Cherundolo Consulting

1280 Route 46 West, Suite 9, Parsippany NJ, 07054

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

Re: Notice of Exempt Modification Application
37 Carmen Hill Rd, Brookfield CT

Latitude: N41.49338
Longitude: W73.4288

Dear Ms. Bachman:

Sprint currently maintains 1 existing panel antennas, and 2 remote radio units at the 257' centerline level of the existing Guyed Tower. Sprint proposes to remove the existing panel antenna and replace it with 6 panel antennas and 4 additional remote radio unit at the 257' centerline on the tower as well as two new sector frames. Sprint further proposes to add 3 hybrid cable. 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.

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 First Selectman Stephen C Dunn, the Town of Brookfield as well as Francis Lollie, Zoning Enforcement Officer, Town of Brookfield, Alice Dew, Wetlands Enforcement Officer and Land Use Manger, Town of Brookfield, Vertical Bridge Holdings, Tower Owner and American Tower, Property 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 as well as the latest CSC decision.

Existing Facility

CSC Summary Statement – CT72XC033 – 39 Carmen Hill Rd, Brookfield, CT 06804

The Communications Tower facility is located at 39 Carmen Hill Rd, Brookfield Ct and is owned by Vertical Bridge Holdings, the Site coordinates are: N41.49338 W73.4288.

The existing facility consists of a 495' Guyed Tower. Sprint currently operates wireless communications equipment inside the building at the facility and has 1 antenna 2 RRU's mounted on at centerline of 257 feet.

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,

Ryan G Bailey
Charles Cherundolo Consulting
856-625-1596
ryan@mackenzierealtyconsulting.com

Additional Recipients:
First Selectman Stephen C Dunn, Town of Brookfield – via FedEx
Francis Lollie, Zoning Enforcement Officer, Town of Brookfield – via FedEx
Alice Dew, Wetlands Enforcement Officer and Land Use Manager, Town of Brookfield - via FedEx
American Tower, property owner -via FedEx
Vertical Bridge Holdings, owner of the tower – via FedEx

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

April 5, 2013

Jennifer Young Gaudet
HPC Wireless Services
46 Mill Plain Road, Floor 2
Danbury, CT 06811

RE: **EM-SPRINT-018-130322** – Sprint Spectrum L.P. notice of intent to modify an existing telecommunications facility located at 39 Carmen Hill Road, Brookfield, Connecticut.

Dear Ms. Gaudet:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Prior to the proposed installation, the tower's foundation shall be investigated for structural capacity in accordance with the recommendation included in the Structural Analysis prepared by Salient Associates dated October 25, 2012 and stamped by Ronald Jackson; and
- Within 45 days following completion of the antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the structure and foundation do not exceed 100 percent of the post-construction structural rating.
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated March 21, 2013. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency

emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Bill Davidson, First Selectman, Town of Brookfield
Alice Dew, Zoning Enforcement Officer, Town of Brookfield
Aurora of Danbury LLC

PROJECT INFORMATION:

TOWER INFORMATION

CASCADE: CT72XC033

ADDRESS: 39 CARMEN HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

LAT: 41.49338°

LONG: -73.4288°

SITE TYPE: 495' GUYED TOWER

APPLICANT

SPRINT
1 INTERNATIONAL BLVD., SUITE 800
MAHWAH, NJ 07495
CONTACT: TBD
PHONE: TBD
EMAIL: TBD

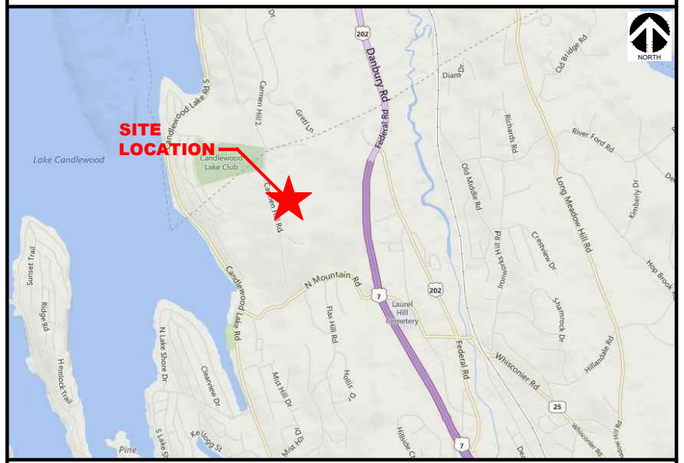
LANDLORD

I-95 WRKI
1004 FEDERAL ROAD
BROOKFIELD, CT 06804
PHONE: (203) 775-1212

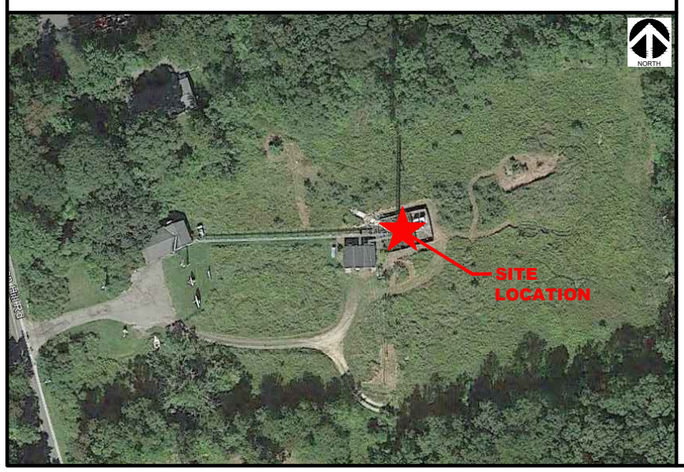
A&E FIRM

RAMAKER & ASSOCIATES, INC.
CONTACT: KEITH BOHNSACK
PROJECT MANAGER
PHONE: (608) 643-4100
EMAIL: kbohnsack@ramaker.com

VICINITY MAP:



AERIAL MAP:



SHEET INDEX:

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A-1	ANTENNA LAYOUTS & EQUIPMENT LAYOUT	-
A-2	TOWER ELEVATION	-
A-3	ANTENNA DETAILS	-
A-4	ANTENNA SCHEDULE & DETAILS	-
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A-6	CABLE COLOR CODING	-
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S-5	STRUCTURAL DETAILS	-
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DO MACRO UPGRADE

SITE CASCADE:

CT72XC033

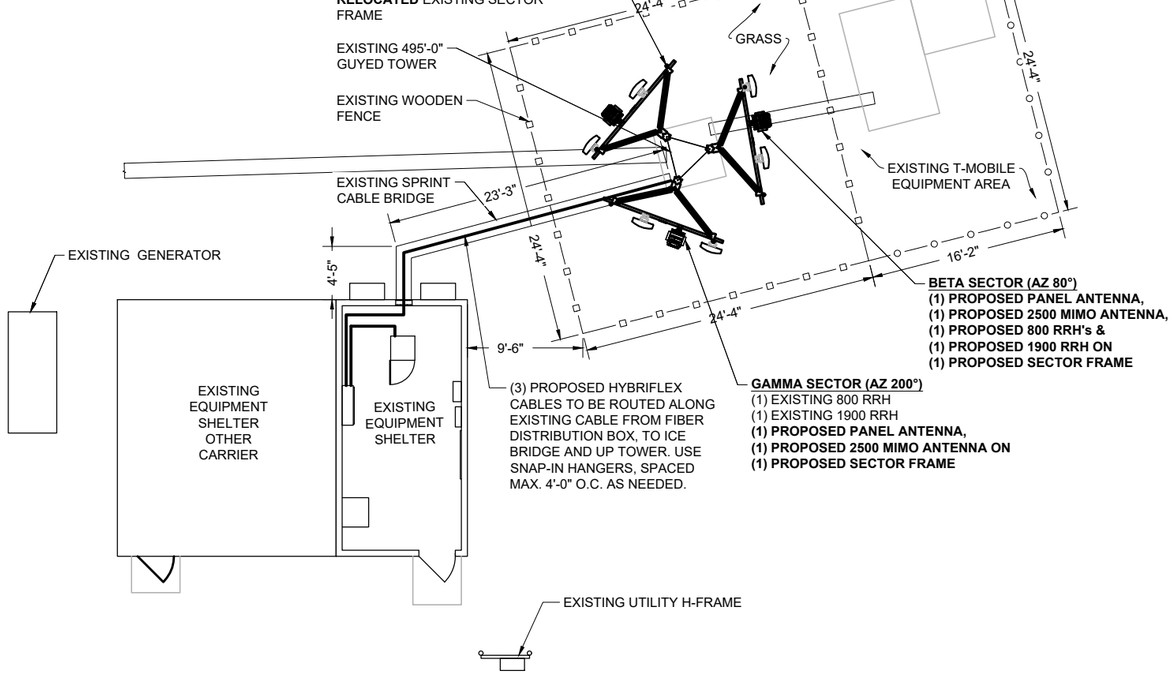
CODE COMPLIANCE:

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

1. INTERNATIONAL BUILDING CODE
2. ANSI/TIA-222 STRUCTURAL STANDARD FOR ANTENNA STRUCTURES
3. NFPA 780 - LIGHTNING PROTECTION CODE
4. NATIONAL ELECTRIC CODE

811 Know what's below. Call before you dig. www.call811.com

NORTH



OVERALL SITE PLAN (1)
SCALE: 1" = 12.5'

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
123 Broadway, Woodcliff Lake, NJ 07677
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 8/06/2018

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 08/06/2018

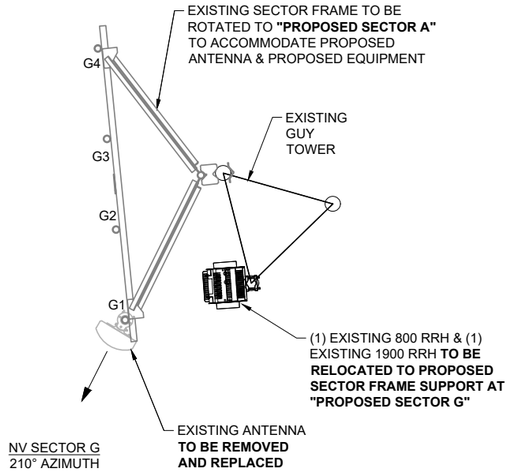
PROJECT TITLE:
CT72XC033

PROJECT INFORMATION:
39 CARMEN HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

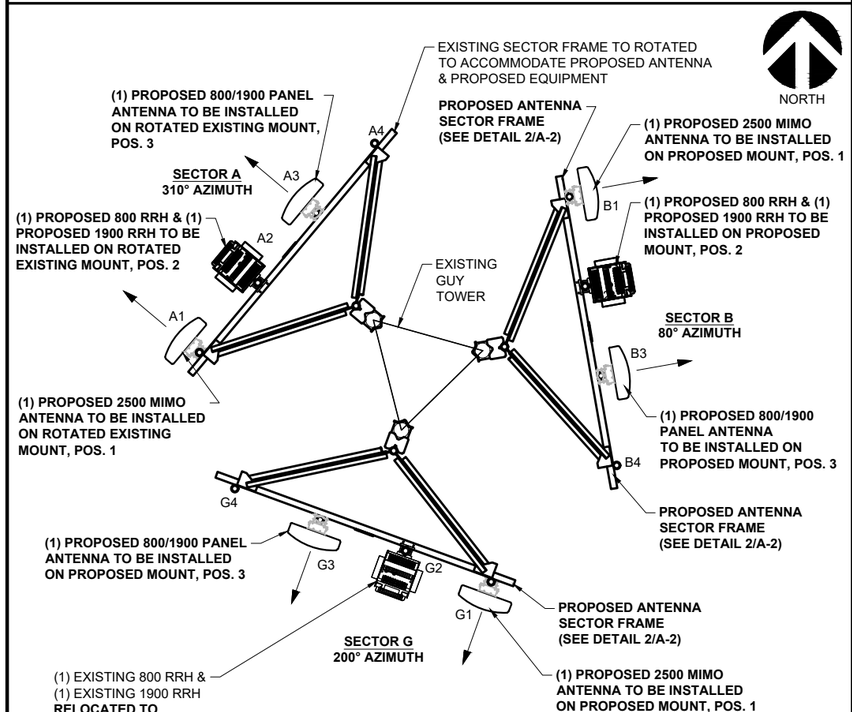
SHEET TITLE:
COVER SHEET & SITE PLAN

0 6.25' 12.5' 25'
11" x 17" - 1" = 12.5'
22" x 34" - 1" = 6.25'

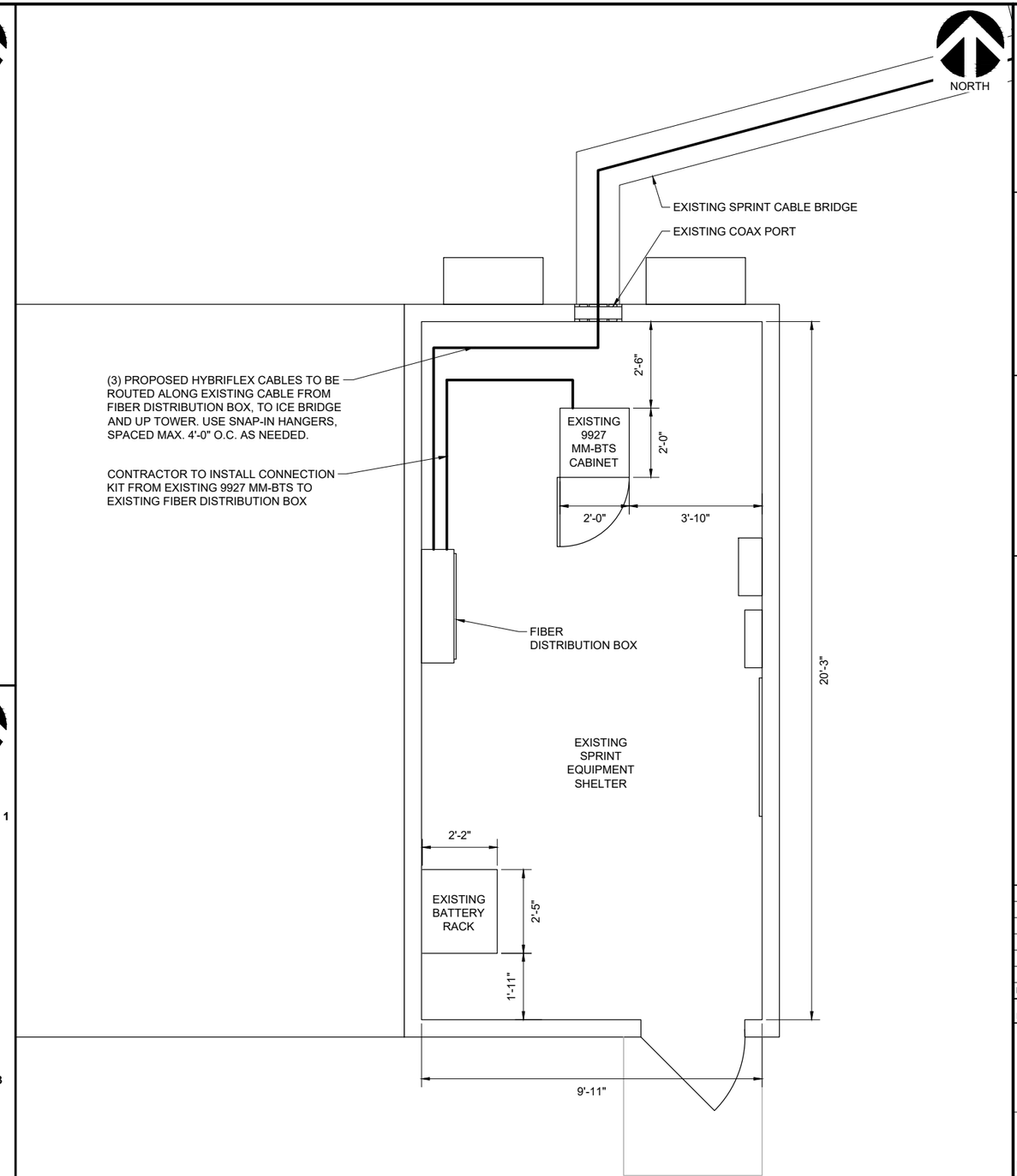
PROJECT NUMBER: 28758
SHEET NUMBER: T-1



EXISTING ANTENNA PLAN (1)
SCALE: NTS



PROPOSED ANTENNA PLAN (2)
SCALE: NTS



EQUIPMENT PLAN (3)
SCALE: 1" = 3.75'

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Signature: 8/06/2018 Date:

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 08/06/2018

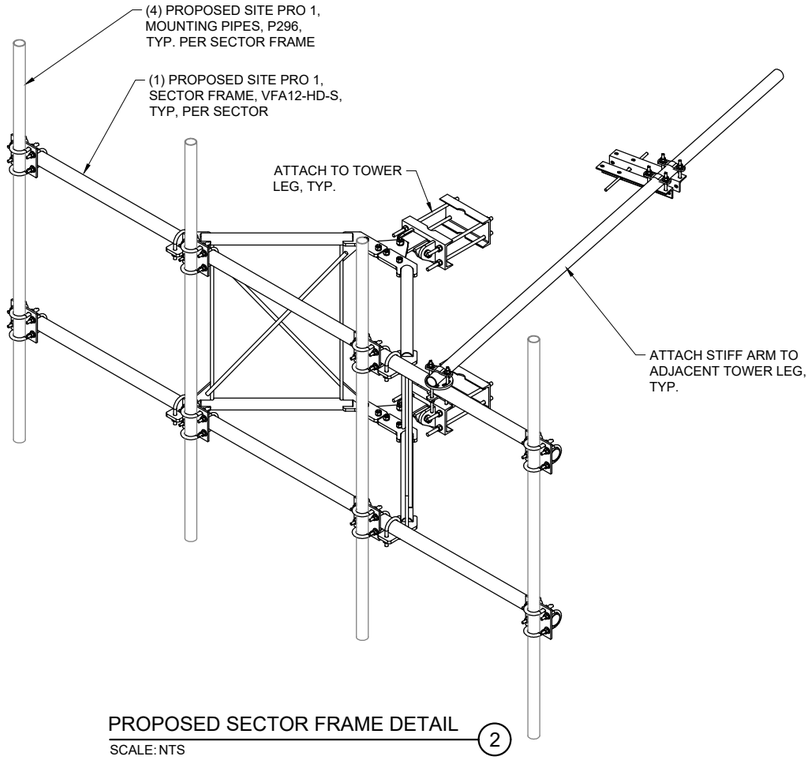
PROJECT TITLE:
CT72XC033

PROJECT INFORMATION:
39 CARMEN HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

SHEET TITLE:
PROPOSED ANTENNA LAYOUT & EQUIPMENT LAYOUT

0 1.875' 3.75' 7.5'
11" x 17" - 1" = 3.75'
22" x 34" - 1" = 1.875'

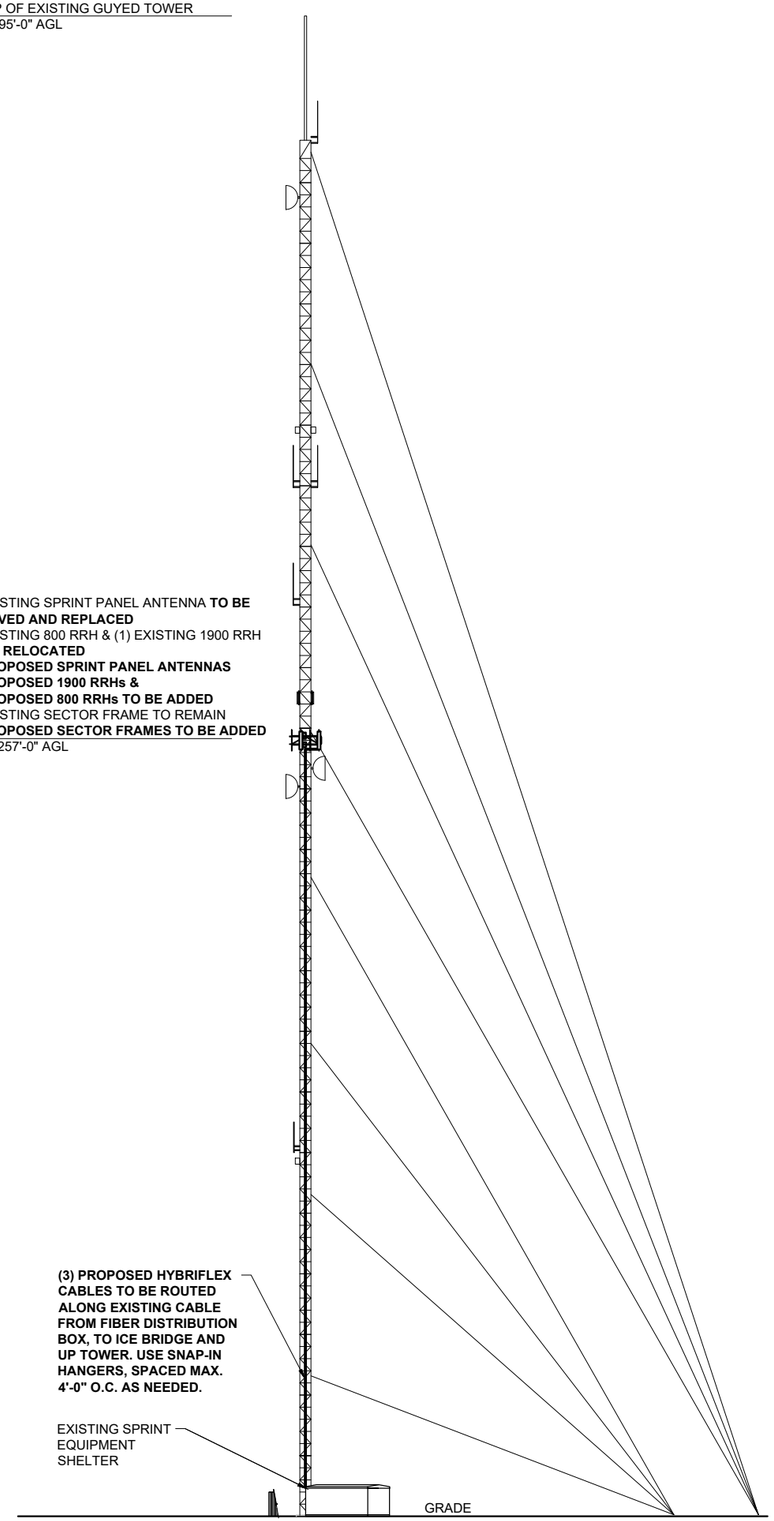
PROJECT NUMBER: 28758
SHEET NUMBER: A-1



PROPOSED SECTOR FRAME DETAIL (2)
SCALE: NTS

TOP OF EXISTING GUYED TOWER @ 495'-0" AGL

(1) EXISTING SPRINT PANEL ANTENNA **TO BE REMOVED AND REPLACED**
(1) EXISTING 800 RRH & (1) EXISTING 1900 RRH **TO BE RELOCATED**
(6) PROPOSED SPRINT PANEL ANTENNAS
(2) PROPOSED 1900 RRHs &
(2) PROPOSED 800 RRHs TO BE ADDED
(1) EXISTING SECTOR FRAME TO REMAIN
(2) PROPOSED SECTOR FRAMES TO BE ADDED
℄ @ ± 257'-0" AGL



TOWER ELEVATION (1)
SCALE: 1" = 50'

Sprint

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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: James R Skowronski Date: 8/06/2018

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 08/06/2018

PROJECT TITLE:
CT72XC033

PROJECT INFORMATION:
39 CARMEN HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

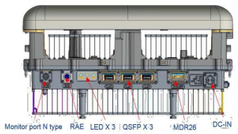
SHEET TITLE:
TOWER ELEVATION

0 25' 50' 100'
11" x 17" - 1" = 50'
22" x 34" - 1" = 25'

PROJECT NUMBER: 28758
SHEET NUMBER: A-2

MECHANICAL	
DIMENSION (HxWxD)	72.0" x 19.6" x 7.8"
WEIGHT	77.4 lbs

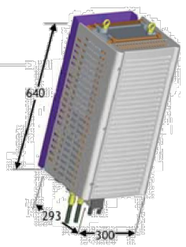
ANTENNA MODEL: COMMSCOPE #NNVV-65B-R4 - ANTENNA SPECS



MECHANICAL	
DIMENSION (HxWxD)	25.6" x 19.7" x 9.64"
WEIGHT	103.7 lbs

ANTENNA MODEL: NOKIA #AAHC - ANTENNA SPECS

1900MHz Remote Radio Head (RRH)



Capacity & Features

CDMA / LTE Multi technology RRH 65MHz bandwidth (PCS A-G Band)

- Sprint is free to deploy any combination of CDMA (1XRTT or EVDO) and LTE carriers in Sprint's spectrum up to 160 Watts of RF power.
- E.g. "A block" and "G block" both with 4 branch MIMO (4Tx & 4Rx)

2 CPRI Optical Connections for multi-carrier LTE and CDMA (1X & DO)

Power Supply: -48 VDC

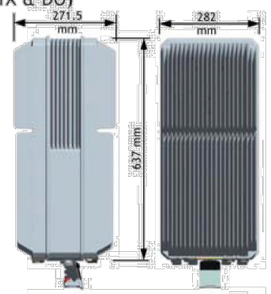
Power Consumption: 700W Typical

Dimensions:

- Size: 282 x 271.5 x 637mm (11.1" x 10.69" x 25.1")
- Volume: 49 Liter
  56 liters with solar shield & mounting OD

Weight: 27 kg (59.5 lbs)

Operating Temp range -40°C/+55°C



Alcatel-Lucent's 65MHz RRH satisfies Sprint's requirements.

MECHANICAL	
DIMENSION (HxWxD)	25.2"x11.8"x11.5"
WEIGHT	59.5 lbs

RRH MODEL: ALU #1900 MHZ 4X45W - RADIO SPECS

800MHz 2X50W Remote Radio Head (RRH)

Simultaneous CDMA & LTE Multi technology RRH 862-869 MHz

- Any combination of CDMA and LTE carriers supported by 100W RF Power

2 CPRI-like Optical Connections for daisy chaining

Software Switchable External Filter for use before Public Safety is cleared

Dimensions:	w/o Filter	w/ Filter
Height:	480 mm (19")	480 mm (19")
Width:	330 mm (13")	330 mm (13")
Depth:	218 mm (8.6")	310 (12.2")
Weight:	24 kg (53 lbs)	29 kg (64 lbs)
	49 liters,	<29kg

Power Supply: -48 VDC

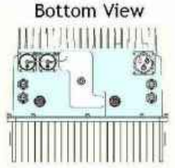
Power Consumption: <400W Typical

Operating Temp range -40°C to +55°C

Option to mount on Ground at tower base

Front/Top View

Bottom View



Alcatel-Lucent's 800 RRH satisfies Sprint's requirements.

