.196	0.000	0.000
			Max. Compression	10	-466.794	0.000	0.000
			Max. Mx	14	-69.401	-0.020	0.000
			Max. My	5	-38.004	0.000	-0.000
			Max. Vy	14	23.516	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
		Bottom Girt	Max Tension	2	1967.308	0.000	0.000
			Max. Compression	12	-61.843	0.000	0.000
			Max. Mx	14	1179.063	-0.020	0.000
			Max. My	5	744.728	0.000	-0.000
			Max. Vy	14	23.516	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
		Guy A	Bottom Tension	9	8060.153		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Tension	9	8143.131		
			Top Cable Vert	9	5896.369		
			Top Cable Norm	9	5615.927		
			Top Cable Tan	9	69.187		
			Bot Cable Vert	9	-5622.932		
			Bot Cable Norm	9	5773.937		
			Bot Cable Tan	9	101.780		
		Guy A	Bottom Tension	8	22153.832		
			Top Tension	8	22409.045		
			Top Cable Vert	8	17154.512		
			Top Cable Norm	8	14418.322		
			Top Cable Tan	8	0.333		
			Bot Cable Vert	8	-16538.038		
			Bot Cable Norm	8	14740.609		
			Bot Cable Tan	8	0.333		
		Guy B	Bottom Tension	12	8045.051		
			Top Tension	12	8128.347		
			Top Cable Vert	12	5888.134		
			Top Cable Norm	12	5603.561		
			Top Cable Tan	12	3.199		
			Bot Cable Vert	12	-5609.889		
			Bot Cable Norm	12	5766.453		
			Bot Cable Tan	12	3.649		
		Guy B	Bottom Tension	12	22145.607		
			Top Tension	12	22400.820		
			Top Cable Vert	12	17148.296		
			Top Cable Norm	12	14412.934		
			Top Cable Tan	12	0.608		
			Bot Cable Vert	12	-16531.823		
			Bot Cable Norm	12	14735.221		
			Bot Cable Tan	12	0.608		
		Guy C	Bottom Tension	3	8061.300		
			Top Tension	3	8144.278		
			Top Cable Vert	3	5897.189		
			Top Cable Norm	3	5616.729		
			Top Cable Tan	3	69.230		
			Bot Cable Vert	3	-5623.752		
			Bot Cable Norm	3	5774.739		
			Bot Cable Tan	3	101.737		
		Guy C	Bottom Tension	4	22174.852		
			Top Tension	4	22430.063		
			Top Cable Vert	4	17170.357		
			Top Cable Norm	4	14432.136		
			Top Cable Tan	4	0.942		
			Bot Cable Vert	4	-16553.884		
			Bot Cable Norm	4	14754.423		
			Bot Cable Tan	4	0.942		
		Top Guy Pull-Off	Max Tension	11	7436.371	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	4646.272	0.031	0.000
			Max. My	5	5323.047	0.000	0.000
			Max. Vy	14	-35.804	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000
		Torque Arm Top	Max Tension	3	5898.689	-5.039	0.000
			Max. Compression	9	-2346.773	-17.882	-0.000
			Max. Mx	4	-1375.931	-18.629	-0.000
			Max. My	5	4169.118	-12.118	-0.000
			Max. Vy	4	5497.441	-18.629	-0.000
			Max. Vx	5	-0.001	-12.118	-0.000
T2	160 - 140	Leg	Max Tension	2	9535.127	-0.009	0.445
			Max. Compression	4	-40394.681	0.004	0.085

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	11	-8145.888	-1.170	-0.257
			Max. My	8	-5666.721	-0.039	1.252
			Max. Vy	11	3270.700	0.838	0.026
			Max. Vx	2	3617.006	-0.032	1.007
		Diagonal	Max Tension	3	4300.755	0.000	0.000
			Max. Compression	9	-4765.938	0.000	0.000
			Max. Mx	17	-269.012	-0.023	0.001
			Max. My	10	-4467.110	-0.007	-0.005
			Max. Vy	17	18.922	-0.023	0.001
			Max. Vx	10	2.205	0.000	0.000
		Top Girt	Max Tension	12	1595.014	0.000	0.000
			Max. Compression	10	-1117.522	0.000	0.000
			Max. Mx	14	371.266	0.013	0.000
			Max. My	5	365.252	0.000	0.000
			Max. Vy	14	-15.465	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000
		Bottom Girt	Max Tension	2	836.573	0.000	0.000
			Max. Compression	12	-97.054	0.000	0.000
			Max. Mx	14	397.471	0.013	0.000
			Max. My	5	197.585	0.000	0.000
			Max. Vy	14	-15.465	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000
T3	140 - 120	Leg	Max Tension	2	24067.520	-0.007	-0.030
			Max. Compression	12	-63571.565	-0.283	-0.121
			Max. Mx	5	-25282.208	0.675	-0.003
			Max. My	8	-6141.867	-0.053	0.649
			Max. Vy	6	-1066.749	-0.220	-0.195
			Max. Vx	2	1349.999	-0.006	0.291
		Diagonal	Max Tension	3	2043.626	0.000	0.000
			Max. Compression	3	-2184.642	0.000	0.000
			Max. Mx	5	463.917	-0.019	0.001
			Max. My	10	-1665.243	0.003	-0.004
			Max. Vy	18	15.001	-0.017	-0.000
			Max. Vx	10	2.035	0.000	0.000
		Top Girt	Max Tension	11	244.427	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	189.311	0.011	0.000
			Max. My	5	169.615	0.000	0.000
			Max. Vy	14	13.410	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000
		Bottom Girt	Max Tension	2	743.555	0.000	0.000
			Max. Compression	12	-249.881	0.000	0.000
			Max. Mx	14	284.559	0.011	0.000
			Max. Vy	14	13.410	0.000	0.000
			Max. Vx	4	-0.000	0.000	0.000
		Guy A	Bottom Tension	8	13757.025		
			Top Tension	8	13844.838		
			Top Cable Vert	8	9579.869		
			Top Cable Norm	8	9995.282		
			Top Cable Tan	8	0.092		
			Bot Cable Vert	8	-9310.509		
			Bot Cable Norm	8	10127.692		
			Bot Cable Tan	8	0.092		
		Guy B	Bottom Tension	12	13775.673		
			Top Tension	12	13863.486		
			Top Cable Vert	12	9592.585		
			Top Cable Norm	12	10008.923		
			Top Cable Tan	12	0.686		
			Bot Cable Vert	12	-9323.225		
			Bot Cable Norm	12	10141.333		
			Bot Cable Tan	12	0.686		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Guy C	Bottom Tension	4	13784.706		
			Top Tension	4	13872.518		
			Top Cable Vert	4	9598.747		
			Top Cable Norm	4	10015.529		
			Top Cable Tan	4	0.779		
			Bot Cable Vert	4	-9329.387		
			Bot Cable Norm	4	10147.938		
			Bot Cable Tan	4	0.779		
		Top Guy Pull-Off	Max Tension	2	5537.448	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	2805.972	0.027	0.000
			Max. My	5	3294.273	0.000	0.000
			Max. Vy	14	-31.097	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000
T4	120 - 100	Leg	Max Tension	2	24065.930	-0.004	-0.125
			Max. Compression	12	-64091.407	-0.270	-0.254
			Max. Mx	5	-46219.930	1.150	-0.231
			Max. My	8	-42921.474	0.009	1.256
			Max. Vy	5	2448.750	0.869	-0.184
			Max. Vx	8	2730.755	0.007	0.943
		Diagonal	Max Tension	5	2655.726	0.000	0.000
			Max. Compression	5	-3318.191	0.000	0.000
			Max. Mx	5	-899.527	0.034	0.003
			Max. My	11	-3312.962	-0.008	-0.005
			Max. Vy	18	22.206	-0.031	-0.000
			Max. Vx	11	-2.390	0.000	0.000
		Top Girt	Max Tension	6	1014.052	0.000	0.000
			Max. Compression	4	-196.208	0.000	0.000
			Max. Mx	14	500.990	0.013	0.000
			Max. My	4	612.168	0.000	0.000
			Max. Vy	14	14.915	0.000	0.000
			Max. Vx	4	-0.000	0.000	0.000
		Bottom Girt	Max Tension	8	783.786	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	577.608	0.013	0.000
			Max. My	11	303.177	0.000	-0.000
			Max. Vy	14	14.915	0.000	0.000
			Max. Vx	11	0.000	0.000	0.000
T5	100 - 80	Leg	Max Tension	2	2462.895	-0.004	-0.732
			Max. Compression	15	-49441.109	0.002	0.020
			Max. Mx	5	-46219.643	0.869	-0.184
			Max. My	8	-42922.238	0.007	0.943
			Max. Vy	5	2472.945	-0.649	0.074
			Max. Vx	8	2756.285	-0.006	-0.749
		Diagonal	Max Tension	5	4155.584	0.000	0.000
			Max. Compression	5	-4272.050	0.000	0.000
			Max. Mx	16	48.220	-0.018	-0.000
			Max. My	4	-3601.126	0.007	0.002
			Max. Vy	16	14.767	-0.018	-0.000
			Max. Vx	4	1.057	0.000	0.000
		Top Girt	Max Tension	6	950.334	0.000	0.000
			Max. Compression	8	-460.587	0.000	0.000
			Max. Mx	14	307.044	0.011	0.000
			Max. My	11	202.455	0.000	-0.000
			Max. Vy	14	-12.776	0.000	0.000
			Max. Vx	11	0.000	0.000	0.000
		Bottom Girt	Max Tension	2	797.815	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	700.632	0.011	0.000
			Max. My	11	470.442	0.000	-0.000
			Max. Vy	14	-12.776	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	11	0.000	0.000	0.000
		Guy A	Bottom Tension	7	24994.136		
			Top Tension	7	25088.152		
			Top Cable Vert	7	16199.485		
			Top Cable Norm	7	19156.998		
			Top Cable Tan	7	38.529		
			Bot Cable Vert	7	-15946.489		
			Bot Cable Norm	7	19245.523		
			Bot Cable Tan	7	161.754		
		Guy B	Bottom Tension	13	25013.699		
			Top Tension	13	25107.714		
			Top Cable Vert	13	16211.997		
			Top Cable Norm	13	19172.036		
			Top Cable Tan	13	38.689		
			Bot Cable Vert	13	-15959.002		
			Bot Cable Norm	13	19260.560		
			Bot Cable Tan	13	161.914		
		Guy C	Bottom Tension	3	25008.736		
			Top Tension	3	25102.749		
			Top Cable Vert	3	16208.817		
			Top Cable Norm	3	19168.222		
			Top Cable Tan	3	39.125		
			Bot Cable Vert	3	-15955.821		
			Bot Cable Norm	3	19256.747		
			Bot Cable Tan	3	162.350		
		Top Guy Pull-Off	Max Tension	2	10054.689	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	4271.099	0.029	0.000
			Max. My	11	6234.731	0.000	-0.000
			Max. Vy	14	-34.029	0.000	0.000
			Max. Vx	11	0.000	0.000	0.000
T6	80 - 60	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	18	-50540.416	0.016	-0.255
			Max. Mx	11	-25323.206	-0.865	-0.249
			Max. My	8	-15510.587	-0.006	0.942
			Max. Vy	11	1932.430	0.321	0.078
			Max. Vx	8	-2164.988	0.003	-0.387
		Diagonal	Max Tension	3	1747.183	0.000	0.000
			Max. Compression	3	-2626.436	-0.007	0.001
			Max. Mx	24	-811.404	-0.035	0.001
			Max. My	10	-2435.361	0.020	-0.002
			Max. Vy	24	23.795	-0.035	0.001
			Max. Vx	10	-0.808	0.000	0.000
		Top Girt	Max Tension	12	1431.476	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	901.782	0.012	0.000
			Max. My	11	574.555	0.000	-0.000
			Max. Vy	14	14.164	0.000	0.000
			Max. Vx	11	0.000	0.000	0.000
		Bottom Girt	Max Tension	19	744.985	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	707.659	0.012	0.000
			Max. My	11	654.243	0.000	-0.000
			Max. Vy	14	14.164	0.000	0.000
			Max. Vx	11	0.000	0.000	0.000
T7	60 - 40	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	20	-55970.635	-0.209	0.080
			Max. Mx	5	-27695.081	-0.640	-0.073
			Max. My	13	-27645.471	0.222	0.590
			Max. Vy	11	1640.661	0.593	-0.199
			Max. Vx	8	-1504.135	-0.286	-0.405

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	5	3942.345	0.000	0.000
			Max. Compression	5	-4162.860	0.000	0.000
			Max. Mx	16	101.953	0.012	0.000
			Max. My	18	-304.614	0.000	0.000
			Max. Vy	16	-11.856	0.000	0.000
			Max. Vx	18	-0.024	0.000	0.000
		Top Girt	Max Tension	6	265.037	0.000	0.000
			Max. Compression	11	-294.902	0.000	0.000
			Max. Mx	14	8.844	0.010	0.000
			Max. My	5	-96.839	0.000	-0.000
			Max. Vy	14	-11.843	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
		Bottom Girt	Max Tension	12	1183.999	0.000	0.000
			Max. Compression	6	-917.859	0.000	0.000
			Max. Mx	19	172.062	0.010	0.000
			Max. My	5	-886.035	0.000	-0.000
			Max. Vy	19	-11.843	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
		Guy A	Bottom Tension	7	11448.592		
			Top Tension	7	11473.966		
			Top Cable Vert	7	5217.635		
			Top Cable Norm	7	10219.006		
			Top Cable Tan	7	9.971		
			Bot Cable Vert	7	-5123.291		
			Bot Cable Norm	7	10238.071		
			Bot Cable Tan	7	63.712		
		Guy B	Bottom Tension	13	11437.232		
			Top Tension	13	11462.607		
			Top Cable Vert	13	5212.533		
			Top Cable Norm	13	10208.857		
			Top Cable Tan	13	9.824		
			Bot Cable Vert	13	-5118.188		
			Bot Cable Norm	13	10227.922		
			Bot Cable Tan	13	63.564		
		Guy C	Bottom Tension	5	11438.316		
			Top Tension	5	11463.700		
			Top Cable Vert	5	5213.031		
			Top Cable Norm	5	10209.832		
			Top Cable Tan	5	7.935		
			Bot Cable Vert	5	-5118.687		
			Bot Cable Norm	5	10228.897		
			Bot Cable Tan	5	61.675		
		Top Guy Pull-Off	Max Tension	11	6064.054	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	23	2685.624	0.025	0.000
			Max. My	5	5456.679	0.000	-0.000
			Max. Vy	14	28.706	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
T8	40 - 20	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	21	-59893.231	-0.163	0.217
			Max. Mx	5	-50972.214	0.626	-0.112
			Max. My	8	-45919.219	-0.034	0.689
			Max. Vy	11	1646.402	0.405	-0.208
			Max. Vx	8	-1502.431	-0.247	-0.233
		Diagonal	Max Tension	11	2788.261	0.000	0.000
			Max. Compression	5	-3044.510	0.000	0.000
			Max. Mx	20	41.572	0.012	0.000
			Max. My	18	-1.726	0.000	0.000
			Max. Vy	20	-11.120	0.000	0.000
			Max. Vx	18	0.020	0.000	0.000
		Top Girt	Max Tension	5	961.160	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	12	-865.210	0.000	0.000
			Max. Mx	14	169.920	0.009	0.000
			Max. My	5	961.132	0.000	-0.000
			Max. Vy	14	11.103	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
		Bottom Girt	Max Tension	10	573.874	0.000	0.000
			Max. Compression	6	-379.608	0.000	0.000
			Max. Mx	14	76.581	0.009	0.000
			Max. My	5	297.834	0.000	-0.000
			Max. Vy	14	11.103	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
T9	20 - 5	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	21	-59922.260	-0.173	0.134
			Max. Mx	24	-58458.542	1.653	0.826
			Max. My	21	-58837.028	-0.089	-1.869
			Max. Vy	25	-15688.608	1.647	0.846
			Max. Vx	21	18238.534	-0.089	-1.869
		Diagonal	Max Tension	3	3035.185	0.000	0.000
			Max. Compression	9	-3246.054	0.000	0.000
			Max. Mx	20	500.497	0.010	0.000
			Max. My	18	309.051	0.000	0.000
			Max. Vy	20	-9.990	0.000	0.000
			Max. Vx	18	-0.017	0.000	0.000
		Top Girt	Max Tension	4	653.211	0.000	0.000
			Max. Compression	10	-555.168	0.000	0.000
			Max. Mx	14	174.094	0.009	0.000
			Max. My	5	-219.551	0.000	-0.000
			Max. Vy	14	-9.971	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
		Bottom Girt	Max Tension	21	10639.704	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	25	10241.982	-0.030	0.000
			Max. My	5	8097.163	0.000	0.000
			Max. Vy	25	35.138	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000
T10	5 - 0	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	21	-63421.039	-0.035	-0.023
			Max. Mx	21	-61421.099	1.869	-0.083
			Max. My	5	-46210.375	-0.777	-0.477
			Max. Vy	18	4713.812	-0.676	-0.080
			Max. Vx	5	1273.365	-0.731	-0.454
		Horizontal	Max Tension	6	159.359	-0.089	-0.039
			Max. Compression	20	-325.117	0.124	-0.044
			Max. Mx	5	-59.018	0.557	-0.125
			Max. My	10	-175.706	0.017	-0.218
			Max. Vy	5	-784.247	0.557	-0.125
			Max. Vx	10	208.888	0.370	-0.004
		Top Girt	Max Tension	19	3142.400	0.304	-0.081
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	6	2041.196	0.484	-0.112
			Max. My	6	2201.893	0.199	-0.184
			Max. Vy	6	-211.380	0.484	-0.112
			Max. Vx	6	-56.444	0.184	-0.018
		Bottom Girt	Max Tension	1	0.000	0.000	0.000
			Max. Compression	5	-2137.034	0.384	-0.409
			Max. Mx	10	-1963.998	1.075	-0.439
			Max. My	10	-1975.279	0.455	-0.499
			Max. Vy	10	3498.811	1.075	-0.439
			Max. Vx	10	1317.693	0.504	-0.049

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	15	173628.047	-36.525	382.363
	Max. H_x	11	121056.634	2600.759	111.490
	Max. H_z	2	128902.873	-1.029	2423.023
	Max. M_x	1	0.000	-2.606	-17.929
	Max. M_z	1	0.000	-2.606	-17.929
	Max. Torsion	5	1.228	-2608.514	116.168
	Min. Vert	1	75884.632	-2.606	-17.929
	Min. H_x	5	120995.495	-2608.514	116.168
	Min. H_z	8	106236.923	-4.780	-2838.499
	Min. M_x	1	0.000	-2.606	-17.929
	Min. M_z	1	0.000	-2.606	-17.929
	Min. Torsion	11	-1.220	2600.759	111.490
Guy C @ 162 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-984.474	-661.940	381.985
	Max. H_x	10	-984.474	-661.940	381.985
	Max. H_z	3	-10885.356	-9579.601	5783.350
	Min. Vert	4	-11092.718	-9874.443	5705.267
	Min. H_x	4	-11092.718	-9874.443	5705.267
	Min. H_z	10	-984.474	-661.940	381.985
Guy B @ 162 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-987.977	664.915	383.717
	Max. H_x	12	-11078.172	9862.075	5697.782
	Max. H_z	13	-10864.212	9561.571	5772.561
	Min. Vert	12	-11078.172	9862.075	5697.782
	Min. H_x	6	-987.977	664.915	383.717
	Min. H_z	6	-987.977	664.915	383.717
Guy A @ 162 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-985.575	-0.010	-765.330
	Max. H_x	11	-6677.755	490.299	-6700.029
	Max. H_z	2	-985.575	-0.010	-765.330
	Min. Vert	8	-11081.985	0.342	-11393.463
	Min. H_x	5	-6649.777	-490.059	-6672.326
	Min. H_z	8	-11081.985	0.342	-11393.463
Guy C @ 142 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-954.166	-578.187	333.772
	Max. H_x	10	-954.166	-578.187	333.772
	Max. H_z	3	-25407.666	-21023.207	12511.688
	Min. Vert	4	-25883.271	-21565.216	12452.671
	Min. H_x	4	-25883.271	-21565.216	12452.671
	Min. H_z	10	-954.166	-578.187	333.772
Guy B @ 142 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-957.339	580.555	335.147
	Max. H_x	12	-25855.048	21543.080	12439.398
	Max. H_z	13	-25368.255	20992.486	12493.441
	Min. Vert	12	-25855.048	21543.080	12439.398
	Min. H_x	6	-957.339	580.555	335.147
	Min. H_z	6	-957.339	580.555	335.147
Guy A @ 142 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-954.927	-0.006	-668.211

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Max. H_x	11	-13206.371	644.810	-12486.981
	Max. H_z	2	-954.927	-0.006	-668.211
	Min. Vert	8	-25848.548	0.425	-24868.300
	Min. H_x	5	-13151.172	-644.412	-12438.104
	Min. H_z	8	-25848.548	0.425	-24868.300
Guy C @ 100 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-42.832	-52.829	30.486
	Max. H_x	10	-42.832	-52.829	30.486
	Max. H_z	3	-21074.327	-25421.902	14938.601
	Min. Vert	3	-21074.327	-25421.902	14938.601
	Min. H_x	5	-21073.166	-25643.769	14551.695
	Min. H_z	10	-42.832	-52.829	30.486
Guy B @ 100 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-42.793	52.779	30.459
	Max. H_x	11	-21062.885	25631.951	14545.078
	Max. H_z	13	-21077.190	25425.036	14939.511
	Min. Vert	13	-21077.190	25425.036	14939.511
	Min. H_x	6	-42.793	52.779	30.459
	Min. H_z	6	-42.793	52.779	30.459
Guy A @ 100 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-42.786	-0.002	-60.938
	Max. H_x	10	-18064.506	366.175	-25301.329
	Max. H_z	2	-42.786	-0.002	-60.938
	Min. Vert	7	-21069.780	-225.465	-29483.594
	Min. H_x	6	-18080.087	-366.146	-25325.290
	Min. H_z	7	-21069.780	-225.465	-29483.594

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	75884.632	2.606	17.929	0.000	0.000	-0.005
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	128902.873	1.029	-2423.023	0.000	0.000	-0.134
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	121097.616	1419.509	-2163.636	0.000	0.000	-0.524
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	106278.462	2442.354	-1385.303	0.000	0.000	-1.081
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	120995.495	2608.514	-116.168	0.000	0.000	-1.228
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	128783.351	2125.415	1242.740	0.000	0.000	-0.855
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	120958.528	1190.879	2343.033	0.000	0.000	-0.300
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	106236.923	4.780	2838.499	0.000	0.000	0.137
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	121074.365	-1180.643	2344.728	0.000	0.000	0.523
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	128906.628	-2115.530	1246.508	0.000	0.000	0.981
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	121056.634	-2600.759	-111.490	0.000	0.000	1.220
1.2 Dead+1.6 Wind 300 deg -	106249.284	-2436.861	-1383.517	0.000	0.000	0.934

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
No Ice+1.0 Guy						
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	121045.464	-1416.805	-2162.845	0.000	0.000	0.291
1.2 Dead+1.0 Ice+Guy	170628.052	36.543	109.899	0.000	0.000	-0.001
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Guy	173628.047	36.525	-382.363	0.000	0.000	-0.119
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Guy	173052.416	263.524	-314.935	0.000	0.000	-0.081
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Guy	172624.034	442.502	-122.632	0.000	0.000	-0.195
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Guy	173044.042	520.737	127.700	0.000	0.000	-0.256
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Guy	173598.933	466.812	356.928	0.000	0.000	-0.076
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Guy	173026.524	294.116	518.279	0.000	0.000	0.124
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Guy	172587.637	36.788	576.466	0.000	0.000	0.117
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Guy	172997.919	-220.692	519.172	0.000	0.000	0.077
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Guy	173567.393	-393.606	358.299	0.000	0.000	0.189
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Guy	173025.315	-447.569	129.073	0.000	0.000	0.251
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Guy	172625.882	-369.314	-121.525	0.000	0.000	0.073
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Guy	173062.408	-190.411	-314.255	0.000	0.000	-0.126
Dead+Wind 0 deg - Service+Guy	76365.273	2.206	-629.756	0.000	0.000	-0.033
Dead+Wind 30 deg - Service+Guy	76339.049	318.341	-535.201	0.000	0.000	-0.126
Dead+Wind 60 deg - Service+Guy	76341.355	549.259	-298.165	0.000	0.000	-0.225
Dead+Wind 90 deg - Service+Guy	76340.053	639.443	20.257	0.000	0.000	-0.264
Dead+Wind 120 deg - Service+Guy	76365.589	563.695	341.441	0.000	0.000	-0.195
Dead+Wind 150 deg - Service+Guy	76338.893	323.654	567.914	0.000	0.000	-0.075
Dead+Wind 180 deg - Service+Guy	76340.076	2.859	649.445	0.000	0.000	0.027
Dead+Wind 210 deg - Service+Guy	76337.874	-318.019	568.453	0.000	0.000	0.121
Dead+Wind 240 deg - Service+Guy	76364.317	-558.291	342.363	0.000	0.000	0.220
Dead+Wind 270 deg - Service+Guy	76339.276	-634.362	21.297	0.000	0.000	0.259
Dead+Wind 300 deg - Service+Guy	76341.298	-544.508	-297.278	0.000	0.000	0.191
Dead+Wind 330 deg - Service+Guy	76339.305	-313.836	-534.692	0.000	0.000	0.070

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	-0.000	-24869.654	0.000	-0.045	24869.396	0.010	0.001%
2	30.791	-29593.836	-58543.973	-30.790	29593.696	58541.871	0.003%
3	29094.237	-29298.709	-50358.860	-29094.275	29298.624	50357.404	0.002%
4	50251.939	-29003.582	-29028.989	-50250.916	29003.543	29028.625	0.002%
5	58135.143	-29298.709	-30.791	-58133.912	29298.625	31.558	0.002%
6	50688.219	-29593.836	29245.321	-50686.407	29593.697	-29244.266	0.003%
7	29040.906	-29298.709	50328.069	-29039.632	29298.625	-50327.378	0.002%
8	-30.791	-29003.582	58004.646	31.047	29003.544	-58003.580	0.002%
9	-29094.237	-29298.709	50358.860	29092.960	29298.625	-50358.166	0.002%
10	-50719.010	-29593.836	29298.653	50717.195	29593.697	-29297.595	0.003%
11	-58135.143	-29298.709	30.791	58133.910	29298.625	-30.024	0.002%
12	-50221.148	-29003.582	-28975.657	50220.307	29003.544	28974.976	0.002%
13	-29040.906	-29298.709	-50328.069	29040.944	29298.625	50326.616	0.002%
14	-0.000	-107041.073	0.000	0.205	107041.072	-1.669	0.002%
15	8.357	-107305.008	-15437.617	-8.359	107304.992	15436.398	0.001%
16	7708.373	-107041.073	-13338.149	-7708.448	107041.051	13336.034	0.002%
17	13339.411	-106777.138	-7703.573	-13337.783	106777.115	7702.369	0.002%
18	15402.271	-107041.073	-8.357	-15400.607	107041.053	9.353	0.002%
19	13369.978	-107305.008	7711.572	-13367.331	107304.969	-7710.038	0.003%
20	7693.898	-107041.073	13329.792	-7692.162	107041.053	-13328.840	0.002%
21	-8.357	-106777.138	15392.672	8.421	106777.117	-15390.722	0.002%
22	-7708.373	-107041.073	13338.149	7706.711	107041.055	-13337.235	0.002%
23	-13378.334	-107305.009	7726.046	13375.782	107304.972	-7724.573	0.003%
24	-15402.271	-107041.073	8.357	15400.670	107041.055	-7.409	0.002%
25	-13331.054	-106777.138	-7689.099	13329.470	106777.115	7687.846	0.002%
26	-7693.898	-107041.073	-13329.792	7693.968	107041.051	13327.672	0.002%
27	6.284	-24929.884	-11947.750	-6.282	24929.877	11946.358	0.005%
28	5937.599	-24869.654	-10277.318	-5937.370	24869.649	10276.273	0.004%
29	10255.498	-24809.424	-5924.284	-10254.832	24809.420	5923.890	0.003%
30	11864.315	-24869.654	-6.284	-11863.306	24869.649	6.596	0.004%
31	10344.535	-24929.884	5968.433	-10343.342	24929.877	-5967.749	0.005%
32	5926.715	-24869.654	10271.034	-5925.934	24869.649	-10270.326	0.004%
33	-6.284	-24809.424	11837.683	6.289	24809.420	-11836.922	0.003%
34	-5937.599	-24869.654	10277.318	5936.829	24869.649	-10276.613	0.004%
35	-10350.818	-24929.884	5979.317	10349.638	24929.877	-5978.638	0.005%
36	-11864.315	-24869.654	6.284	11863.315	24869.649	-5.974	0.004%
37	-10249.214	-24809.424	-5913.400	10248.553	24809.420	5913.004	0.003%
38	-5926.715	-24869.654	-10271.034	5926.490	24869.649	10269.988	0.004%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	8	0.00000001	0.00002389
2	Yes	18	0.00000001	0.00006377
3	Yes	18	0.00000001	0.00004741
4	Yes	13	0.00000001	0.00006548
5	Yes	18	0.00000001	0.00004810
6	Yes	18	0.00000001	0.00006406
7	Yes	18	0.00000001	0.00004716
8	Yes	13	0.00000001	0.00006397
9	Yes	18	0.00000001	0.00004738
10	Yes	18	0.00000001	0.00006433
11	Yes	18	0.00000001	0.00004813
12	Yes	13	0.00000001	0.00006416
13	Yes	18	0.00000001	0.00004726

14	Yes	9	0.00000001	0.00005537
15	Yes	14	0.00000001	0.00004220
16	Yes	13	0.00000001	0.00006965
17	Yes	12	0.00000001	0.00007696
18	Yes	13	0.00000001	0.00006391
19	Yes	13	0.00000001	0.00009648
20	Yes	13	0.00000001	0.00006517
21	Yes	12	0.00000001	0.00007388
22	Yes	13	0.00000001	0.00006253
23	Yes	13	0.00000001	0.00009324
24	Yes	13	0.00000001	0.00006157
25	Yes	12	0.00000001	0.00007654
26	Yes	13	0.00000001	0.00006994
27	Yes	10	0.00000001	0.00009883
28	Yes	10	0.00000001	0.00007739
29	Yes	10	0.00000001	0.00005675
30	Yes	10	0.00000001	0.00007637
31	Yes	10	0.00000001	0.00009750
32	Yes	10	0.00000001	0.00007615
33	Yes	10	0.00000001	0.00005556
34	Yes	10	0.00000001	0.00007533
35	Yes	10	0.00000001	0.00009654
36	Yes	10	0.00000001	0.00007564
37	Yes	10	0.00000001	0.00005640
38	Yes	10	0.00000001	0.00007741

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	0.898	33	0.038	0.047
T2	160 - 140	1.052	37	0.062	0.047
T3	140 - 120	1.292	29	0.047	0.060
T4	120 - 100	1.383	29	0.009	0.084
T5	100 - 80	1.207	29	0.066	0.094
T6	80 - 60	0.891	27	0.055	0.102
T7	60 - 40	0.718	31	0.041	0.102
T8	40 - 20	0.576	31	0.040	0.092
T9	20 - 5	0.367	31	0.070	0.064
T10	5 - 0	0.095	31	0.088	0.039

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.000	Rohn 6'x15' Boom Gate (3)	33	0.917	0.043	0.046	111791
162.523	Guy	37	1.027	0.061	0.047	32556
162.523	Guy	37	1.027	0.061	0.047	32556
152.000	Pirod 15' T-Frame Sector Mount (1)	29	1.148	0.064	0.050	150294
146.926	ALU RRH-4X45-1900	29	1.212	0.060	0.053	71129
141.852	ALU RRH-4X45-1900	29	1.272	0.052	0.058	31255
136.778	ALU RRH-4X45-1900	29	1.322	0.038	0.063	23217
136.000	Pirod 15' T-Frame Sector Mount (1)	29	1.329	0.036	0.064	22665
132.159	Guy	29	1.357	0.024	0.069	20367

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
131.704	ALU RRH-4X45-1900	29	1.359	0.022	0.070	20126
126.630	ALU RRH-4X45-1900	29	1.381	0.011	0.077	17777
121.556	ALU RRH-4X45-1900	29	1.386	0.008	0.082	16083
120.000	AIR 21 B4A B2P W/Mount Pipe	29	1.383	0.009	0.084	15903
116.481	ALU RRH-4X45-1900	29	1.371	0.015	0.087	16364
111.407	ALU RRH-4X45-1900	29	1.339	0.030	0.090	17898
106.333	ALU RRH-4X45-1900	29	1.289	0.048	0.092	19769
101.259	ALU RRH-4X45-1900	29	1.225	0.063	0.093	22733
98.000	GPS	29	1.176	0.068	0.095	29647
96.185	ALU RRH-4X45-1900	29	1.147	0.070	0.095	38956
91.111	ALU RRH-4X45-1900	29	1.062	0.069	0.098	704007
86.037	ALU RRH-4X45-1900	27	0.979	0.063	0.100	40511
82.523	Guy	27	0.926	0.058	0.101	24516
80.963	ALU RRH-4X45-1900	27	0.904	0.056	0.102	21853
75.889	ALU RRH-4X45-1900	27	0.843	0.050	0.103	23438
70.815	ALU RRH-4X45-1900	31	0.796	0.046	0.104	34268
65.741	ALU RRH-4X45-1900	31	0.757	0.044	0.104	63847
60.667	ALU RRH-4X45-1900	31	0.722	0.042	0.103	292372
55.593	ALU RRH-4X45-1900	31	0.688	0.039	0.100	359591
50.519	ALU RRH-4X45-1900	31	0.653	0.037	0.099	242457
49.750	Guy	31	0.647	0.037	0.099	231084
45.444	ALU RRH-4X45-1900	31	0.617	0.037	0.096	182994
40.370	ALU RRH-4X45-1900	31	0.579	0.040	0.092	121634
35.296	ALU RRH-4X45-1900	31	0.538	0.045	0.087	54893
30.222	ALU RRH-4X45-1900	31	0.492	0.053	0.080	32871
25.148	ALU RRH-4X45-1900	31	0.437	0.061	0.073	23451
20.074	ALU RRH-4X45-1900	31	0.368	0.070	0.065	20178
15.000	ALU RRH-4X45-1900	31	0.284	0.076	0.056	29759

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	8.842	10	0.337	0.275
T2	160 - 140	10.338	10	0.453	0.277
T3	140 - 120	12.192	2	0.333	0.325
T4	120 - 100	13.007	2	0.090	0.422
T5	100 - 80	12.026	2	0.406	0.460
T6	80 - 60	9.869	2	0.457	0.481
T7	60 - 40	7.996	6	0.477	0.483
T8	40 - 20	5.993	6	0.530	0.426
T9	20 - 5	3.454	6	0.720	0.303
T10	5 - 0	0.881	6	0.823	0.173

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.000	Rohn 6'x15' Boom Gate (3)	10	9.046	0.359	0.274	23144
162.523	Guy	10	10.120	0.445	0.275	6760

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
162.523	Guy	10	10.120	0.445	0.275	6760
152.000	Pirod 15' T-Frame Sector Mount (1)	10	11.091	0.452	0.288	62822
146.926	ALU RRH-4X45-1900	2	11.583	0.423	0.300	8633
141.852	ALU RRH-4X45-1900	2	12.041	0.364	0.317	4473
136.778	ALU RRH-4X45-1900	2	12.429	0.269	0.340	3438
136.000	Pirod 15' T-Frame Sector Mount (1)	2	12.481	0.252	0.344	3365
132.159	Guy	2	12.704	0.166	0.364	3065
131.704	ALU RRH-4X45-1900	2	12.727	0.156	0.366	3033
126.630	ALU RRH-4X45-1900	2	12.924	0.080	0.392	2718
121.556	ALU RRH-4X45-1900	2	13.007	0.080	0.416	2483
120.000	AIR 21 B4A B2P W/Mount Pipe	2	13.007	0.090	0.422	2456
116.481	ALU RRH-4X45-1900	2	12.965	0.129	0.433	2511
111.407	ALU RRH-4X45-1900	2	12.801	0.210	0.445	2698
106.333	ALU RRH-4X45-1900	2	12.522	0.299	0.453	2918
101.259	ALU RRH-4X45-1900	2	12.137	0.384	0.458	3246
98.000	GPS	2	11.838	0.434	0.462	3915
96.185	ALU RRH-4X45-1900	2	11.656	0.452	0.464	4665
91.111	ALU RRH-4X45-1900	2	11.110	0.476	0.469	11005
86.037	ALU RRH-4X45-1900	2	10.536	0.471	0.475	8204
82.523	Guy	2	10.142	0.462	0.479	4919
80.963	ALU RRH-4X45-1900	2	9.972	0.458	0.480	4377
75.889	ALU RRH-4X45-1900	2	9.452	0.453	0.485	4681
70.815	ALU RRH-4X45-1900	6	8.971	0.457	0.488	6822
65.741	ALU RRH-4X45-1900	6	8.514	0.466	0.488	12599
60.667	ALU RRH-4X45-1900	6	8.057	0.476	0.484	18652
55.593	ALU RRH-4X45-1900	6	7.584	0.483	0.475	14394
50.519	ALU RRH-4X45-1900	6	7.089	0.490	0.463	14163
49.750	Guy	6	7.012	0.492	0.461	14129
45.444	ALU RRH-4X45-1900	6	6.572	0.503	0.448	13942
40.370	ALU RRH-4X45-1900	6	6.034	0.528	0.428	12399
35.296	ALU RRH-4X45-1900	6	5.470	0.567	0.404	7766
30.222	ALU RRH-4X45-1900	6	4.866	0.617	0.375	5293
25.148	ALU RRH-4X45-1900	6	4.205	0.670	0.342	4015
20.074	ALU RRH-4X45-1900	6	3.466	0.719	0.304	3568
15.000	ALU RRH-4X45-1900	6	2.641	0.759	0.262	5336

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Diagonal	A325N	0.625	1	6062.810	12425.200	0.488 ✓	1	Bolt Shear
		Top Girt	A325N	0.625	1	405.196	9107.810	0.044 ✓	1	Member Block Shear
		Bottom Girt	A325N	0.625	1	1967.310	9107.810	0.216 ✓	1	Member Block Shear
T2	160	Leg	A325N	0.750	4	2429.920	29820.600	0.081 ✓	1	Bolt Tension
		Diagonal	A325N	0.500	1	4765.940	7952.160	0.599 ✓	1	Bolt Shear
		Top Girt	A325N	0.500	1	1595.010	7952.160	0.201 ✓	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	836.573	7952.160	0.105 ✓	1	Bolt Shear
T3	140	Leg	A325N	0.750	4	3366.640	29820.600	0.113 ✓	1	Bolt Tension
		Diagonal	A325N	0.500	1	2043.630	4165.560	0.491 ✓	1	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Top Girt	A325N	0.500	1	244.427	4165.560	0.059 ✔	1	Member Bearing
		Bottom Girt	A325N	0.500	1	743.555	4165.560	0.179 ✔	1	Member Bearing
T4	120	Leg	A325N	0.750	4	6016.480	29820.600	0.202 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	3318.190	7952.160	0.417 ✔	1	Bolt Shear
		Top Girt	A325N	0.500	1	1014.050	7952.160	0.128 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	783.786	7952.160	0.099 ✔	1	Bolt Shear
T5	100	Leg	A325N	0.750	4	3852.000	29820.600	0.129 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	4155.580	4165.560	0.998 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	950.334	4165.560	0.228 ✔	1	Member Bearing
		Bottom Girt	A325N	0.500	1	797.815	4165.560	0.192 ✔	1	Member Bearing
T6	80	Leg	A325N	0.750	4	4123.200	29820.600	0.138 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	2626.440	7952.160	0.330 ✔	1	Bolt Shear
		Top Girt	A325N	0.500	1	1431.480	7952.160	0.180 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	744.985	7952.160	0.094 ✔	1	Bolt Shear
T7	60	Leg	A325N	0.750	4	4205.580	29820.600	0.141 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	3942.350	4165.560	0.946 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	265.037	4165.560	0.064 ✔	1	Member Bearing
		Bottom Girt	A325N	0.500	1	1184.000	4165.560	0.284 ✔	1	Member Bearing
T8	40	Leg	A325N	0.750	4	4667.170	29820.600	0.157 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	2788.260	4165.560	0.669 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	961.160	4165.560	0.231 ✔	1	Member Bearing
		Bottom Girt	A325N	0.500	1	573.874	4165.560	0.138 ✔	1	Member Bearing
T9	20	Leg	A325N	0.750	4	4993.520	29820.600	0.167 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	3035.180	4165.560	0.729 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	653.211	4165.560	0.157 ✔	1	Member Bearing
		Bottom Girt	A325N	0.625	2	5319.850	12425.200	0.428 ✔	1	Bolt Shear
T10	5	Leg	A325N	0.750	4	5119.080	29820.600	0.172 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T1	162.523 (A) (462)	1/2 EHS	2690.000	26900.043	8117.980	16140.000	1.000	1.988 ✔
	162.523 (A) (463)	1/2 EHS	2690.000	26900.043	8143.130	16140.000	1.000	1.982 ✔
	162.523 (B) (458)	1/2 EHS	2690.000	26900.043	7983.630	16140.000	1.000	2.022 ✔
	162.523 (B) (459)	1/2 EHS	2690.000	26900.043	8128.350	16140.000	1.000	1.986 ✔