MECHANICAL	
DIMENSION (HxWxD)	19" x 13" x 12.2"
WEIGHT	64 lbs

RRH MODEL: ALU #800 MHz 2x50W - RADIO SPECS

Sprint

1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495

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STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED
PROFESSIONAL ENGINEER

Signature: 8/06/2018 Date:

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 08/06/2018

PROJECT TITLE:
CT72XC033

PROJECT INFORMATION:
39 CARMEN HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

SHEET TITLE:
ANTENNA DETAILS

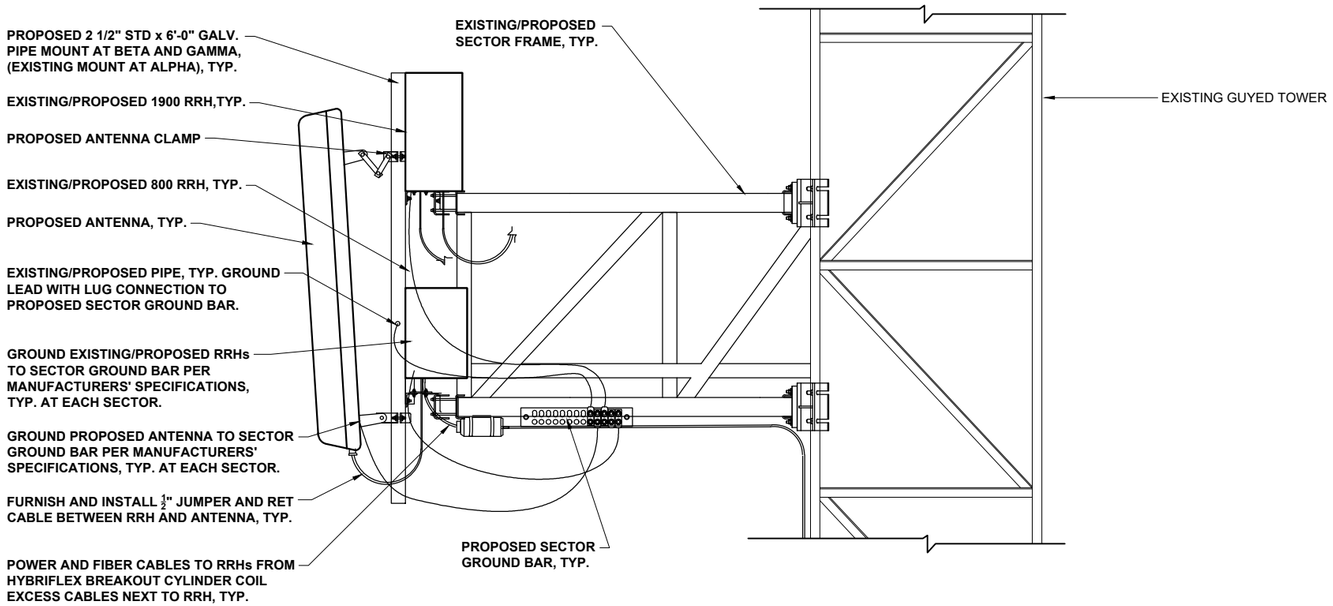
SCALE: NONE

PROJECT NUMBER: 28758
SHEET NUMBER: A-3

800/1900/2500 EQUIPMENT SCHEDULE

SECTOR	POSITION	ANTENNA MAKE/MODEL	AZIMUTH	CENTERLINE	RRH	CABLE TYPE	CABLE LENGTH	JUMPER TYPE
ALPHA	1	PROPOSED 2500 MIMO ANTENNA (NOKIA AAHC) (EXISTING ANTENNA TO BE REMOVED)	310°	257'	-	(1) PROPOSED HYBRIFLEX	350'	8' HYBRID
	2	-	-	257'	(1) PROPOSED RRH 1900 4X45 65 MHz (1) PROPOSED RRH 800 MHz 2x50W	SHARED W/ GAMMA	350'	8' HYBRID
	3	PROPOSED 800/1900 PANEL ANTENNA (COMMSCOPE NNVV-65B-R4)	310°	257'	-	-	-	
	4	VACANT	-	257'	-	-	-	-
BETA	1	PROPOSED 2500 MIMO ANTENNA (NOKIA AAHC) (EXISTING ANTENNA TO BE REMOVED)	80°	257'	-	(1) PROPOSED HYBRIFLEX	350'	8' HYBRID
	2	-	-	257'	(1) PROPOSED RRH 1900 4X45 65 MHz (1) PROPOSED RRH 800 MHz 2x50W	SHARED W/ GAMMA	350'	8' HYBRID
	3	PROPOSED 800/1900 PANEL ANTENNA (COMMSCOPE NNVV-65B-R4)	80°	257'	-	-	-	
	4	VACANT	-	257'	-	-	-	-
GAMMA	1	PROPOSED 2500 MIMO ANTENNA (NOKIA AAHC) (EXISTING ANTENNA TO BE REMOVED)	200°	257'	-	(1) PROPOSED HYBRIFLEX	350'	8' HYBRID
	2	-	-	257'	(1) EXISTING RRH 1900 4X45 65 MHz (1) EXISTING RRH 800 MHz 2x50W	(1) EXISTING HYBRIFLEX	350'	8' HYBRID
	3	PROPOSED 800/1900 PANEL ANTENNA (COMMSCOPE NNVV-65B-R4)	200°	257'	-	-	-	
	4	VACANT	-	257'	-	-	-	-

EQUIPMENT & CABLE SCHEDULE (1)
SCALE: NTS



ANTENNA & RRH MOUNTING DETAIL (2)
SCALE: NTS

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495

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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: 8/06/2018 Date:

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL — DATE ISSUED: 08/06/2018

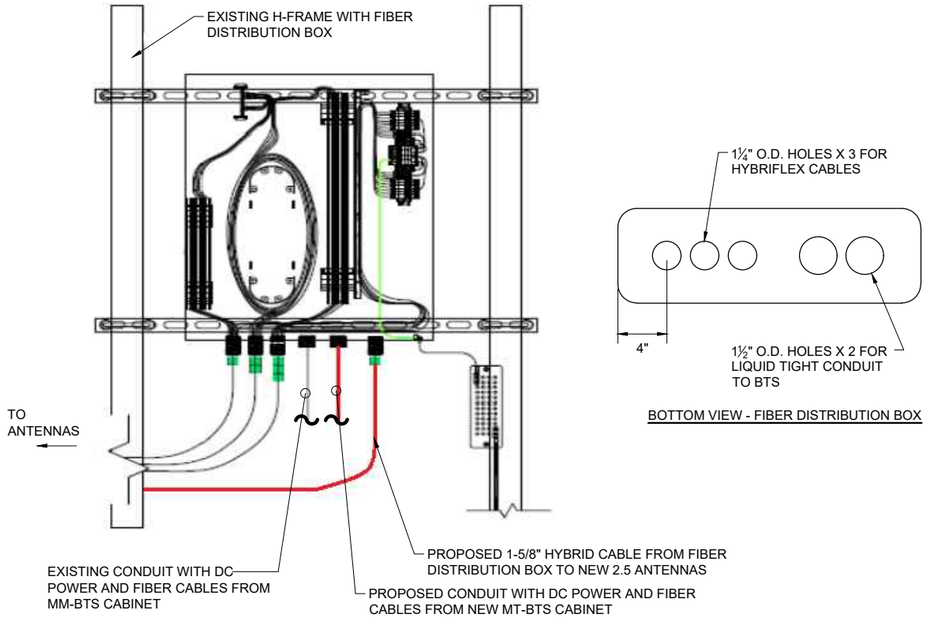
PROJECT TITLE:
CT72XC033

PROJECT INFORMATION:
39 CARMEN HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

SHEET TITLE:
ANTENNA SCHEDULE & DETAIL

SCALE: NONE

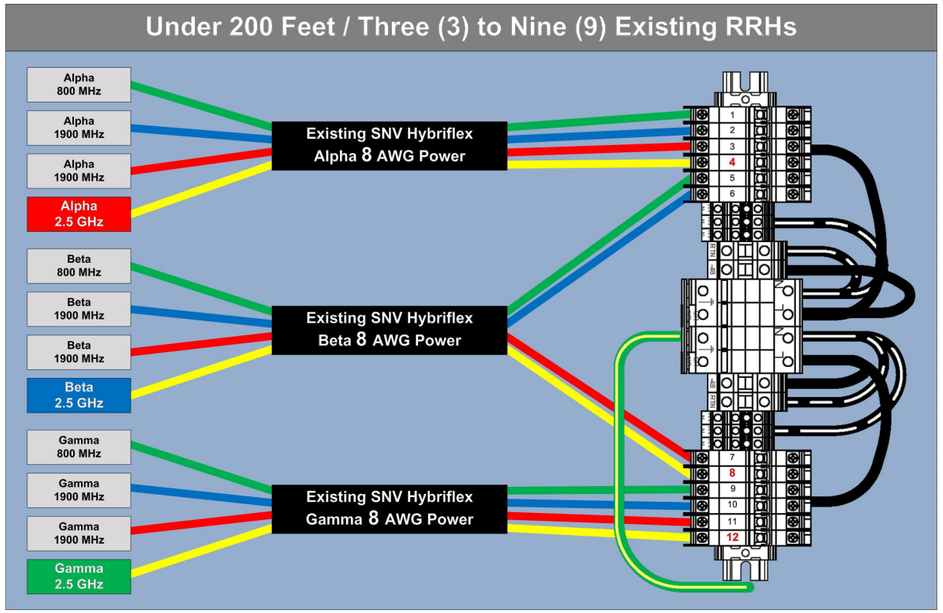
PROJECT NUMBER: 28758
SHEET NUMBER: A-4



BOTTOM VIEW - FIBER DISTRIBUTION BOX

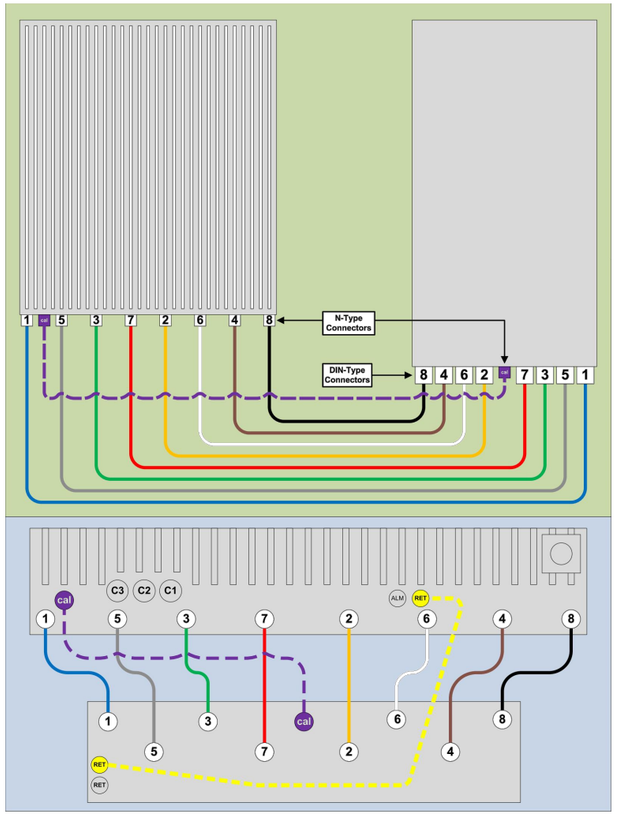
TYPICAL FIBER DISTRIBUTION BOX DETAIL (1)

SCALE: NTS



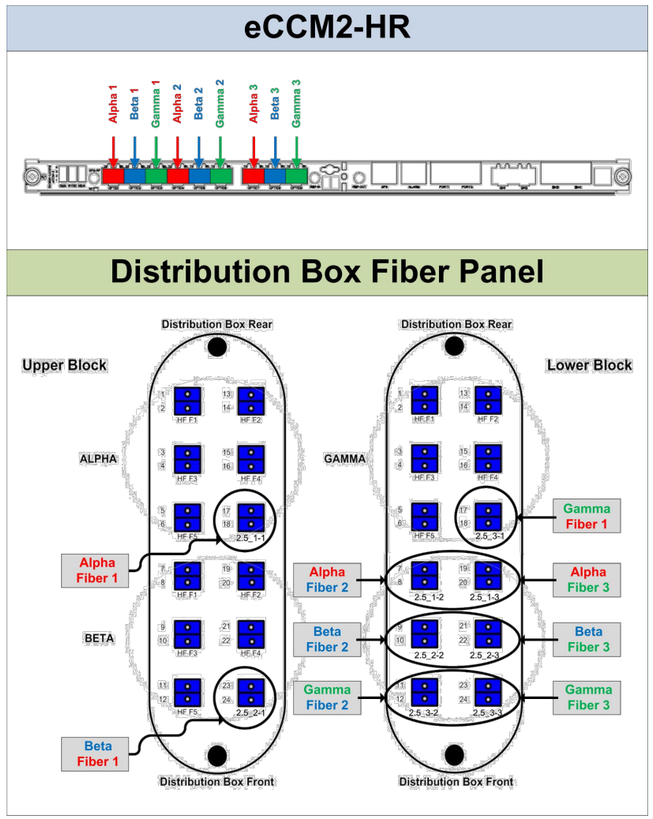
RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL (2)

SCALE: NTS



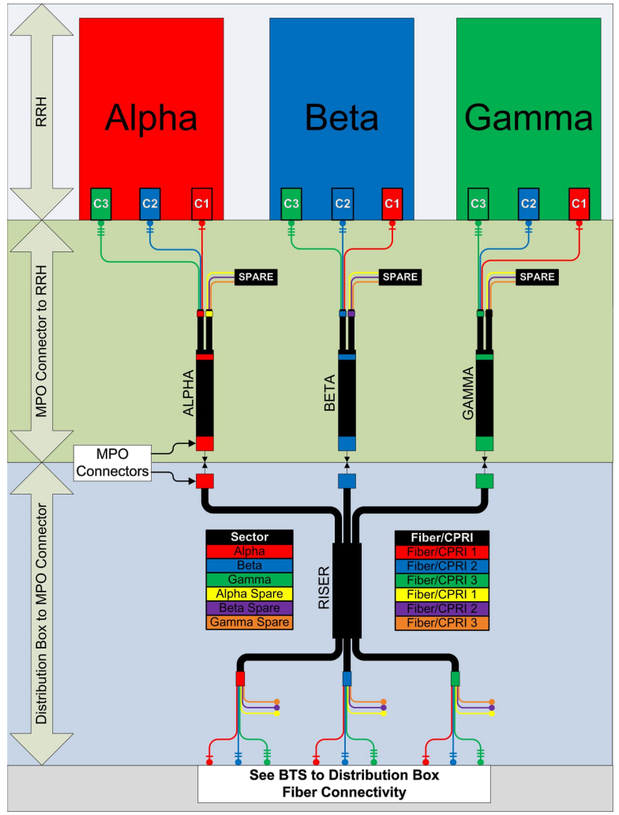
8T8R DETAIL (3)

SCALE: NTS



BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (4)

SCALE: NTS



RRH TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (5)

SCALE: NTS

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713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED PROFESSIONAL ENGINEER

Signature: 8/06/2018 Date:

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 08/06/2018

PROJECT TITLE:

CT72XC033

PROJECT INFORMATION:
39 CARMEN HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

SHEET TITLE:

FIBER PLUMBING DIAGRAM

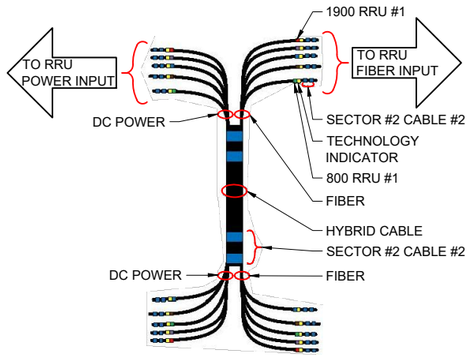
SCALE: NONE

PROJECT NUMBER: 28758
SHEET NUMBER: A-5

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

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




Example – Sector 2, Cable 2, 800mhz Radio #1


Example – Sector 3, Cable 1, 1900mhz Radio #1


Example – Sector 1, Cable 4, 800 mhz Radio #1 and 1900mhz Radio #1

COLOR CODING CHARTS (1)
SCALE: NTS

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 LABELED WITH BOTH THE CABLE AND FREQUENCY.

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Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: James R Skowronski Date: 8/06/2018

MARK	DATE	DESCRIPTION
.		

ISSUE PHASE: FINAL
DATE ISSUED: 08/06/2018

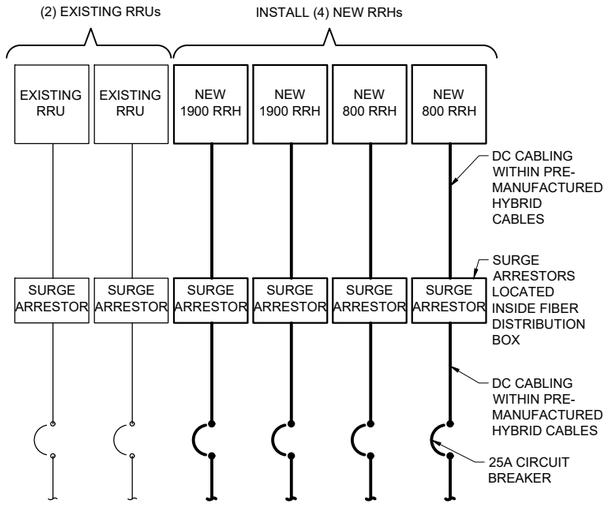
PROJECT TITLE:
CT72XC033

PROJECT INFORMATION:
39 CARMEN HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

SHEET TITLE:
CABLE COLOR CODING

SCALE: NONE

PROJECT NUMBER: 28758
SHEET NUMBER: A-6

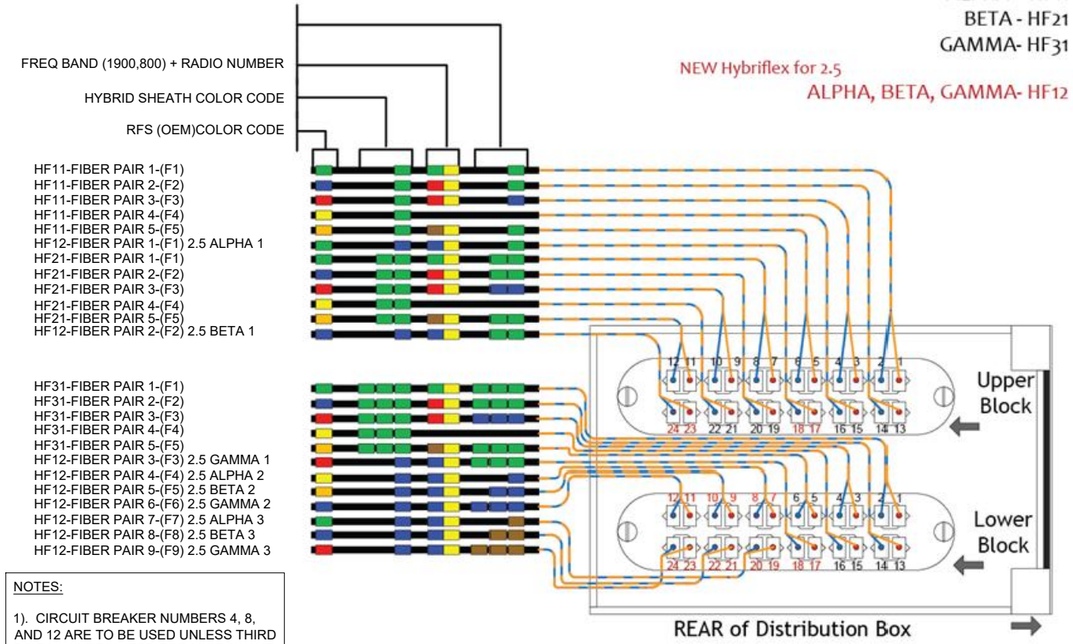


DC ONE-LINE DIAGRAM
SCALE: NTS
1

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.

TYPICAL FIBER DISTRIBUTION
SCALE: NTS
2

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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: 8/06/2018 Date:

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 08/06/2018

PROJECT TITLE:
CT72XC033

PROJECT INFORMATION:
39 CARMEN HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

SHEET TITLE:
DC POWER & FIBER DISTRIBUTION DETAIL

SCALE: NONE

PROJECT NUMBER: 28758
SHEET NUMBER: E-1

GENERAL NOTES:

1. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST HAVE CONSIDERABLE EXPERIENCE IN PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED AND PROPERLY REGISTERED TO DO THIS WORK IN THE STATE.
2. WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE CURRENT STATE BUILDING CODE.
3. UNLESS SHOWN OR NOTED OTHERWISE ON THE CONTRACT DRAWINGS, OR IN THE SPECIFICATIONS, THE FOLLOWING NOTES SHALL APPLY TO THE MATERIALS LISTED HEREIN, AND TO THE PROCEDURES TO BE USED ON THIS PROJECT.
4. ALL HARDWARE ASSEMBLY MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
5. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE THE ERECTION PROCEDURE AND SEQUENCE TO INSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION AND/OR FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF TEMPORARY BRACING, GUYS, OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT.
6. ALL DIMENSIONS, ELEVATIONS, AND EXISTING CONDITIONS SHOWN ON THE DRAWINGS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO BEGINNING ANY MATERIALS ORDERING, FABRICATION, OR CONSTRUCTION WORK ON THIS PROJECT. CONTRACTOR SHALL NOT SCALE CONTRACT DRAWINGS IN LIEU OF FIELD VERIFICATIONS. ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND THE OWNER'S ENGINEER. THE DISCREPANCIES MUST BE RESOLVED BEFORE THE CONTRACTOR IS TO PROCEED WITH THE WORK. THE CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTION OF THE PROTECTIVE MEASURES OR THE PROCEDURES.
7. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS, AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK.
9. THE CONTRACTOR SHALL COORDINATE ACCESS AND CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIALS ACCESS, WITH THE LEASING AGENT FOR APPROVAL.
10. ALL PERMITS THAT MUST BE OBTAINED ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
11. 24 HOURS PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, THE CONTRACTOR MUST NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY, OR CITY) ENGINEER.
12. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE YEAR FROM ACCEPTANCE DATE.
13. ALL TOWER DIMENSIONS SHALL BE VERIFIED WITH THE PLANS (LATEST REVISION) PRIOR TO COMMENCING CONSTRUCTION. NOTIFY THE ENGINEER IMMEDIATELY IF ANY DISCREPANCIES ARE DISCOVERED. THE OWNER SHALL HAVE A SET OF APPROVED PLANS AVAILABLE AT THE SITE AT ALL TIMES WHILE WORK IS BEING PERFORMED. A DESIGNATED RESPONSIBLE EMPLOYEE SHALL BE AVAILABLE FOR CONTACT BY THE GOVERNING AGENCY INSPECTORS.
14. ALL TOWER MODIFICATION WORK SHALL BE IN ACCORDANCE WITH TIA-1019-A-2012, "STANDARD FOR INSTALLATION, ALTERATION AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
15. THE CLIMBING FACILITIES, SAFETY CLIMB, AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED, OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE TOWER OWNER OR ENGINEER OF RECORD.
16. ALL CONSTRUCTION MEANS AND METHODS, INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR. EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET THE ANSI/TIA-1019-A, OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019-A, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.
17. ANTENNAS AND OTHER APPURTENANCES MAY NEED TO BE TEMPORARILY RELOCATED DURING THE INSTALLATION OF MODIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, THE RCSC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, AND THE CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES.
2. UNLESS OTHERWISE NOTED, ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
   - A. ANGLE: ASTM A36
   - B. PIPE/TUBE: ASTM A500-46
   - C. PLATE: ASTM A36 (SELF-SUPPORTING AND GUYED TOWERS)
   - D. PLATE: ASTM A572-65 (MONOPOLES)
   - E. BOLTS: ASTM A325 TYPE 1 GALVANIZED HIGH STRENGTH BOLTS
   - F. U-BOLTS: ASTM A193 GRADE B7
   - G. NUTS: ASTM A563 CARBON AND ALLOY STEEL NUTS
   - H. WASHERS: ASTM F436 HARDENED STEEL WASHERS
3. ALL CONNECTIONS NOT FULLY DETAILED IN THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH THE LATEST AISC STEEL CONSTRUCTION MANUAL.
4. HOLES SHALL NOT BE FLAME CUT THROUGH STEEL UNLESS APPROVED BY THE ENGINEER.
5. HOT-DIP GALVANIZE ALL ITEMS UNLESS OTHERWISE NOTED, AFTER FABRICATION WHERE PRACTICABLE. GALVANIZING: ASTM A123, ASTM, A153/A153M OR ASTM A653/A653M, G90, AS APPLICABLE. ADDITIONALLY, ALL NEW STEEL SHALL BE PAINTED TO MATCH EXISTING STEEL. CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION TO PROTECT STEEL BY ANY OTHER MEANS.
6. REPAIR DAMAGED SURFACES WITH GALVANIZING REPAIR METHOD AND PAINT CONFORMING TO ASTM A780 OR BY APPLICATION OF STICK OR THICK PASTED MATERIAL SPECIFICALLY DESIGNED FOR REPAIR OF GALVANIZING. CLEAN AREAS TO BE REPAIRED AND REMOVE SLAG FROM WELDS. HEAT SURFACES TO WHICH STICK OR PASTE MATERIAL IS APPLIED. WITH A TORCH TO A TEMPERATURE SUFFICIENT TO MELT THE METALLICS IN STICK OR PASTED; SPREAD MOLTEN MATERIAL UNIFORMLY OVER SURFACES TO BE COATED AND WIPE OFF EXCESS MATERIAL. AFTER REPAIR, STEEL SHALL BE REPAINTED TO MATCH EXISTING FINISH (IF APPLICABLE).
7. A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED BOLTS. GALVANIZED ASTM A325 BOLTS SHALL NOT BE REUSED.
8. ALL PROPOSED AND /OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.