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
	162.523 (C) (454)	1/2 EHS	2690.000	26900.043	8144.280	16140.000	1.000	1.982 ✔
	162.523 (C) (455)	1/2 EHS	2690.000	26900.043	7981.440	16140.000	1.000	2.022 ✔
	162.523 (A) (483)	7/8 EHS	7970.000	79699.844	22409.000	47820.000	1.000	2.134 ✔
	162.523 (B) (482)	7/8 EHS	7970.000	79699.844	22400.801	47820.000	1.000	2.135 ✔
	162.523 (C) (478)	7/8 EHS	7970.000	79699.844	22430.100	47820.000	1.000	2.132 ✔
T3	132.159 (A) (471)	9/16 EHS	3500.000	35000.035	13844.800	21000.000	1.000	1.517 ✔
	132.159 (B) (470)	9/16 EHS	3500.000	35000.035	13863.500	21000.000	1.000	1.515 ✔
	132.159 (C) (466)	9/16 EHS	3500.000	35000.035	13872.500	21000.000	1.000	1.514 ✔
T5	82.523 (A) (477)	3/4 EHS	5830.000	58299.914	25088.199	34980.000	1.000	1.394 ✔
	82.523 (B) (476)	3/4 EHS	5830.000	58299.914	25107.699	34980.000	1.000	1.393 ✔
	82.523 (C) (472)	3/4 EHS	5830.000	58299.914	25102.801	34980.000	1.000	1.393 ✔
T7	49.750 (A) (489)	1/2 EHS	2690.000	26900.043	11474.000	16140.000	1.000	1.407 ✔
	49.750 (B) (488)	1/2 EHS	2690.000	26900.043	11462.600	16140.000	1.000	1.408 ✔
	49.750 (C) (484)	1/2 EHS	2690.000	26900.043	11463.700	16140.000	1.000	1.408 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	ROHN 2.5 X-STR	20.000	2.409	31.3 K=1.00	2.254	1.00	-32278.801	94406.898	0.342 [1] ✔
T2	160 - 140	ROHN 2.5 X-STR	20.000	2.409	31.3 K=1.00	2.254	1.00	-40394.699	94406.898	0.428 [1] ✔
T3	140 - 120	ROHN 2.5 X-STR	20.000	2.409	31.3 K=1.00	2.254	0.99	-63571.602	93644.102	0.679 [1] ✔
T4	120 - 100	ROHN 2.5 X-STR	20.000	2.409	31.3 K=1.00	2.254	0.99	-64091.398	93630.797	0.685 [1] ✔
T5	100 - 80	ROHN 2.5 X-STR	20.000	2.409	31.3 K=1.00	2.254	0.98	-49441.102	92189.898	0.536 [1] ✔
T6	80 - 60	ROHN 2.5 X-STR	20.000	2.409	31.3 K=1.00	2.254	1.00	-50540.398	94406.898	0.535 [1] ✔
T7	60 - 40	ROHN 2.5 X-STR	20.000	2.409	62.6 K=2.00	2.254	1.00	-55970.602	76169.703	0.735 [1] ✔
T8	40 - 20	ROHN 2.5 X-STR	20.000	2.409	62.6	2.254	1.00	-59893.199	76169.703	0.786 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T9	20 - 5	ROHN 2.5 X-STR	15.000	2.378	K=2.00 61.8	2.254	1.00	-59922.301	76718.102	✔ 0.781 [1]
T10	5 - 0	ROHN 2.5 X-STR	5.376	1.075	K=2.00 2.8 K=0.20	2.254	0.91	-63421.000	92278.602	✔ 0.687 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L2x2x1/4	4.183	1.945	59.7 K=1.00	0.938	-6062.810	25192.699	0.241 [1] ✔
T2	160 - 140	ROHN TS1.5x11 ga	4.183	1.945	47.7 K=1.00	0.520	-4765.940	17104.699	0.279 [1] ✔
T3	140 - 120	ROHN TS1.5x16 ga	4.183	1.945	45.7 K=1.00	0.263	-2184.640	8734.080	0.250 [1] ✔
T4	120 - 100	ROHN TS1.5x11 ga	4.183	1.945	47.7 K=1.00	0.520	-3318.190	17104.699	0.194 [1] ✔
T5	100 - 80	ROHN TS1.5x16 ga	4.183	1.945	45.7 K=1.00	0.263	-4272.050	8734.080	0.489 [1] ✔
T6	80 - 60	ROHN TS1.5x11 ga	4.183	1.945	47.7 K=1.00	0.520	-2626.440	17104.699	0.154 [1] ✔
T7	60 - 40	ROHN TS1.5x16 ga	4.183	3.890	91.5 K=1.00	0.263	-4162.860	5939.690	0.701 [1] ✔
T8	40 - 20	ROHN TS1.5x16 ga	4.183	3.890	91.5 K=1.00	0.263	-3044.510	5939.690	0.513 [1] ✔
T9	20 - 5	ROHN TS1.5x16 ga	4.166	3.874	91.1 K=1.00	0.263	-3246.050	5965.130	0.544 [1] ✔

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T10	5 - 0	L4x4x1/4	2.394	2.154	32.5 K=1.00	1.940	-325.117	57548.199	0.006 [1] ✔

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L2x2x1/4	3.420	3.180	97.6 K=1.00	0.938	-466.794	18404.301	0.025 [1] ✔
T2	160 - 140	ROHN TS1.5x11 ga	3.420	3.180	77.9 K=1.00	0.520	-1117.520	13543.100	0.083 [1] ✔
T4	120 - 100	ROHN TS1.5x11 ga	3.420	3.180	77.9 K=1.00	0.520	-196.208	13543.100	0.014 [1] ✔
T5	100 - 80	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-460.587	7043.680	0.065 [1] ✔
T7	60 - 40	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-294.902	7043.680	0.042 [1] ✔
T8	40 - 20	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-865.210	7043.680	0.123 [1] ✔
T9	20 - 5	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-555.168	7043.680	0.079 [1] ✔

[1] $P_u / \phi P_n$ controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L2x2x1/4	3.420	3.180	97.6 K=1.00	0.938	-61.843	18404.301	0.003 [1] ✔
T2	160 - 140	ROHN TS1.5x11 ga	3.420	3.180	77.9 K=1.00	0.520	-97.054	13543.100	0.007 [1] ✔
T3	140 - 120	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-249.881	7043.680	0.035 [1] ✔
T7	60 - 40	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-917.859	7043.680	0.130 [1] ✔
T8	40 - 20	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-379.608	7043.680	0.054 [1] ✔
T10	5 - 0	L4x4x1/4	0.342	0.102	1.5 K=1.00	1.940	-2137.030	60720.898	0.035 [1] ✔

[1] $P_u / \phi P_n$ controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (456)	C12x20.7	3.415	3.295	49.5 K=1.00	6.090	-1375.970	173446.000	0.008

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (457)	C12x20.7	3.415	3.295	49.5 K=1.00	6.090	-1290.610	173446.000	0.007
T1	180 - 160 (460)	C12x20.7	3.415	3.295	49.5 K=1.00	6.090	-1196.870	173446.000	0.007
T1	180 - 160 (461)	C12x20.7	3.415	3.295	49.5 K=1.00	6.090	-1193.130	173446.000	0.007
T1	180 - 160 (464)	C12x20.7	3.415	3.295	49.5 K=1.00	6.090	-1362.000	173446.000	0.008
T1	180 - 160 (465)	C12x20.7	3.415	3.295	49.5 K=1.00	6.090	-1270.690	173446.000	0.007

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	180 - 160 (456)	C12x20.7	-18.629	58.050	0.321	-0.000	9.423	0.000
T1	180 - 160 (457)	C12x20.7	-18.610	58.050	0.321	0.000	9.423	0.000
T1	180 - 160 (460)	C12x20.7	-18.598	58.050	0.320	0.000	9.423	0.000
T1	180 - 160 (461)	C12x20.7	-18.624	58.050	0.321	-0.000	9.423	0.000
T1	180 - 160 (464)	C12x20.7	-18.600	58.050	0.320	0.000	9.423	0.000
T1	180 - 160 (465)	C12x20.7	-18.608	58.050	0.321	0.000	9.423	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160 (456)	C12x20.7	0.008	0.321	0.000	0.325 ✔	1.000	4.8.1 ✔
T1	180 - 160 (457)	C12x20.7	0.007	0.321	0.000	0.324 ✔	1.000	4.8.1 ✔
T1	180 - 160 (460)	C12x20.7	0.007	0.320	0.000	0.324 ✔	1.000	4.8.1 ✔
T1	180 - 160 (461)	C12x20.7	0.007	0.321	0.000	0.324 ✔	1.000	4.8.1 ✔
T1	180 - 160 (464)	C12x20.7	0.008	0.320	0.000	0.324 ✔	1.000	4.8.1 ✔
T1	180 - 160 (465)	C12x20.7	0.007	0.321	0.000	0.324 ✔	1.000	4.8.1 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	ROHN 2.5 X-STR	20.000	2.409	31.3	2.254	27635.699	101409.000	0.273 [1] ✔
T2	160 - 140	ROHN 2.5 X-STR	20.000	2.409	31.3	2.254	9535.130	101409.000	0.094 [1] ✔
T3	140 - 120	ROHN 2.5 X-STR	20.000	2.409	31.3	2.254	24067.500	101409.000	0.237 [1] ✔
T4	120 - 100	ROHN 2.5 X-STR	20.000	2.409	31.3	2.254	24065.900	101409.000	0.237 [1] ✔
T5	100 - 80	ROHN 2.5 X-STR	20.000	2.409	31.3	2.254	2462.900	101409.000	0.024 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L2x2x1/4	4.183	1.945	38.3	0.563	3802.210	24485.100	0.155 [1] ✔
T2	160 - 140	ROHN TS1.5x11 ga	4.183	1.945	47.7	0.520	4300.750	19665.400	0.219 [1] ✔
T3	140 - 120	ROHN TS1.5x16 ga	4.183	1.945	45.7	0.263	2043.630	9931.960	0.206 [1] ✔
T4	120 - 100	ROHN TS1.5x11 ga	4.183	1.945	47.7	0.520	2655.730	19665.400	0.135 [1] ✔
T5	100 - 80	ROHN TS1.5x16 ga	4.183	1.945	45.7	0.263	4155.580	9931.960	0.418 [1] ✔
T6	80 - 60	ROHN TS1.5x11 ga	4.183	1.945	47.7	0.520	1747.180	19665.400	0.089 [1] ✔
T7	60 - 40	ROHN TS1.5x16 ga	4.183	3.890	91.5	0.263	3942.350	9931.960	0.397 [1] ✔
T8	40 - 20	ROHN TS1.5x16 ga	4.183	3.890	91.5	0.263	2788.260	9931.960	0.281 [1] ✔
T9	20 - 5	ROHN TS1.5x16 ga	4.166	3.874	91.1	0.263	3035.180	9931.960	0.306 [1] ✔

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T10	5 - 0	L4x4x1/4	1.026	0.786	7.5	1.940	159.359	62856.000	0.003 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L2x2x1/4	3.420	3.180	62.7	0.563	405.196	24485.100	0.017 [1] ✔
T2	160 - 140	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	1595.010	19665.400	0.081 [1] ✔
T3	140 - 120	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	244.427	9931.960	0.025 [1] ✔
T4	120 - 100	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	1014.050	19665.400	0.052 [1] ✔
T5	100 - 80	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	950.334	9931.960	0.096 [1] ✔
T6	80 - 60	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	1431.480	19665.400	0.073 [1] ✔
T7	60 - 40	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	265.037	9931.960	0.027 [1] ✔
T8	40 - 20	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	961.160	9931.960	0.097 [1] ✔
T9	20 - 5	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	653.211	9931.960	0.066 [1] ✔
T10	5 - 0	L4x4x1/4	3.078	2.838	27.2	1.940	3142.400	62856.000	0.050 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L2x2x1/4	3.420	3.180	62.7	0.563	1967.310	24485.100	0.080 [1] ✔
T2	160 - 140	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	836.573	19665.400	0.043 [1] ✔
T3	140 - 120	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	743.555	9931.960	0.075 [1] ✔
T4	120 - 100	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	783.786	19665.400	0.040 [1] ✔
T5	100 - 80	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	797.815	9931.960	0.080 [1] ✔
T6	80 - 60	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	744.985	19665.400	0.038 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	60 - 40	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	1184.000	9931.960	0.119 [1]
T8	40 - 20	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	573.874	9931.960	0.058 [1]
T9	20 - 5	L3x3x1/2	3.420	3.180	42.5	1.781	10639.700	77484.398	0.137 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	2L2x2x1/4x3/8 2L 'a' > 18.377 in - 481	3.420	3.180	62.7	1.410	7436.370	68737.500	0.108 [1]
T3	140 - 120	4x3/8	3.420	3.180	352.6	1.125	5537.450	54843.801	0.101 [1]
T5	100 - 80	2L2x2x1/4x3/8 2L 'a' > 18.377 in - 473	3.420	3.180	62.7	1.410	10054.700	68737.500	0.146 [1]
T7	60 - 40	4x3/8	3.420	3.180	352.6	1.125	6064.050	54843.801	0.111 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	180 - 160	2L2x2x1/4x3/8	0.000	2.779	0.000	0.000	4.711	0.000
T3	140 - 120	4x3/8	0.000	5.625	0.000	0.000	0.527	0.000
T5	100 - 80	2L2x2x1/4x3/8	0.011	2.779	0.004	0.000	4.711	0.000
T7	60 - 40	4x3/8	0.000	5.625	0.000	0.000	0.527	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160	2L2x2x1/4x3/8	0.108	0.000	0.000	0.108 [1]	1.000	4.8.1
T3	140 - 120	4x3/8	0.101	0.000	0.000	0.101 [1]	1.000	4.8.1
T5	100 - 80	2L2x2x1/4x3/8	0.146	0.004	0.000	0.146 [1]	1.000	4.8.1

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T7	60 - 40	4x3/8	0.111	0.000	0.000	0.111 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (456)	C12x20.7	3.415	3.295	49.5	6.090	282.830	197316.000	0.001
T1	180 - 160 (457)	C12x20.7	3.415	3.295	49.5	6.090	454.689	197316.000	0.002
T1	180 - 160 (460)	C12x20.7	3.415	3.295	49.5	6.090	462.502	197316.000	0.002
T1	180 - 160 (461)	C12x20.7	3.415	3.295	49.5	6.090	464.926	197316.000	0.002
T1	180 - 160 (464)	C12x20.7	3.415	3.295	49.5	6.090	294.907	197316.000	0.001
T1	180 - 160 (465)	C12x20.7	3.415	3.295	49.5	6.090	473.392	197316.000	0.002

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	180 - 160 (456)	C12x20.7	-18.159	58.050	0.313	-0.000	9.423	0.000
T1	180 - 160 (457)	C12x20.7	-18.322	58.050	0.316	0.000	9.423	0.000
T1	180 - 160 (460)	C12x20.7	-18.336	58.050	0.316	0.000	9.423	0.000
T1	180 - 160 (461)	C12x20.7	-18.376	58.050	0.317	-0.000	9.423	0.000
T1	180 - 160 (464)	C12x20.7	-18.170	58.050	0.313	0.000	9.423	0.000
T1	180 - 160 (465)	C12x20.7	-18.380	58.050	0.317	0.000	9.423	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160 (456)	C12x20.7	0.001	0.313	0.000	0.314 ✔	1.000	4.8.1 ✔
T1	180 - 160 (457)	C12x20.7	0.002	0.316	0.000	0.317 ✔	1.000	4.8.1 ✔
T1	180 - 160 (460)	C12x20.7	0.002	0.316	0.000	0.317 ✔	1.000	4.8.1 ✔
T1	180 - 160 (461)	C12x20.7	0.002	0.317	0.000	0.318 ✔	1.000	4.8.1 ✔
T1	180 - 160 (464)	C12x20.7	0.001	0.313	0.000	0.314 ✔	1.000	4.8.1 ✔
T1	180 - 160 (465)	C12x20.7	0.002	0.317	0.000	0.318 ✔	1.000	4.8.1 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
						✔		

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	180 - 160	Leg	ROHN 2.5 X-STR	1	-32278.801	94406.898	34.2	Pass
		Diagonal	L2x2x1/4	14	-6062.810	25192.699	24.1 48.8 (b)	Pass
		Top Girt	L2x2x1/4	5	-466.794	18404.301	2.5 4.4 (b)	Pass
		Bottom Girt	L2x2x1/4	7	1967.310	24485.100	8.0 21.6 (b)	Pass
		Guy A@162.523	1/2	463	8143.130	16140.000	50.5	Pass
		Guy A@162.523	7/8	483	22409.000	47820.000	46.9	Pass
		Guy B@162.523	1/2	459	8128.350	16140.000	50.4	Pass
		Guy B@162.523	7/8	482	22400.801	47820.000	46.8	Pass
		Guy C@162.523	1/2	454	8144.280	16140.000	50.5	Pass
		Guy C@162.523	7/8	478	22430.100	47820.000	46.9	Pass
		Top Guy Pull-Off@162.523	2L2x2x1/4x3/8	481	7436.370	68737.500	10.8	Pass
		Torque Arm Top@162.523	C12x20.7	456	-1375.970	173446.000	32.5	Pass
T2	160 - 140	Leg	ROHN 2.5 X-STR	58	-40394.699	94406.898	42.8	Pass
		Diagonal	ROHN TS1.5x11 ga	113	-4765.940	17104.699	27.9 59.9 (b)	Pass
		Top Girt	ROHN TS1.5x11 ga	62	-1117.520	13543.100	8.3 20.1 (b)	Pass
		Bottom Girt	ROHN TS1.5x11 ga	64	836.573	19665.400	4.3 10.5 (b)	Pass
T3	140 - 120	Leg	ROHN 2.5 X-STR	116	-63571.602	93644.102	67.9	Pass
		Diagonal	ROHN TS1.5x16 ga	153	-2184.640	8734.080	25.0 49.1 (b)	Pass
		Top Girt	ROHN TS1.5x16 ga	120	244.427	9931.960	2.5 5.9 (b)	Pass
		Bottom Girt	ROHN TS1.5x16 ga	121	743.555	9931.960	7.5 17.9 (b)	Pass
		Guy A@132.159	9/16	471	13844.800	21000.000	65.9	Pass
		Guy B@132.159	9/16	470	13863.500	21000.000	66.0	Pass
		Guy C@132.159	9/16	466	13872.500	21000.000	66.1	Pass
		Top Guy Pull-Off@132.159	4x3/8	467	5537.450	54843.801	10.1	Pass
T4	120 - 100	Leg	ROHN 2.5 X-STR	173	-64091.398	93630.797	68.5	Pass
		Diagonal	ROHN TS1.5x11 ga	182	-3318.190	17104.699	19.4 41.7 (b)	Pass
		Top Girt	ROHN TS1.5x11 ga	177	1014.050	19665.400	5.2 12.8 (b)	Pass
		Bottom Girt	ROHN TS1.5x11 ga	178	783.786	19665.400	4.0 9.9 (b)	Pass
T5	100 - 80	Leg	ROHN 2.5 X-STR	231	-49441.102	92189.898	53.6	Pass
		Diagonal	ROHN TS1.5x16 ga	245	-4272.050	8734.080	48.9 99.8 (b)	Pass
		Top Girt	ROHN TS1.5x16 ga	234	950.334	9931.960	9.6 22.8 (b)	Pass
		Bottom Girt	ROHN TS1.5x16 ga	235	797.815	9931.960	8.0 19.2 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Guy A@82.5234	3/4	477	25088.199	34980.000	71.7	Pass
		Guy B@82.5234	3/4	476	25107.699	34980.000	71.8	Pass
		Guy C@82.5234	3/4	472	25102.801	34980.000	71.8	Pass
		Top Guy Pull-Off@82.5234	2L2x2x1/4x3/8	473	10054.700	68737.500	14.6	Pass
T6	80 - 60	Leg	ROHN 2.5 X-STR	288	-50540.398	94406.898	53.5	Pass
		Diagonal	ROHN TS1.5x11 ga	342	-2626.440	17104.699	15.4 33.0 (b)	Pass
		Top Girt	ROHN TS1.5x11 ga	291	1431.480	19665.400	7.3 18.0 (b)	Pass
		Bottom Girt	ROHN TS1.5x11 ga	293	744.985	19665.400	3.8 9.4 (b)	Pass
T7	60 - 40	Leg	ROHN 2.5 X-STR	345	-55970.602	76169.703	73.5	Pass
		Diagonal	ROHN TS1.5x16 ga	361	-4162.860	5939.690	70.1 94.6 (b)	Pass
		Top Girt	ROHN TS1.5x16 ga	348	-294.902	7043.680	4.2 6.4 (b)	Pass
		Bottom Girt	ROHN TS1.5x16 ga	349	-917.859	7043.680	13.0 28.4 (b)	Pass
		Guy A@49.75	1/2	489	11474.000	16140.000	71.1	Pass
		Guy B@49.75	1/2	488	11462.600	16140.000	71.0	Pass
		Guy C@49.75	1/2	484	11463.700	16140.000	71.0	Pass
		Top Guy Pull-Off@49.75	4x3/8	486	6064.050	54843.801	11.1	Pass
T8	40 - 20	Leg	ROHN 2.5 X-STR	378	-59893.199	76169.703	78.6	Pass
		Diagonal	ROHN TS1.5x16 ga	406	-3044.510	5939.690	51.3 66.9 (b)	Pass
		Top Girt	ROHN TS1.5x16 ga	379	-865.210	7043.680	12.3 23.1 (b)	Pass
		Bottom Girt	ROHN TS1.5x16 ga	384	573.874	9931.960	5.8 13.8 (b)	Pass
T9	20 - 5	Leg	ROHN 2.5 X-STR	411	-59922.301	76718.102	78.1	Pass
		Diagonal	ROHN TS1.5x16 ga	420	-3246.050	5965.130	54.4 72.9 (b)	Pass
		Top Girt	ROHN TS1.5x16 ga	414	-555.168	7043.680	7.9 15.7 (b)	Pass
		Bottom Girt	L3x3x1/2	417	10639.700	77484.398	13.7 42.8 (b)	Pass
T10	5 - 0	Leg	ROHN 2.5 X-STR	438	-63421.000	92278.602	68.7	Pass
		Horizontal	L4x4x1/4	446	-198.159	60294.602	4.0	Pass
		Top Girt	L4x4x1/4	441	3142.400	62856.000	5.0	Pass
		Bottom Girt	L4x4x1/4	444	-2131.170	60720.898	18.0	Pass
						Summary		
						Leg (T8)	78.6	Pass
						Diagonal (T5)	99.8	Pass
						Horizontal (T10)	4.0	Pass
						Top Girt (T8)	23.1	Pass
						Bottom Girt (T9)	42.8	Pass
						Guy A (T5)	71.7	Pass
						Guy B (T5)	71.8	Pass
						Guy C (T5)	71.8	Pass
						Top Guy Pull-Off (T5)	14.6	Pass
						Torque Arm Top (T1)	32.5	Pass
						Bolt Checks	99.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						RATING =	**99.8**	**Pass**

SITE ID: CT03XC111
SITE NAME: 227 BOOMBRIDGE ROAD

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

DO MACRO PROJECT

SITE INFORMATION

ADDRESS:	227 BOOM BRIDGE ROAD NORTH STONINGTON, CT 06359
JURISDICTION:	TOWN OF NORTH STONINGTON
COUNTY :	NEW LONDON
PROPERTY OWNER:	LEWIS DAVID BABCOCK LLC 273 BOOM BRIDGE ROAD NORTH STONINGTON, CT 06359
TOWER OWNER:	NORTHEAST TOWERS, INC 199 BRICKYARD ROAD FARMINGTON, CT 06032 PHONE: 860-677-1999
APPLICANT:	SPRINT 201 STATE ROUTE 17 NORTH RUTHERFORD, NJ 07070
LATITUDE (NAD 83):	N 41.42881°
LONGITUDE (NAD 83):	W 71.80911°
CURRENT USE:	UNMANNED TELECOMMUNICATIONS FACILITY
PROPOSED USE:	NO CHANGE
UTILITY COMPANY:	CONNECTICUT LIGHT AND POWER PHONE: 800-266-2000

RF CONFIGURATION

THE CONTRACTOR SHALL OBTAIN THE LATEST RF DATA SHEET AND CONFIRM SAME WITH THE SPRINT CONSTRUCTION MANAGER PRIOR TO START OF CONSTRUCTION.

PROJECT CONTACTS

	NAME:	COMPANY:	PHONE #:
ENGINEER:	JEREMY MCKEON	MASER CONSULTING P.A.	973.398.3110
CONSTRUCTION:	TOM JUPIN	CHERUNDOLO CONSULTING	973.819.9033

STRUCTURAL STATEMENT

THE PROPOSED ANTENNA AND EQUIPMENT INSTALLATION SHALL BE EVALUATED INCLUDING THE NEW LOAD CONDITIONS ON THE SUPPORTING ELEMENTS OF THE EXISTING STRUCTURE. THESE PLANS HAVE BEEN DEVELOPED FOR THE PROPOSED TELECOMMUNICATION FACILITY TO BE OWNED OR LEASED BY SPRINT IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED BY CHERUNDOLO CONSULTING. MASER HAS INCORPORATED THE SCOPE OF WORK WITHIN THESE PLANS. ELEMENTS OF THE STRUCTURE AFFECTED BY THE SCOPE OF WORK SHALL BE ANALYZED UNDER SEPARATE COVER. MASER ASSUMES NO RESPONSIBILITY FOR ANY ELEMENTS OF THE SITE NOT AFFECTED BY THE SCOPE OR FOR CHANGES TO THE SCOPE OF WORK NOT SPECIFICALLY SHOWN ON THESE DRAWINGS.

APPROVALS

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

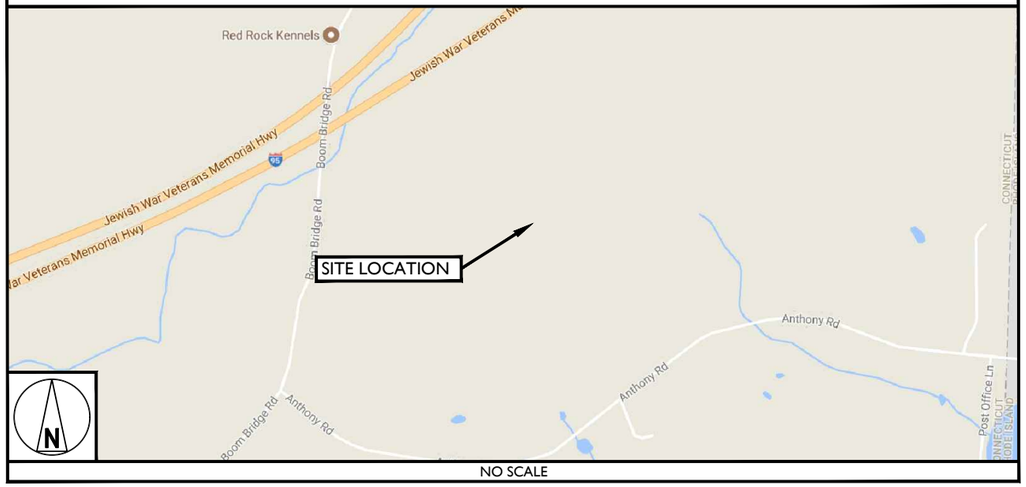
CONSTRUCTION:_____ DATE: _____

LEASING/SITE ACQUISITION: _____ DATE: _____

RF ENGINEERING: _____ DATE: _____

LANDLORD/PROPERTY OWNER: _____ DATE: _____

LOCAL MAP



NO SCALE

DRIVING DIRECTIONS

FROM SPRINT OFFICES, MAHWAH, NJ: TAKE INTERNATIONAL BLVD AND LEISURE LN TO NJ-17 N. HEAD NORTHWEST ON INTERNATIONAL BLVD/PARK ST TOWARD QUEENSLAND RD. CONTINUE TO FOLLOW INTERNATIONAL BLVD. INTERNATIONAL BLVD TURNS SLIGHTLY LEFT AND BECOMES PARK ST. TURN RIGHT ONTO PARK LN. CONTINUE ONTO LEISURE LN. FOLLOW I-287 E AND CT-15 N TO I-95 N IN NORTH STONINGTON. MERGE ONTO NJ-17 N. USE THE LEFT 3 LANES TO MERGE ONTO I-287 N/NJ-17 N TOWARD NY THRUWAY. ENTERING NEW YORK. USE THE RIGHT 2 LANES TO MERGE ONTO I-287 E/I-87 S TOWARD TAPPAN ZEE BR/NEW YORK CITY. KEEP LEFT AT THE FORK TO CONTINUE ON I-287 E, FOLLOW SIGNS FOR WHITE PLAINS/RYE. TAKE EXIT 9N-95 FOR HUTCHINSON PKWY TOWARD WHITESTONE BRIDGE/MERRITT PKWY. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR WESTCHESTER AVE AND MERGE ONTO WESTCHESTER AVE. USE THE RIGHT LANE TO TAKE THE HUTCHINSON PKWY N RAMP TO MERRITT PKWY. MERGE ONTO HUTCHINSON RIVER PKWY N. KEEP RIGHT AT THE FORK TO STAY ON HUTCHINSON RIVER PKWY N. ENTERING CONNECTICUT . CONTINUE ONTO CT-15 N. TAKE EXIT 54 TOWARD INTERSTATE 95/U.S. 1/MILFORD/NEW LONDON MERGE ONTO MILFORD PKWY. TAKE THE INTERSTATE 95 N EXIT TOWARD NEW LONDON/NEW HAVEN. MERGE ONTO I-95 N. KEEP RIGHT AT THE FORK TO STAY ON I-95 N, FOLLOW SIGNS FOR NEW LONDON/PROVIDENCE.

DRAWING INDEX

NYC DOB NUMBER	SHEET TITLE	REV.
T-001.00	TITLE SHEET	0
ANT-001.00	GENERAL NOTES - 1	0
ANT-002.00	GENERAL NOTES - 2	0
ANT-003.00	GENERAL NOTES - 3	0
ANT-004.00	SITE PLAN	0
ANT-005.00	EQUIPMENT PLAN AND ELEVATION	0
ANT-006.00	ANTENNA ORIENTATION PLANS	0
ANT-007.00	DETAILS	0
ANT-008.00	ANTENNA SCHEDULE, WIRING DIAGRAM, BILL OF MATERIALS AND NOTES	0
ANT-009.00	FIBER PLUMBING DIAGRAMS - 1	0
ANT-010.00	FIBER PLUMBING DIAGRAMS - 2	0
ANT-011.00	CABLE COLOR CODING, DC POWER DETAILS & PANEL SCHEDULES	0
ANT-012.00	ELECTRICAL AND GROUNDING NOTES	0
ANT-013.00	GROUNDING SCHEMATIC AND DETAILS	0

APPLICABLE BUILDING CODES & STANDARDS

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

1. 2016 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2012 INTERNATIONAL BUILDING CODE
2. TIA/EIA-222-G OR LATEST EDITION
3. NFPA 780-LIGHTNING PROTECTION CODE 201
4. 2014 NATIONAL ELECTRIC CODE OR LATEST EDITION
5. ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES MOST RECENT EDITIONS
6. CT BUILDING CODE
7. LOCAL BUILDING CODE
8. CITY/COUNTY ORDINANCES

SCOPE OF WORK

SPRINT PROPOSED TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- INSTALL (3) NEW PANEL ANTENNAS
- INSTALL (9) NEW RRH'S
- INSTALL (30) JUMPER CABLES
- INSTALL (4) HYBRID CABLES
- RELOCATE (3) 1900 RRH'S TO TOWER

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RUTHERFORD, NJ 07070
PHONE: (201) 684-4000 FAX: (201) 684-4223

Cherundolo Consulting

Charles Cherundulo Consulting, Inc.
713 Clover Lane
Moscow, PA 18444
Phone: 973-207-4248
Fax: 570-842-5592

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

SCALE :	JOB NUMBER :
AS SHOWN	17924001A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17		DTS	FEP

STATE OF CONNECTICUT
PETROS T. SOUKALAS
LICENSED PROFESSIONAL ENGINEER

PETROS T. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0025[illegible]

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

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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

SHEET TITLE :
TITLE SHEET

SHEET NUMBER :
T-001.00

GENERAL NOTES

1. CONTRACTOR SHALL NOT COMMENCE ANY WORK UNTIL HE OBTAINS, AT HIS OWN EXPENSE, ALL INSURANCE REQUIRED BY SPRINT, THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
2. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND EACH OF THE DRAWINGS HAVE BEEN REVISED TO INDICATE "ISSUED FOR CONSTRUCTION.
3. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES OR OTHER PUBLIC AUTHORITIES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
5. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS FOR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THIS PROJECT IN ACCORDANCE WITH THE OVERALL INTENT OF THESE DRAWINGS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING DEMOLITION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF REMOVAL OF THIS FACILITY.
7. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR AS REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
8. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE REMOVED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
9. THE DEMOLITION CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL REMOVAL MEANS AND METHODS. THE DEMOLITION CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.
10. THE CONTRACTOR IS TO REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. THE CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND RELATED PARTIES. THE SUBCONTRACTOR SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT EFFECTS THEIR WORK.
11. THE CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON THE SITE AT ALL TIMES AND INSURE THE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA CONTRACTOR FURNISH 3 SETS OF REDLINE "AS-REMOVED" DRAWINGS TO SPRINT UPON COMPLETION OF THE WORK.
12. REPAIR MATERIALS INSTALLED SHALL MEET REQUIREMENTS OF CONTRACTORS DOCUMENTS. NO SUBSTITUTIONS ARE ALLOWED.
13. THE CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
14. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS EXISTING WHICH ARE NOT FOUND TO BE IN THE FIELD.
15. DEMOLITION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST-ACCEPTED PRACTICE. ALL SURFACES SHALL BE REPAIRED TO MATCH THEIR SURROUNDINGS AND PROVIDE WEATHER TIGHT SEAL ON SAME DAY AS REMOVAL.
16. THE CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
18. THE CONTRACTOR SHALL REPAIR ALL EXISTING SURFACES DAMAGED DURING REMOVAL SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
19. THE CONTRACTOR SHALL KEEP CONTRACT AREA CLEAN, HAZARD FREE AND DISPOSE OF ALL DEBRIS AND RUBBISH. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
20. BEFORE FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT, TEMPORARY WORKS, UNUSED AND USELESS MATERIALS, RUBBISH AND TEMPORARY STRUCTURES.

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SCALE :	JOB NUMBER :
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A	08/18/17	DRAFT	DTS	FEP

STATE OF CONNECTICUT
PETROS T. SOUKALAS
LICENSED PROFESSIONAL ENGINEER

PETROS T. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0032[illegible]

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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

SHEET TITLE :
GENERAL NOTES - 1

SHEET NUMBER :
ANT-001.00

SECTION 01 100 - SCOPE OF WORK

THE WORK:
THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE CONSTRUCTION DRAWINGS AND ASSOCIATED OUTLINE SPECIFICATIONS AND THE SITE SPECIFIC WORK ORDER, DESCRIBE THE WORK TO BE PERFORMED BY THIS CONSTRUCTION CONTRACTOR (SUPPLIER).

RELATED DOCUMENTS:
A. THE REQUIREMENTS OF EACH SECTION OF THIS SPECIFICATION APPLY TO ALL SECTIONS, INDIVIDUALLY AND COLLECTIVELY.
B. RELATED DOCUMENTS: THE CONTRACTOR SHALL COMPLY WITH THE MOST CURRENT VERSION OF THE FOLLOWING SUPPLEMENTAL REQUIREMENTS FOR INSTALLATION AND TESTING.
   1.EN-2012-001: (FIBER OPTIC, DC CABLE, AND DC CIRCUIT BREAKER TAGGING STANDARDS)
   2.TS-0200 - (TRANSMISSION ANTENNA LINE ACCEPTANCE STANDARDS)
   3.EL-0568: (FIBER TESTING POLICY)
   4.NP-312-201: (EXTERIOR GROUNDING SYSTEM TESTING)
   5.NP-760-500: ETHERNET, MICROWAVE, TESTING AND ACCEPTANCE

PRECEDENCE:
SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

NATIONALLY RECOGNIZED CODES AND STANDARDS:

THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
C. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY -GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
D. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE - "NEC") AND NFPA 101 (LIFE SAFETY CODE).
E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
G. AMERICAN CONGRETE INSTITUTE (ACI)
H. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
I. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
J. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
K. PORTLAND CEMENT ASSOCIATION (PCA)
L. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
M. BRICK INDUSTRY ASSOCIATION (BIA)
N. AMERICAN WELDING SOCIETY (AWS)
O. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
P. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
Q. DOOR AND HARDWARE INSTITUTE (DHI)
R. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
S. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

DEFINITIONS:
A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B. COMPANY: "SPRINT"; SPRINT NEXTEL CORPORATION AND IT'S OPERATING ENTITIES.
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D. CONTRACTOR: CONSTRUCTION CONTRACTOR, SUPPLIER, CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
F. CONSTRUCTION MANAGER - ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT.

SITE FAMILIARITY:
CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

POINT OF CONTACT:
COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

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

DRAWINGS REQUIRED AT JOBSITE:
THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.
B. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

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

UTILITY SERVICES:
WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

PERMITS/FEES:
WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

CONTRACTOR:
CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:
CONTRACTOR WILL UTILIZE ITS BEST EFFORTS TO WORK WITH SPRINT ELECTRONIC PROJECT MANAGEMENT SYSTEMS. CONTRACTOR UNDERSTANDS THAT SUFFICIENT INTERNET ACCESS, EQUIVALENT TO "BROADBAND" OR BETTER, IS REQUIRED TO TIMELY AND EFFECTIVELY UTILIZE SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS AND AGREES TO MAINTAIN APPROPRIATE CONNECTIONS FOR CONTRACTOR'S STAFF AND OFFICES THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS

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

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

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

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

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

FURNISHED MATERIALS:
COMPANY FURNISHED MATERIALS AND EQUIPMENT TO BE INSTALLED BY THE CONTRACTOR (OFIC) IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.

RECEIPT OF MATERIAL AND EQUIPMENT:
A. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
   1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
   2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
   3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
B. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
C. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
D. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

DELIVERABLES:
A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.
B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

SECTION 01 300 - CELL SITE CONSTRUCTION

NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S ISSUANCE OF THE WORK ORDER.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

GENERAL REQUIREMENTS FOR CONSTRUCTION:
A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.
B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.
C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
   1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
   2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.
D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION

FUNCTIONAL REQUIREMENTS:
A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. CONTRACTOR SHALL TAKE ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.
B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.
C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES
D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
   2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
   3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND BACKHAUL (FIBER, COPPER, OR MICROWAVE).
   4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
   5. INSTALL ABOVE GROUND GROUNDING SYSTEMS, CONDUIT AND BOXES.
   6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
   7. INSTALL "H-FRAMES", CABINETS AND PADS AND PLATFORMS AS INDICATED.
   8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
   9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
   10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
   11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
   12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
   13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
   14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
   15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
   16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
   17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
   18. CONDUCT ALL REQUIRED TESTS AND INSPECTIONS
   19. PERFORM, DOCUMENT, AND CLOSE OUT ALL JURISDICTIONAL PERMITTING REQUIREMENTS AND ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
   20. PERFORM ALL ADDITIONAL WORK AS IDENTIFIED IN SCOPE OF SERVICES ATTACHED TO THE SUPPLIER AGREEMENT FOR THIS PROJECT. THIS WORK MAY INCLUDE COMMISSIONING, INTEGRATION, SPECIAL WAREHOUSING, REVERSE LOGISTICS ACTIVITIES, ETC. PERFORM COMMISSIONING AND INTEGRATION ACTIVITIES PER APPLICABLE MOPS.

DELIVERABLES:
A. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED TEST REPORTS AND DOCUMENTATION INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
   1. PRODUCT SPECIFICATIONS FOR MATERIALS OR SPECIAL CONSTRUCTION IF REQUESTED BY SPRINT
   2. ACTUALIZE ALL CONSTRUCTION RELATED MILESTONES IN SITERRA AND COMPLETE ALL ON-LINE FORMS AND COMPLETE DOCUMENT UP-LOADS. UPLOAD ALL REQUIRED CLOSEOUT DOCUMENTS AND FINAL SITE PHOTOS
   3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT LEFT ON SITE INSIDE BASE OF MAIN RF CABINET IN A PROTECTIVE POUCH.
   4. ALL REQUIRED TEST REPORTS.
   5. REQUIRED CLOSEOUT DOCUMENTATION INCLUDING BUT NOT LIMITED TO:
      a. ALL JURISDICTIONAL PERMITTING AND OCCUPANCY INFORMATION
      b. PDF SCAN OF REDLINES PRODUCED IN THE FIELD
      c. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS
      d. LIEN WAIVERS
      e. FINAL PAYMENT APPLICATION
      f. REQUIRED FINAL CONSTRUCTION PHOTOS
      g. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
      h. LISTS OF SUBCONTRACTORS
B. PROVIDE ADDITIONAL DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.
   1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
   2. PROJECT PROGRESS REPORTS.
   3. PRE-CONSTRUCTION MEETING NOTES.

SECTION 01 400 - TESTS, INSPECTIONS, SUBMITTALS, AND PROJECT CLOSEOUT

TESTS AND INSPECTIONS:
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. COAX SWEEPS AND FIBER TESTS PER TS-0200 (CURRENT VERSION) ANTENNA LINE ACCEPTANCE STANDARDS
   2. POST CONSTRUCTION HEIGHT VERIFICATION, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
   3. CONCRETE BREAK TESTS
   4. SITE RESISTANCE TO EARTH TEST
   5. STRUCTURAL BACKFILL COMPACTION TESTS
   6. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
   7. ADDITIONAL TESTING AS REQUIRED ELSEWHERE IN THIS SPECIFICATION.

SUBMITTALS:
A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.
B. UPLOAD THE FOLLOWING TO SITERRA AS APPLICABLE INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   1. CONCRETE MIX-DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
   2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
   3. CHEMICAL GROUNDING SYSTEM .
   4. REINFORCEMENT CERTIFICATIONS
   5. STRUCTURAL BACKFILL TEST RESULTS
   6. SWEEP AND FIBER TESTS
   7. ANTENNA AZIMUTH AND DOWN-TILT VERIFICATION
   8. POST CONSTRUCTION HEIGHT VERIFICATION
   9. ADDITIONAL SUBMITTALS MAY BE REQUIRED FOR SPECIAL CONSTRUCTION OR MINOR MATERIALS
C. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

TESTING BY THIRD PARTY AGENCY:
A. EMPLOY AN AGENCY OF ENGINEERS AND SCIENTISTS WHO IS REGULARLY ENGAGED IN FIELD AND LABORATORY TESTING AND ANALYSIS. AGENCY SHALL HAVE BEEN IN BUSINESS A MINIMUM OF FIVE YEARS, AND BE LICENSED AS PROFESSIONAL ENGINEERS IN THE STATE WHERE THE PROJECT IS LOCATED. AGENCY IS SUBJECT TO APPROVAL BY COMPANY.
   1. AGENCY MUST HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
   2. AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
   3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
B. REQUIRED THIRD PARTY TESTS:
   1. SITE RESISTANCE TO EARTH TEST PER NP-312-201
   2. CONCRETE CYLINDER BREAK TESTS FOR TOWER PIER AND ANCHORS PER NATIONALLY RECOGNIZED STANDARDS
   3. STRUCTURAL SOILS COMPACTION TESTS PER NATIONALLY RECOGNIZED STANDARDS
   4. REBAR PLACEMENT VERIFICATION WITH REPORT
   5. TESTING TENSION STUDY FOR ROCK ANCHORS
   6. ALL THIRD PARTY TESTS AS REQUIRED BY LOCAL JURISDICTION
C. REQUIRED TESTS BY CONTRACTOR
   1. COAX SWEEP TESTS PER SPRINT STANDARD TS-0200
   2. FIBER TESTS PER SPRINT STANDARD EL-0568
   3. MICROWAVE LINK TESTS PER NP-760-500
   4. ANTENNA AZIMUTHS AND DOWN TILT USING ELECTRONIC ALIGNMENT TOOL PER ANTENNA INSTALLATION SPECIFICATION HEREIN.
   5. POST CONSTRUCTION HEIGHT VERIFICATION AS REQUIRED HEREWITH IN THE TOWER INSTALLATION SPECIFICATIONS.
   6. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED HEREWITH IN THE ASPHALT PAVING SPECIFICATIONS.
   7. FIELD QUALITY CONTROL TESTING AS SPECIFIED HEREWITH IN THE CONCRETE PAVING SPECIFICATIONS.
   8. TESTING REQUIRED HEREWITH UNDER SPECIFICATIONS FOR AGGREGATE BASE FOR ROADWAYS
   9. ALL OTHER TESTS REQUIRED BY LOCAL JURISDICTION
D. INSPECTIONS BY COMPANY: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN INSPECTION ACTIVITIES, FINAL ACCEPTANCE / PUNCH WALK REVIEW, AND/OR AS A RESULT OF TESTING
E. SPRINT RESERVES THE RIGHT TO INSPECT THE CONSTRUCTION SITE AT ANY TIME VIA SITE WALKS AND/OR PHOTO REVIEWS. CONTRACTOR SHALL GIVE SPRINT 24 HOURS NOTICE PRIOR TO THE COMMENCEMENT OF THE FOLLOWING CONSTRUCTION ACTIVITIES AND PHOTOGRAPHS OF THE IN-PROGRESS WORK.
   1. GROUNDING SYSTEM AND BURIED UTILITIES INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
   2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
   3. COMPACTION OF BACKFILL MATERIALS, AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS, ASPHALT PAVING, AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
   4. PRE AND POST CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES. PRIOR TO CONSTRUCTION ACTIVITIES AND AFTER CONSTRUCTION IS COMPLETE, PROVIDE PHOTOGRAPHIC DOCUMENTATION OF ROOF, FLASHINGS, AND PARAPETS, BOTH BEFORE AND AFTER CONSTRUCTION IS COMPLETE.
   5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
   6. TOWER TOP AND INACCESSIBLE EQUIPMENT (RRUS, ANTENNAS, AND CABLING): PROVIDE PHOTOS OF THE BACKS OF ALL ANTENNAS, RRUS, COMBINERS, FILTERS, FIBER AND DC CABLING, CABLE COLOR CODING, EQUIPMENT GROUNDING AND CONNECTOR WATER PROOFING INCLUDING NAME PLATE AND SERIAL NUMBER FOR ALL SERIALIZED EQUIPMENT.