WELDING NOTES:

1. ALL WELDING SHALL BE IN ACCORDANCE WITH THE LATEST AWS D1.1/D1.1M: "STRUCTURAL WELDING CODE - STEEL".
2. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
3. CONTRACTOR SHALL RETAIN AN AWS CERTIFIED WELD INSPECTOR TO PERFORM VISUAL INSPECTIONS ON FIELD WELDS. A LETTER AND REPORT SHALL BE ISSUED TO THE CONTRACTOR. CONTRACTOR SHALL SUBMIT A LETTER AND REPORT TO RAMAKER.
4. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. GRIND THE SURFACE OF THE ROD TO BE INSTALLED FOR A DISTANCE OF 2" MINIMUM ALL AROUND THE AREA TO BE WELDED. ENSURE BOTH AREAS ARE 10O% FREE OF ALL GALVANIZING. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING.
5. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0 DEG F. THE MINIMUM PREHEAT AND INTERPASS TEMPERATURE REQUIREMENTS SHALL COMPLY WITH SECTION 3.5.1 AND TABLE 3.2 OF THE AWS D1.1/D1.1M.
6. DO NOT WELD ON WET OR FROST-COVERED SURFACES AND PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.
7. USE 70 KSI LOW HYDROGEN ELECTRODES FOR ALL WELDING. POLYGONAL MONOPOLE REINFORCEMENT SHALL USE 80 KSI ELECTRODES. THE ELECTRODES SHALL BE APPROPRIATE FOR THE WELDING POSITION REQUIRED TO MAKE THE JOINT.
8. AFTER FINAL INSPECTION, THE AREA OF THE WELDS AND ALL SURFACES DAMAGED BY WELDING OR GRINDING SHALL RECEIVE AT LEAST TWO (2) COATS OF ZRC COLD GALVANIZING COMPOUND. THIS COATING SHALL BE APPLIED BY BRUSH. OTHER APPROVED GALVANIZING COMPOUNDS SHALL CONTAIN A MINIMUM OF 95% ± PURE ZINC. THE FINISHED COATING SHALL BE A MINIMUM THICKNESS OF 3 MILS. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
9. FOR MONOPOLE TOWERS FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY ULTRASONIC TESTING (UT) IN ACCORDANCE WITH AWS D1.1.
10. FOR MONOPOLE TOWERS PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MAGNETIC PARTICLE (MT) IN ACCORDANCE WITH AWS D1.1.

BOLT TIGHTENING PROCEDURE:

1. CONNECTION BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8.2.1 OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. ALL OTHER BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1 OF THE SPECIFICATION.
2. PRETENSIONED JOINTS SHALL BE UTILIZE PROPERLY ALIGNED HOLES AND FASTENERS SHALL BE TIGHTENED BY ONE OF THE METHODS FROM SECTIONS 8.2.1 THROUGH 8.2.4.

8.1. SNUG-TIGHTENED JOINTS

ALL BOLT HOLES SHALL BE ALIGNED TO PERMIT INSERTION OF THE BOLTS WITHOUT UNDUE DAMAGE TO THE THREADS. BOLTS SHALL BE PLACED IN ALL HOLES WITH WASHERS POSITIONED AS REQUIRED IN SECTION 6.1 AND NUTS THREADED TO COMPLETE THE ASSEMBLY. COMPACTING THE JOINT TO THE SNUG-TIGHT CONDITION SHALL PROGRESS SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT. THE SNUG TIGHTENED CONDITION IS THE TIGHTNESS THAT IS ATTAINED WITH A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH TO BRING THE PLIES INTO FIRM CONTACT.

8.2.1. TURN-OF-THE-NUT PRETENSIONING

ALL BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN SECTION 8.1, WITH WASHERS POSITIONED AS REQUIRED IN SECTION 6.2. SUBSEQUENTLY, THE NUT OR HEAD ROTATION SPECIFIED IN TABLE 8.2 SHALL BE APPLIED TO ALL FASTENER ASSEMBLIES IN THE JOINT, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT IN A MANNER THAT WILL MINIMIZE RELAXATION OF PREVIOUSLY PRETENSIONED BOLTS. THE PART NOT TURNED BY THE WRENCH SHALL BE PREVENTED FROM ROTATING DURING THIS OPERATION. UPON COMPLETION OF THE APPLICATION OF THE REQUIRED NUT ROTATION FOR PRETENSIONING, IT IS NOT PERMITTED TO TURN THE NUT IN THE LOOSENING DIRECTION EXCEPT FOR THE PURPOSE OF COMPLETE REMOVAL OF THE INDIVIDUAL FASTENER ASSEMBLY.

PROVIDE NUT ROTATION FROM THE SNUG-TIGHT CONDITION TO TURN-OF-NUT PRETENSIONING, USING THE CHART BELOW (PARTIAL RCSC TABLE 8.2):

BOLT LENGTHS UP TO AND INCLUDING FOUR DIAMETERS:

1/2" BOLT	LENGTH ≤ 2.0 INCHES	+1/3 TURN BEYOND SNUG TIGHT
5/8" BOLT	LENGTH ≤ 2.5 INCHES	+1/3 TURN BEYOND SNUG TIGHT
3/4" BOLT	LENGTH ≤ 3.0 INCHES	+1/3 TURN BEYOND SNUG TIGHT
7/8" BOLT	LENGTH ≤ 3.5 INCHES	+1/3 TURN BEYOND SNUG TIGHT
1" BOLT	LENGTH ≤ 4.0 INCHES	+1/3 TURN BEYOND SNUG TIGHT

BOLT LENGTHS OVER FOUR DIAMETERS BUT NOT EXCEEDING EIGHT DIAMETERS:I

1/2" BOLT	LENGTH = 2.25 TO 4.0 INCHES	+1/2 TURN BEYOND SNUG TIGHT
5/8" BOLT	LENGTH = 2.75 TO 5.0 INCHES	+1/2 TURN BEYOND SNUG TIGHT
3/4" BOLT	LENGTH = 3.25 TO 6.0 INCHES	+1/2 TURN BEYOND SNUG TIGHT
7/8" BOLT	LENGTH = 3.75 TO 7.0 INCHES	+1/2 TURN BEYOND SNUG TIGHT
1" BOLT	LENGTH = 4.25 TO 8.0 INCHES	+1/2 TURN BEYOND SNUG TIGHT

8.2.2 CALIBRATED WRENCH PRETENSIONING

THE PRE-INSTALLATION VERIFICATION PROCEDURES IN SECTION 7 SHALL BE PERFORMED DAILY FOR THE CALIBRATION OF THE INSTALLATION WRENCH. TORQUE VALUES DETERMINED FROM TABLES OR FROM EQUATIONS THAT CLAIM TO RELATE TORQUE TO PRETENSION WITHOUT VERIFICATION SHALL NOT BE USED. ALL BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN SECTION 8.1, WITH WASHERS POSITIONED AS REQUIRED IN SECTION 6.2. SUBSEQUENTLY, THE INSTALLATION TORQUE DETERMINED IN THE PRE-INSTALLATION VERIFICATION OF THE FASTENER ASSEMBLY (SECTION 7) SHALL BE APPLIED TO ALL BOLTS IN THE JOINT, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT IN A MANNER THAT WILL MINIMIZE RELAXATION OF PREVIOUSLY PRETENSIONED BOLTS. THE PART NOT TURNED BY THE WRENCH SHALL BE PREVENTED FROM ROTATING DURING THIS OPERATION. APPLICATION OF THE INSTALLATION TORQUE NEED NOT PRODUCE A RELATIVE ROTATION BETWEEN THE BOLT AND NUT THAT IS GREATER THAN THE ROTATION SPECIFIED IN TABLE 8.2.

8.2.3. TWIST-OFF-TYPE TENSION-CONTROL BOLT PRETENSIONING

TWIST-OFF-TYPE TENSION CONTROL BOLT ASSEMBLIES THAT MEET THE REQUIREMENTS OF ASTM F1852 OR F2280 SHALL BE USED. ALL FASTENER ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN SECTION 8.1 WITHOUT SEVERING THE SPLINED END AND WITH WASHERS POSITIONED AS REQUIRED IN SECTION 6.2. IF A SPLINED END IS SEVERED DURING THIS OPERATION, THE FASTENER ASSEMBLY SHALL BE REMOVED AND REPLACED. SUBSEQUENTLY, ALL BOLTS IN THE JOINT SHALL BE PRETENSIONED WITH THE TWIST-OFF-TYPE TENSION-CONTROL BOLT INSTALLATION WRENCH, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT IN A MANNER THAT WILL MINIMIZE RELAXATION OF PREVIOUSLY PRETENSIONED BOLTS.

8.2.4. DIRECT-TENSION-INDICATOR PRETENSIONING

DIRECT TENSION INDICATORS THAT MEET THE REQUIREMENTS OF ASTM F959 SHALL BE USED. THE PRE-INSTALLATION VERIFICATION PROCEDURES SPECIFIED IN SECTION 7 SHALL DEMONSTRATE THAT, WHEN THE PRETENSION IN THE BOLT REACHES THAT REQUIRED IN TABLE 7.1, THE GAP IS NOT LESS THAN THE JOB INSPECTION GAP IN ACCORDANCE WITH ASTM F959. ALL BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS IN SECTION 8.1, WITH WASHERS POSITIONED AS REQUIRED IN SECTION 6.2. THE INSTALLER SHALL VERIFY THAT THE DIRECT-TENSION-INDICATOR PROTRUSIONS HAVE NOT BEEN COMPRESSED TO A GAP THAT IS LESS THAN THE JOB INSPECTION GAP DURING THIS OPERATION, AND IF THIS HAS OCCURRED, THE DIRECT TENSION INDICATOR SHALL BE REMOVED AND REPLACED. SUBSEQUENTLY, ALL BOLTS IN THE JOINT SHALL BE PRETENSIONED, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT IN A MANNER THAT WILL MINIMIZE RELAXATION OF PREVIOUSLY PRETENSIONED BOLTS. THE INSTALLER SHALL VERIFY THAT THE DIRECT TENSION INDICATOR PROTRUSIONS HAVE BEEN COMPRESSED TO A GAP THAT IS LESS THAN THE JOB INSPECTION GAP.

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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: James R. Skowronski Date: 8/06/2018

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL — DATE ISSUED: 08/06/2018

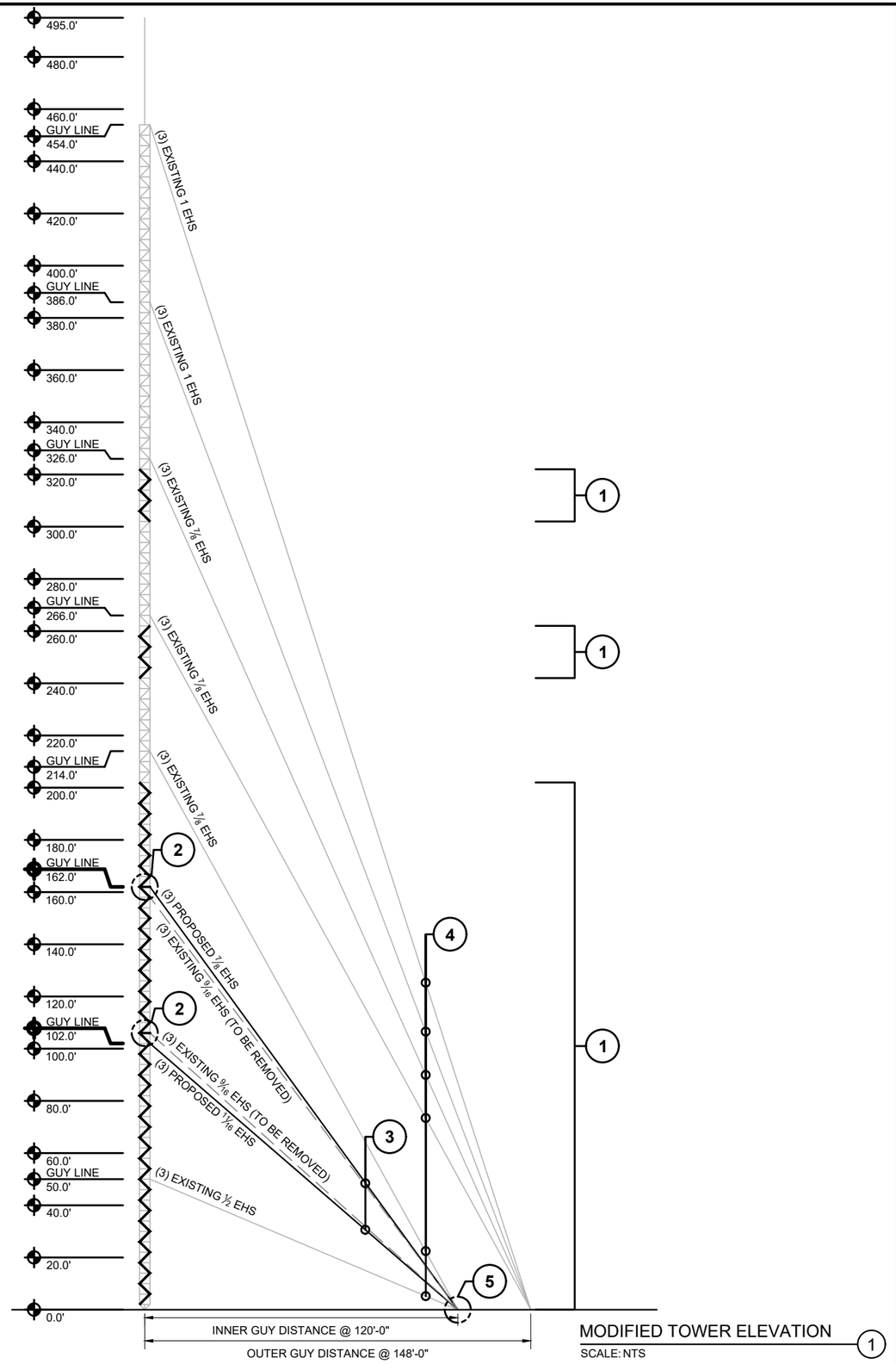
PROJECT TITLE:
CT72XC033

PROJECT INFORMATION:
39 CARMEN HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

SHEET TITLE:
STRUCTURAL NOTES

SCALE: NONE

PROJECT NUMBER: 28758
SHEET NUMBER: S-1



MODIFIED TOWER ELEVATION 1
SCALE: NTS

NO.	ELEVATION (FT)	TOWER MODIFICATION SCHEDULE	REFERENCE DETAIL/SHEET
1	322'-302', 262' - 242' & 202' - 0'	REPLACE DIAGONALS	S-3
2	162' & 102'	INSTALL GUY EARS AND HORIZONTALS & ADD GUSSET REINFORCING	S-3 & S-4
3	162' & 102'	REPLACE EXISTING GUY LINES	S-5 & S-6
4	454', 386', 326', 266', 214' & 50'	RETENSION EXISTING GUY LINES	S-6
5	0'	INCREASE HOLE DIAMETER AS NEEDED ON ANCHOR HEAD TO ACCOMMODATE STANDARD GUY CONNECTIONS	-

NOTES:
1. ALL PROPOSED STEEL AND HARDWARE TO BE HOT-DIPPED GALVANIZED.
2. ALL PROPOSED BOLTS TO BE GRADE A325, UNLESS NOTED OTHERWISE.
3. DO NOT REUSE EXISTING BOLTS, INSTALL NEW BOLTS.
4. NEW HARDWARE SHALL BE INSTALLED WITH NEW GUY LINES.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE TOWER DURING CONSTRUCTION.
6. SEE STRUCTURAL NOTES ON PAGES S-1

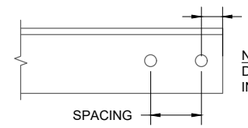
NOMINAL HOLE DIMENSIONS

BOLT DIA.	STANDARD HOLE	SHORT SLOT
½	9/16	9/16 x 1 1/16
5/8	11/16	1 1/16 x 7/8
3/4	13/16	13/16 x 1
7/8	15/16	15/16 x 1 1/8
1	1 1/16	1 1/16 x 1 5/16

NOTE: DIMENSIONS GIVEN IN INCHES

BOLT EDGE AND SPACING

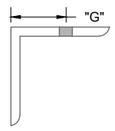
BOLT DIA.	MIN. EDGE	SPACING
½	7/8	1½
5/8	1⅛	1⅞
3/4	1¼	2¼
7/8	1½	2⅝
1	1¾	3



NOTE:
DIMENSIONS GIVEN IN INCHES.

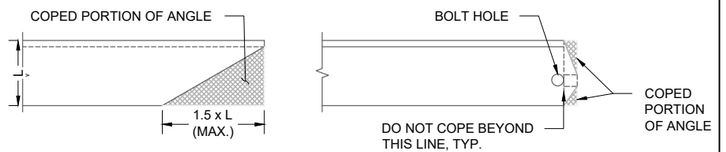
WORKABLE GAGES

LEG	4	3½	3	2½	2	1¾
G	2½	2	1¾	1⅜	1⅛	1



NOTE:
- WORKABLE GAGES GIVEN IN INCHES
- MATCH EXISTING WHEN APPLICABLE

ALLOWABLE ANGLE COPE



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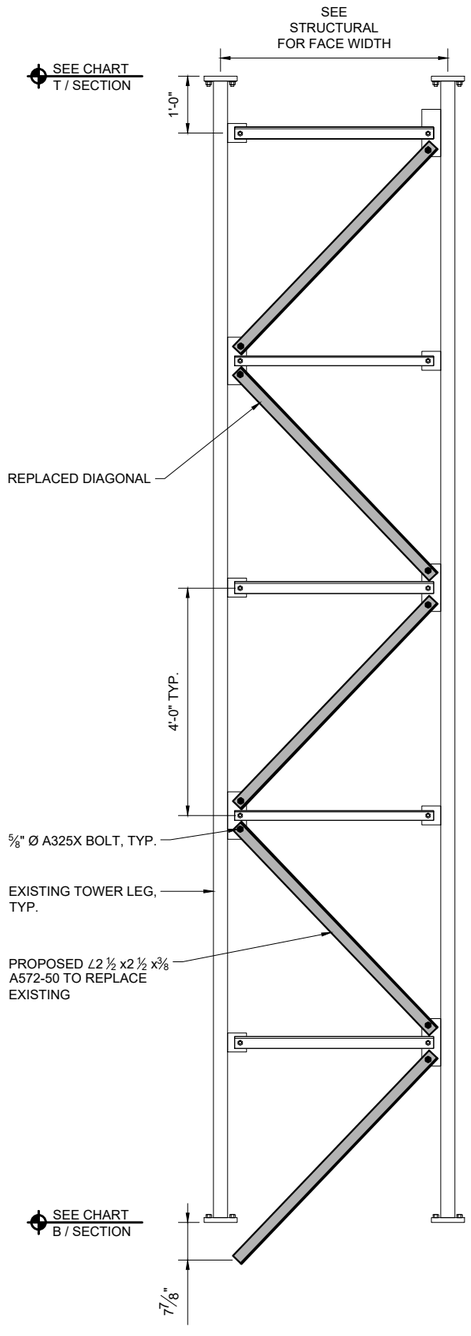
PROJECT INFORMATION:
39 CARMEN HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

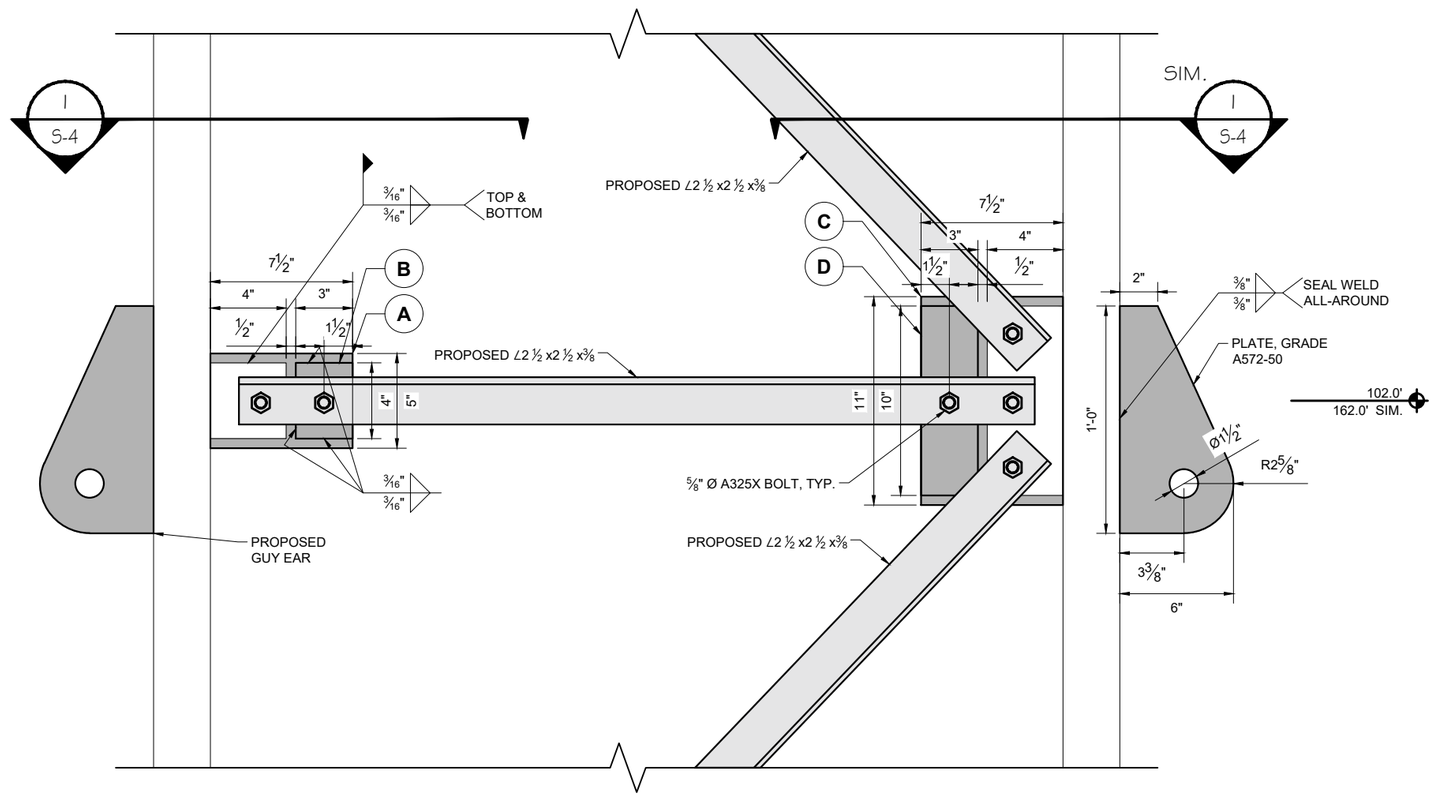
SHEET TITLE:
STRUCTURAL DETAILS

SCALE: NONE

PROJECT NUMBER: 28758
SHEET NUMBER: S-2



SECTION ELEVATION (1)
SCALE: NTS



GUY EAR REINFORCING DETAIL (2)
SCALE: NTS

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JAMES R. SKOWRONSKI
26266
LICENSED
PROFESSIONAL ENGINEER

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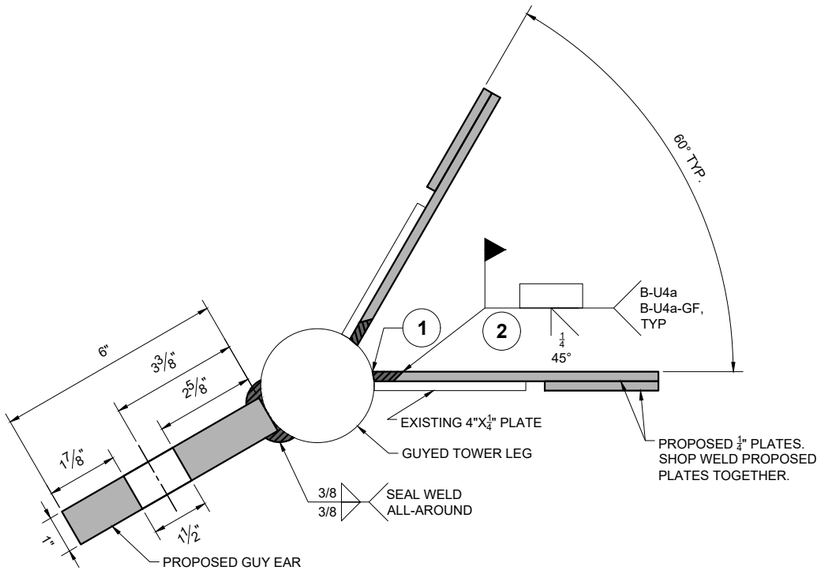
SHEET TITLE:
STRUCTURAL DETAILS

SCALE: NONE

PROJECT NUMBER: 28758
SHEET NUMBER: S-3



NOTES:

1. BUILD PLATFORM WITH WELD (BUTTER) TO MATCH THE HEIGHT OF THE EXISTING FILLET WELD. ENGINEERING APPROVAL IS PROVIDED FOR CORRECTING ROOT OPENINGS GREATER THAN THOSE PERMITTED.
2. PERFORM CJP WELD USING EXISTING GUSSET AS BACKING BAR

GUY EAR REINFORCING DETAIL (1)
SCALE: NTS

GUSSET PLATE SCHEDULE

ELEVATION (ft)	LOCATION	EXISTING GUSSET THICKNESS (in)	PROPOSED GUSSET PLATE (ASTM A572-50) LENGTH (in)	WIDTH (in)	THICKNESS (in)	QUANTITY	EDGE DISTANCE (in)	HOLE Ø (in)
162	A	¼	7 ½	5	¼	3	1 ½	1 1/16
	B	¼	3	4	¼	3	1 ½	1 1/16
	C	¼	7 ½	11	¼	3	1 ½	1 1/16
	D	¼	3	10	¼	3	1 ½	1 1/16
102	A	¼	7 ½	5	¼	3	1 ½	1 1/16
	B	¼	3	4	¼	3	1 ½	1 1/16
	C	¼	7 ½	11	¼	3	1 ½	1 1/16
	D	¼	3	10	¼	3	1 ½	1 1/16