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0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17	[illegible]	DTS	FEP

STATE OF CONNECTICUT — PETROS P. TSOUKALAS — CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0025[illegible]

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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

SHEET TITLE : GENERAL NOTES - 2

SHEET NUMBER : ANT-002.00

PROJECT CLOSEOUT:
A. FINAL ACCEPTANCE PUNCH WALK AND INSPECTION: AS IDENTIFIED IN THE SCOPE OF SERVICES, SPRINT WILL CONDUCT A FINAL PUNCH WALK OR FINAL DESK TOP PHOTO REVIEW (SITE MODIFICATIONS). PUNCH WALKS MUST BE SCHEDULED IN ADVANCE AS REQUIRED. AT THE PUNCH WALK / REVIEW, SPRINT MAY IDENTIFY CRITICAL DEFICIENCIES WHICH MUST BE CORRECTED PRIOR TO PUTTING SITE ON AIR. MINOR DEFICIENCIES MUST BE CORRECTED WITHIN 30 DAYS EXCEPT AS OTHERWISE REQUIRED. VERIFICATIONS OF CORRECTIONS MAY BE MADE BY COMPANY DURING A REPEAT SITE WALK OR DESK TOP PHOTO REVIEW AT COMPANY'S SOLE DISCRETION.
B. CLOSEOUT DOCUMENTATION: ALL CLOSEOUT DOCUMENTATION AND PHOTOGRAPHS SHALL BE UPLOADED PRIOR TO FINAL ACCEPTANCE. SPRINT WILL REVIEW CLOSEOUT DOCUMENTATION FOR PRESENCE AND CONTENT. CLOSEOUT DOCUMENTATION SHALL INCLUDE BUT IS NOT LIMITED TO THE FOLLOWING AS APPLICABLE:
1. COAX SWEEP TESTS:
2. FIBER TESTS:
3. JURISDICTION FINAL INSPECTION DOCUMENTATION
4. REINFORCEMENT CERTIFICATION (MILL CERTIFICATION)
5. CONCRETE MIX DESIGN AND PRODUCT DATA (TOWER FOUNDATION)
6. LIEN WAIVERS AND RELEASES.
7. POST -CONSTRUCTION HEIGHT VERIFICATION
8. JURISDICTION CERTIFICATE OF OCCUPANCY
9. ELECTRONIC ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
10. STRUCTURAL BACKFILL TEST RESULTS (IF APPLICABLE)
11. CELL SITE UTILITY SETUP
12. AS-BUILT REDLINE CONSTRUCTION DRAWINGS (PDF SCAN OF FIELD MARKS)
13. AS-BUILT CONSTRUCTION DRAWINGS IN DWG AND PDF FORMATS
14. LIST OF SUB CONTRACTORS
15. APPROVED PERMITTING DOCUMENTS
16. FINAL SITE PHOTOS UP-LOADED TO SITERRA. INCLUDE THE FOLLOWING AS APPLICABLE:
    a. TOWER, ANTENNAS, RRUS, AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX/CABLE LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING - TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
    b. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
    c. SITE LAYOUT - PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
    d. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.

PROJECT PHOTOGRAPHS:
A. PROVIDE PROJECT CLOSEOUT GENERAL ARRANGEMENT PHOTOS OF ALL NEW WORK. THE FOLLOWING LIST REPRESENTS MINIMUM REQUIREMENTS AND MINIMUM QUANTITY. ADDITIONAL PHOTOS MAY BE REQUIRED TO ADEQUATELY DOCUMENT THE WORK.
1. ASR AND RF MPE SIGNAGE (IF NOT IN PLACE, SUPPLIER NOTIFIES EMS FIELD REPRESENTATIVE)
2. BACK OF ANTENNAS AND RRUS (1 EACH SECTOR)
3. BACK OF ANTENNAS AND RRUS (1 EACH SECTOR) CLOSE UP SHOWING WEATHERPROOFING AND GROUNDING (AS REQUIRED). CLOSE-UP OF BACK SIDE OF EACH PERMANENT RRU SHOWING SERIAL NUMBER/BAR CODE.
4. VIEW (1 EACH SECTOR) ALONG THE AZIMUTH AND TILT OF THE ANTENNAS
5. TOP OF TOWER FROM GROUND, 1 EACH SECTOR
6. MAINLINE HYBRID CABLE ROUTE DOWN TOWER SHOWING FASTENERS AND SUPPORT
7. MAINLINE/HYBRID CABLE ROUTE ALONG ICE BRIDGE OR IN CABLE TRAY SHOWING FASTENERS AND SUPPORT
8. GROUND MOUNTED RRU RACKS (FRONT AND BACK)
9. FRONT, SIDE AND BACK ELEVATIONS OF ALL GROUND CABINETS
10. VIEW OF COMPOUND FROM A DISTANCE
11. VIEW OF EACH GROUND CABINET (POWER, RF, FIBER SPOOL, PPC POWER, PPC TELCO WITH DOOR OPEN)
12. BACKHAUL FIBER MEET-ME-POINT AND CONDUIT ROUTE (MICROWAVE INSTALLATION IF NOT FIBER)
13. AAV NETWORK INTERFACE DEVICE OR MICROWAVE RADIO INSTALLATION

DEFICIENCY CORRECTIONS:
CONTRACTOR IS RESPONSIBLE FOR ALL CORRECTIONS TO DEFICIENCIES IDENTIFIED THROUGH TESTING, REVIEW OF SUBMITTALS, INSPECTIONS AND CLOSEOUT REVIEWS.

SECTION 01 500 - PROJECT REPORTING

WEEKLY REPORTS:
A. CONTRACTOR SHALL REPORT TO SPRINT AT MINIMUM ON A WEEKLY BASIS VIA SITERRA BY UPDATING ALL APPLICABLE POST END KEEPING MILESTONES WITH ACTUAL AND FORECASTED COMPLETION DATES.
B. ADDITIONAL REQUIREMENTS FOR REPORTING MAY BE IDENTIFIED ELSEWHERE OR REQUIRED BY THE SCOPE OF SERVICES OR SPRINT'S LOCAL MARKET CONSTRUCTION MANAGER. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.
PROJECT CONFERENCE CALLS:
SPRINT MAY HOLD PERIODIC PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.
FINAL PROJECT ACCEPTANCE: PRIOR TO SPRINT'S FINAL PROJECT ACCEPTANCE. ALL REQUIRED MILESTONE ACTUALS MUST BE UPDATED IN SITERRA AND ALL REQUIRED REPORTING TASKS MUST BE COMPLETE.

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

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

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

HYBRID CABLE:
HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTORS:
FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE, MIN. LENGTH FOR JUMPER SHALL BE 10"-0".

REMOTE ELECTRICAL TILT (RET) CABLES:

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

ANTENNA INSTALLATION:
THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE CONSTRUCTION DRAWINGS.
A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.
B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

HYBRID CABLE INSTALLATION:
A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.
C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.
1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE INSTALLED INSIDE MONOPOLE WITH CABLE SUPPORT GRIPS AS REQUIRED BY THE MANUFACTURER.
2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
    a. FIBER: SUPPORT FIBER BUNDLES USING 1/2 " VELCRO STRAPS OF THE REQUIRED LENGTH AT 18" O.C. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
    b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
4. CABLE INSTALLATION:
    a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
    b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
    c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.
5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 (CURRENT VERSION).
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:
A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.
B. WEATHERPROOF USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.
1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2 " WIDE ELECTRICAL TAPE EXTENDING 2 " BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

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

SUMMARY:
A. THIS SECTION SPECIFIES MMBS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).
B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRED BY THE APPLICABLE INSTALLATION MOPS.
C. COMPLY WITH MANUFACTURER'S INSTALLATION AND START-UP REQUIREMENTS.

DC CIRCUIT BREAKER LABELING
A. NEW DC CIRCUIT IS REQUIRED IN MMBS CABINET SHALL BE CLEARLY IDENTIFIED AS TO RRU BEING SERVICED.

SECTION 26 100 - BASIC ELECTRICAL REQUIREMENTS

SUMMARY:
THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS

QUALITY ASSURANCE:
A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.
B. MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.
C. MATERIALS AND EQUIPMENT: ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:
A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
1. ALLIED TUBE AND CONDUIT.
2. B-LINE SYSTEM.
3. UNISTRUT DIVERSIFIED PRODUCTS.
4. THOMAS & BETTS.
B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

SUPPORTING DEVICES:
A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.
B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.
C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:
1. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.
2. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:
A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.
B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR UNDERGROUND RUNS. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED - SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.
B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.
C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.
D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.
E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRED BY NEC. MANUFACTURERS OF FLEXIBLE CONDUIT'S SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.
F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:
A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.
B. CABLE TERMINATION FITTINGS FOR CONDUIT
1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL BY ROXTEC.
2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO - CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.
C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.
D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKET COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.
E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM:
A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM TO THE EXTENT INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS EXCEPT AS OTHERWISE NOTED.
B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO-OX.
C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

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

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

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

SCALE : AS SHOWN
JOB NUMBER : 17924001A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17	[illegible]	DTS	FEP

STATE OF CONNECTICUT
PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0025811
NOT LICENSED IN NY

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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

SHEET TITLE : GENERAL NOTES - 3

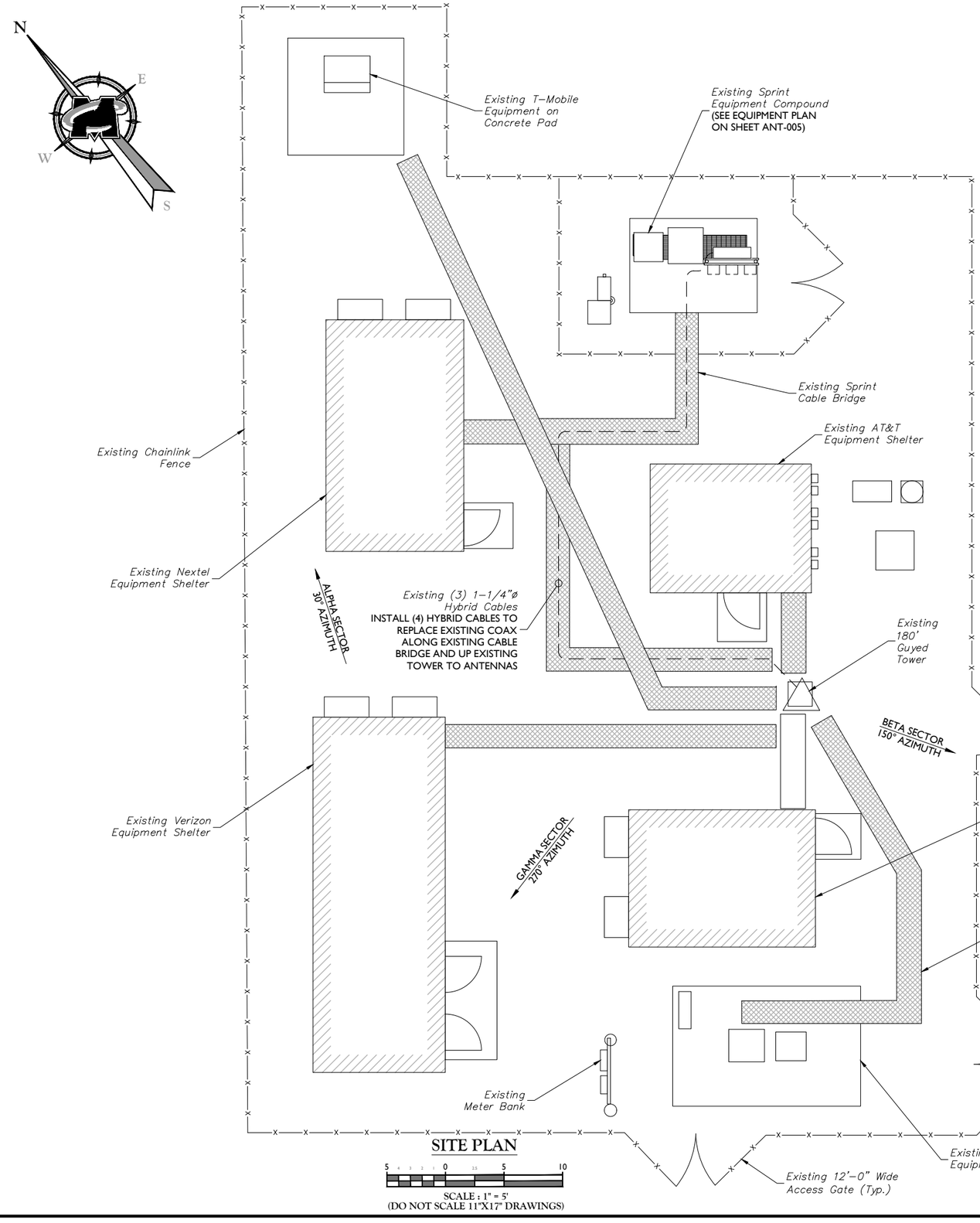
SHEET NUMBER : ANT-003.00

GENERAL NOTES:

1. SITE INFORMATION OBTAINED FROM THE FOLLOWING:

   A. DRAWINGS ENTITLED "227 BOOMBRIDGE ROAD," PREPARED BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. OF NEWBURGH, NEW YORK DATED 11/21/12.

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



SITE PLAN

5 4 3 2 1 0 2.5 5 10

SCALE : 1" = 5'
(DO NOT SCALE 11"X17" DRAWINGS)

LEGEND

LIGHT LINE WORK INDICATES EXISTING OBJECTS
HEAVY LINE WORK INDICATED PROPOSED OBJECTS

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SCALE :	JOB NUMBER :
AS SHOWN	17924001A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17		DTS	FEP

PETROS P. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0025[illegible]

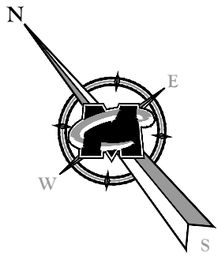
SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

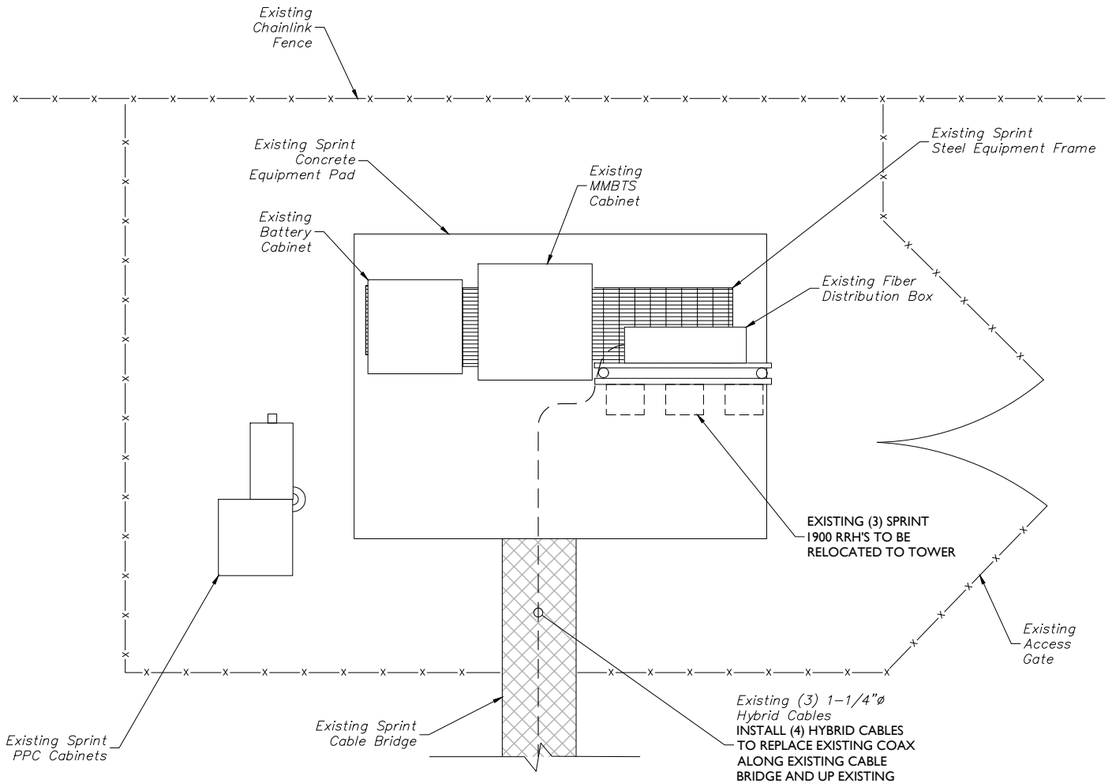
227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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

SHEET TITLE : SITE PLAN

SHEET NUMBER : ANT-004.00

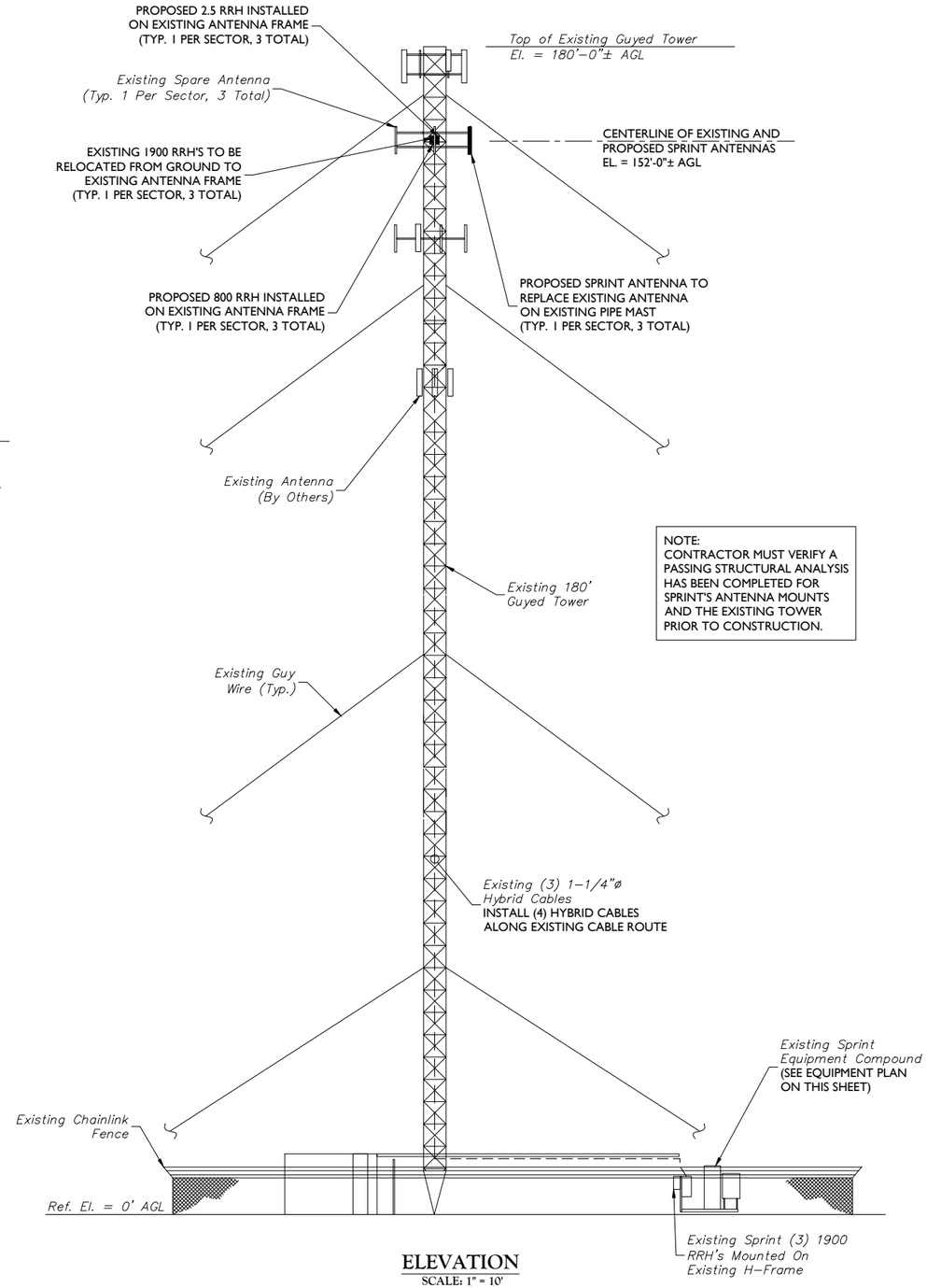




EQUIPMENT PLAN

2 1.6 1.2 0.8 0.4 0 1 2 4

SCALE : 1" = 2'
(DO NOT SCALE 11"X17" DRAWINGS)



NOTE:
CONTRACTOR MUST VERIFY A PASSING STRUCTURAL ANALYSIS HAS BEEN COMPLETED FOR SPRINT'S ANTENNA MOUNTS AND THE EXISTING TOWER PRIOR TO CONSTRUCTION.