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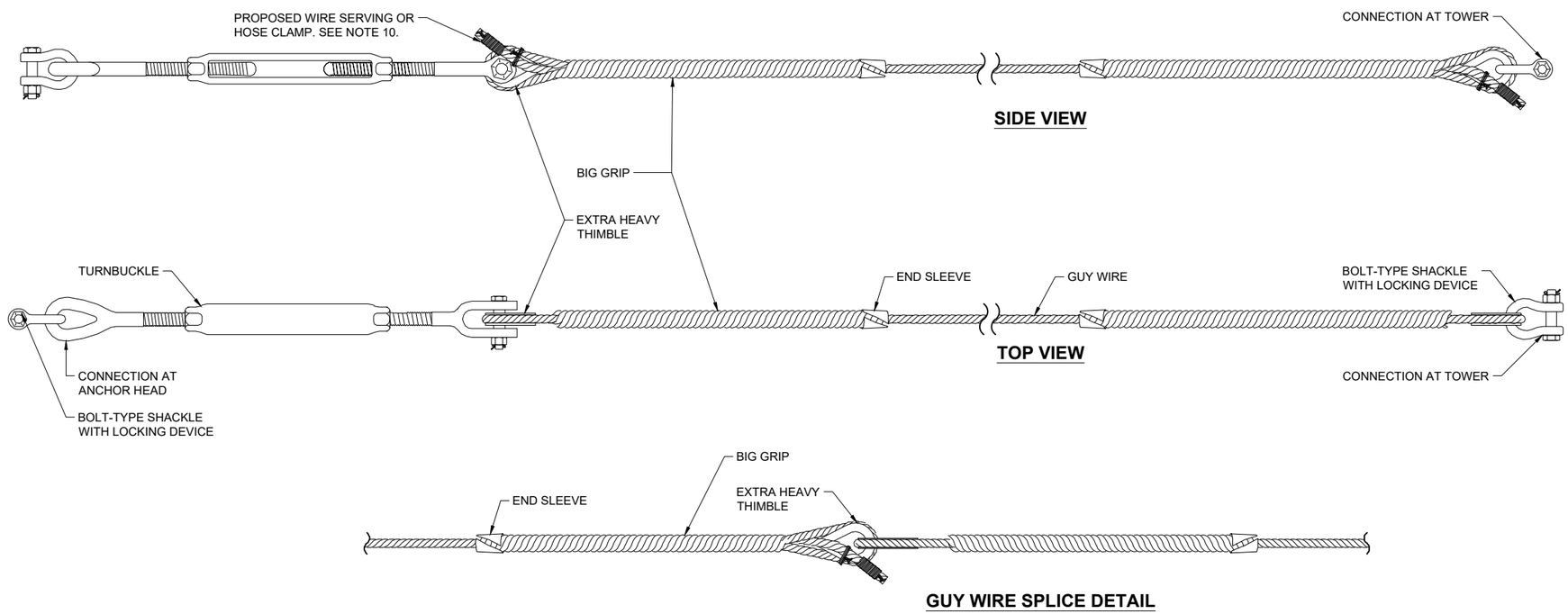
SHEET NUMBER: S-4



GUY WIRE DETAIL (1)
SCALE: NTS

PARTS SCHEDULE

WIRE PROPERTIES			TURNBUCKLE		SHACKLE		EXTRA HEAVY THIMBLE		END SLEEVE	BIG GRIP
SIZE	# OF WIRES IN STRAND	MIN. BREAKING STRENGTH (KIPS)	SIZE	CROSBY PART #	SIZE	CROSBY PART #	SIZE	CROSBY PART #	SIZE	SIZE
5/16" EHS	7	11.20	3/4"x18"	1035334	1/2"	1019472	1/2"	1037719	5/16"	5/16"
3/8" EHS	7	15.40	3/4"x18"	1035334	1/2"	1019472	1/2"	1037719	3/8"	3/8"
7/16" EHS	7	2.80	3/4"x18"	1035334	5/8"	1019490	1/2"	1037719	7/16"	7/16"
1/2" EHS	7	26.90	7/8"x18"	1035352	5/8"	1019490	5/8"	1037755	1/2"	1/2"
9/16" EHS	7	35.00	1"x18"	1035389	3/4"	1019515	5/8"	1037755	9/16"	9/16"
5/8" EHS	7	42.40	1"x18"	1035389	3/4"	1019515	3/4"	1037773	5/8"	5/8"
11/16" EHS	19	50.00	1-1/4"x18"	1035414	7/8"	1019533	7/8"	1037791	3/4"	3/4"
3/4" EHS	19	58.30	1-1/4"x18"	1035414	7/8"	1019533	7/8"	1037791	3/4"	3/4"
7/8" EHS	19	79.70	1-1/2"x18"	1035441	1"	1019551	1-1/8"	1037835	7/8"	7/8"
1" EHS	19	104.5	1-1/2"x18"	1035441	1-1/4"	1019597	1-1/8"	1037835	1"	1"

GUY HARDWARE NOTES

1. BIG GRIPS SHALL BE PURCHASED FROM PREFORMED LINE PRODUCTS (PLP) AT WWW.PREFORMED.COM OR (440) 461-5200.
2. GALVANIZED STEEL GUY STRAND SHALL CONFORM TO THE MINIMUM REQUIREMENTS OF ASTM STANDARD A475 EXTRA HIGH STRENGTH (EHS) OR EQUIVALENT RECOGNIZED STANDARD WITH EOR APPROVAL.
3. SHACKLES AND TURNBUCKLE ASSEMBLIES SHALL BE FORGED AISI GRADE 1030, 1035. OR 1045 STEEL OR EQUIVALENT AND SUITABLY HEAT-TREATED (QUENCHED & TEMPERED, NORMALIZED, OR ANNEALED)
4. SHACKLES AND TURNBUCKLES SUPPLIED BY CROSBY GROUP ARE PRE-APPROVED. OTHERS REQUIRE APPROVAL BY THE EOR PRIOR TO INSTALLATION. INSTALLATION OF NON-APPROVED HARDWARE IS CAUSE FOR AUTOMATIC REJECTION.
5. PINS SHALL CONSIST OF A BOLT, NUT, AND STAINLESS STEEL COTTER PIN.
6. TURNBUCKLES SHALL BE ADJUSTED BY A PROPERLY SIZED SMOOTH JAWED WRENCH. USE OF PLIERS AND CHANNEL LOCKS ARE PROHIBITED.
7. ALL EXISTING SCREW TYPE SHACKLES AT THE ANCHOR HEAD SHALL HAVE MOUSING INSTALLED AS PART OF THE MODIFICATION. MOUSING SHALL CONSIST OF AT LEAST 4 WRAPS OF WIRE MEASURING BETWEEN 0.06" AND 0.08" IN DIAMETER.
8. GUY HARDWARE LISTED ARE MINIMUM DIMENSIONS. LARGER SIZES ARE PERMITTED WITH EOR APPROVAL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY FIT -UP AT THE PRE-CONSTRUCTION SITE WALK.
9. CERTIFICATION/VERIFICATION DOCUMENTATION FOR THE GUY WIRE, TURNBUCKLES, SHACKLES, AND BIG GRIPS SHALL BE SUPPLIED TO THE MODIFICATION INSPECTOR TO BE INCLUDED IN THE CLOSEOUT REPORT.
10. PROPOSED WIRE SERVING TO BE INSTALLED AT CUT ENDS OF GUY WIRES FOR A LENGTH EQUAL TO THREE TIMES THE DIAMETER OF THE GUY WIRE. SERVING SHALL BE GALVANIZED ANNEALED IRON WIRE MEASURING BETWEEN 0.06" AND 0.08" IN DIAMETER.

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FAIRFIELD COUNTY

SHEET TITLE:
STRUCTURAL DETAILS

SCALE: NONE

PROJECT NUMBER: 28758
SHEET NUMBER: S-5

GUY DATA

GUY ELEVATION FT	GUY GRADE		GUY SIZE	INITIAL TENSION lb	INITIAL TENSION %	GUY MODULUS ksi	GUY WEIGHT plf	Lu ft	ANCHOR RADIUS ft	ANCHOR AZIMUTH ADJ. °	ANCHOR ELEVATION ft	END FITTING EFFICIENCY %
454	EHS	A	1	10450.0	10%	19000	2.100	476.36	148	0	0	100%
		B	1	10450.0	10%	19000	2.100	476.36	148	0	0	100%
		C	1	10450.0	10%	19000	2.100	476.36	148	0	0	100%
386	EHS	A	1	10450.0	10%	19000	2.100	412.20	148	0	0	100%
		B	1	10450.0	10%	19000	2.100	412.20	148	0	0	100%
		C	1	10450.0	10%	19000	2.100	412.20	148	0	0	100%
326	EHS	A	7/8	7970.0	10%	19000	1.581	356.75	148	0	0	100%
		B	7/8	7970.0	10%	19000	1.581	356.75	148	0	0	100%
		C	7/8	7970.0	10%	19000	1.581	356.75	148	0	0	100%
266	EHS	A	7/8	7970.0	10%	19000	1.581	303.01	148	0	0	100%
		B	7/8	7970.0	10%	19000	1.581	303.01	148	0	0	100%
		C	7/8	7970.0	10%	19000	1.581	303.01	148	0	0	100%
214	EHS	A	7/8	7970.0	10%	19000	1.581	244.01	120	0	0	100%
		B	7/8	7970.0	10%	19000	1.581	244.01	120	0	0	100%
		C	7/8	7970.0	10%	19000	1.581	244.01	120	0	0	100%
162	EHS	A	7/8	6774.5	8.50%	19000	1.581	200.09	120	0	0	100%
		B	7/8	6774.5	8.50%	19000	1.581	200.09	120	0	0	100%
		C	7/8	6774.5	8.50%	19000	1.581	200.09	120	0	0	100%
102	EHS	A	11/16	4000.0	8%	19000	1.000	155.63	120	0	0	100%
		B	11/16	4000.0	8%	19000	1.000	155.63	120	0	0	100%
		C	11/16	4000.0	8%	19000	1.000	155.63	120	0	0	100%
50	EHS	A	1/2	2690.0	10%	21000	0.517	127.76	120	0	0	100%
		B	1/2	2690.0	10%	21000	0.517	127.76	120	0	0	100%
		C	1/2	2690.0	10%	21000	0.517	127.76	120	0	0	100%

GUY-TENSIONING INFORMATION

Temperature At Time Of Tensioning

				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
GUY ELEVATION ft		H ft	V ft	INITIAL TENSION lb	INTERCEPT ft	INITIAL TENSION lb	INTERCEPT ft	INITIAL TENSION lb	INTERCEPT ft	INITIAL TENSION lb	INTERCEPT ft	INITIAL TENSION lb	INTERCEPT ft	INITIAL TENSION lb	INTERCEPT ft	INITIAL TENSION lb	INTERCEPT ft
454	A	145.69	454	10841	21.07	10710	21.32	10580	21.57	10450	21.83	10320	22.09	10191	22.36	10062	22.64
	B	145.69	454	10841	21.07	10710	21.32	10580	21.57	10450	21.83	10320	22.09	10191	22.36	10062	22.64
	C	145.69	454	10841	21.07	10710	21.32	10580	21.57	10450	21.83	10320	22.09	10191	22.36	10062	22.64
386	A	145.69	386	10972	15.69	10797	15.94	10623	16.19	10450	16.45	10277	16.72	10105	17.00	9934	17.28
	B	145.69	386	10972	15.69	10797	15.94	10623	16.19	10450	16.45	10277	16.72	10105	17.00	9934	17.28
	C	145.69	386	10972	15.69	10797	15.94	10623	16.19	10450	16.45	10277	16.72	10105	17.00	9934	17.28
326	A	145.69	326	8504	11.49	8325	11.73	8147	11.98	7970	12.24	7794	12.51	7618	12.79	7444	13.08
	B	145.69	326	8504	11.49	8325	11.73	8147	11.98	7970	12.24	7794	12.51	7618	12.79	7444	13.08
	C	145.69	326	8504	11.49	8325	11.73	8147	11.98	7970	12.24	7794	12.51	7618	12.79	7444	13.08
266	A	145.69	266	8710	8.14	8462	8.38	8215	8.62	7970	8.88	7726	9.16	7484	9.45	7244	9.75
	B	145.69	266	8710	8.14	8462	8.38	8215	8.62	7970	8.88	7726	9.16	7484	9.45	7244	9.75
	C	145.69	266	8710	8.14	8462	8.38	8215	8.62	7970	8.88	7726	9.16	7484	9.45	7244	9.75
214	A	117.69	214	8730	5.29	8476	5.45	8222	5.61	7970	5.79	7719	5.97	7469	6.17	7220	6.38
	B	117.69	214	8730	5.29	8476	5.45	8222	5.61	7970	5.79	7719	5.97	7469	6.17	7220	6.38
	C	117.69	214	8730	5.29	8476	5.45	8222	5.61	7970	5.79	7719	5.97	7469	6.17	7220	6.38
162	A	117.69	162	7884	3.95	7511	4.15	7141	4.36	6775	4.59	6412	4.84	6055	5.12	5704	5.43
	B	117.69	162	7884	3.95	7511	4.15	7141	4.36	6775	4.59	6412	4.84	6055	5.12	5704	5.43
	C	117.69	162	7884	3.95	7511	4.15	7141	4.36	6775	4.59	6412	4.84	6055	5.12	5704	5.43
102	A	117.69	102	5115	2.35	4738	2.53	4366	2.74	4000	2.99	3643	3.28	3296	3.62	2965	4.02
	B	117.69	102	5115	2.35	4738	2.53	4366	2.74	4000	2.99	3643	3.28	3296	3.62	2965	4.02
	C	117.69	102	5115	2.35	4738	2.53	4366	2.74	4000	2.99	3643	3.28	3296	3.62	2965	4.02
50	A	117.69	50	3699	1.14	3360	1.25	3023	1.39	2690	1.56	2363	1.78	2044	2.05	1740	2.41
	B	117.69	50	3699	1.14	3360	1.25	3023	1.39	2690	1.56	2363	1.78	2044	2.05	1740	2.41
	C	117.69	50	3699	1.14	3360	1.25	3023	1.39	2690	1.56	2363	1.78	2044	2.05	1740	2.41

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
123 Broadway, Woodcliff Lake, NJ 07677
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: James R. Skowronski Date: 8/06/2018

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 08/06/2018

PROJECT TITLE:
CT72XC033

PROJECT INFORMATION:
39 CARMEN HILL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

SHEET TITLE:
STRUCTURAL DETAILS

SCALE: NONE

PROJECT NUMBER: 28758
SHEET NUMBER: S-6

RAMAKER & ASSOCIATES, INC.

August 6, 2018

Tom Jupin
Charles Cherundolo Consulting, Inc.
1280 Rt. 46 West
Parsippany, NJ 07054

Ramaker & Associates, Inc.
855 Community Drive
Sauk City, WI 53583

SUBJECT: **STRUCTURAL ASSESSMENT**
495-FOOT GUYED TOWER

CARRIER: **SPRINT**

SITE: **CT72XC033**
39 CARMEN HILL ROAD
BROOKFIELD, FAIRFIELD COUNTY, CONNECTICUT 06804
RAMAKER & ASSOCIATES PROJECT NUMBER: 28758

RESULTS:			
	TOWER:	**94.8%**	**PASS WITH MODIFICATIONS**
	FOUNDATION:	**31.1%**	**PASS**

Dear Tom Jupin:

Ramaker & Associates, Inc. (RAMAKER) respectfully submits this structural assessment for the above mentioned site. The purpose of this report is to determine the structural integrity of the existing structure with the existing and proposed loading. Engineering recommendations regarding the analysis results are provided in the following pages.

RAMAKER developed a finite element model of the tower using tnxTower analysis software. All information contained herein is valid only for the described structure configuration and loading conditions. RAMAKER reserves the right to modify our recommendations should alterations to the tower loading occur.

If you have any questions or comments, please do not hesitate to contact our office.

Sincerely,

RAMAKER & ASSOCIATES, INC.

Thomas E. Moore
Project Engineer

James R. Skowronski, P.E.
Supervising Engineer

ANALYSIS CRITERIA

State Building Code	2016 CT State Building Code
Adopted Building Code	2012 IBC
Referenced Standard	TIA-222-G
Risk Category	II
Ultimate Design Wind Speed, V_{ult}	120 mph (3 sec. gust)
Nominal Design Wind Speed, V_{asd}	93 mph (3 sec. gust)
Design Wind Speed w/ Ice	50 mph (3 sec. gust)
Ice Thickness	3/4 inch
Exposure Category	C
Topographic Category	5 (SEAW RSM-03)
Crest Height	294 ft
Slope Distance	2388 ft

SUPPORTING DOCUMENTATION

- Geotechnical report by Tower Engineering Professionals, Inc., job number 131593.96741, dated 2/5/18
- Foundation mapping by Tower Engineering Professionals, Inc., job number 131593.155155, dated 1/29/18
- Structural analysis by Stainless, job number 361116, dated 1/25/16
- Tower mapping for KM Consulting Engineers, Inc., dated 2/25/14
- Structural analysis by Ramaker & Associates, job number 28758, 7/16/14
- Structural analysis by Salient Associates, LLC, dated 12/14/12
- Construction drawings by RAMAKER, project number 28758
- Site visit(s) conducted by RAMAKER
- Other pertinent data procured or assumed by RAMAKER during site due diligence activities

TOWER LOADING

RAMAKER understands that the loading to be used for this analysis will consist of the antenna equipment, mount, and cable configurations as shown in the following chart:

Elevation	Appurtenance	Mount	Coax	Owner	Status
479	(1) FM Antenna	Tower	(1) 3	--	Existing
460	(1) Yagi		(1) 7/8		
446	--	Platform w/Handrail	--		
438	(1) Andrew GP6F-21A	Tower Leg	(1) 1 1/4		
353	(1) Andrew P3F-52-N7A	Tower Leg	(1) 5/8		
340	(1) Andrew DB496-A	(1) Standoff	(1) 7/8		
305	(1) 4' Yagi	(1) Standoff	(1) 1 1/4		
282	(3) RFS APX16DWV-16DWVS-A20	(1) Sector Frame	(18) 1 5/8	T-Mobile	
	(3) Commscope LNX-6515DS-VTM				
257	**(1) RFS APXVSPP18-C-A20**	(1) Sector Frame **(2) Sector Frame**	(1) 1 5/8 **(3) Hybrid**	Sprint	**Remove**
	(3) RFS APXVTM14-ALU-120				**Proposed**
	(3) Commscope NNVV-65B-R4				
	(3) ALU TD-RRH8X20				
	(2) ALU 800MHz 2x50W RRH				
	(2) ALU 1900MHz 4x45W RRH				
	(1) ALU 800MHz 2x50W RRH				**Relocate**
	(1) ALU 1900MHz 4x45W RRH				
248	(1) Andrew GP6F-21A	Tower Leg	(1) 7/8	--	Existing
242	(1) Andrew GP6F-21A	Tower Leg	(1) 7/8		
239	(2) Large Beacon	Tower Face			
140	(1) 10' Dipole	(1) Standoff	(1) 7/8		
125	(1) 10' Dipole	(1) Standoff	(1) 7/8		
108	(1) 10' Dipole	(1) Standoff	(1) 7/8		

TOWER RESULTS

The maximum tower member stress capacities under the loading conditions previously described are as follows:

Component Type	Percent Capacity	Pass/Fail
Pole	61.9	Pass
Leg	94.8	Pass
Diagonal	78.6	Pass
Horizontal	32.9	Pass
Guy Pull Off	33.7	Pass
Guy Line	92.2	Pass
Bolt	93.2	Pass
RATING	**94.8**	**PASS**

Results of the analysis show that the modified tower will be stressed to a maximum of 94.8 percent of capacity. Therefore, the modified tower will pass the TIA-222-G analysis requirements under proposed loading conditions.

DISH TWIST/SWAY RESULTS

The twist/sway results for a 60 mph service wind speed are as follows:

Elevation	Dish	Deflection (in)	Tilt (deg)	Twist (deg)
438	Andrew GP6F-21A	9.292	0.1624	0.1853
353	Andrew P3F-52-N7A	6.914	0.1020	0.2568
340	Andrew DB496-A	6.692	0.0923	0.2893
248	Andrew GP6F-21A	5.222	0.1225	0.3726
242	Andrew GP6F-21A	5.072	0.1299	0.3889

FOUNDATION RESULTS

The maximum foundation stress capacities are as follows:

Component Type	Percent Capacity	Pass/Fail
Pad & Pier - Soil Interaction	31.1	Pass
Inner Guy Anchor - Soil Interaction	28.1	Pass
Outer Guy Anchor - Soil Interaction	25.5	Pass
RATING	**31.1**	**PASS**

The foundations were analyzed utilizing the foundation drawings and geotechnical report referenced above. Foundation reinforcement was assumed for this structural analysis. Results of the analysis show that the existing foundations will be stressed to a maximum of 31.1 percent of capacity. Therefore, the existing foundations will pass the TIA-222-G analysis requirements under proposed loading conditions.

LIMITATIONS

The recommendations contained within this report were developed using the supporting documentation as previously described. All recommendations pertain only to the proposed antenna installation activities as described in this report. RAMAKER assumes no responsibility for failures caused by factors beyond our control. These include but are not limited to the following:

- Missing, corroding, and/or deteriorating members
- Improper manufacturing and/or construction
- Improper maintenance

RAMAKER assumes no responsibility for modifications completed prior to or hereafter in which RAMAKER was not directly involved. These modifications include but are not limited to the following:

- Replacing or strengthening bracing members
- Reinforcing or extending vertical members
- Installing or removing antenna mounting gates or side arms
- Changing loading configurations

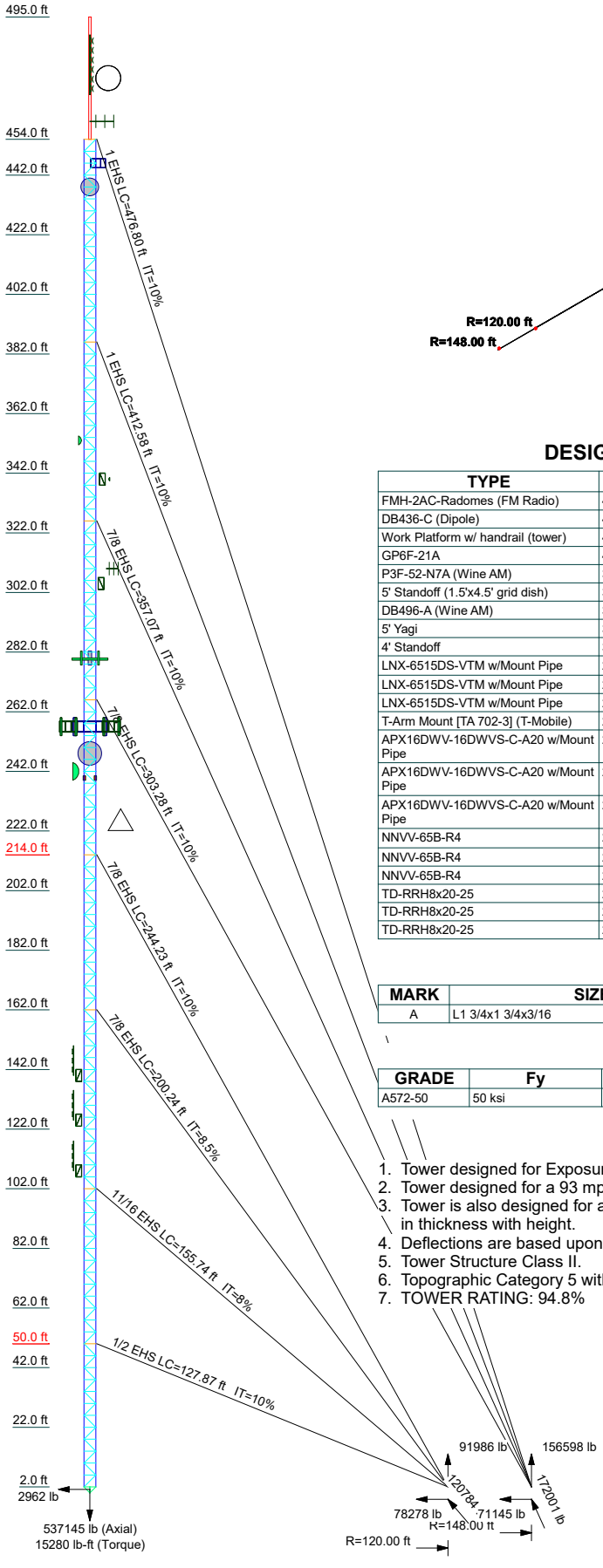
The tower owner is responsible for verifying that the existing loading on the structure is consistent with the loading applied to the structure within this report. If there is any information contrary to that contained herein, or if there are any defects arising from the original design, material, fabrication and erection deficiencies, this report should be disregarded and RAMAKER should be contacted immediately. RAMAKER is not liable for any representation, recommendation, or conclusion not expressly stated herein.

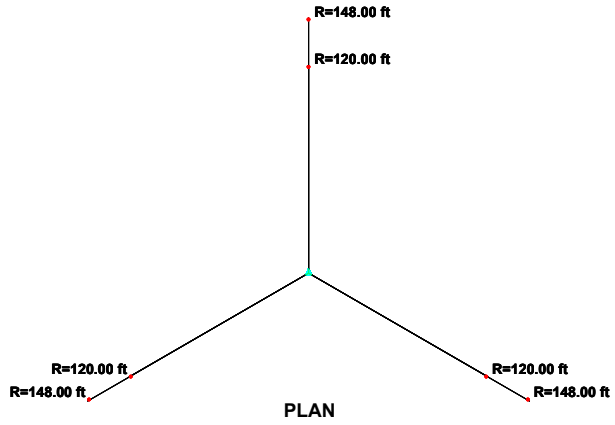
This analysis pertains only to the tower structure, and no analyses or conclusions were made regarding the antenna and equipment mounting structure(s). Analysis and certification of the antenna and equipment mounting structure(s) is performed and submitted separately.

ATTACHMENTS

- Analysis Figures
- Analysis Calculations

Section		L1	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23
Legs		P10x.5	SR 2				SR 2 1/4			SR 2 1/2			SR 2 3/4							SR 3					
Leg Grade		A53-B-35	A572-50																						
Diagonals		N.A.	L2x2x3/16			L2x2x1/4	A	L2x2x1/4	B	A572-50	A36	A572-50	A572-50	A36	B	N.A.	A572-50	L2 1/2x2 1/2x3/8						
Diagonal Grade		N.A.	A36																						
Horizontals		N.A.	L2x2x3/16																						
Top Guy Pull-Offs		N.A.	B	N.A.	B	N.A.	B	N.A.	B	N.A.	B	B	N.A.	N.A.	B	N.A.	B	B	N.A.	N.A.	B	N.A.	B	N.A.	N.A.
Face Width (ft)		0.895833	4																						
# Panels @ (ft)		N.A.	113 @ 4																						
Weight (lb)	41771.6	2246.3	637.7	993.8	1164.2	1270.0	1137.1	1228.6	1270.0	1647.7	1419.0	1899.6	1858.2	1858.2	2130.1	2088.7	2088.7	2130.1	2088.7	2088.7	2130.1	2088.7	2130.1	2088.7	2088.7





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
FMH-2AC-Radomes (FM Radio)	479	1900MHz 4x45W RRH	257
DB436-C (Dipole)	460	1900MHz 4x45W RRH	257
Work Platform w/ handrail (tower)	446	1900MHz 4x45W RRH	257
GP6F-21A	438	800MHz 2x50W RRH	257
P3F-52-N7A (Wine AM)	353	800MHz 2x50W RRH	257
5' Standoff (1.5'x4.5' grid dish)	340	800MHz 2x50W RRH	257
DB496-A (Wine AM)	340	(4) 8'x2" Pipe Mount	257
5' Yagi	305	(4) 8'x2" Pipe Mount	257
4' Standoff	305	Sector Mount [SM 303-1] (Sprint)	257
LNX-6515DS-VTM w/Mount Pipe	280	SitePro1 VFA12-HD-S (1) (Sprint)	257
LNX-6515DS-VTM w/Mount Pipe	280	SitePro1 VFA12-HD-S (1) (Sprint)	257
LNX-6515DS-VTM w/Mount Pipe	280	APXVTM14-C-120	257
T-Arm Mount [TA 702-3] (T-Mobile)	280	APXVTM14-C-120	257
APX16DWV-16DWVS-C-A20 w/Mount Pipe	280	APXVTM14-C-120	257
		GP8F-21A	248
APX16DWV-16DWVS-C-A20 w/Mount Pipe	280	GP6F-21A	242
APX16DWV-16DWVS-C-A20 w/Mount Pipe	280	Large Beacon	239
		Large Beacon	239
NNVV-65B-R4	257	4' Standoff	140
NNVV-65B-R4	257	10' Dipole	140
NNVV-65B-R4	257	10' Dipole	125
TD-RRH8x20-25	257	4' Standoff	125
TD-RRH8x20-25	257	4' Standoff	108
TD-RRH8x20-25	257	10' Dipole	108

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 3/4x1 3/4x3/16	B	L2 1/2x2 1/2x3/8

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 5 with Crest Height of 294.00 ft
7. TOWER RATING: 94.8%

ALL REACTIONS ARE FACTORED

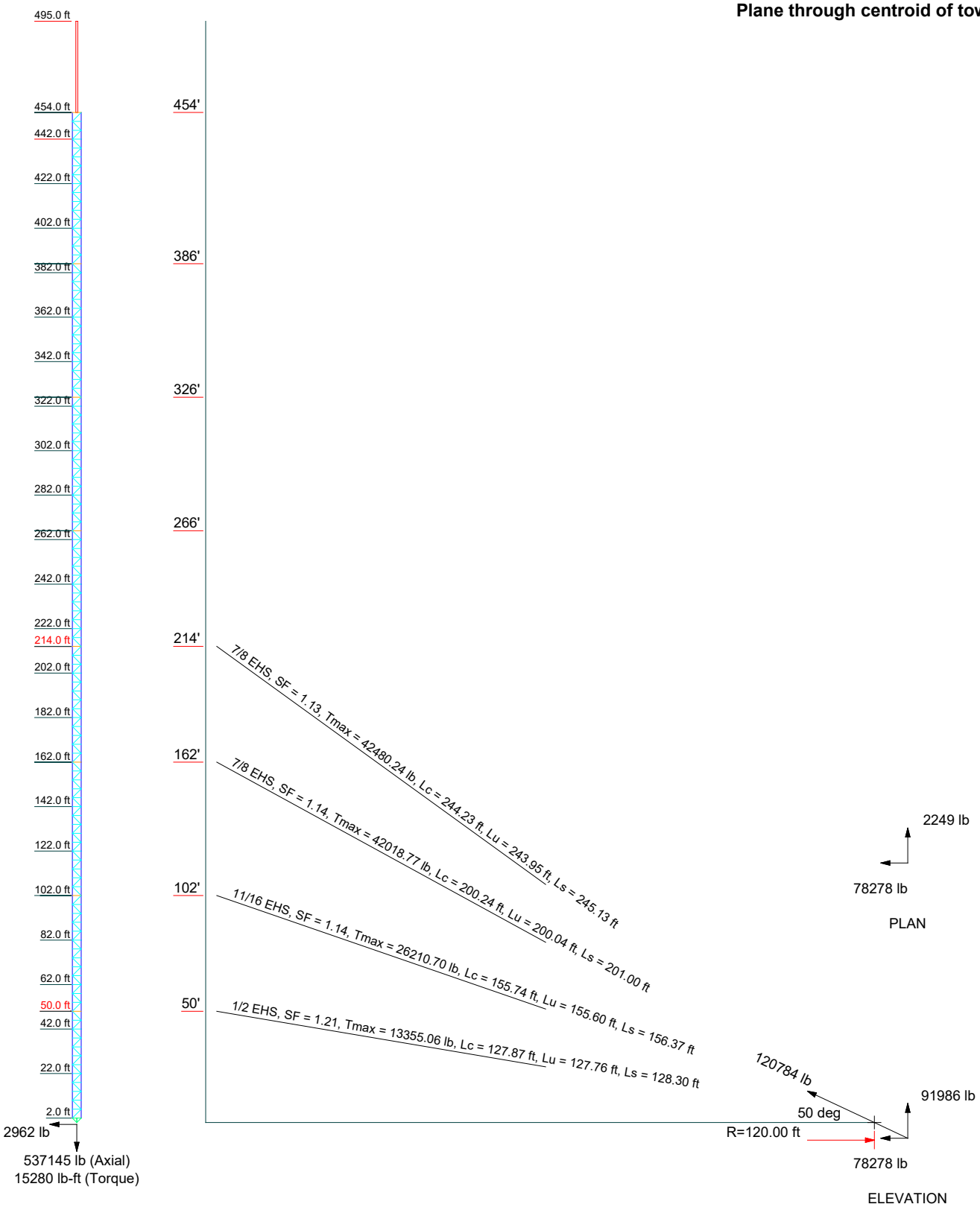
Ramaker & Associates, Inc
855 Community Drive
Sauk City, WI 53583
Phone: (608) 643-4100
FAX:

Job: *CT72XC033-A*			
Project: *28758*			
Client: Sprint	Drawn by: TEM	App'd:	
Code: TIA-222-G	Date: 08/06/18	Scale: NTS	
Path: I:\28700\28758\Structural\tnx\28758 rev3A.eri		Dwg No. E-1	

Guy Tensions and Tower Reactions

TIA-222-G - 93 mph/50 mph 0.7500 in Ice Exposure C

Maximum Values
Anchor 'A'@120 ft Azimuth 0 deg Elev 0 ft
Plane through centroid of tower



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Code: TIA-222-G	Date: 08/06/18	Scale: NTS	
Path: I:\28700\28758\Structural\tnx\28758 rev3A.eri		Dwg No. E-6	

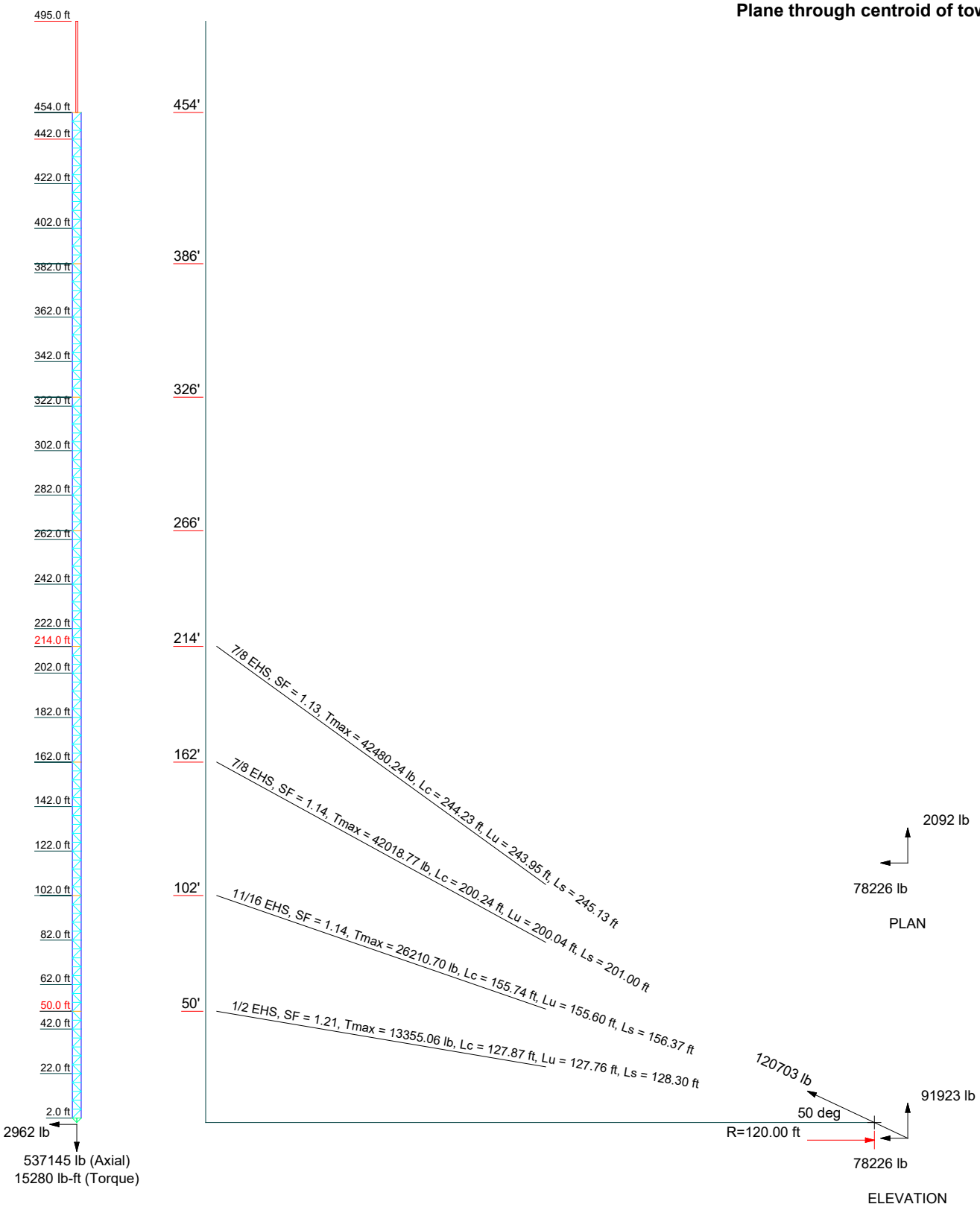
Guy Tensions and Tower Reactions

TIA-222-G - 93 mph/50 mph 0.7500 in Ice Exposure C

Maximum Values

Anchor 'B'@120 ft Azimuth 120 deg Elev 0 ft

Plane through centroid of tower



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Project: ***28758***			
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Code: TIA-222-G	Date: 08/06/18	Scale: NTS	
Path: I:\28700\28758\Structural\tnx\28758 rev3A.eri		Dwg No. E-6	

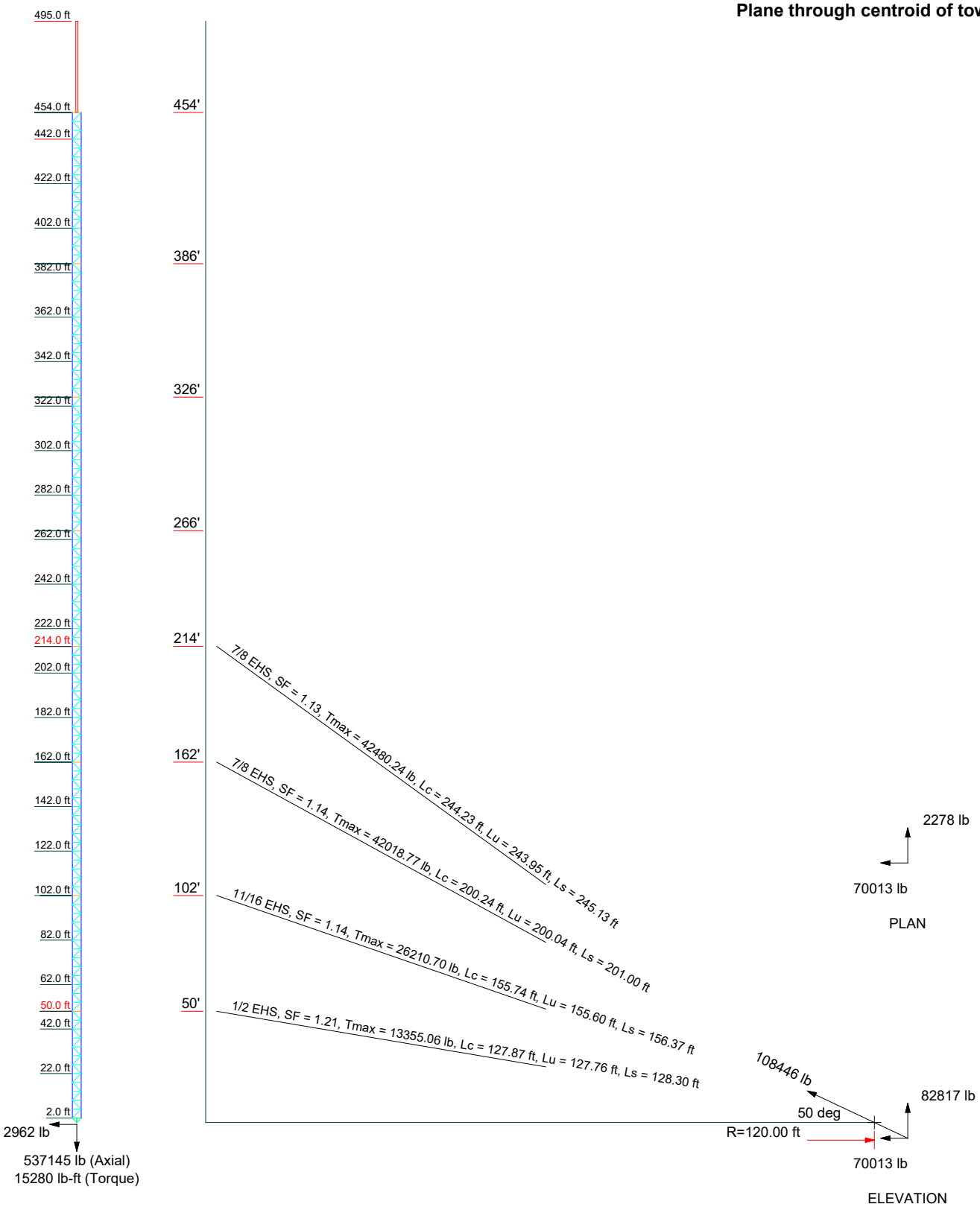
Guy Tensions and Tower Reactions

TIA-222-G - 93 mph/50 mph 0.7500 in Ice Exposure C

Maximum Values

Anchor 'C'@120 ft Azimuth 240 deg Elev 0 ft

Plane through centroid of tower



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Project: ***28758***			
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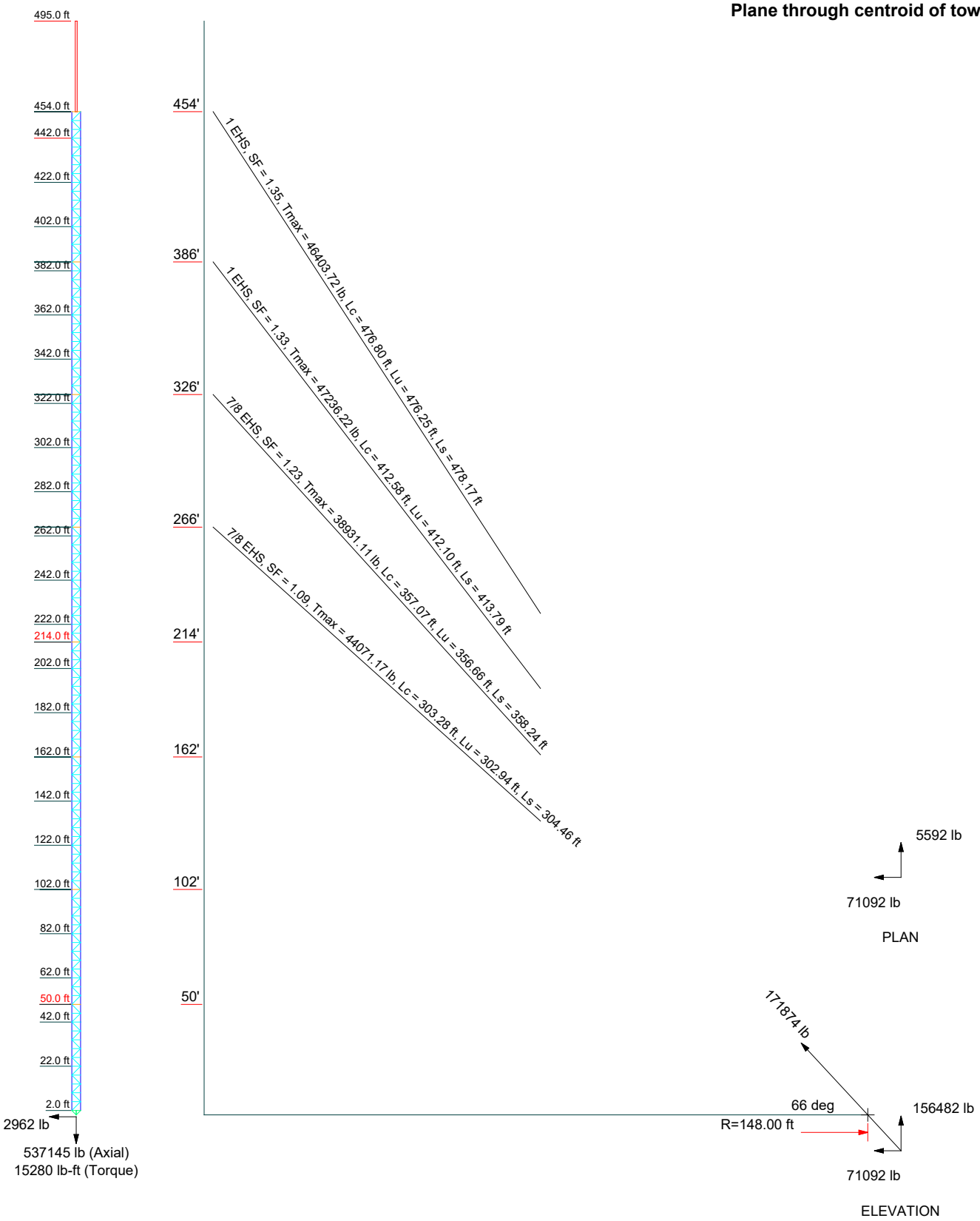
Code: TIA-222-G	Date: 08/06/18	Scale: NTS	
Path: I:\28700\28758\Structural\tnx\28758 rev3A.eri		Dwg No. E-6	

Guy Tensions and Tower Reactions

TIA-222-G - 93 mph/50 mph 0.7500 in Ice Exposure C

Maximum Values
Anchor 'A'@148 ft Azimuth 0 deg Elev 0 ft
Plane through centroid of tower



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Project: ***28758***			
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Code: TIA-222-G	Date: 08/06/18	Scale: NTS	
Path: I:\28700\28758\Structural\tnx\28758 rev3A.eri		Dwg No. E-6	

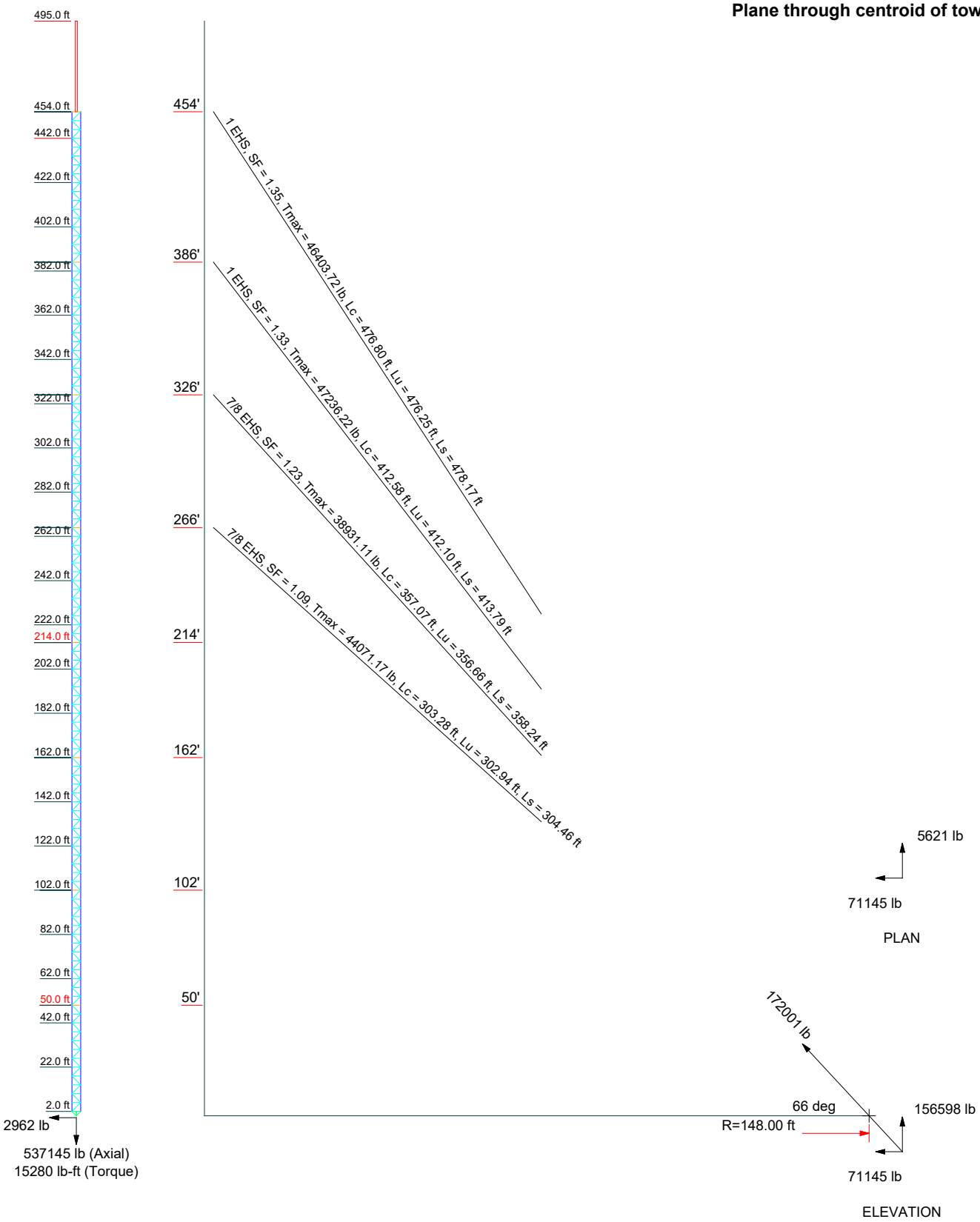
Guy Tensions and Tower Reactions

TIA-222-G - 93 mph/50 mph 0.7500 in Ice Exposure C

Maximum Values

Anchor 'B'@148 ft Azimuth 120 deg Elev 0 ft

Plane through centroid of tower



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Code: TIA-222-G	Date: 08/06/18	Scale: NTS	
Path: I:\28700\28758\Structural\tnx\28758 rev3A.eri		Dwg No. E-6	