ELEVATION

SCALE: 1" = 10'

LEGEND

LIGHT LINE WORK INDICATES EXISTING OBJECTS
HEAVY LINE WORK INDICATED PROPOSED OBJECTS

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SCALE :	JOB NUMBER :
AS SHOWN	17924001A

REV	DATE	DESCRIPTION	DRAWN	CHECKED BY
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17		DTS	FEP

STATE OF CONNECTICUT
PETROS SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0021
LICENSED PROFESSIONAL ENGINEER

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
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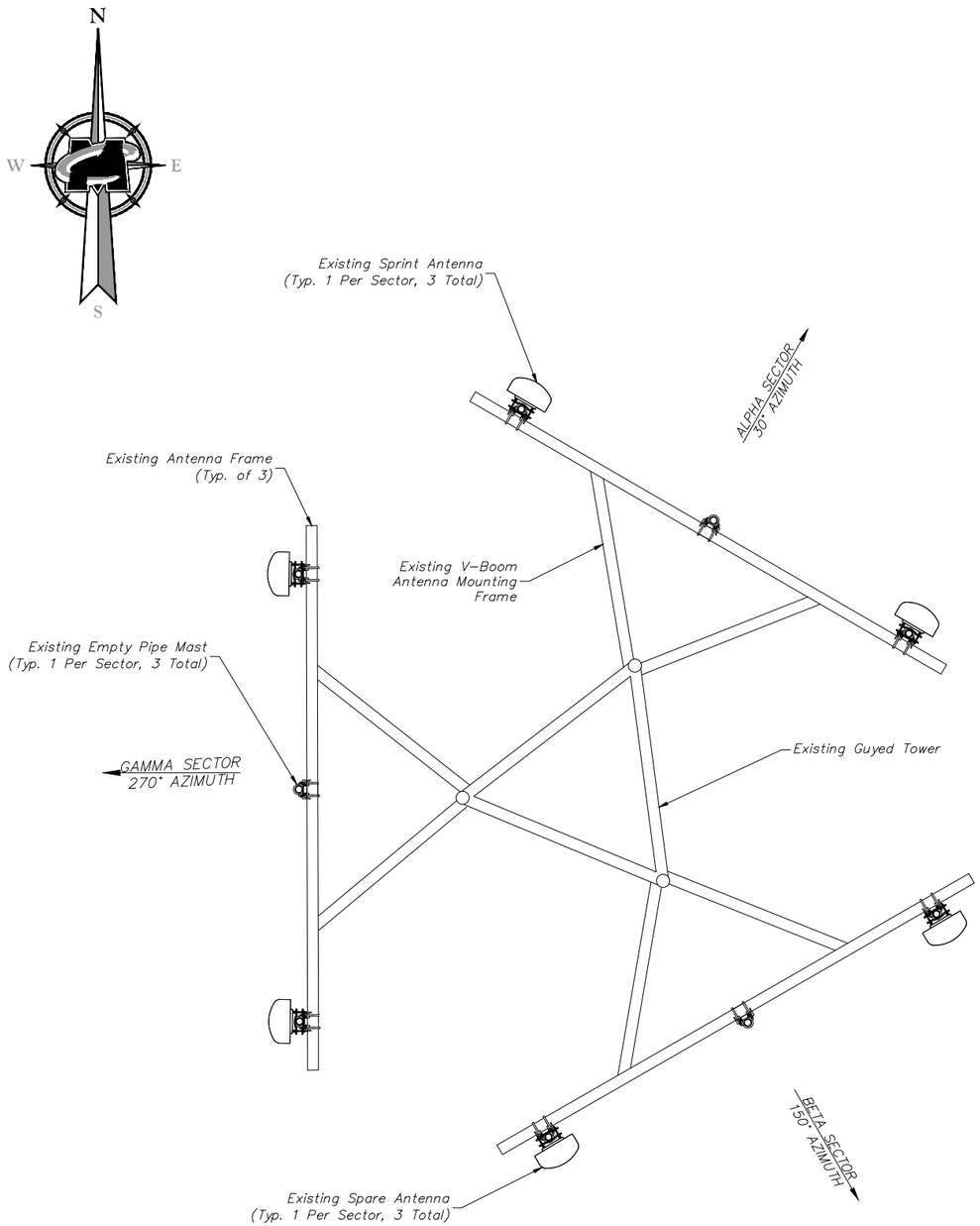
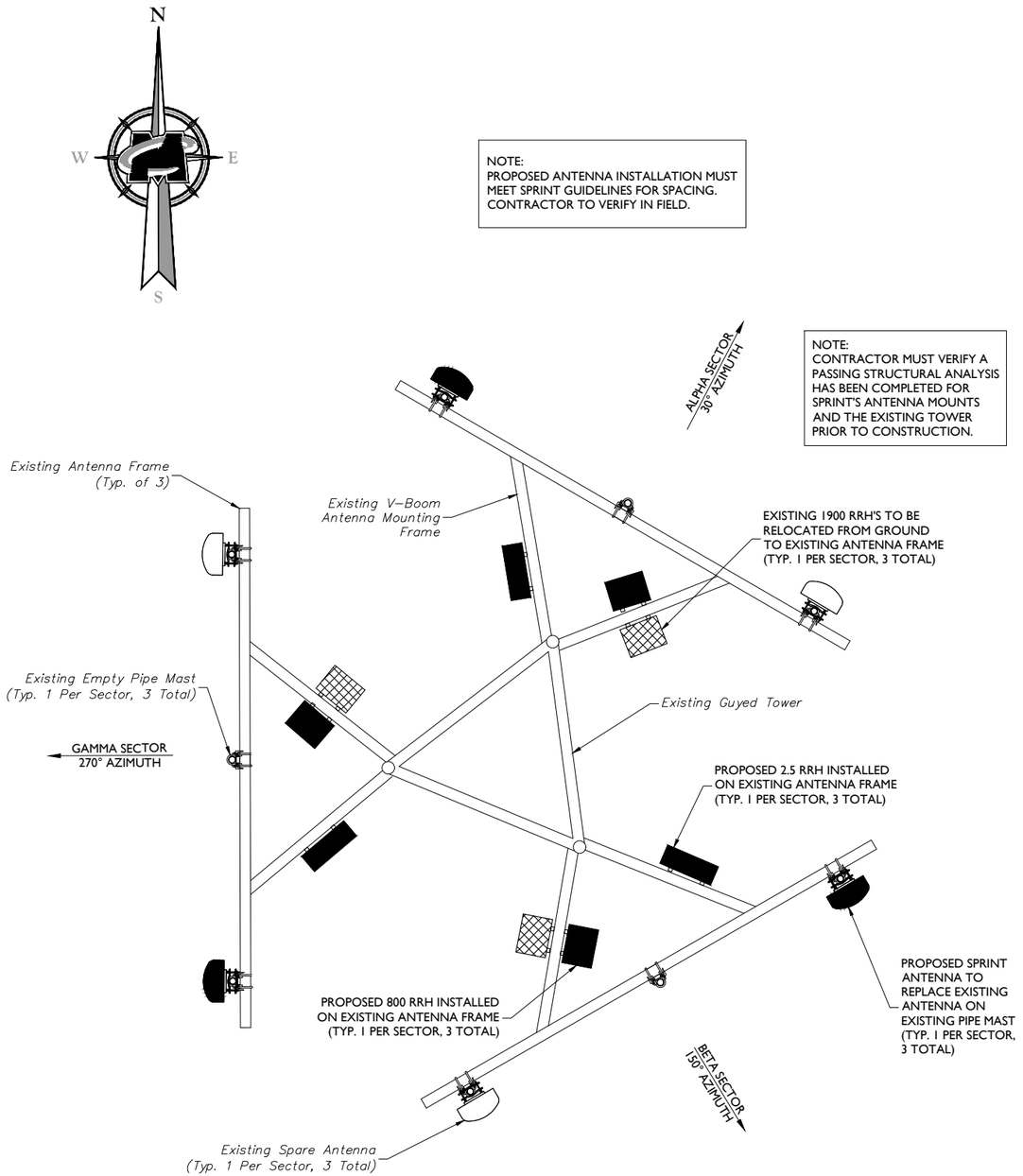
SHEET TITLE :
EQUIPMENT PLAN AND ELEVATION

SHEET NUMBER :
ANT-005.00



EXISTING ANTENNA LAYOUT

SCALE: 1" = 2'-0"



PROPOSED ANTENNA LAYOUT

SCALE: 1" = 2'-0"

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STATE OF CONNECTICUT
PETROS T. SOUKALAS
LICENSED PROFESSIONAL ENGINEER

PETROS T. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0259[illegible]

SITE NAME: 227
BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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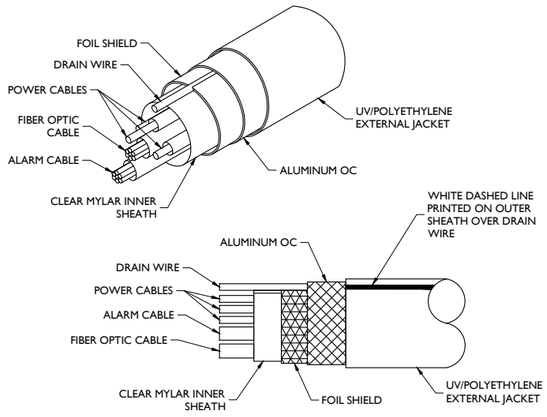
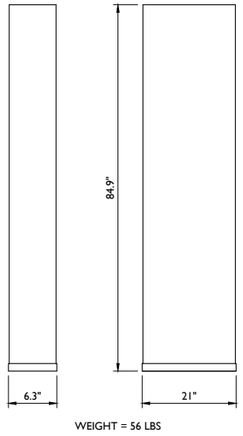
SHEET TITLE:
ANTENNA
ORIENTATION PLANS

SHEET NUMBER:
ANT-006.00



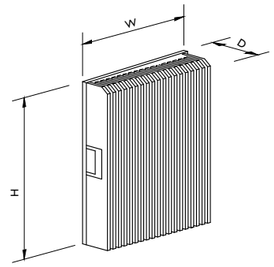
HYBRID CABLE
NOT TO SCALE



WEIGHT = 56 LBS

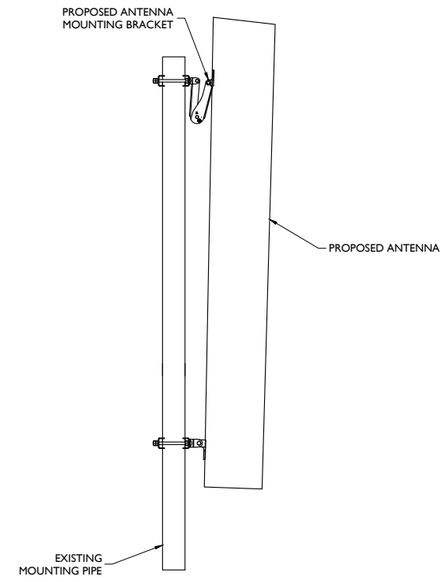
KMW ETCR-654L12H6

ANTENNA DETAIL
NOT TO SCALE

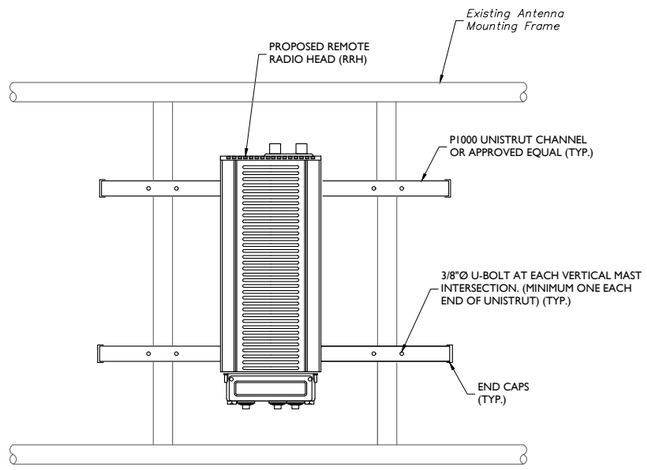


MODEL:	HEIGHT (H)	WIDTH (W)	DEPTH (D)	WEIGHT
ALU TD-RRH8x20-25	26"	18.6"	6.7"	76.2 LBS
ALU RRH-4x45-1900	25"	12"	12"	69.5 LBS
ALU RRH-2x50-800	16"	13"	10"	69.1 LBS

RRH SPECIFICATIONS
NOT TO SCALE



ANTENNA MOUNTING DETAIL
NOT TO SCALE



REMOTE RADIO HEAD (RRH) MOUNTING DETAIL
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STATE OF CONNECTICUT
PETROS TROUKALAS
LICENSED PROFESSIONAL ENGINEER

PETROS TROUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0025[illegible]

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
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SHEET TITLE :
DETAILS - 1

SHEET NUMBER :
ANT-007.00

RF NOTES

1. ACTUAL CABLE LENGTHS SHALL BE DETERMINED PER SITE CONDITION BY SUBCONTRACTOR.
2. THE DESIGN IS BASED ON RF DATA SHEETS, SIGNED AND APPROVED.
3. RADIO SIGNAL CABLE AND RACEWAY SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC, NFPA 70), CHAPTER 8.
4. ALL SPECIFIED MATERIAL FOR EACH LOCATION (E.G., OUTDOORS, INDOORS-OCCUPIED, INDOORS-UNOCCUPIED, PLENUMS, RISER SHAFTS, ETC.) SHALL BE APPROVED, LISTED, OR LABELED AS REQUIRED BY THE NEC.
5. HARDLINE AND JUMPER CABLES SHALL BE SUPPORTED WITH HANGERS AND AT INTERVALS AS REQUIRED BY THE MANUFACTURER FOR 125 mph WIND SPEED AND EXPECTED ICE CONDITIONS. FOR SITES WITH TOWER HEIGHT OVER 300' OR ARE LOCATED IN THE EXTREME WEATHER/OPERATION AREAS, THE WORST CASE SCENARIO FOR 150 mph WIND SPEED AND 1" ICE CONDITION SHOULD BE APPLIED. ALL CABLES SHOULD BE SUPPORTED AT HALF THE DISTANCE OF THE MAXIMUM HANGER SPACING FROM THE CABLE CONNECTOR LOCATION TO THE 1ST HANGER. MANUFACTURER RECOMMENDED CABLE SUPPORT ACCESSORIES SHALL BE USED. PLASTIC CABLE TIES ARE NOT ACCEPTABLE. HANGER STACKING LIMIT SHOULD ALSO REFER TO VENDOR'S RECOMMENDATION.
6. THE OUTDOOR CABLE SUPPORT SYSTEM SHALL BE PROVIDED WITH AN ICE SHIELD TO SUPPORT AND PROTECT ANTENNA CABLE RUNS.
7. DRIP LOOPS SHALL BE REQUIRED ON ALL OUTSIDE CABLES. CABLES SHALL BE SLOPED AWAY FROM THE BUILDING OR OUTDOOR BTS CABINETS TO PREVENT WATER FROM ENTERING THROUGH THE COAXIAL CABLE PORT.
8. ALL FEEDER LINE AND JUMPER CONNECTORS SHALL BE 7/16 DIN CABLE CONNECTORS THAT MEET IP68 STANDARDS.
9. CONNECTORS IN INDOOR APPLICATIONS REQUIRE NO WEATHERPROOFING. OUTDOOR APPLICATIONS REQUIRE WEATHERPROOFING AND THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED:

   RE-ENTERABLE AND RE-SEALABLE PLASTIC ENCLOSURE APPROVED BY CABLE MANUFACTURER AND CONTRACTOR IS RECOMMENDED METHOD TO WEATHERPROOF CONNECTORS.

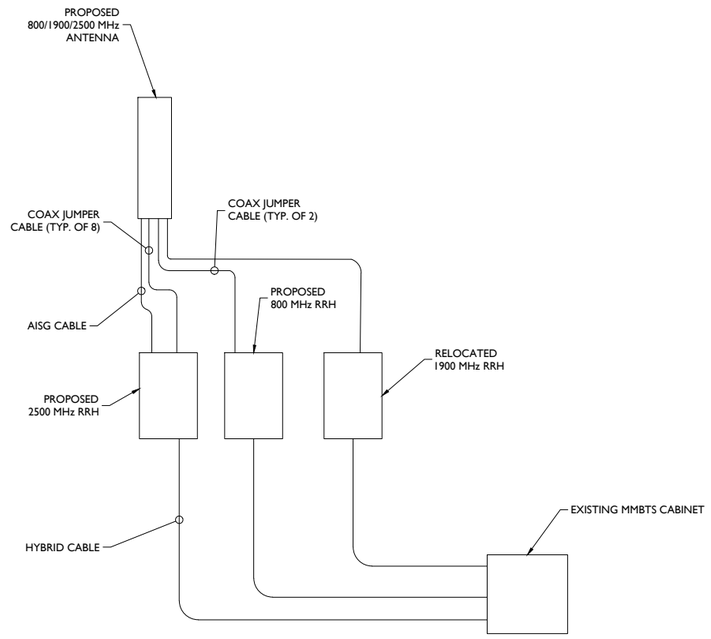
   ALSO ACCEPTABLE IS THE USE OF BUTYL RUBBER WEATHERPROOFING KIT APPROVED BY CABLE MANUFACTURE AND CONTRACTOR. START BUTYL RUBBER TAPE APPROXIMATELY 5 INCHES FROM THE CONNECTOR AND WRAP 2 INCHES TOWARD THE CONNECTOR, THEN REVERSE THE TAPE SO THAT THE STICKY SIDE IS UP. TAPE OVER THE CONNECTOR OR SURGE ARRESTOR UNTIL THREE (3) TO FOUR (4) INCHES BEYOND THE CONNECTOR AND REVERSE AGAIN WITH THE STICKY SIDE DOWN FOR ANOTHER TWO INCHES. FINISH WITH TWO LAYERS OF VINYL TAPE. COLD SHRINK IS STRICTLY PROHIBITED. SELF-BONDING, AMALGAMATING TAPE MAYBE USED AS AN ALTERNATIVE TO BUTYL RUBBER TAPE.
10. ANTENNAS SHALL BE PAINTED, WHEN REQUIRED, BY THE LANDLORD OR AUTHORITY HAVING JURISDICTION IN ACCORDANCE WITH ANTENNA MANUFACTURERS' SURFACE PREPARATION AND PAINTING REQUIREMENTS.
11. CABLE SHIELDS, AND TOWER CONDUITS SHALL BE GROUNDED AT THE TOP OF THE TOWER, WITHIN 10 FEET OF THEIR CONNECTORS, AND AT THE BOTTOM OF THE TOWER ABOUT 6 INCHES BEFORE THEY TURN TOWARD THE FACILITY. THEY SHALL BE GROUNDED AT THE MIDPOINT OF TOWERS THAT ARE BETWEEN 100 FEET AND 200 FEET HIGH, AND AT INTERVALS OF 100 FEET OR LESS ON TOWERS THAT ARE HIGHER THAN 200 FEET.
12. APPROVED GROUNDING KITS, WHICH INCLUDE GROUNDING STRAPS, SHALL BE USED TO GROUND THE COAXIAL CABLE SHIELDS, AND CONDUITS. THE GROUND CONDUCTORS FOR THE KITS AT THE TOP OF THE TOWER, AND IN THE MIDDLE SECTION OF THE TOWER, ARE BONDED DIRECTLY TO TOWER STEEL USING BOLTED, OR APPROVED CLAMP CONNECTIONS. EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTORS STRUCTURAL ENGINEER.
13. ALL RADIO SIGNAL CABLE SHALL BE LABELED AND COLOR CODED PER MARKET REQUIREMENTS.
14. ANTENNA FEED LINE SYSTEM SWEEP TESTING SHALL BE PERFORMED AND REPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF PROJECT SPECIFICATIONS. CONTRACTOR WILL NOT ACCEPT A RADIO SIGNAL CABLE INSTALLATION WITH UNSATISFACTORY SWEEP TEST RESULTS.
15. PIM TESTS SHALL BE PERFORMED ON NEW AND MOVED OR MODIFIED COAXIAL CABLE INSTALLATIONS. TEST SHALL BE PERFORMED AND REPORTED IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
16. DC CONNECTORS AT OUTDOOR BIAS-Ts OR DIPLEXER/TRIPLEXER PORTS SHALL BE WEATHERPROOFED PER MANUFACTURER RECOMMENDATIONS.
17. AISG CONNECTIONS DO NOT REQUIRE ADDITIONAL WEATHERPROOFING UNLESS RECOMMENDED BY MANUFACTURER OR BY MARKET REQUIREMENTS.
18. INSTALL ONLY STANDARD RF JUMPER CABLES (e.g. LDF4 OR LCF12) AT TOWER-TOP APPLICATIONS. FLEXIBLE RF CABLES (e.g. FSJ4 OR SCF12) SHALL NOT BE USED.
19. CABLES AND CONNECTORS MUST BE PREPARED AND INSTALLED USING THE TOOLS RECOMMENDED BY THE COAXIAL CABLE MANUFACTURER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE CORRECT TOOLS ARE USED FOR THE SIZE AND TYPE OF COAX AND CONNECTOR. ALL ASPECTS OF INSTALLATION OF ALL COAXIAL CABLE SHALL FOLLOW THE CABLE MANUFACTURER'S RECOMMENDATIONS, INCLUDING THOSE FOR PULLING, MOUNTING AND GROUNDING.

PROPOSED ANTENNA CONFIGURATION

SECTOR		PROPOSED ANTENNA	TECH.	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH	ANT. CL. ELEV (ft.)	ELECTRICAL DOWNTILT	MECHANICAL DOWNTILT
ALPHA	A1	KMW ETCR-654L12H6	800/1900/2500	NEW	56.3	12.6	6.3	56	30°	152'	2°	0°
BETA	B1	KMW ETCR-654L12H6	800/1900/2500	NEW	56.3	12.6	6.3	56	150°	152'	2°	0°
GAMMA	C1	KMW ETCR-654L12H6	800/1900/2500	NEW	56.3	12.6	6.3	56	270°	152'	2°	0°

BILL OF MATERIALS

NUMBER	QUANTITY	DESCRIPTION	MANUFACTURER	MODEL NUMBER
1	3	PANEL ANTENNA	KMW	KMW ETCR-654L12H6
2	3	2500MHZ RRH	ALU	TD-RRH8X20-25
3	3	800MHZ RRH	ALU	RRH-2X50-800
4	250 LF	1-1/4"Ø HYBRID FIBER RISER	ALU	TBD
5	30	1/2"Ø JUMPER CABLE (8' LONG)	TBD	
6	3	0.315"Ø AISG CABLE (8' LONG)	COMMSCOPE	ATCB-B01-006



ANTENNA WIRING DIAGRAM

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PETROS P. SOUKALAS
LICENSED PROFESSIONAL ENGINEER
PETROS P. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0025[illegible]

SITE NAME: 227
BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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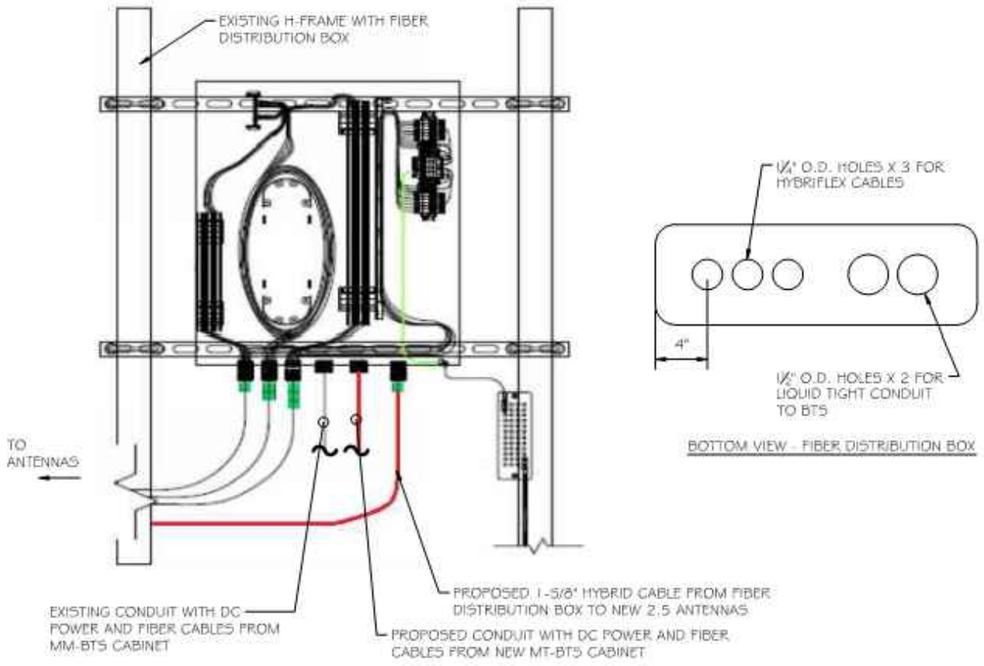
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE:
ANTENNA SCHEDULE, WIRING DIAGRAM, BILL OF MATERIALS AND NOTES

SHEET NUMBER:
ANT-008.00



TYPICAL FIBER DISTRIBUTION BOX DETAIL
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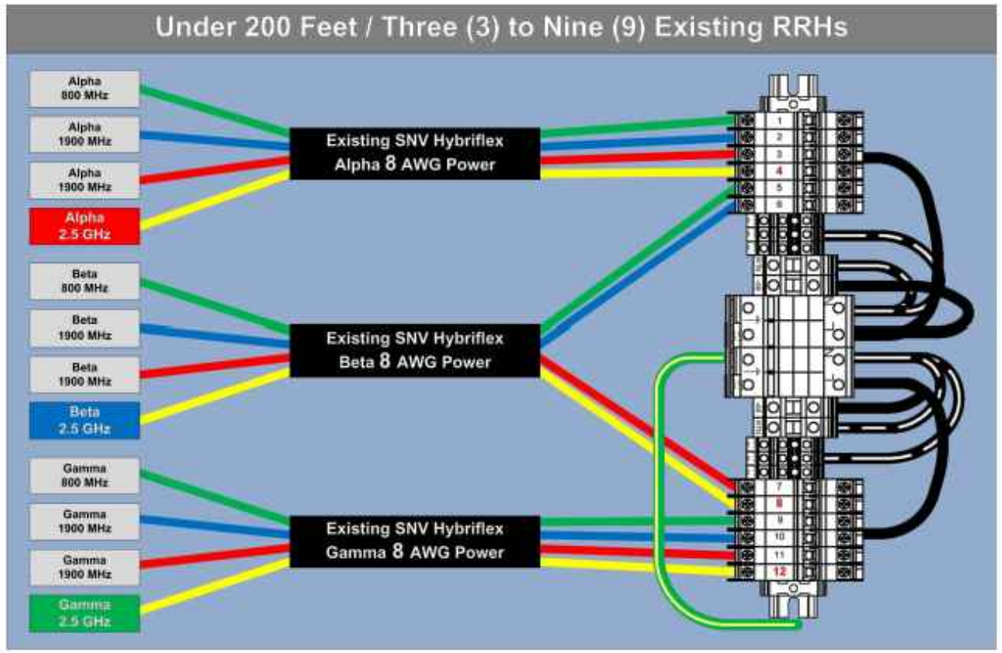
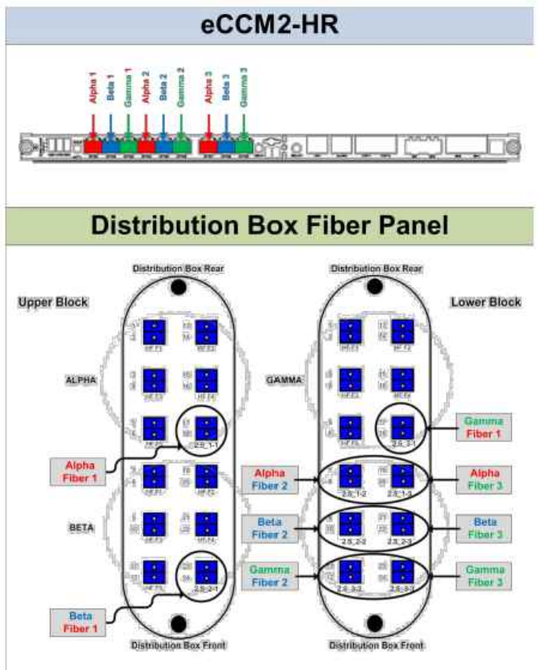
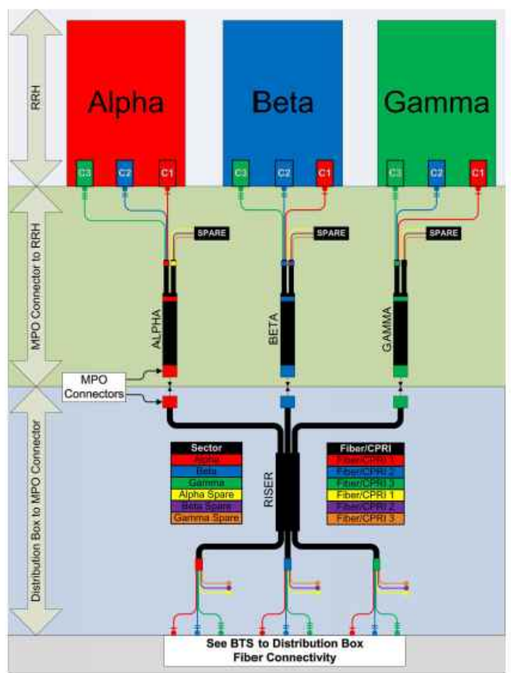


RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL
NOT TO SCALE



BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL
NOT TO SCALE



RRH TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL
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STATE OF CONNECTICUT PETROS T. SOUKALAS LICENSED PROFESSIONAL ENGINEER

PETROS T. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0259[illegible]

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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331 Newman Springs Road
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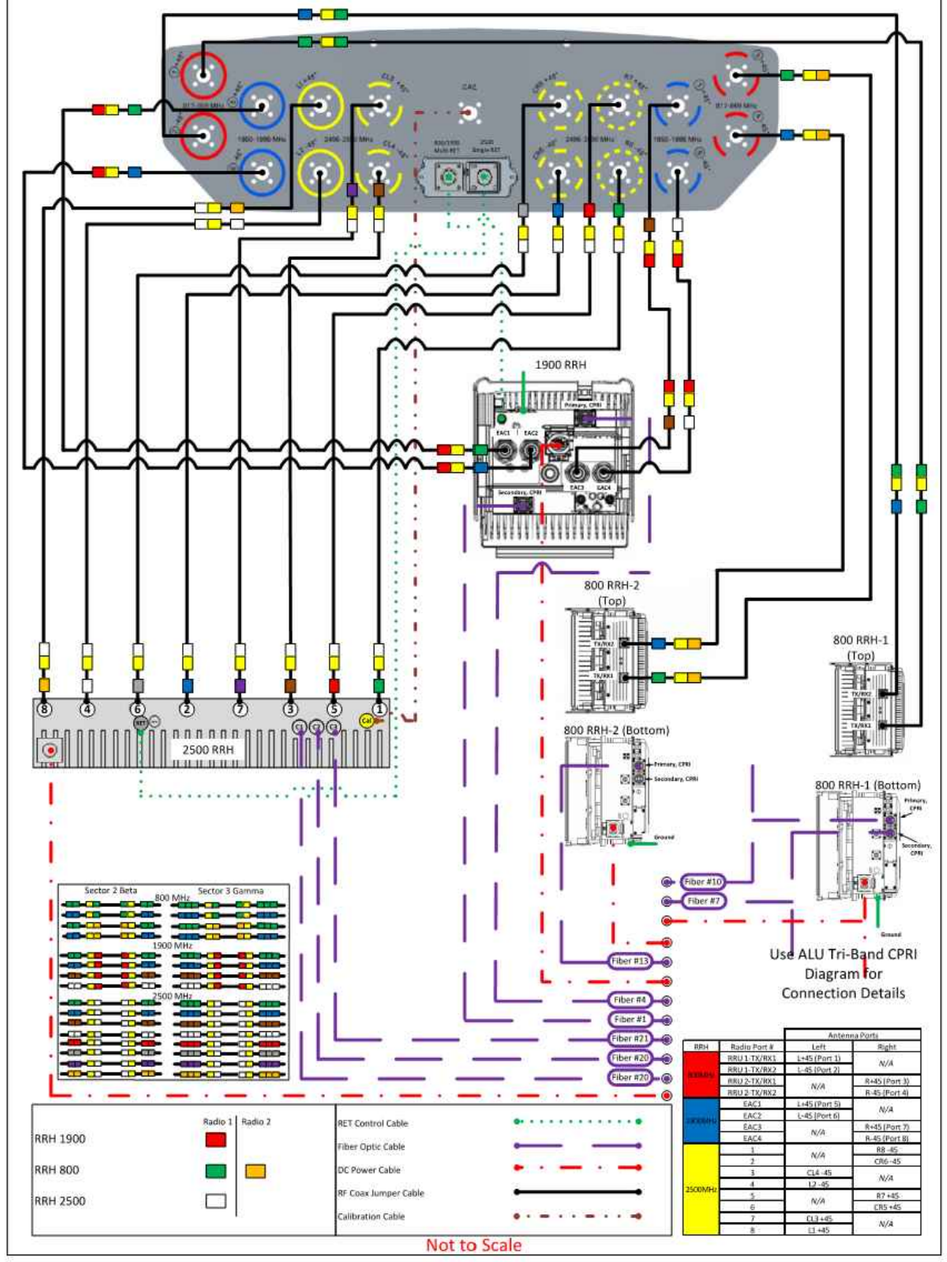
SHEET TITLE :
FIBER PLUMBING DIAGRAMS - 1

SHEET NUMBER :
ANT-009.00

Prepared By	Creation Date	Revision Number	
Mark Elliott	January 24, 2017	R-2	Sprint
Approved By	Approval Date		
RAN Hardware & Antenna Teams	January 26, 2017		

KMW 16 Port Nokia-A RRH 800, 1900, and 2500



RRH	Radio Port #	Antenna Ports Left	Antenna Ports Right
800MHz	RRU 1-TX/RX1	L+45 (Port 1)	N/A
	RRU 1-TX/RX2	L-45 (Port 2)	
	RRU 2-TX/RX1	N/A	R+45 (Port 3)
	RRU 2-TX/RX2		R-45 (Port 4)
1900MHz	EAC1	L+45 (Port 5)	N/A
	EAC2	L-45 (Port 6)	
	EAC3	N/A	R+45 (Port 7)
	EAC4		R-45 (Port 8)
2500MHz	1	N/A	R8 -45
	2		CR6 -45
	3	CL4 -45	N/A
	4	L2 -45	
	5	N/A	R7 +45
	6		CR5 +45
	7	CL3 +45	N/A
	8	L1 +45	

FIBER PLUMBING DIAGRAM

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SHEET TITLE : FIBER PLUMBING DIAGRAMS - 2

SHEET NUMBER : ANT-010.00

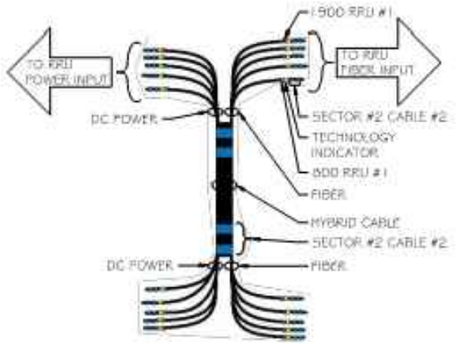
CABLE MARKING NOTES

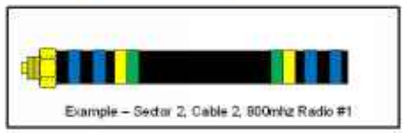
1. ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAKOUT UNIT. THERE SHALL BE 1" SPACE BETWEEN EACH RING.
3. A 2" GAP SHALL SEPARATE THE CABLE 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.
4. THE 2" COLORED TAPE(S) SHALL 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.
5. SITES WITH MORE THAN FOUR (4) SECTORS WILL REQUIRE ADDITIONAL RINGS FOR EACH SECTOR, FOLLOWING THE PATTERN. HIGH CAPACITY SITES WILL USE THE SECOND CABLE IDENTIFIED BY BLUE BANDS OF TAPE
6. 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.
7. HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.
8. INDIVIDUAL POWER PAIRS AND FIBER BUNDLES SHALL BE LABEL

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

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

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





COLOR CODING CHARTS

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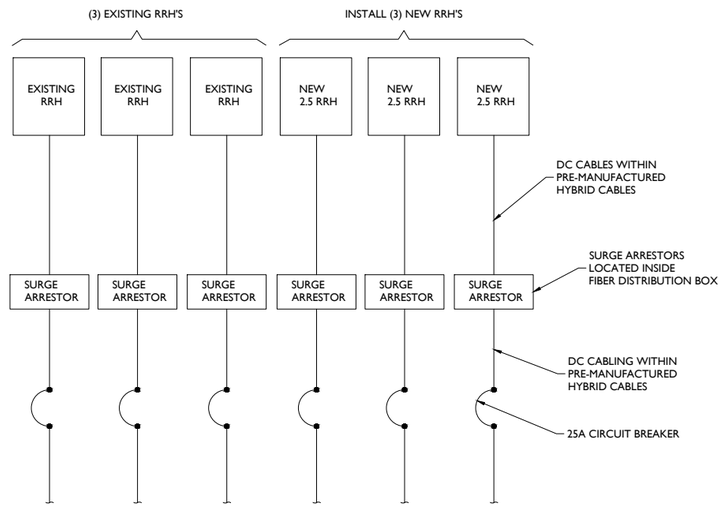

DC ONE-LINE DIAGRAM

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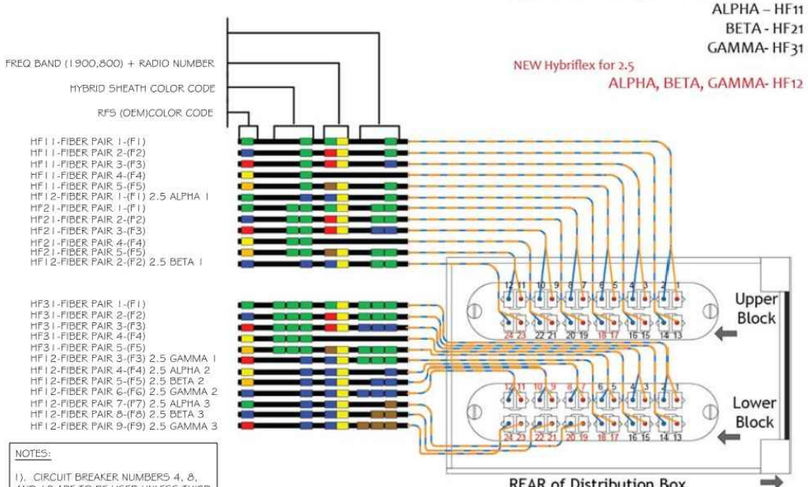
Each sector has separate Hybriflex cable .
Hybriflex cable naming as follows:
ALPHA – HF11
BETA - HF21
GAMMA- HF31

NEW Hybriflex for 2.5
ALPHA, BETA, GAMMA- HF12



NOTES:

1). CIRCUIT BREAKER NUMBERS 4, 8, AND 12 ARE TO BE USED UNLESS THIRD DC RAIL IS REQUIRED FOR MICROWAVE.
2). USE DC POWER LOOP.
3). ALL UNUSED DC FEEDERS TO BE TERMINATED WITH WIRE NUTS AND TAPED.
4). REMOVE ALL DEBRIS FROM INTERIOR OF FIBER DISTRIBUTION BOX WHEN COMPLETE.

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SCALE :	JOB NUMBER :
AS SHOWN	17924001A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17	[illegible]	DTS	FEP

STATE OF CONNECTICUT
PETROS E. SOUKALAS
LICENSED PROFESSIONAL ENGINEER

PETROS E. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0025[illegible]

SITE NAME: 227
BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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

SHEET TITLE :
CABLE COLOR CODING, DC POWER DETAILS & PANEL SCHEDULES

SHEET NUMBER :
ANT-011.00

GENERAL REQUIREMENTS:

1. THE WORK TO BE DONE UNDER THIS PROJECT INCLUDES PROVIDING ALL EQUIPMENT, MATERIALS, LABOR AND SERVICES, AND PERFORMING ALL OPERATIONS FOR COMPLETE AND OPERATING SYSTEMS. ANY WORK NOT SPECIFICALLY COVERED BY NECESSARY TO COMPLETE THIS INSTALLATION, SHALL BE PROVIDED. ALL EQUIPMENT AND WIRING TO BE NEW AND PROVIDED UNDER THIS CONTRACT UNLESS OTHERWISE NOTED.
2. ENTIRE INSTALLATION, INCLUDING MATERIALS, EQUIPMENT AND WORKMANSHIP, SHALL CONFORM TO THE 2011 EDITION OF THE NATIONAL ELECTRIC CODE (NEC) AS WELL AS ALL APPLICABLE LAWS AND REGULATIONS AND REGULATORY BODIES HAVING JURISDICTION OVER THIS WORK.
3. THE TERM "FURNISH" SHALL MEAN TO OBTAIN AND SUPPLY THE JOB SITE. THE TERM "INSTALL" SHALL MEAN TO FIX IN POSITION AND CONNECT FOR USE. THE TERM "PROVIDE" SHALL MEAN TO FURNISH AND INSTALL. THE TERM "CONTRACTOR" SHALL MEAN ELECTRICAL CONTRACTOR.
4. ONLY WRITTEN CHANGES AND/OR MODIFICATIONS APPROVED BY THE ENGINEER, CONSULTING ENGINEER OR OWNER'S REPRESENTATIVE WILL BE RECOGNIZED.
5. THE ELECTRICAL CONTRACTOR SHALL SUBMIT, FOR THE ENGINEER'S APPROVAL, DETAILED SHOP DRAWINGS OF ALL EQUIPMENT SPECIFIED.
6. CONTRACTOR SHALL COORDINATE WITH SPECIFICATIONS BY OTHER TRADES.
7. PROVIDE OPERATING AND MAINTENANCE MANUALS, PER SPECIFICATIONS, AND GIVE INSTRUCTIONS TO USER FOR ALL EQUIPMENT AND SYSTEMS PROVIDED UNDER THIS CONTRACT AFTER ALL ARE CLEANED AND OPERATING.
8. KEEP PREMISES FREE FROM RUBBISH. REMOVE ALL ELECTRICAL RUBBISH FROM SITE.
9. ALL WORK SHALL BE INSTALLED CONCEALED UNLESS OTHERWISE NOTED.
10. THE WORK SHALL INCLUDE ALL PANELS, DEVICES, FEEDERS AND BRANCH CIRCUIT WIRING AS REQUIRED FOR THE DISTRIBUTION SYSTEM INDICATED AND CALLED FOR ON THE DRAWINGS. REQUIRED BY SPECIFICATIONS AND AS NECESSARY FOR COMPLETE FUNCTIONAL SYSTEMS PRESENTED AND INTENDED.
11. THE CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR, TOOLS, EQUIPMENT, CONSUMABLES AND SERVICES REQUIRED FOR OBTAINING, DELIVERY, INSTALLATION, CONNECTION, DISCONNECTION, REMOVAL, RELOCATION, REPAIR, REPLACEMENT, TESTING AND COMMISSIONING OF ALL EQUIPMENT AND DEVICES INCLUDED IN OR NECESSARY FOR THE WORK, AS APPLICABLE. THIS INCLUDES SCAFFOLDING, LADDERS, RIGGING, HOISTING, ETC.
12. ELECTRICAL WORK SHALL INCLUDE ALL REQUIRED CUTTING, PATCHING AND THE FULL RESTORATION OF WALL AND FLOOR STRUCTURE AND SURFACES. ALL EQUIPMENT, WALLS, FLOORS, ETC., DISTURBED OR DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER, AT THE CONTRACTORS EXPENSE.
13. BEFORE SUBMITTING HIS BID, THE CONTRACTOR SHALL FULLY ACQUAINT HIMSELF/HERSELF WITH THE JOB CONDITIONS AND DIFFICULTIES THAT WILL PERTAIN TO THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR. EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED, WHICH COULD NOT HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.
14. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING UTILITIES.
15. UPON COMPLETION OF THE ELECTRICAL WORK, THE CONTRACTOR SHALL TEST THE COMPLETE ELECTRICAL SYSTEM FOR SHORTS, GROUNDS, AND PROPER OPERATION, IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE.
16. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL CLEAN AND ADJUST ALL EQUIPMENT AND LIGHTING AND TEST SYSTEMS TO THE SATISFACTION OF OWNER AND ENGINEER. RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
17. THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS OF FINISHED CONSTRUCTION PRI9OR TO FABRICATION AND INSTALLATION OF FIXTURES AND EQUIPMENT.
18. EXACT ROUTING OF CONDUITS AND "MC" CABLES SHALL BE DETERMINED IN THE FIELD.
19. IF THE OWNER AND/OR HIS REPRESENTATIVE CONSIDERS ANY WORK TO BE INFERIOR, THE RESPECTIVE CONTRACTOR SHALL REPLACE SAME WITH CONTRACT STANDARD WORK WITHOUT ADDITIONAL CHARGE. ALL WORK SHALL BE DONE IN A NEAT, WORKMANLIKE MANNER. LEFT CLEAN AND FREE FROM DEFECTS, AND COMPLETELY OPERABLE.
20. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS AS SHOWN ON THE DRAWINGS AND/OR AS SPECIFIED. ALL MATERIALS SHALL BE NEW, AND BEAR THE UL LABEL. ALL WORK SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER.
21. DRAWINGS ARE TO BE CONSIDERED DIAGRAMMATIC, AND SHALL BE FOLLOWED AS CLOSELY AS CONDITIONS ALLOW TO COMPLETE THE INTENT OF THE CONTRACT. THE DRAWINGS AND SPECIFICATIONS COMPLIMENT AND VICE VERSA, IS TO BE INCLUDED IN THE SCOPE OF WORK.
22. ALL EQUIPMENT CONNECTIONS SHALL BE INSTALLED PER APPLICABLE SEISMIC REQUIREMENTS.
23. ENGINEER WILL MAKE A FINAL INSPECTION WITH THE OWNER AND CONTRACTOR AND WILL NOTIFY THE CONTRACTOR IN WRITING OF ALL PARTICULARS IN WHICH THIS INSPECTION REVEALS THAT THE WORK IS INCOMPLETE OR DEFECTIVE. THE CONTRACTOR SHALL IMMEDIATELY TAKE SUCH MEASURES AS ARE NECESSARY TO COMPLETE SUCH WORK OR REMEDY SUCH DEFICIENCIES.
24. THE CONTRACTOR SHALL PERFORM ALL EXCAVATION, TRENCHING, AND BACKFILL AS REQUIRED FOR ELECTRICAL WORK. BACKFILL SHALL BE SUITABLE MATERIAL PROPERLY COMPACTED TO 95% DENSITY IN EACH LAYER OF SIX (6) INCH DEPTH. CONDUIT SHALL BE MINIMUM 36" BELOW FINISHED GRADE.