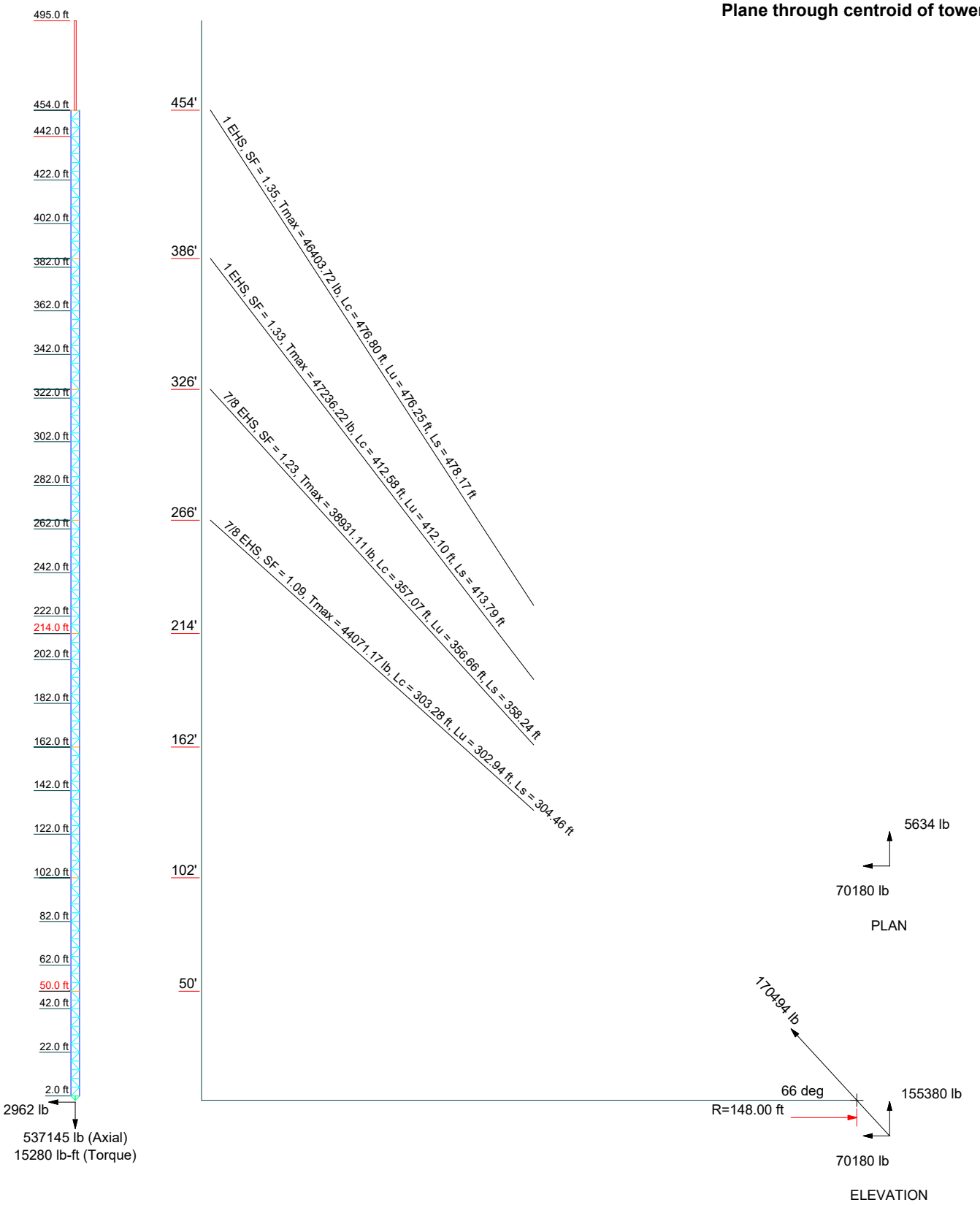
Guy Tensions and Tower Reactions

TIA-222-G - 93 mph/50 mph 0.7500 in Ice Exposure C

Maximum Values

Anchor 'C'@148 ft Azimuth 240 deg Elev 0 ft

Plane through centroid of tower



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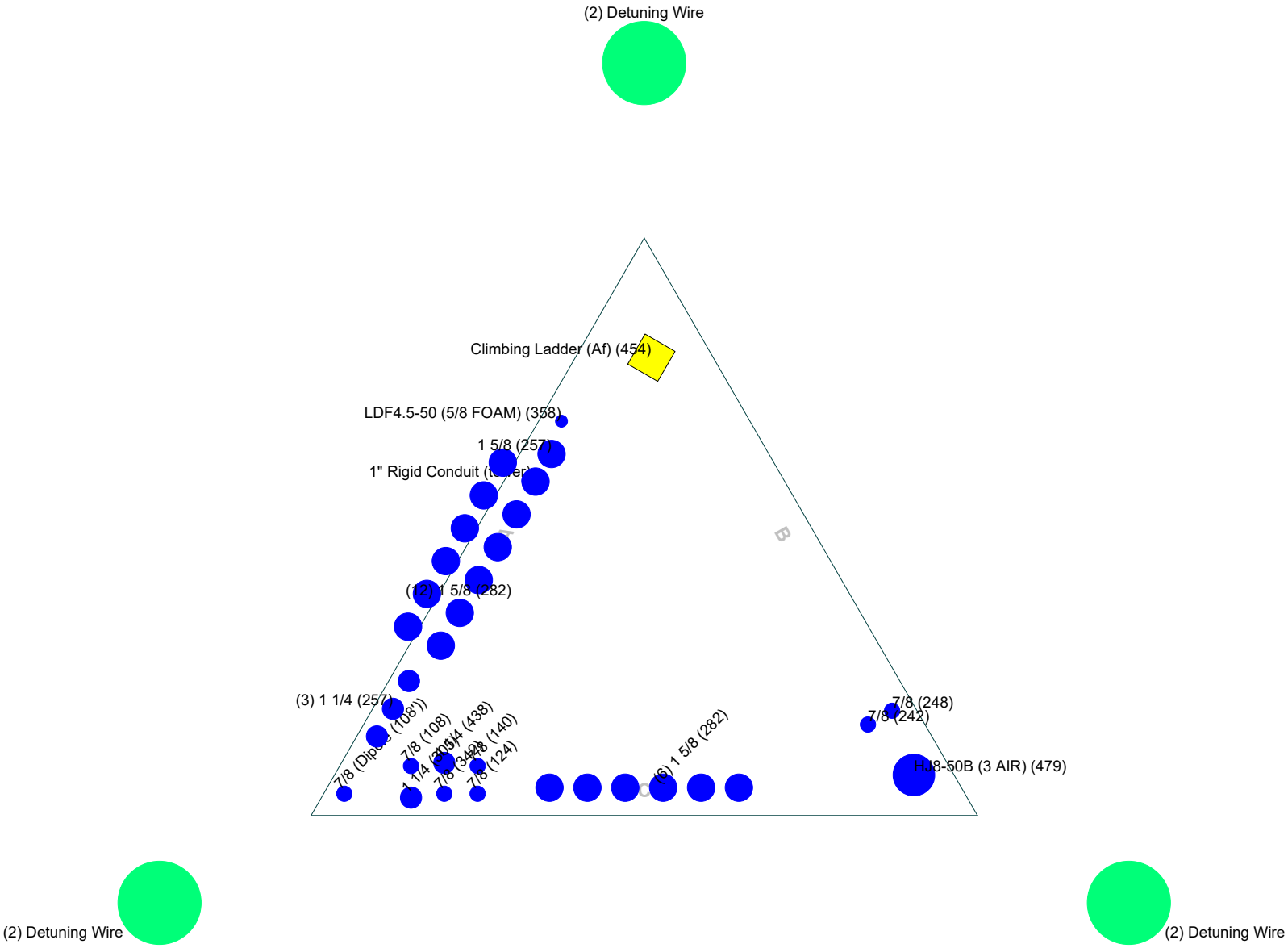
Project: ***28758***			
Client: Sprint	Drawn by: TEM	App'd:	
Code: TIA-222-G	Date: 08/06/18	Scale: NTS	
Path: I:\28700\28758\Structural\tnx\28758 rev3A.eri		Dwg No. E-6	

Feed Line Plan

Round Flat App In Face App Out Face



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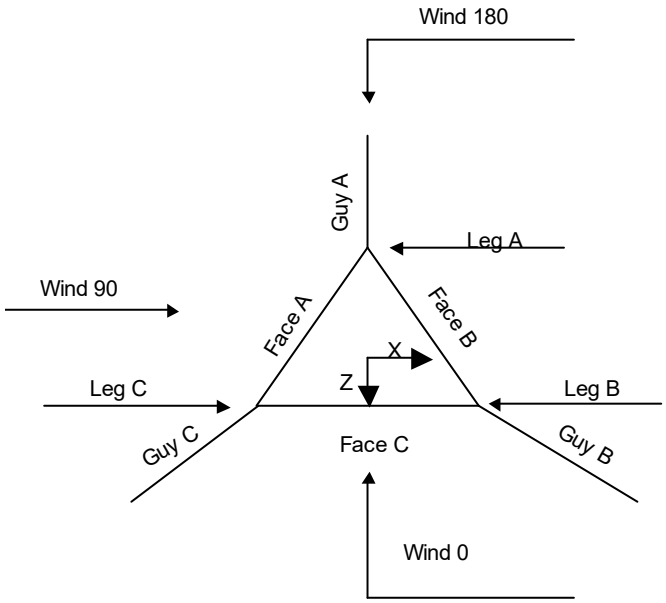
Path: I:\28700\28758\Structural\tnx\28758 rev3A.eri		Dwg No. E-7	

Tower Input Data

The main tower is a 3x guyed tower with an overall height of 495.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 4.00 ft at the top and 4.00 ft at the base.
An index plate is provided at the 3x guyed -tower connection.
There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- Basic wind speed of 93 mph.
- Structure Class II.
- Exposure Category C.
- Topographic Category 5.
- Crest Height 294.00 ft.
- SEAW RSM-03 procedures for wind speed-up calculations are used.
  - Topographic Feature: Continuous Ridge.
  - Slope Distance L: 2388.00 ft.
  - Distance from Crest x: 0.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- I-Beam base is 2.00 ft above the pivot.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- 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.



Corner & Starmount Guyed Tower

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	495.00-454.00	41.00	P10x.5	A53-B-35 (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 495.00-454.00				1	1	1			

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	454.00-442.00			4.00	1	12.00
T2	442.00-422.00			4.00	1	20.00
T3	422.00-402.00			4.00	1	20.00
T4	402.00-382.00			4.00	1	20.00
T5	382.00-362.00			4.00	1	20.00
T6	362.00-342.00			4.00	1	20.00
T7	342.00-322.00			4.00	1	20.00
T8	322.00-302.00			4.00	1	20.00
T9	302.00-282.00			4.00	1	20.00
T10	282.00-262.00			4.00	1	20.00
T11	262.00-242.00			4.00	1	20.00
T12	242.00-222.00			4.00	1	20.00
T13	222.00-202.00			4.00	1	20.00
T14	202.00-182.00			4.00	1	20.00
T15	182.00-162.00			4.00	1	20.00
T16	162.00-142.00			4.00	1	20.00
T17	142.00-122.00			4.00	1	20.00
T18	122.00-102.00			4.00	1	20.00
T19	102.00-82.00			4.00	1	20.00
T20	82.00-62.00			4.00	1	20.00
T21	62.00-42.00			4.00	1	20.00
T22	42.00-22.00			4.00	1	20.00
T23	22.00-2.00			4.00	1	20.00

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	454.00-442.00	4.00	K Brace Left	No	Yes	0.0000	0.0000
T2	442.00-422.00	4.00	K Brace Right	No	Yes	0.0000	0.0000
T3	422.00-402.00	4.00	K Brace Left	No	Yes	0.0000	0.0000
T4	402.00-382.00	4.00	K Brace Right	No	Yes	0.0000	0.0000
T5	382.00-362.00	4.00	K Brace Left	No	Yes	0.0000	0.0000
T6	362.00-342.00	4.00	K Brace Right	No	Yes	0.0000	0.0000
T7	342.00-322.00	4.00	K Brace Left	No	Yes	0.0000	0.0000
T8	322.00-302.00	4.00	K Brace Right	No	Yes	0.0000	0.0000
T9	302.00-282.00	4.00	K Brace Left	No	Yes	0.0000	0.0000
T10	282.00-262.00	4.00	K Brace Right	No	Yes	0.0000	0.0000
T11	262.00-242.00	4.00	K Brace Left	No	Yes	0.0000	0.0000
T12	242.00-222.00	4.00	K Brace Right	No	Yes	0.0000	0.0000
T13	222.00-202.00	4.00	K Brace Left	No	Yes	0.0000	0.0000
T14	202.00-182.00	4.00	K Brace Right	No	Yes	0.0000	0.0000
T15	182.00-162.00	4.00	K Brace Left	No	Yes	0.0000	0.0000
T16	162.00-142.00	4.00	K Brace Right	No	Yes	0.0000	0.0000
T17	142.00-122.00	4.00	K Brace Left	No	Yes	0.0000	0.0000
T18	122.00-102.00	4.00	K Brace Right	No	Yes	0.0000	0.0000
T19	102.00-82.00	4.00	K Brace Left	No	Yes	0.0000	0.0000
T20	82.00-62.00	4.00	K Brace Right	No	Yes	0.0000	0.0000
T21	62.00-42.00	4.00	K Brace Left	No	Yes	0.0000	0.0000
T22	42.00-22.00	4.00	K Brace Right	No	Yes	0.0000	0.0000
T23	22.00-2.00	4.00	K Brace Left	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Leg Type*	*Leg Size*	*Leg Grade*	*Diagonal Type*	*Diagonal Size*	*Diagonal Grade*
T1 454.00-442.00	Solid Round	2	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T2 442.00-422.00	Solid Round	2	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T3 422.00-402.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 402.00-382.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T5 382.00-362.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T6 362.00-342.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T7 342.00-322.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T8 322.00-302.00	Solid Round	2 1/2	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 ksi)
T9 302.00-282.00	Solid Round	2 1/2	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T10 282.00-262.00	Solid Round	2 3/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A36 (36 ksi)
T11 262.00-242.00	Solid Round	2 3/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 ksi)
T12 242.00-222.00	Solid Round	2 3/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A36 (36 ksi)
T13 222.00-202.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A36 (36 ksi)
T14 202.00-182.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 ksi)
T15 182.00-162.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 ksi)
T16 162.00-142.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 ksi)
T17 142.00-122.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 ksi)
T18 122.00-102.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 ksi)
T19 102.00-82.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 ksi)
T20 82.00-62.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 ksi)
T21 62.00-42.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 ksi)
T22 42.00-22.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 ksi)
T23 22.00-2.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A572-50 (50 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
T1 454.00-442.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T2 442.00-422.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T3 422.00-402.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 402.00-382.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T5 382.00-362.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T6 362.00-342.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T7 342.00-322.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T8 322.00-302.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T9 302.00-282.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T10 282.00-262.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T11 262.00-242.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T12 242.00-222.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T13 222.00-202.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T14 202.00-182.00	None	Solid Round		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T15 182.00-162.00	None	Solid Round		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T16 162.00-142.00	None	Solid Round		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T17 142.00-122.00	None	Solid Round		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T18 122.00-102.00	None	Solid Round		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T19 102.00-82.00	None	Solid Round		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T20 82.00-62.00	None	Solid Round		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T21 62.00-42.00	None	Solid Round		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T22 42.00-22.00	None	Solid Round		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T23 22.00-2.00	None	Solid Round		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 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 454.00-442.00	0.00	0.2500	A36	1	1	1	36.0000	36.0000	36.0000

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
T2 442.00-422.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T3 422.00-402.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T4 402.00-382.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T5 382.00-362.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T6 362.00-342.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T7 342.00-322.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T8 322.00-302.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T9 302.00-282.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T10 282.00-262.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T11 262.00-242.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T12 242.00-222.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T13 222.00-202.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T14 202.00-182.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T15 182.00-162.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T16 162.00-142.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T17 142.00-122.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T18 122.00-102.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T19 102.00-82.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T20 82.00-62.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T21 62.00-42.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T22 42.00-22.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T23 22.00-2.00	0.00	0.2500	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000

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 454.00-442.00	Yes	Yes	1	1	1	1	1	1	1	1

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
				1	1	1	1	1	1	1
T2 442.00-422.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 422.00-402.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 402.00-382.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 382.00-362.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 362.00-342.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 342.00-322.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 322.00-302.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 302.00-282.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 282.00-262.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 262.00-242.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T12 242.00-222.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T13 222.00-202.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T14 202.00-182.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T15 182.00-162.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T16 162.00-142.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T17 142.00-122.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T18 122.00-102.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T19 102.00-82.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T20 82.00-62.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T21 62.00-42.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T22 42.00-22.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T23 22.00-2.00	Yes	Yes	1	1	1	1	1	1	1	1
				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 454.00-442.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T2 442.00-422.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T3 422.00-402.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T4 402.00-382.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T5 382.00-362.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T6 362.00-342.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T7 342.00-322.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T8 322.00-302.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T9 302.00-282.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T10 282.00-262.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T11 262.00-242.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T12 242.00-222.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T13 222.00-202.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T14 202.00-182.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T15 182.00-162.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T16 162.00-142.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T17 142.00-122.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T18 122.00-102.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T19 102.00-82.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T20 82.00-62.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T21 62.00-42.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T22 42.00-22.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T23 22.00-2.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	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 454.00-442.00	Flange	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T2 442.00-422.00	Flange	0.6250 A325N	3	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T3 422.00-402.00	Flange	0.6250 A325N	3	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T4 402.00-382.00	Flange	0.6250 A325N	3	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T5 382.00-362.00	Flange	0.6250 A325N	3	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T6 362.00-342.00	Flange	0.6250 A325N	3	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T7 342.00-322.00	Flange	0.6250 A325N	3	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T8 322.00-302.00	Flange	0.6250 A325N	3	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T9 302.00-282.00	Flange	0.6250 A325N	3	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T10 282.00-262.00	Flange	0.6250 A325N	3	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T11 262.00-242.00	Flange	0.6250 A325N	3	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 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.
T12 242.00-222.00	Flange	0.6250 A325N	3	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T13 222.00-202.00	Flange	0.6250 A325N	3	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T14 202.00-182.00	Flange	0.6250 A325N	3	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T15 182.00-162.00	Flange	0.6250 A325N	3	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T16 162.00-142.00	Flange	0.6250 A325N	3	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T17 142.00-122.00	Flange	0.6250 A325N	3	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T18 122.00-102.00	Flange	0.6250 A325N	3	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T19 102.00-82.00	Flange	0.6250 A325N	3	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T20 82.00-62.00	Flange	0.6250 A325N	3	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T21 62.00-42.00	Flange	0.6250 A325N	3	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T22 42.00-22.00	Flange	0.6250 A325N	3	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T23 22.00-2.00	Flange	0.6250 A325N	3	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 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 %
454	EHS	A	1	10450.00	10%	19000	2.100	476.36	148.00	0.0000	0.00	100%
		B	1	10450.00	10%	19000	2.100	476.36	148.00	0.0000	0.00	100%
		C	1	10450.00	10%	19000	2.100	476.36	148.00	0.0000	0.00	100%
386	EHS	A	1	10450.00	10%	19000	2.100	412.20	148.00	0.0000	0.00	100%
		B	1	10450.00	10%	19000	2.100	412.20	148.00	0.0000	0.00	100%
		C	1	10450.00	10%	19000	2.100	412.20	148.00	0.0000	0.00	100%
326	EHS	A	7/8	7970.00	10%	19000	1.581	356.75	148.00	0.0000	0.00	100%
		B	7/8	7970.00	10%	19000	1.581	356.75	148.00	0.0000	0.00	100%
		C	7/8	7970.00	10%	19000	1.581	356.75	148.00	0.0000	0.00	100%
266	EHS	A	7/8	7970.00	10%	19000	1.581	303.01	148.00	0.0000	0.00	100%
		B	7/8	7970.00	10%	19000	1.581	303.01	148.00	0.0000	0.00	100%
		C	7/8	7970.00	10%	19000	1.581	303.01	148.00	0.0000	0.00	100%
214	EHS	A	7/8	7970.00	10%	19000	1.581	244.01	120.00	0.0000	0.00	100%
		B	7/8	7970.00	10%	19000	1.581	244.01	120.00	0.0000	0.00	100%
		C	7/8	7970.00	10%	19000	1.581	244.01	120.00	0.0000	0.00	100%
162	EHS	A	7/8	6774.50	8.5%	19000	1.581	200.09	120.00	0.0000	0.00	100%
		B	7/8	6774.50	8.5%	19000	1.581	200.09	120.00	0.0000	0.00	100%
		C	7/8	6774.50	8.5%	19000	1.581	200.09	120.00	0.0000	0.00	100%
102	EHS	A	11/16	4000.00	8%	19000	1.000	155.63	120.00	0.0000	0.00	100%
		B	11/16	4000.00	8%	19000	1.000	155.63	120.00	0.0000	0.00	100%
		C	11/16	4000.00	8%	19000	1.000	155.63	120.00	0.0000	0.00	100%

50	EHS	A	1/2	2690.00	10%	21000	0.517	127.76	120.00	0.0000	0.00	100%
		B	1/2	2690.00	10%	21000	0.517	127.76	120.00	0.0000	0.00	100%
		C	1/2	2690.00	10%	21000	0.517	127.76	120.00	0.0000	0.00	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*
454	Corner						
386	Corner						
326	Corner						
266	Corner						
214	Corner						
162	Corner						
102	Corner						
50	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*
454.00	A572-50 (50 ksi)	Equal Angle			No	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/8
386.00	A572-50 (50 ksi)	Equal Angle			No	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/8
326.00	A572-50 (50 ksi)	Equal Angle			No	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/8
266.00	A572-50 (50 ksi)	Equal Angle			No	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/8
214.00	A572-50 (50 ksi)	Equal Angle			No	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/8
162.00	A572-50 (50 ksi)	Equal Angle			No	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/8
102.00	A572-50 (50 ksi)	Equal Angle			No	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/8
50.00	A572-50 (50 ksi)	Equal Angle			No	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/8

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*
454	1000.36	1000.36	1000.36		21.83 8.1 sec/pulse	21.83 8.1 sec/pulse	21.83 8.1 sec/pulse	
386	865.62	865.62	865.62		16.45	16.45	16.45	

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
326	564.02	564.02	564.02		7.0 sec/pulse 12.24	7.0 sec/pulse 12.24	7.0 sec/pulse 12.24	
266	479.06	479.06	479.06		6.0 sec/pulse 8.88	6.0 sec/pulse 8.88	6.0 sec/pulse 8.88	
214	385.77	385.77	385.77		5.1 sec/pulse 5.79	5.1 sec/pulse 5.79	5.1 sec/pulse 5.79	
162	316.33	316.33	316.33		4.2 sec/pulse 4.59	4.2 sec/pulse 4.59	4.2 sec/pulse 4.59	
102	155.63	155.63	155.63		3.7 sec/pulse 2.99	3.7 sec/pulse 2.99	3.7 sec/pulse 2.99	
50	66.05	66.05	66.05		3.0 sec/pulse 1.56	3.0 sec/pulse 1.56	3.0 sec/pulse 1.56	
					2.2 sec/pulse	2.2 sec/pulse	2.2 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
454	No	No			1	1	1	1
386	No	No			1	1	1	1
326	No	No			1	1	1	1
266	No	No			1	1	1	1
214	No	No			1	1	1	1
162	No	No			1	1	1	1
102	No	No			1	1	1	1
50	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
454	0.6250 A325N	0	0.0000	0.75	0.7500 A325N	2	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
386	0.6250 A325N	0	0.0000	0.75	0.7500 A325N	2	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
326	0.6250 A325N	0	0.0000	0.75	0.7500 A325N	2	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
266	0.6250 A325N	0	0.0000	0.75	0.7500 A325N	2	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
214	0.0000 A325N	0	0.0000	1	0.7500 A325N	2	0.0000	0.75	0.6250 A325X	0	0.0000	0.75
162	0.6250 A325N	0	0.0000	0.75	0.6250 A325X	2	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
102	0.6250 A325N	0	0.0000	0.75	0.6250 A325X	2	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
50	0.6250 A325N	0	0.0000	0.75	0.7500 A325N	2	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
454	A	227.00	41	12	2.0706
	B	227.00	41	12	2.0706
	C	227.00	41	12	2.0706
386	A	193.00	41	12	2.0587
	B	193.00	41	12	2.0587
	C	193.00	41	12	2.0587
326	A	163.00	41	12	2.0442
	B	163.00	41	12	2.0442
	C	163.00	41	12	2.0442
266	A	133.00	40	12	2.0242
	B	133.00	40	12	2.0242
	C	133.00	40	12	2.0242
214	A	107.00	39	11	1.9998
	B	107.00	39	11	1.9998
	C	107.00	39	11	1.9998
162	A	81.00	38	11	1.9646
	B	81.00	38	11	1.9646
	C	81.00	38	11	1.9646
102	A	51.00	36	10	1.8990
	B	51.00	36	10	1.8990
	C	51.00	36	10	1.8990
50	A	25.00	32	9	1.7884
	B	25.00	32	9	1.7884
	C	25.00	32	9	1.7884

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 lb-ft	M_y lb-ft	M_z lb-ft
454	A	72.2083	11402.49 10450.00	0.00	10903.52	-3336.15	-25180.61	0.00	0.00
	B	72.2083	11402.49 10450.00	2889.19	10903.52	1668.08	12590.30	0.00	-21807.05
	C	72.2083	11402.49 10450.00	-2889.19	10903.52	1668.08	12590.30	-0.00	21807.05
			Sum:	0.00	32710.57	0.00	0.00	0.00	0.00
386	A	69.3216	11259.83 10450.00	0.00	10588.07	-3830.99	-24452.11	0.00	0.00
	B	69.3216	11259.83 10450.00	3317.73	10588.07	1915.49	12226.05	0.00	-21176.15
	C	69.3216	11259.83 10450.00	-3317.73	10588.07	1915.49	12226.05	-0.00	21176.15
			Sum:	0.00	31764.22	-0.00	0.00	0.00	0.00
326	A	65.9200	8484.92 7970.00	0.00	7793.24	-3355.48	-17997.72	0.00	0.00
	B	65.9200	8484.92 7970.00	2905.93	7793.24	1677.74	8998.86	0.00	-15586.48
	C	65.9200	8484.92 7970.00	-2905.93	7793.24	1677.74	8998.86	-0.00	15586.48

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	lb-ft	lb-ft	lb-ft
			Sum:	0.00	23379.73	-0.00	0.00	0.00	0.00
266	A	61.2901	8390.15 7970.00	0.00	7413.74	-3928.26	-17121.29	0.00	0.00
	B	61.2901	8390.15 7970.00	3401.97	7413.74	1964.13	8560.64	0.00	-14827.47
	C	61.2901	8390.15 7970.00	-3401.97	7413.74	1964.13	8560.64	-0.00	14827.47
			Sum:	0.00	22241.21	-0.00	0.00	0.00	0.00
214	A	61.1911	8308.02 7970.00	0.00	7324.39	-3921.28	-16914.96	0.00	0.00
	B	61.1911	8308.02 7970.00	3395.93	7324.39	1960.64	8457.48	0.00	-14648.78
	C	61.1911	8308.02 7970.00	-3395.93	7324.39	1960.64	8457.48	-0.00	14648.78
			Sum:	0.00	21973.17	0.00	0.00	0.00	0.00
162	A	54.0022	7030.42 6774.50	0.00	5742.33	-4056.16	-13261.34	0.00	0.00
	B	54.0022	7030.42 6774.50	3512.74	5742.33	2028.08	6630.67	0.00	-11484.65
	C	54.0022	7030.42 6774.50	-3512.74	5742.33	2028.08	6630.67	-0.00	11484.65
			Sum:	0.00	17226.98	-0.00	0.00	0.00	0.00
102	A	40.9148	4101.92 4000.00	0.00	2730.84	-3060.76	-6306.60	0.00	0.00
	B	40.9148	4101.92 4000.00	2650.70	2730.84	1530.38	3153.30	0.00	-5461.68
	C	40.9148	4101.92 4000.00	-2650.70	2730.84	1530.38	3153.30	-0.00	5461.68
			Sum:	0.00	8192.52	-0.00	0.00	0.00	0.00
50	A	23.0179	2715.83 2690.00	0.00	1089.89	-2487.54	-2516.98	0.00	0.00
	B	23.0179	2715.83 2690.00	2154.28	1089.89	1243.77	1258.49	0.00	-2179.77
	C	23.0179	2715.83 2690.00	-2154.28	1089.89	1243.77	1258.49	-0.00	2179.77
			Sum:	0.00	3269.66	-0.00	0.00	0.00	0.00

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	lb-ft	lb-ft	lb-ft
454	A	72.2083	19753.52 15279.10	0.00	19024.07	-5318.49	-43934.21	0.00	0.00
	B	72.2083	19753.52 15279.10	4605.95	19024.07	2659.24	21967.10	0.00	-38048.14
	C	72.2083	19753.52 15279.10	-4605.95	19024.07	2659.24	21967.10	-0.00	38048.14
			Sum:	0.00	57072.21	0.00	0.00	0.00	0.00
386	A	69.3216	19303.29 15527.76	0.00	18307.29	-6120.49	-42278.87	0.00	0.00
	B	69.3216	19303.29	5300.50	18307.29	3060.25	21139.43	0.00	-36614.57