PROJECT COORDINATION:

1. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS AT THE SITE AND NOTIFY THE OWNER OF ANY DISCREPANCIES, PRIOR TO COMMENCING WITH THE WORK.
2. THE CONTRACTOR SHALL REVIEW AND COORDINATE WITH THE DOCUMENTS OF ALL TRADES.
3. THE CONTRACTOR SHALL FURNISH A SCHEDULE INDICATING HIS PORTION OF TIME, WITHIN THE OVERALL SCHEDULE, REQUIRED TO COMPLETE THE WORK, IN CONJUNCTION WITH ALL TRADES. ALL WORK THAT MAY AFFECT OPERATION OF BUILDING SYSTEMS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE.
4. SHUT DOWN OF POWER SHALL BE COORDINATED WITH THE OWNER, ARCHITECT AND PROJECT MANAGER AT LEAST 14 WORKING DAYS PRIOR TO SHUT DOWN. SHUT DOWNS LONGER THAN 2 DAYS SHALL BE COORDINATED WITH THE ABOVE PERSONNEL AT LEAST ONCE A MONTH IN ADVANCE. TEMPORARY POWER FOR CONSTRUCTION SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR FOR SHUT DOWNS OVER 2 DAYS.
5. ALL CONDUITS AND DEVICE BOXES SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR, INCLUDING ALL TECHNOLOGY CONDUITS AND BOXES.
6. INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. TEMPORARY SHUT DOWNS OF ANY SYSTEMS SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER AND ARCHITECT.

PROTECTION OF WORK:

1. EFFECTIVELY PROTECT ALL MATERIALS AND EQUIPMENT FROM ENVIRONMENTAL AND PHYSICAL DAMAGE UNTIL FINAL ACCEPTANCE. CLOSE AND PROTECT ALL OPENINGS DURING CONSTRUCTION. PROVIDE NEW MATERIALS AND EQUIPMENT TO REPLACE ITEMS DAMAGED.

WARRANTIES AND BONDS:

1. ALL MATERIALS, EQUIPMENT AND WORKMANSHIP SHALL BE GUARANTEED IN WRITING FOR A MINIMUM OF ONE YEAR AFTER FINAL ACCEPTANCE BY OWNER.
2. OBTAIN AND DELIVER TO THE OWNER'S REPRESENTATIVE ALL GUARANTEES AND CERTIFICATES OF COMPLIANCE.

PERMITS:

1. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND INSPECTION FEES FOR ELECTRICAL WORK.

RACEWAYS:

1. ALL CONDUIT SHALL BE MINIMUM SIZE OF 3/4" FOR POWER CIRCUITS AND CONTROL CIRCUITS EXCEPT WHERE FLEXIBLE CONDUIT IS CALLED FOR ON PROJECT DOCUMENTS. ALL EXTERIOR EXPOSED CONDUIT SHALL BE GRC (GALVANIZED RIGID METAL CONDUIT). ALL UNDERGROUND, IN SLAB OR UNDER SLAB SHALL BE RNC (RIGID NONMETALLIC CONDUIT). CHANGE RIGID METALLIC CONDUIT FOR INTERMEDIATE METALLIC CONDUIT BEFORE EXITING OUT OF CONCRETE OR PENETRATING A WALL, FLOOR OR ROOF. EMT IS ALLOWED IN INTERIOR DRY LOCATIONS WHERE NOT SUBJECT TO DAMAGE.
2. ALL FLEXIBLE CONDUIT IN WET OR DRY AREAS SHALL BE LIQUID TIGHT CONDUIT. NONMETALLIC FLEXIBLE CONDUIT IS SPECIFICALLY PROHIBITED.
3. CONDUIT SHALL BE RUN AT RIGHT ANGLES AND PARALLEL TO BUILDING LINES, SHALL BE NEATLY RACKED AND SECURELY FASTENED. JUNCTION BOXES SHALL BE PROVIDED WHERE REQUIRED TO FACILITATE INSTALLATION OF WIRES.
4. ALL CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN AN APPROVED MANNER.
5. ALL EMPTY RACEWAYS SHALL BE FURNISHED WITH A 200 LB. TEST NYLON DRAG LINE.
6. ARRANGEMENT OF CONDUIT AND EQUIPMENT SHALL BE AS INDICATED, UNLESS MODIFICATION IS REQUIRED TO AVOID INTERFERENCES.
7. FOR CONDUITS CROSSING EXPANSION JOINTS, PROVIDE EXPANSION FITTINGS FOR SIZE 1 1/4" AND LARGER. PROVIDE SECTIONS OF FLEXIBLE CONDUIT WITH GROUNDING JUMPERS FOR SIZES 1" AND SMALLER.
8. THE CONTRACTOR SHALL INSTALL DETECTABLE UNDERGROUND TAPES FOR THE PROTECTION, LOCATION AND IDENTIFICATION OF UNDERGROUND CONDUIT INSTALLATION.
9. EXACT ROUTING OF CONDUITS AND CABLES SHALL BE DETERMINED IN FIELD.

WIRING:

1. ALL WIRE SHALL BE COPPER WITH TYPE THNN/THWN 600 VOLT INSULATION, MINIMUM #12 AWG FOR POWER AND LIGHTING CIRCUITS AND #16 AWG FOR CONTROL CIRCUITS.
2. UNDER NO CIRCUMSTANCES SHALL FEEDERS BE SPLICED.
3. ALL COMPUTER CIRCUITS SHALL HAVE SEPARATE NEUTRAL CONDUCTORS. ALL OTHER CIRCUITS MAY SHARE GROUND AND NEUTRAL CONDUCTORS.
4. WHERE EQUIPMENT, LIGHTING FIXTURES AND WIRING DEVICES ARE SHOWN WITH CIRCUIT NUMBERS ONLY, THE MINIMUM BRANCH CIRCUITING REQUIREMENTS SHALL BE AS FOLLOWS.
5. CONTRACTOR SHALL INCREASE SIZE OF CIRCUIT WIRING/CONDUCTORS TO COMPENSATE FOR VOLTAGE DROP.
6. WIRE SIZES SHALL BE INCREASED TO COMPENSATE FOR VOLTAGE DROP AS FOLLOWS:

GROUNDING:

1. PROVIDE A COMPLETE EQUIPMENT GROUND SYSTEM FOR THE ELECTRICAL SYSTEM AS REQUIRED BY ARTICLE 250, OF THE NEC, AND AS SPECIFIED HEREIN.
2. ALL BRANCH CIRCUITS FOR POWER WIRING SHALL CONTAIN A COPPER GROUND WIRE. NO FLEXIBLE METAL CONDUIT OF ANY KIND OR LENGTH SHALL BE USED AS THE EQUIPMENT GROUNDING CONDUCTOR.
3. THE EQUIPMENT BONDING JUMPER SHALL BE PERMITTED TO BE INSTALLED INSIDE OR OUTSIDE OF A RACEWAY OR ENCLOSURE. WHERE INSTALLED ON OUTSIDE, THE LENGTH OF THE EQUIPMENT BONDING JUMPER SHALL NOT EXCEED 6 FEET AND SHALL BE ROUTED WITH THE RACEWAY OR ENCLOSURE. REFER TO NEC 2011 - 250.102 (E)
4. ALL GROUNDING DEVICES SHALL BE U.L. APPROVED OR LISTED FOR THEIR INTENDED USE.
5. ALL WIRES SHALL BE AWG THHN/THWN COPPER UNLESS NOTED OTHERWISE.
6. GROUNDING CONNECTIONS TO GROUND RODS, GROUND RING WIRE, TOWER BASE AND FENCE POSTS SHALL BE EXOTHERMIC ("CADWELDS") UNLESS NOTED OTHERWISE. CLEAN SURFACES TO SHINY METAL. WHERE GROUND WIRES ARE CADWELDED TO GALVANIZED SURFACES, SPRAY CADWELD WITH GALVANIZING PAINT.
7. GROUNDING CONNECTIONS TO GROUND BARS ARE TO BE TWO-HOLE BRASS MECHANICAL CONNECTORS WITH STAINLESS STEEL HARDWARE (INCLUDE SCREW SET). CLEAN GROUND BAR TO SHINY METAL. AFTER MECHANICAL CONNECTION, TREAT WITH PROTECTIVE ANTIOXIDANT COATING.
8. GROUND COAXIAL CABLE SHIELDS AT BOTH ENDS WITH MANUFACTURERS' GROUNDING KITS.
9. ROUTE GROUNDING CONDUCTORS THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 12" RADIUS.
10. INSTALL #2 AWG GREEN-INSULATED STRANDED WIRE FOR ABOVE GRADE GROUNDING AND #2 BARE TINNED COPPER WIRE FOR BELOW GRADE GROUNDING UNLESS OTHERWISE NOTED.
11. GROUNDING CONNECTIONS SHALL BE EXOTHERMIC TYPE ("CADWELDS") TO GROUND RING. REMAINING GROUNDING CONNECTIONS SHALL BE COMPRESSION FITTINGS. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO-HOLE LUGS.
12. EXOTHERMIC WELDS SHALL BE MADE IN ACCORDANCE WITH ERICO PRODUCTS BULLETIN A-AT.
13. CONSTRUCTION OF GROUND RING AND CONNECTIONS TO EXISTING GROUND RING SYSTEM SHALL BE DOCUMENTED WITH PHOTOGRAPHS PRIOR TO BACKFILLING SITE. PROVIDE PHOTOS TO CARRIER'S CONSTRUCTION MANAGER.
14. ALL GROUND LEADS EXCEPT THOSE TO THE EQUIPMENT ARE TO BE #2/0 TINNED. ALL EXTERIOR GROUND BARS TINNED COPPER.
15. PRIOR TO INSTALLING LUGS ON GROUND WIRES, APPLY THOMAS & BETTS KOPR-SHIELD (TM OF JET LUBE INC.) PRIOR TO BOLTING GROUND WIRE LUGS TO GROUND BARS, APPLY KOPR-SHIELD OR EQUAL.
16. ENGAGE IN INDEPENDENTLY ELECTRICAL TESTING FIRM TO TEST AND VERIFY THAT IMPEDANCE DOES NOT EXCEED FIVE OHMS TO GROUND BY MEANS OF "FALL OF POTENTIAL TEST". TEST SHALL BE WITNESSED BY CARRIER REPRESENTATIVE, AND RECORDED ON CARRIER'S "GROUND RESISTANCE TEST" FORM.
17. WHERE BARE COPPER GROUND WIRES ARE ROUTED FROM ANY CONNECTION ABOVE GRADE TO GROUND RING, INSTALL WIRE IN 3/4" PVC SLEEVE, FROM 1' BELOW GRADE AND SEAL TOP WITH SILICONE MATERIAL.
18. PREPARE ALL BONDING SURFACES FOR GROUNDING CONNECTIONS BY REMOVING ALL PAINT AND CORROSION DOWN TO SHINY METAL. FOLLOWING CONNECTION, APPLY APPROPRIATE ANTI-OXIDIZATION PAINT.
19. ANY SITE WHERE THE EQUIPMENT (BTS, CABLE BRIDGE, PPC, GENERATOR, ETC.) IS LOCATED WITHIN 6 FEET OF METAL FENCING THE BGR SHALL BE BONDED TO THE NEAREST FENCE POST USING (2) RUNS OF #2 BARE TINNED COPPER WIRE.

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REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
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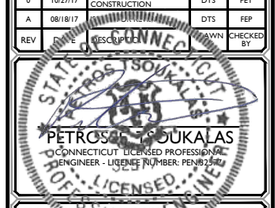

PETROS S. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0025911

SITE NAME: 227
BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

RED BANK OFFICE
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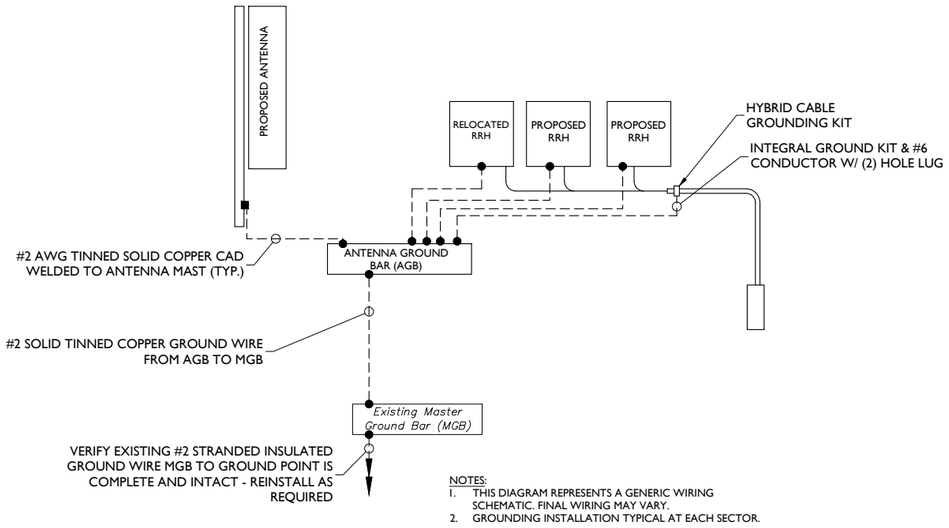
SHEET TITLE :
ELECTRICAL AND GROUNDING NOTES

SHEET NUMBER :
ANT-012.00

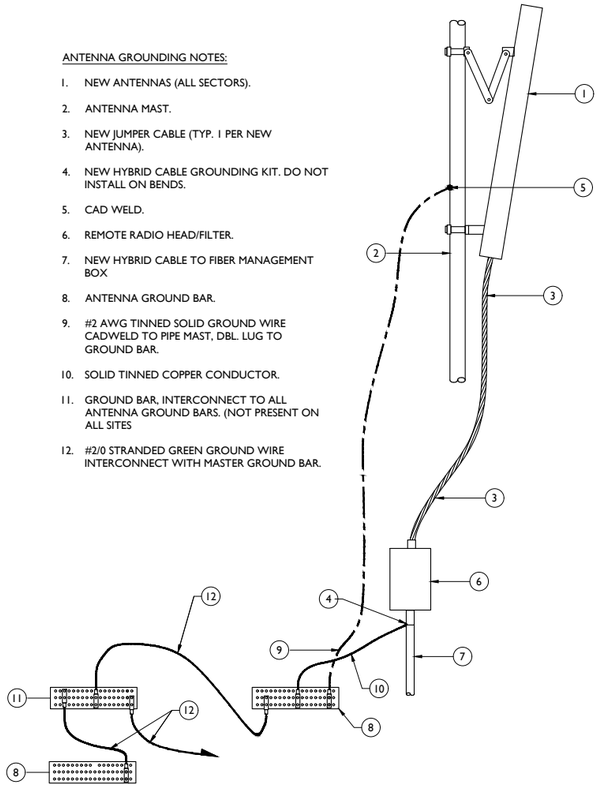


NOTES:
1. THIS DIAGRAM REPRESENTS A GENERIC WIRING SCHEMATIC. FINAL WIRING MAY VARY.
2. GROUNDING INSTALLATION TYPICAL AT EACH SECTOR.

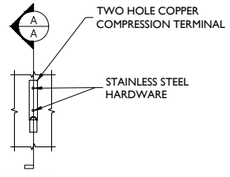
GROUNDING SCHEMATIC
NOT TO SCALE

ANTENNA GROUNDING NOTES:

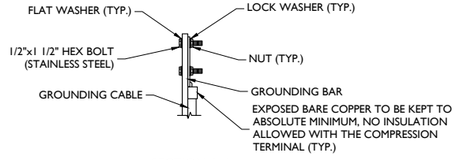
1. NEW ANTENNAS (ALL SECTORS).
2. ANTENNA MAST.
3. NEW JUMPER CABLE (TYP. 1 PER NEW ANTENNA).
4. NEW HYBRID CABLE GROUNDING KIT. DO NOT INSTALL ON BENDS.
5. CAD WELD.
6. REMOTE RADIO HEAD/FILTER.
7. NEW HYBRID CABLE TO FIBER MANAGEMENT BOX
8. ANTENNA GROUND BAR.
9. #2 AWG TINNED SOLID GROUND WIRE CADWELD TO PIPE MAST, DBL. LUG TO GROUND BAR.
10. SOLID TINNED COPPER CONDUCTOR.
11. GROUND BAR, INTERCONNECT TO ALL ANTENNA GROUND BARS. (NOT PRESENT ON ALL SITES
12. #2/0 STRANDED GREEN GROUND WIRE INTERCONNECT WITH MASTER GROUND BAR.



ANTENNA GROUNDING SCHEMATIC
NOT TO SCALE

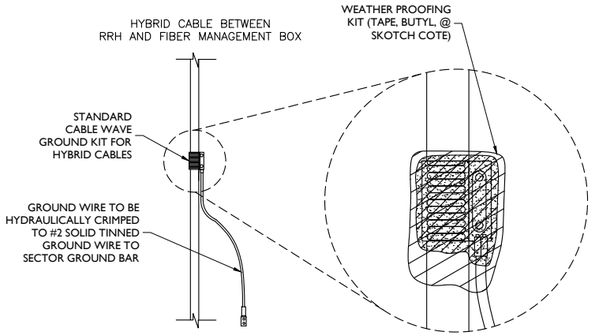


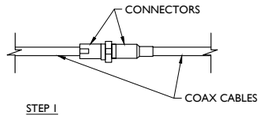
ELEVATION



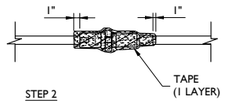
SECTION A-A

TYPICAL GROUND BAR CONNECTION DETAIL
NOT TO SCALE





STEP 1



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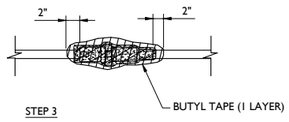
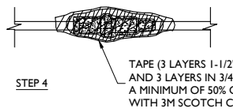
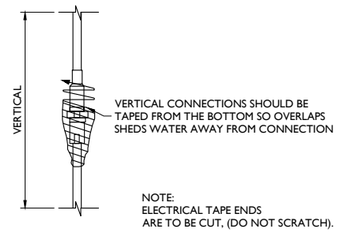


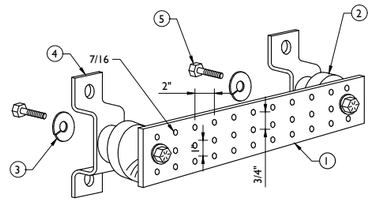
STEP 3



STEP 4



CABLE WRAPPING DETAIL
NOT TO SCALE



1. COPPER GROUND BAR, 1/4" X 4" X 20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION. (ACTUAL GROUND BAR SIZE WILL VARY BASED ON NUMBER OF GROUND CONNECTIONS)
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4 OR EQUAL
3. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8 OR EQUAL
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056 OR EQUAL
5. 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1 OR EQUAL

NOTE: INSULATORS SHALL BE ELIMINATED WHEN BONDING DIRECTLY TO MONOPOLE STRUCTURE. CONNECTION TO MONOPOLE STRUCTURE SHALL BE PER MANUFACTURERS RECOMMENDATIONS.

GROUND BAR DETAIL
NOT TO SCALE

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AS SHOWN	17924001A

REV	DATE	DESCRIPTION	DRAWN	CHECKED BY
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17		DTS	FEP

STATE OF CONNECTICUT · PETROS P. SOUKALAS · 29317 · LICENSED PROFESSIONAL ENGINEER

PETROS P. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.29317

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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

SHEET TITLE :
GROUNDING SCHEMATIC AND DETAILS

SHEET NUMBER :
ANT-013.00