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	lb-ft	lb-ft	lb-ft
			15527.76						
	C	69.3216	19303.29	-5300.50	18307.29	3060.25	21139.43	-0.00	36614.57
			15527.76						
			Sum:	0.00	54921.86	-0.00	0.00	0.00	0.00
326	A	65.9200	15384.86	0.00	14305.31	-5661.44	-33036.70	0.00	0.00
			12496.32						
	B	65.9200	15384.86	4902.95	14305.31	2830.72	16518.35	0.00	-28610.62
			12496.32						
	C	65.9200	15384.86	-4902.95	14305.31	2830.72	16518.35	-0.00	28610.62
			12496.32						
			Sum:	0.00	42915.93	-0.00	0.00	0.00	0.00
266	A	61.2901	15004.45	0.00	13461.82	-6626.68	-31088.75	0.00	0.00
			12679.69						
	B	61.2901	15004.45	5738.87	13461.82	3313.34	15544.38	0.00	-26923.65
			12679.69						
	C	61.2901	15004.45	-5738.87	13461.82	3313.34	15544.38	-0.00	26923.65
			12679.69						
			Sum:	0.00	40385.47	-0.00	0.00	0.00	0.00
214	A	61.1911	13925.64	0.00	12443.18	-6252.27	-28736.29	0.00	0.00
			12086.43						
	B	61.1911	13925.64	5414.62	12443.18	3126.13	14368.15	0.00	-24886.36
			12086.43						
	C	61.1911	13925.64	-5414.62	12443.18	3126.13	14368.15	-0.00	24886.36
			12086.43						
			Sum:	0.00	37329.54	-0.00	0.00	0.00	0.00
162	A	54.0022	12646.13	0.00	10518.78	-7019.96	-24292.08	0.00	0.00
			11287.28						
	B	54.0022	12646.13	6079.46	10518.78	3509.98	12146.04	0.00	-21037.56
			11287.28						
	C	54.0022	12646.13	-6079.46	10518.78	3509.98	12146.04	-0.00	21037.56
			11287.28						
			Sum:	0.00	31556.34	-0.00	0.00	0.00	0.00
102	A	40.9148	8324.76	0.00	5761.02	-6009.35	-13304.49	0.00	0.00
			7611.49						
	B	40.9148	8324.76	5204.25	5761.02	3004.68	6652.25	0.00	-11522.03
			7611.49						
	C	40.9148	8324.76	-5204.25	5761.02	3004.68	6652.25	-0.00	11522.03
			7611.49						
			Sum:	0.00	17283.05	-0.00	0.00	0.00	0.00
50	A	23.0179	5635.35	0.00	2500.85	-5050.04	-5775.47	0.00	0.00
			5359.89						
	B	23.0179	5635.35	4373.46	2500.85	2525.02	2887.74	0.00	-5001.71
			5359.89						
	C	23.0179	5635.35	-4373.46	2500.85	2525.02	2887.74	-0.00	5001.71
			5359.89						
			Sum:	0.00	7502.56	-0.00	0.00	0.00	0.00

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	lb-ft	lb-ft	lb-ft

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	lb-ft	lb-ft	lb-ft
454	A	72.2083	11402.49 10450.00	0.00	10903.52	-3336.15	-25180.61	0.00	0.00
	B	72.2083	11402.49 10450.00	2889.19	10903.52	1668.08	12590.30	0.00	-21807.05
	C	72.2083	11402.49 10450.00	-2889.19	10903.52	1668.08	12590.30	-0.00	21807.05
			Sum:	0.00	32710.57	0.00	0.00	0.00	0.00
386	A	69.3216	11259.83 10450.00	0.00	10588.07	-3830.99	-24452.11	0.00	0.00
	B	69.3216	11259.83 10450.00	3317.73	10588.07	1915.49	12226.05	0.00	-21176.15
	C	69.3216	11259.83 10450.00	-3317.73	10588.07	1915.49	12226.05	-0.00	21176.15
			Sum:	0.00	31764.22	-0.00	0.00	0.00	0.00
326	A	65.9200	8484.92 7970.00	0.00	7793.24	-3355.48	-17997.72	0.00	0.00
	B	65.9200	8484.92 7970.00	2905.93	7793.24	1677.74	8998.86	0.00	-15586.48
	C	65.9200	8484.92 7970.00	-2905.93	7793.24	1677.74	8998.86	-0.00	15586.48
			Sum:	0.00	23379.73	-0.00	0.00	0.00	0.00
266	A	61.2901	8390.15 7970.00	0.00	7413.74	-3928.26	-17121.29	0.00	0.00
	B	61.2901	8390.15 7970.00	3401.97	7413.74	1964.13	8560.64	0.00	-14827.47
	C	61.2901	8390.15 7970.00	-3401.97	7413.74	1964.13	8560.64	-0.00	14827.47
			Sum:	0.00	22241.21	-0.00	0.00	0.00	0.00
214	A	61.1911	8308.02 7970.00	0.00	7324.39	-3921.28	-16914.96	0.00	0.00
	B	61.1911	8308.02 7970.00	3395.93	7324.39	1960.64	8457.48	0.00	-14648.78
	C	61.1911	8308.02 7970.00	-3395.93	7324.39	1960.64	8457.48	-0.00	14648.78
			Sum:	0.00	21973.17	0.00	0.00	0.00	0.00
162	A	54.0022	7030.42 6774.50	0.00	5742.33	-4056.16	-13261.34	0.00	0.00
	B	54.0022	7030.42 6774.50	3512.74	5742.33	2028.08	6630.67	0.00	-11484.65
	C	54.0022	7030.42 6774.50	-3512.74	5742.33	2028.08	6630.67	-0.00	11484.65
			Sum:	0.00	17226.98	-0.00	0.00	0.00	0.00
102	A	40.9148	4101.92 4000.00	0.00	2730.84	-3060.76	-6306.60	0.00	0.00
	B	40.9148	4101.92 4000.00	2650.70	2730.84	1530.38	3153.30	0.00	-5461.68
	C	40.9148	4101.92 4000.00	-2650.70	2730.84	1530.38	3153.30	-0.00	5461.68
			Sum:	0.00	8192.52	-0.00	0.00	0.00	0.00
50	A	23.0179	2715.83 2690.00	0.00	1089.89	-2487.54	-2516.98	0.00	0.00
	B	23.0179	2715.83 2690.00	2154.28	1089.89	1243.77	1258.49	0.00	-2179.77
	C	23.0179	2715.83 2690.00	-2154.28	1089.89	1243.77	1258.49	-0.00	2179.77
			Sum:	0.00	3269.66	-0.00	0.00	0.00	0.00

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension lb	0 F Intercept ft	20 F Initial Tension lb	20 F Intercept ft	40 F Initial Tension lb	40 F Intercept ft	60 F Initial Tension lb	60 F Intercept ft	80 F Initial Tension lb	80 F Intercept ft	100 F Initial Tension lb	100 F Intercept ft	120 F Initial Tension lb	120 F Intercept ft
454	A	145.69	454.00	10841	21.07	10710	21.32	10580	21.57	10450	21.83	10320	22.09	10191	22.36	10062	22.64
	B	145.69	454.00	10841	21.07	10710	21.32	10580	21.57	10450	21.83	10320	22.09	10191	22.36	10062	22.64
	C	145.69	454.00	10841	21.07	10710	21.32	10580	21.57	10450	21.83	10320	22.09	10191	22.36	10062	22.64
386	A	145.69	386.00	10972	15.69	10797	15.94	10623	16.19	10450	16.45	10277	16.72	10105	17.00	9934	17.28
	B	145.69	386.00	10972	15.69	10797	15.94	10623	16.19	10450	16.45	10277	16.72	10105	17.00	9934	17.28
	C	145.69	386.00	10972	15.69	10797	15.94	10623	16.19	10450	16.45	10277	16.72	10105	17.00	9934	17.28
326	A	145.69	326.00	8504	11.49	8325	11.73	8147	11.98	7970	12.24	7794	12.51	7618	12.79	7444	13.08
	B	145.69	326.00	8504	11.49	8325	11.73	8147	11.98	7970	12.24	7794	12.51	7618	12.79	7444	13.08
	C	145.69	326.00	8504	11.49	8325	11.73	8147	11.98	7970	12.24	7794	12.51	7618	12.79	7444	13.08
266	A	145.69	266.00	8710	8.14	8462	8.38	8215	8.62	7970	8.88	7726	9.16	7484	9.45	7244	9.75
	B	145.69	266.00	8710	8.14	8462	8.38	8215	8.62	7970	8.88	7726	9.16	7484	9.45	7244	9.75
	C	145.69	266.00	8710	8.14	8462	8.38	8215	8.62	7970	8.88	7726	9.16	7484	9.45	7244	9.75
214	A	117.69	214.00	8730	5.29	8476	5.45	8222	5.61	7970	5.79	7719	5.97	7469	6.17	7220	6.38
	B	117.69	214.00	8730	5.29	8476	5.45	8222	5.61	7970	5.79	7719	5.97	7469	6.17	7220	6.38
	C	117.69	214.00	8730	5.29	8476	5.45	8222	5.61	7970	5.79	7719	5.97	7469	6.17	7220	6.38
162	A	117.69	162.00	7884	3.95	7511	4.15	7141	4.36	6775	4.59	6412	4.84	6055	5.12	5704	5.43
	B	117.69	162.00	7884	3.95	7511	4.15	7141	4.36	6775	4.59	6412	4.84	6055	5.12	5704	5.43
	C	117.69	162.00	7884	3.95	7511	4.15	7141	4.36	6775	4.59	6412	4.84	6055	5.12	5704	5.43
102	A	117.69	102.00	5115	2.35	4738	2.53	4366	2.74	4000	2.99	3643	3.28	3296	3.62	2965	4.02
	B	117.69	102.00	5115	2.35	4738	2.53	4366	2.74	4000	2.99	3643	3.28	3296	3.62	2965	4.02
	C	117.69	102.00	5115	2.35	4738	2.53	4366	2.74	4000	2.99	3643	3.28	3296	3.62	2965	4.02
50	A	117.69	50.00	3699	1.14	3360	1.25	3023	1.39	2690	1.56	2363	1.78	2044	2.05	1740	2.41
	B	117.69	50.00	3699	1.14	3360	1.25	3023	1.39	2690	1.56	2363	1.78	2044	2.05	1740	2.41
	C	117.69	50.00	3699	1.14	3360	1.25	3023	1.39	2690	1.56	2363	1.78	2044	2.05	1740	2.41

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
**********												
Climbing Ladder (Af) (454)	A	No	Af (CaAa)	454.00 - 0.00	-3.5000	0.35	1	1	3.8400	2.5000		7.90
1" Rigid Conduit (tower)	A	No	Ar (CaAa)	0.00 - 0.00	-1.0000	0.1	1	1	1.3150	1.3150		1.53
**********												
HJ8-50B (3 AIR) (479)	B	No	Ar (CaAa)	454.00 - 0.00	-1.0000	0.4	1	1	3.0100	3.0100		1.78
**********												
7/8 (Dipole (108'))	C	No	Ar (CaAa)	454.00 - 0.00	-1.0000	0.45	1	1	1.1100	1.1100		0.54
**********												
1 1/4 (438)	C	No	Ar (CaAa)	438.00 - 0.00	-3.0000	0.3	1	1	1.5500	1.5500		0.66
**********												
LDF4.5-50 (5/8 FOAM) (358)	A	No	Ar (CaAa)	353.00 - 0.00	-1.0000	0.2	1	1	0.8700	0.8700		0.15
**********												
7/8 (342)	C	No	Ar (CaAa)	340.00 - 0.00	-1.0000	0.3	1	1	1.1100	1.1100		0.54
**********												
1 1/4 (305)	C	No	Ar (CaAa)	305.00 - 0.00	-0.5000	0.35	1	1	1.5500	1.5500		0.66
**********												
1 5/8 (282)	C	No	Ar (CaAa)	280.00 - 0.00	-1.0000	0	6	6	0.7500	1.9800		1.04

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 (282)	A	No	Ar (CaAa)	280.00 - 0.00	-1.0000	-0.04	12	6	0.7500	1.9800		1.04
**********												
1 5/8 (257)	A	No	Ar (CaAa)	257.00 - 0.00	-1.0000	0.15	1	1	1.9800	1.9800		1.04
1 1/4 (257)	A	No	Ar (CaAa)	257.00 - 0.00	-0.5000	-0.3	3	3	0.7500	1.5500		0.66
**********												
7/8 (248)	B	No	Ar (CaAa)	248.00 - 0.00	-1.0000	0.3	1	1	1.1100	1.1100		0.54
**********												
7/8 (242)	B	No	Ar (CaAa)	242.00 - 0.00	-3.0000	0.3	1	1	1.1100	1.1100		0.54
**********												
7/8 (140)	C	No	Ar (CaAa)	140.00 - 0.00	-3.0000	0.25	1	1	1.1100	1.1100		0.54
**********												
7/8 (124)	C	No	Ar (CaAa)	125.00 - 0.00	-1.0000	0.25	1	1	1.1100	1.1100		0.54
**********												
7/8 (108)	C	No	Ar (CaAa)	108.00 - 0.00	-3.0000	0.35	1	1	1.1100	1.1100		0.54
**********												

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
**********										
Detuning Wire	A	No	CaAa (Out Of Face)	240.00 - 0.00	0.0000	0.2	2	No Ice	0.02	0.07
								1/2" Ice	0.12	0.48
								1" Ice	0.22	1.52
Detuning Wire	B	No	CaAa (Out Of Face)	240.00 - 0.00	0.0000	0.2	2	No Ice	0.02	0.07
								1/2" Ice	0.12	0.48
								1" Ice	0.22	1.52
Detuning Wire	C	No	CaAa (Out Of Face)	240.00 - 0.00	0.0000	0.2	2	No Ice	0.02	0.07
								1/2" Ice	0.12	0.48
								1" Ice	0.22	1.52
**********										

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
L1	495.00-454.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T1	454.00-442.00	A	0.000	0.000	5.000	0.000	94.80
		B	0.000	0.000	3.370	0.000	21.36
		C	0.000	0.000	1.332	0.000	6.48
T2	442.00-422.00	A	0.000	0.000	8.333	0.000	158.00
		B	0.000	0.000	5.614	0.000	35.60

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
		C	0.000	0.000	4.700	0.000	21.36
T3	422.00-402.00	A	0.000	0.000	8.333	0.000	158.00
		B	0.000	0.000	5.611	0.000	35.60
		C	0.000	0.000	5.320	0.000	24.00
T4	402.00-382.00	A	0.000	0.000	8.333	0.000	158.00
		B	0.000	0.000	5.608	0.000	35.60
		C	0.000	0.000	5.320	0.000	24.00
T5	382.00-362.00	A	0.000	0.000	8.333	0.000	158.00
		B	0.000	0.000	5.605	0.000	35.60
		C	0.000	0.000	5.320	0.000	24.00
T6	362.00-342.00	A	0.000	0.000	9.290	0.000	159.65
		B	0.000	0.000	5.602	0.000	35.60
		C	0.000	0.000	5.320	0.000	24.00
T7	342.00-322.00	A	0.000	0.000	10.073	0.000	161.00
		B	0.000	0.000	5.599	0.000	35.60
		C	0.000	0.000	7.318	0.000	33.72
T8	322.00-302.00	A	0.000	0.000	10.073	0.000	161.00
		B	0.000	0.000	5.597	0.000	35.60
		C	0.000	0.000	8.005	0.000	36.78
T9	302.00-282.00	A	0.000	0.000	10.073	0.000	161.00
		B	0.000	0.000	5.595	0.000	35.60
		C	0.000	0.000	10.640	0.000	48.00
T10	282.00-262.00	A	0.000	0.000	52.841	0.000	385.64
		B	0.000	0.000	5.595	0.000	35.60
		C	0.000	0.000	32.024	0.000	160.32
T11	262.00-242.00	A	0.000	0.000	67.538	0.000	455.90
		B	0.000	0.000	6.262	0.000	38.84
		C	0.000	0.000	34.400	0.000	172.80
T12	242.00-222.00	A	0.000	0.000	70.853	0.675	473.34
		B	0.000	0.000	10.038	0.675	59.54
		C	0.000	0.000	34.400	0.675	175.14
T13	222.00-202.00	A	0.000	0.000	70.853	0.750	473.60
		B	0.000	0.000	10.043	0.750	59.80
		C	0.000	0.000	34.400	0.750	175.40
T14	202.00-182.00	A	0.000	0.000	70.853	0.750	473.60
		B	0.000	0.000	10.052	0.750	59.80
		C	0.000	0.000	34.400	0.750	175.40
T15	182.00-162.00	A	0.000	0.000	70.853	0.750	473.60
		B	0.000	0.000	10.064	0.750	59.80
		C	0.000	0.000	34.400	0.750	175.40
T16	162.00-142.00	A	0.000	0.000	70.853	0.750	473.60
		B	0.000	0.000	10.083	0.750	59.80
		C	0.000	0.000	34.400	0.750	175.40
T17	142.00-122.00	A	0.000	0.000	70.853	0.750	473.60
		B	0.000	0.000	10.110	0.750	59.80
		C	0.000	0.000	36.731	0.750	186.74
T18	122.00-102.00	A	0.000	0.000	70.853	0.750	473.60
		B	0.000	0.000	10.148	0.750	59.80
		C	0.000	0.000	39.506	0.750	200.24
T19	102.00-82.00	A	0.000	0.000	70.853	0.750	473.60
		B	0.000	0.000	10.204	0.750	59.80
		C	0.000	0.000	41.060	0.750	207.80
T20	82.00-62.00	A	0.000	0.000	70.853	0.750	473.60
		B	0.000	0.000	10.288	0.750	59.80
		C	0.000	0.000	41.060	0.750	207.80
T21	62.00-42.00	A	0.000	0.000	70.853	0.750	473.60
		B	0.000	0.000	10.421	0.750	59.80
		C	0.000	0.000	41.060	0.750	207.80
T22	42.00-22.00	A	0.000	0.000	70.853	0.750	473.60
		B	0.000	0.000	10.460	0.750	59.80
		C	0.000	0.000	41.060	0.750	207.80

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
T23	22.00-2.00	A	0.000	0.000	70.853	0.750	473.60
		B	0.000	0.000	10.460	0.750	59.80
		C	0.000	0.000	41.060	0.750	207.80

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
L1	495.00-454.00	A	2.105	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T1	454.00-442.00	A	2.103	0.000	0.000	10.048	0.000	271.11
		B		0.000	0.000	8.660	0.000	179.04
		C		0.000	0.000	6.380	0.000	105.57
T2	442.00-422.00	A	2.102	0.000	0.000	16.741	0.000	451.57
		B		0.000	0.000	14.428	0.000	298.16
		C		0.000	0.000	19.834	0.000	336.38
T3	422.00-402.00	A	2.100	0.000	0.000	16.734	0.000	451.21
		B		0.000	0.000	14.421	0.000	297.84
		C		0.000	0.000	22.122	0.000	376.06
T4	402.00-382.00	A	2.098	0.000	0.000	16.727	0.000	450.83
		B		0.000	0.000	14.413	0.000	297.51
		C		0.000	0.000	22.106	0.000	375.55
T5	382.00-362.00	A	2.096	0.000	0.000	16.718	0.000	450.42
		B		0.000	0.000	14.405	0.000	297.15
		C		0.000	0.000	22.090	0.000	374.99
T6	362.00-342.00	A	2.094	0.000	0.000	22.273	0.000	535.02
		B		0.000	0.000	14.396	0.000	296.75
		C		0.000	0.000	22.072	0.000	374.38
T7	342.00-322.00	A	2.091	0.000	0.000	26.805	0.000	603.80
		B		0.000	0.000	14.386	0.000	296.31
		C		0.000	0.000	31.579	0.000	530.67
T8	322.00-302.00	A	2.089	0.000	0.000	26.782	0.000	602.88
		B		0.000	0.000	14.375	0.000	295.81
		C		0.000	0.000	34.322	0.000	576.82
T9	302.00-282.00	A	2.085	0.000	0.000	26.756	0.000	601.83
		B		0.000	0.000	14.362	0.000	295.24
		C		0.000	0.000	44.006	0.000	744.13
T10	282.00-262.00	A	2.082	0.000	0.000	75.531	0.000	1739.33
		B		0.000	0.000	14.346	0.000	294.58
		C		0.000	0.000	90.576	0.000	1519.58
T11	262.00-242.00	A	2.077	0.000	0.000	112.175	0.000	2331.53
		B		0.000	0.000	17.488	0.000	345.58
		C		0.000	0.000	95.660	0.000	1602.01
T12	242.00-222.00	A	2.072	0.000	0.000	122.472	15.594	2696.51
		B		0.000	0.000	35.324	15.594	851.06
		C		0.000	0.000	95.544	15.594	1811.69
T13	222.00-202.00	A	2.066	0.000	0.000	122.313	17.276	2711.68
		B		0.000	0.000	35.249	17.276	870.31
		C		0.000	0.000	95.405	17.276	1828.04
T14	202.00-182.00	A	2.058	0.000	0.000	122.122	17.216	2701.24
		B		0.000	0.000	35.159	17.216	864.79
		C		0.000	0.000	95.238	17.216	1819.03
T15	182.00-162.00	A	2.049	0.000	0.000	121.889	17.143	2688.50
		B		0.000	0.000	35.049	17.143	858.07
		C		0.000	0.000	95.033	17.143	1808.04
T16	162.00-142.00	A	2.038	0.000	0.000	121.600	17.051	2672.77

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
		B		0.000	0.000	34.912	17.051	849.76
		C		0.000	0.000	94.780	17.051	1794.47
T17	142.00-122.00	A	2.023	0.000	0.000	121.237	16.937	2653.07
		B		0.000	0.000	34.741	16.937	839.36
		C		0.000	0.000	105.291	16.937	1951.48
T18	122.00-102.00	A	2.005	0.000	0.000	120.773	16.791	2627.96
		B		0.000	0.000	34.521	16.791	826.11
		C		0.000	0.000	117.609	16.791	2131.70
T19	102.00-82.00	A	1.981	0.000	0.000	120.165	16.599	2597.93
		B		0.000	0.000	34.234	16.599	811.57
		C		0.000	0.000	123.957	16.599	2211.65
T20	82.00-62.00	A	1.949	0.000	0.000	119.340	16.339	2558.40
		B		0.000	0.000	33.844	16.339	792.98
		C		0.000	0.000	122.844	16.339	2166.26
T21	62.00-42.00	A	1.902	0.000	0.000	118.155	15.966	2502.08
		B		0.000	0.000	33.283	15.966	766.55
		C		0.000	0.000	121.245	15.966	2101.76
T22	42.00-22.00	A	1.827	0.000	0.000	116.267	15.370	2413.43
		B		0.000	0.000	32.389	15.370	725.06
		C		0.000	0.000	118.697	15.370	2000.69
T23	22.00-2.00	A	1.672	0.000	0.000	112.321	14.123	2232.49
		B		0.000	0.000	30.519	14.123	640.88
		C		0.000	0.000	113.368	14.123	1796.21

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	495.00-454.00	0.0000	0.0000	0.0000	0.0000
T1	454.00-442.00	1.9470	0.1604	0.3545	-0.1904
T2	442.00-422.00	1.4091	0.5304	-0.4186	0.3623
T3	422.00-402.00	1.2485	0.6041	-0.5896	0.4828
T4	402.00-382.00	1.2378	0.5992	-0.5864	0.4803
T5	382.00-362.00	1.2822	0.6183	-0.6016	0.4917
T6	362.00-342.00	1.1529	0.3944	-0.7508	0.0205
T7	342.00-322.00	0.6749	0.5569	-1.5155	0.2802
T8	322.00-302.00	0.4984	0.6307	-1.6339	0.4311
T9	302.00-282.00	-0.0316	1.0650	-2.3817	1.0088
T10	282.00-262.00	-1.6670	-0.0738	-2.8116	0.6785
T11	262.00-242.00	-2.4027	-0.0576	-3.3744	0.6387
T12	242.00-222.00	-2.0653	0.1495	-2.0053	0.7372
T13	222.00-202.00	-2.0388	0.1482	-1.9342	0.7093
T14	202.00-182.00	-2.0442	0.1497	-1.9439	0.7118
T15	182.00-162.00	-2.0410	0.1513	-1.9471	0.7119
T16	162.00-142.00	-2.0291	0.1532	-1.9449	0.7097
T17	142.00-122.00	-2.1822	0.3257	-2.1901	0.9521
T18	122.00-102.00	-2.3689	0.5441	-2.4926	1.2544
T19	102.00-82.00	-2.4897	0.6504	-2.7068	1.3923
T20	82.00-62.00	-2.4774	0.6617	-2.7270	1.3979
T21	62.00-42.00	-2.4366	0.6744	-2.7361	1.3957
T22	42.00-22.00	-3.0073	0.3973	-2.7706	1.4016
T23	22.00-2.00	-3.0073	0.3973	-2.8227	1.4008

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	Climbing Ladder (Af)	442.00 - 454.00	0.6000	0.5031
T1	5	HJ8-50B (3 AIR)	442.00 - 454.00	1.0000	0.5031
T1	7	7/8	442.00 - 454.00	0.6000	0.5031
T2	2	Climbing Ladder (Af)	422.00 - 442.00	0.6000	0.5063
T2	5	HJ8-50B (3 AIR)	422.00 - 442.00	1.0000	0.5063
T2	7	7/8	422.00 - 442.00	0.6000	0.5063
T2	9	1 1/4	422.00 - 438.00	0.6000	0.5063
T3	2	Climbing Ladder (Af)	402.00 - 422.00	0.6000	0.5008
T3	5	HJ8-50B (3 AIR)	402.00 - 422.00	1.0000	0.5008
T3	7	7/8	402.00 - 422.00	0.6000	0.5008
T3	9	1 1/4	402.00 - 422.00	0.6000	0.5008
T4	2	Climbing Ladder (Af)	382.00 - 402.00	0.6000	0.4996
T4	5	HJ8-50B (3 AIR)	382.00 - 402.00	1.0000	0.4996
T4	7	7/8	382.00 - 402.00	0.6000	0.4996
T4	9	1 1/4	382.00 - 402.00	0.6000	0.4996
T5	2	Climbing Ladder (Af)	362.00 - 382.00	0.6000	0.5078
T5	5	HJ8-50B (3 AIR)	362.00 - 382.00	1.0000	0.5078
T5	7	7/8	362.00 - 382.00	0.6000	0.5078
T5	9	1 1/4	362.00 - 382.00	0.6000	0.5078
T6	2	Climbing Ladder (Af)	342.00 - 362.00	0.6000	0.5019
T6	5	HJ8-50B (3 AIR)	342.00 - 362.00	1.0000	0.5019
T6	7	7/8	342.00 - 362.00	0.6000	0.5019
T6	9	1 1/4	342.00 - 362.00	0.6000	0.5019
T6	11	LDF4.5-50 (5/8 FOAM)	342.00 - 353.00	0.6000	0.5019
T7	2	Climbing Ladder (Af)	322.00 - 342.00	0.6000	0.5005
T7	5	HJ8-50B (3 AIR)	322.00 - 342.00	1.0000	0.5005
T7	7	7/8	322.00 - 342.00	0.6000	0.5005
T7	9	1 1/4	322.00 - 342.00	0.6000	0.5005
T7	11	LDF4.5-50 (5/8 FOAM)	322.00 - 342.00	0.6000	0.5005
T7	13	7/8	322.00 - 340.00	0.6000	0.5005
T8	2	Climbing Ladder (Af)	302.00 - 322.00	0.6000	0.4847
T8	5	HJ8-50B (3 AIR)	302.00 - 322.00	1.0000	0.4847
T8	7	7/8	302.00 - 322.00	0.6000	0.4847
T8	9	1 1/4	302.00 - 322.00	0.6000	0.4847
T8	11	LDF4.5-50 (5/8 FOAM)	302.00 - 322.00	0.6000	0.4847
T8	13	7/8	302.00 - 322.00	0.6000	0.4847
T8	15	1 1/4	302.00 - 305.00	0.6000	0.4847
T9	2	Climbing Ladder (Af)	282.00 - 302.00	0.6000	0.4977
T9	5	HJ8-50B (3 AIR)	282.00 - 302.00	1.0000	0.4977
T9	7	7/8	282.00 - 302.00	0.6000	0.4977
T9	9	1 1/4	282.00 - 302.00	0.6000	0.4977
T9	11	LDF4.5-50 (5/8 FOAM)	282.00 - 302.00	0.6000	0.4977
T9	13	7/8	282.00 - 302.00	0.6000	0.4977
T9	15	1 1/4	282.00 - 302.00	0.6000	0.4977
T10	2	Climbing Ladder (Af)	262.00 - 282.00	0.6000	0.4787
T10	5	HJ8-50B (3 AIR)	262.00 - 282.00	1.0000	0.4787
T10	7	7/8	262.00 - 282.00	0.6000	0.4787
T10	9	1 1/4	262.00 - 282.00	0.6000	0.4787
T10	11	LDF4.5-50 (5/8 FOAM)	262.00 - 282.00	0.6000	0.4787
T10	13	7/8	262.00 - 282.00	0.6000	0.4787
T10	15	1 1/4	262.00 - 282.00	0.6000	0.4787
T10	17	1 5/8	262.00 - 280.00	0.6000	0.4787
T10	18	1 5/8	262.00 - 280.00	0.6000	0.4787
T11	2	Climbing Ladder (Af)	242.00 - 262.00	0.6000	0.4812

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	5	HJ8-50B (3 AIR)	242.00 - 262.00	1.0000	0.4812
T11	7	7/8	242.00 - 262.00	0.6000	0.4812
T11	9	1 1/4	242.00 - 262.00	0.6000	0.4812
T11	11	LDF4.5-50 (5/8 FOAM)	242.00 - 262.00	0.6000	0.4812
T11	13	7/8	242.00 - 262.00	0.6000	0.4812
T11	15	1 1/4	242.00 - 262.00	0.6000	0.4812
T11	17	1 5/8	242.00 - 262.00	0.6000	0.4812
T11	18	1 5/8	242.00 - 262.00	0.6000	0.4812
T11	21	1 5/8	242.00 - 257.00	0.6000	0.4812
T11	22	1 1/4	242.00 - 257.00	0.6000	0.4812
T11	24	7/8	242.00 - 248.00	0.6000	0.4812
T12	2	Climbing Ladder (Af)	222.00 - 242.00	0.6000	0.4820
T12	5	HJ8-50B (3 AIR)	222.00 - 242.00	1.0000	0.4820
T12	7	7/8	222.00 - 242.00	0.6000	0.4820
T12	9	1 1/4	222.00 - 242.00	0.6000	0.4820
T12	11	LDF4.5-50 (5/8 FOAM)	222.00 - 242.00	0.6000	0.4820
T12	13	7/8	222.00 - 242.00	0.6000	0.4820
T12	15	1 1/4	222.00 - 242.00	0.6000	0.4820
T12	17	1 5/8	222.00 - 242.00	0.6000	0.4820
T12	18	1 5/8	222.00 - 242.00	0.6000	0.4820
T12	21	1 5/8	222.00 - 242.00	0.6000	0.4820
T12	22	1 1/4	222.00 - 242.00	0.6000	0.4820
T12	24	7/8	222.00 - 242.00	0.6000	0.4820
T12	26	7/8	222.00 - 242.00	0.6000	0.4820
T13	2	Climbing Ladder (Af)	202.00 - 222.00	0.6000	0.4756
T13	5	HJ8-50B (3 AIR)	202.00 - 222.00	1.0000	0.4756
T13	7	7/8	202.00 - 222.00	0.6000	0.4756
T13	9	1 1/4	202.00 - 222.00	0.6000	0.4756
T13	11	LDF4.5-50 (5/8 FOAM)	202.00 - 222.00	0.6000	0.4756
T13	13	7/8	202.00 - 222.00	0.6000	0.4756
T13	15	1 1/4	202.00 - 222.00	0.6000	0.4756
T13	17	1 5/8	202.00 - 222.00	0.6000	0.4756
T13	18	1 5/8	202.00 - 222.00	0.6000	0.4756
T13	21	1 5/8	202.00 - 222.00	0.6000	0.4756
T13	22	1 1/4	202.00 - 222.00	0.6000	0.4756
T13	24	7/8	202.00 - 222.00	0.6000	0.4756
T13	26	7/8	202.00 - 222.00	0.6000	0.4756
T14	2	Climbing Ladder (Af)	182.00 - 202.00	0.6000	0.4786
T14	5	HJ8-50B (3 AIR)	182.00 - 202.00	1.0000	0.4786
T14	7	7/8	182.00 - 202.00	0.6000	0.4786
T14	9	1 1/4	182.00 - 202.00	0.6000	0.4786
T14	11	LDF4.5-50 (5/8 FOAM)	182.00 - 202.00	0.6000	0.4786
T14	13	7/8	182.00 - 202.00	0.6000	0.4786
T14	15	1 1/4	182.00 - 202.00	0.6000	0.4786
T14	17	1 5/8	182.00 - 202.00	0.6000	0.4786
T14	18	1 5/8	182.00 - 202.00	0.6000	0.4786
T14	21	1 5/8	182.00 - 202.00	0.6000	0.4786
T14	22	1 1/4	182.00 - 202.00	0.6000	0.4786
T14	24	7/8	182.00 - 202.00	0.6000	0.4786
T14	26	7/8	182.00 - 202.00	0.6000	0.4786
T15	2	Climbing Ladder (Af)	162.00 - 182.00	0.6000	0.4798
T15	5	HJ8-50B (3 AIR)	162.00 - 182.00	1.0000	0.4798
T15	7	7/8	162.00 - 182.00	0.6000	0.4798
T15	9	1 1/4	162.00 - 182.00	0.6000	0.4798
T15	11	LDF4.5-50 (5/8 FOAM)	162.00 - 182.00	0.6000	0.4798
T15	13	7/8	162.00 - 182.00	0.6000	0.4798
T15	15	1 1/4	162.00 - 182.00	0.6000	0.4798
T15	17	1 5/8	162.00 - 182.00	0.6000	0.4798
T15	18	1 5/8	162.00 - 182.00	0.6000	0.4798
T15	21	1 5/8	162.00 - 182.00	0.6000	0.4798
T15	22	1 1/4	162.00 - 182.00	0.6000	0.4798
T15	24	7/8	162.00 - 182.00	0.6000	0.4798

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T15	26	7/8	162.00 - 182.00	0.6000	0.4798
T16	2	Climbing Ladder (Af)	142.00 - 162.00	0.6000	0.4797
T16	5	HJ8-50B (3 AIR)	142.00 - 162.00	1.0000	0.4797
T16	7	7/8	142.00 - 162.00	0.6000	0.4797
T16	9	1 1/4	142.00 - 162.00	0.6000	0.4797
T16	11	LDF4.5-50 (5/8 FOAM)	142.00 - 162.00	0.6000	0.4797
T16	13	7/8	142.00 - 162.00	0.6000	0.4797
T16	15	1 1/4	142.00 - 162.00	0.6000	0.4797
T16	17	1 5/8	142.00 - 162.00	0.6000	0.4797
T16	18	1 5/8	142.00 - 162.00	0.6000	0.4797
T16	21	1 5/8	142.00 - 162.00	0.6000	0.4797
T16	22	1 1/4	142.00 - 162.00	0.6000	0.4797
T16	24	7/8	142.00 - 162.00	0.6000	0.4797
T16	26	7/8	142.00 - 162.00	0.6000	0.4797
T17	2	Climbing Ladder (Af)	122.00 - 142.00	0.6000	0.4833
T17	5	HJ8-50B (3 AIR)	122.00 - 142.00	1.0000	0.4833
T17	7	7/8	122.00 - 142.00	0.6000	0.4833
T17	9	1 1/4	122.00 - 142.00	0.6000	0.4833
T17	11	LDF4.5-50 (5/8 FOAM)	122.00 - 142.00	0.6000	0.4833
T17	13	7/8	122.00 - 142.00	0.6000	0.4833
T17	15	1 1/4	122.00 - 142.00	0.6000	0.4833
T17	17	1 5/8	122.00 - 142.00	0.6000	0.4833
T17	18	1 5/8	122.00 - 142.00	0.6000	0.4833
T17	21	1 5/8	122.00 - 142.00	0.6000	0.4833
T17	22	1 1/4	122.00 - 142.00	0.6000	0.4833
T17	24	7/8	122.00 - 142.00	0.6000	0.4833
T17	26	7/8	122.00 - 142.00	0.6000	0.4833
T17	28	7/8	122.00 - 140.00	0.6000	0.4833
T17	30	7/8	122.00 - 125.00	0.6000	0.4833
T18	2	Climbing Ladder (Af)	102.00 - 122.00	0.6000	0.4858
T18	5	HJ8-50B (3 AIR)	102.00 - 122.00	1.0000	0.4858
T18	7	7/8	102.00 - 122.00	0.6000	0.4858
T18	9	1 1/4	102.00 - 122.00	0.6000	0.4858
T18	11	LDF4.5-50 (5/8 FOAM)	102.00 - 122.00	0.6000	0.4858
T18	13	7/8	102.00 - 122.00	0.6000	0.4858
T18	15	1 1/4	102.00 - 122.00	0.6000	0.4858
T18	17	1 5/8	102.00 - 122.00	0.6000	0.4858
T18	18	1 5/8	102.00 - 122.00	0.6000	0.4858
T18	21	1 5/8	102.00 - 122.00	0.6000	0.4858
T18	22	1 1/4	102.00 - 122.00	0.6000	0.4858
T18	24	7/8	102.00 - 122.00	0.6000	0.4858
T18	26	7/8	102.00 - 122.00	0.6000	0.4858
T18	28	7/8	102.00 - 122.00	0.6000	0.4858
T18	30	7/8	102.00 - 122.00	0.6000	0.4858
T18	32	7/8	102.00 - 108.00	0.6000	0.4858
T19	2	Climbing Ladder (Af)	82.00 - 102.00	0.6000	0.4874
T19	5	HJ8-50B (3 AIR)	82.00 - 102.00	1.0000	0.4874
T19	7	7/8	82.00 - 102.00	0.6000	0.4874
T19	9	1 1/4	82.00 - 102.00	0.6000	0.4874
T19	11	LDF4.5-50 (5/8 FOAM)	82.00 - 102.00	0.6000	0.4874
T19	13	7/8	82.00 - 102.00	0.6000	0.4874
T19	15	1 1/4	82.00 - 102.00	0.6000	0.4874
T19	17	1 5/8	82.00 - 102.00	0.6000	0.4874
T19	18	1 5/8	82.00 - 102.00	0.6000	0.4874
T19	21	1 5/8	82.00 - 102.00	0.6000	0.4874
T19	22	1 1/4	82.00 - 102.00	0.6000	0.4874
T19	24	7/8	82.00 - 102.00	0.6000	0.4874
T19	26	7/8	82.00 - 102.00	0.6000	0.4874
T19	28	7/8	82.00 - 102.00	0.6000	0.4874
T19	30	7/8	82.00 - 102.00	0.6000	0.4874
T19	32	7/8	82.00 - 102.00	0.6000	0.4874
T20	2	Climbing Ladder (Af)	62.00 - 82.00	0.6000	0.4935

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T20	5	HJ8-50B (3 AIR)	62.00 - 82.00	1.0000	0.4935
T20	7	7/8	62.00 - 82.00	0.6000	0.4935
T20	9	1 1/4	62.00 - 82.00	0.6000	0.4935
T20	11	LDF4.5-50 (5/8 FOAM)	62.00 - 82.00	0.6000	0.4935
T20	13	7/8	62.00 - 82.00	0.6000	0.4935
T20	15	1 1/4	62.00 - 82.00	0.6000	0.4935
T20	17	1 5/8	62.00 - 82.00	0.6000	0.4935
T20	18	1 5/8	62.00 - 82.00	0.6000	0.4935
T20	21	1 5/8	62.00 - 82.00	0.6000	0.4935
T20	22	1 1/4	62.00 - 82.00	0.6000	0.4935
T20	24	7/8	62.00 - 82.00	0.6000	0.4935
T20	26	7/8	62.00 - 82.00	0.6000	0.4935
T20	28	7/8	62.00 - 82.00	0.6000	0.4935
T20	30	7/8	62.00 - 82.00	0.6000	0.4935
T20	32	7/8	62.00 - 82.00	0.6000	0.4935
T21	2	Climbing Ladder (Af)	42.00 - 62.00	0.6000	0.4982
T21	5	HJ8-50B (3 AIR)	42.00 - 62.00	1.0000	0.4982
T21	7	7/8	42.00 - 62.00	0.6000	0.4982
T21	9	1 1/4	42.00 - 62.00	0.6000	0.4982
T21	11	LDF4.5-50 (5/8 FOAM)	42.00 - 62.00	0.6000	0.4982
T21	13	7/8	42.00 - 62.00	0.6000	0.4982
T21	15	1 1/4	42.00 - 62.00	0.6000	0.4982
T21	17	1 5/8	42.00 - 62.00	0.6000	0.4982
T21	18	1 5/8	42.00 - 62.00	0.6000	0.4982
T21	21	1 5/8	42.00 - 62.00	0.6000	0.4982
T21	22	1 1/4	42.00 - 62.00	0.6000	0.4982
T21	24	7/8	42.00 - 62.00	0.6000	0.4982
T21	26	7/8	42.00 - 62.00	0.6000	0.4982
T21	28	7/8	42.00 - 62.00	0.6000	0.4982
T21	30	7/8	42.00 - 62.00	0.6000	0.4982
T21	32	7/8	42.00 - 62.00	0.6000	0.4982
T22	2	Climbing Ladder (Af)	22.00 - 42.00	0.6000	0.5102
T22	5	HJ8-50B (3 AIR)	22.00 - 42.00	0.6000	0.5102
T22	7	7/8	22.00 - 42.00	0.6000	0.5102
T22	9	1 1/4	22.00 - 42.00	0.6000	0.5102
T22	11	LDF4.5-50 (5/8 FOAM)	22.00 - 42.00	0.6000	0.5102
T22	13	7/8	22.00 - 42.00	0.6000	0.5102
T22	15	1 1/4	22.00 - 42.00	0.6000	0.5102
T22	17	1 5/8	22.00 - 42.00	0.6000	0.5102
T22	18	1 5/8	22.00 - 42.00	0.6000	0.5102
T22	21	1 5/8	22.00 - 42.00	0.6000	0.5102
T22	22	1 1/4	22.00 - 42.00	0.6000	0.5102
T22	24	7/8	22.00 - 42.00	0.6000	0.5102
T22	26	7/8	22.00 - 42.00	0.6000	0.5102
T22	28	7/8	22.00 - 42.00	0.6000	0.5102
T22	30	7/8	22.00 - 42.00	0.6000	0.5102
T22	32	7/8	22.00 - 42.00	0.6000	0.5102
T23	2	Climbing Ladder (Af)	2.00 - 22.00	0.6000	0.5318
T23	5	HJ8-50B (3 AIR)	2.00 - 22.00	0.6000	0.5318
T23	7	7/8	2.00 - 22.00	0.6000	0.5318
T23	9	1 1/4	2.00 - 22.00	0.6000	0.5318
T23	11	LDF4.5-50 (5/8 FOAM)	2.00 - 22.00	0.6000	0.5318
T23	13	7/8	2.00 - 22.00	0.6000	0.5318
T23	15	1 1/4	2.00 - 22.00	0.6000	0.5318
T23	17	1 5/8	2.00 - 22.00	0.6000	0.5318
T23	18	1 5/8	2.00 - 22.00	0.6000	0.5318
T23	21	1 5/8	2.00 - 22.00	0.6000	0.5318
T23	22	1 1/4	2.00 - 22.00	0.6000	0.5318
T23	24	7/8	2.00 - 22.00	0.6000	0.5318
T23	26	7/8	2.00 - 22.00	0.6000	0.5318
T23	28	7/8	2.00 - 22.00	0.6000	0.5318
T23	30	7/8	2.00 - 22.00	0.6000	0.5318

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T23	32	7/8	2.00 - 22.00	0.6000	0.5318

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
**********									
DB436-C	C	From Face	3.00	0.0000	460.00	No Ice	0.45	0.45	7.00
(Dipole)			0.00			1/2" Ice	0.81	0.81	9.10
			0.00			1" Ice	1.17	1.17	11.20
FMH-2AC-Radomes	C	From Face	1.00	0.0000	479.00	No Ice	19.00	19.00	350.00
(FM Radio)			0.00			1/2" Ice	23.00	23.00	660.00
			0.00			1" Ice	27.00	27.00	970.00
**********									
Work Platform w/ handrail	B	From Face	2.00	0.0000	446.00	No Ice	6.30	3.00	270.00
(tower)			0.00			1/2" Ice	9.50	4.50	380.00
			0.00			1" Ice	12.70	6.00	490.00
**********									
**********									
5' Standoff	B	From Leg	2.50	0.0000	340.00	No Ice	3.26	3.26	60.00
(1.5'x4.5' grid dish)			0.00			1/2" Ice	5.89	5.89	107.00
			0.00			1" Ice	8.52	8.52	154.00
**********									
4' Standoff	B	From Leg	2.00	0.0000	305.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00			1" Ice	7.10	7.10	128.00
5' Yagi	B	From Leg	4.00	0.0000	305.00	No Ice	2.60	2.60	30.00
			0.00			1/2" Ice	6.78	6.78	58.70
			5.00			1" Ice	10.98	10.98	113.07
**********									
APX16DWV-16DWVS-C-A20 w/Mount Pipe	A	From Leg	1.00	0.0000	280.00	No Ice	6.70	3.50	61.38
			0.00			1/2" Ice	7.15	4.27	109.35
			0.00			1" Ice	7.59	4.96	163.80
APX16DWV-16DWVS-C-A20 w/Mount Pipe	B	From Leg	1.00	0.0000	280.00	No Ice	6.70	3.50	61.38
			0.00			1/2" Ice	7.15	4.27	109.35
			0.00			1" Ice	7.59	4.96	163.80
APX16DWV-16DWVS-C-A20 w/Mount Pipe	C	From Leg	1.00	0.0000	280.00	No Ice	6.70	3.50	61.38
			0.00			1/2" Ice	7.15	4.27	109.35
			0.00			1" Ice	7.59	4.96	163.80
LNX-6515DS-VTM w/Mount Pipe	A	From Leg	0.00	0.0000	280.00	No Ice	11.64	9.84	83.12
			0.00			1/2" Ice	12.36	11.36	172.54
			0.00			1" Ice	13.08	12.90	271.91
LNX-6515DS-VTM w/Mount Pipe	B	From Leg	0.00	0.0000	280.00	No Ice	11.64	9.84	83.12
			0.00			1/2" Ice	12.36	11.36	172.54
			0.00			1" Ice	13.08	12.90	271.91
LNX-6515DS-VTM w/Mount Pipe	C	From Leg	0.00	0.0000	280.00	No Ice	11.64	9.84	83.12
			0.00			1/2" Ice	12.36	11.36	172.54
			0.00			1" Ice	13.08	12.90	271.91
T-Arm Mount [TA 702-3]	C	None		0.0000	280.00	No Ice	5.64	5.64	339.00
(T-Mobile)						1/2" Ice	6.55	6.55	429.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						1" Ice	7.46	7.46	519.00
**********									
APXVTM14-C-120	A	From Leg	4.00 -6.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	6.34 6.72 7.10	3.61 3.97 4.33	67.70 107.23 151.82
APXVTM14-C-120	B	From Leg	4.00 -6.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	6.34 6.72 7.10	3.61 3.97 4.33	67.70 107.23 151.82
APXVTM14-C-120	C	From Leg	4.00 -6.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	6.34 6.72 7.10	3.61 3.97 4.33	67.70 107.23 151.82
NNVV-65B-R4	A	From Leg	4.00 3.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	5.75 6.21 6.67	77.40 149.54 228.32
NNVV-65B-R4	B	From Leg	4.00 3.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	5.75 6.21 6.67	77.40 149.54 228.32
NNVV-65B-R4	C	From Leg	4.00 3.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	5.75 6.21 6.67	77.40 149.54 228.32
TD-RRH8x20-25	A	From Leg	4.00 -6.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	70.00 97.14 127.80
TD-RRH8x20-25	B	From Leg	4.00 -6.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	70.00 97.14 127.80
TD-RRH8x20-25	C	From Leg	4.00 -6.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	70.00 97.14 127.80
1900MHz 4x45W RRH	A	From Leg	4.00 -3.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	59.50 82.62 108.98
1900MHz 4x45W RRH	B	From Leg	4.00 -3.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	59.50 82.62 108.98
1900MHz 4x45W RRH	C	From Leg	4.00 -3.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	59.50 82.62 108.98
800MHz 2x50W RRH	A	From Leg	1.00 -3.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	64.00 86.12 111.30
800MHz 2x50W RRH	B	From Leg	1.00 -3.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	64.00 86.12 111.30
800MHz 2x50W RRH	C	From Leg	1.00 -3.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	64.00 86.12 111.30
(4) 8'x2" Pipe Mount	B	From Leg	0.00 0.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	30.00 44.34 63.96
(4) 8'x2" Pipe Mount	C	From Leg	0.00 0.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	1.90 2.73 3.40	1.90 2.73 3.40	30.00 44.34 63.96
Sector Mount [SM 303-1] (Sprint)	A	From Leg	4.00 0.00 0.00	0.0000	257.00	No Ice 1/2" Ice 1" Ice	18.56 26.00 33.44	20.17 28.95 37.73	626.50 901.48 1176.45
SitePro1 VFA12-HD-S (1)	B	From Leg	4.00	0.0000	257.00	No Ice	12.50	7.00	578.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Sprint)			0.00			1/2" Ice	18.50	11.30	686.00
			0.00			1" Ice	24.60	15.30	846.00
SitePro1 VFA12-HD-S (1)	C	From Leg	4.00	0.0000	257.00	No Ice	12.50	7.00	578.00
(Sprint)			0.00			1/2" Ice	18.50	11.30	686.00
			0.00			1" Ice	24.60	15.30	846.00
**********									
Large Beacon	A	From Face	1.00	0.0000	239.00	No Ice	1.56	1.56	28.00
			0.00			1/2" Ice	2.41	2.41	58.19
			0.00			1" Ice	2.64	2.64	91.58
Large Beacon	B	From Face	1.00	0.0000	239.00	No Ice	1.56	1.56	28.00
			0.00			1/2" Ice	2.41	2.41	58.19
			0.00			1" Ice	2.64	2.64	91.58
**********									
4' Standoff	C	From Leg	2.00	0.0000	140.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00			1" Ice	7.10	7.10	128.00
10' Dipole	C	From Leg	4.00	0.0000	140.00	No Ice	2.83	2.83	30.00
			0.00			1/2" Ice	4.03	4.03	51.79
			5.00			1" Ice	5.03	5.03	80.14
**********									
4' Standoff	C	From Leg	2.00	0.0000	125.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00			1" Ice	7.10	7.10	128.00
10' Dipole	C	From Leg	4.00	0.0000	125.00	No Ice	2.84	2.84	30.00
			0.00			1/2" Ice	4.03	4.03	51.79
			5.00			1" Ice	5.03	5.03	80.14
**********									
**********									
4' Standoff	C	From Leg	2.00	0.0000	108.00	No Ice	2.72	2.72	50.00
			0.00			1/2" Ice	4.91	4.91	89.00
			0.00			1" Ice	7.10	7.10	128.00
10' Dipole	C	From Leg	4.00	0.0000	108.00	No Ice	2.86	2.86	30.00
			0.00			1/2" Ice	4.03	4.03	51.79
			5.00			1" Ice	5.03	5.03	80.14
**********									
**********									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
GP6F-21A	A	Grid	From Leg	2.00	0.0000		438.00	6.00	No Ice	28.30	198.00
				0.00					1/2" Ice	29.05	347.13
				0.00					1" Ice	29.80	496.25
P3F-52-N7A	C	Grid	From Leg	1.00	0.0000		353.00	3.00	No Ice	5.70	105.00
(Wine AM)				0.00					1/2" Ice	7.46	143.31
				0.00					1" Ice	9.23	181.62
DB496-A	B	Grid	From Leg	5.00	0.0000		340.00	1.13	No Ice	1.30	9.00

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight lb
(Wine AM)				0.00					1/2" Ice	1.15	14.88
				0.00					1" Ice	0.00	20.77
GP8F-21A	A	Grid	From Leg	2.00	0.0000		248.00	8.00	No Ice	50.30	282.00
				0.00					1/2" Ice	51.29	545.30
				0.00					1" Ice	52.28	808.60
GP6F-21A	C	Grid	From Leg	2.00	0.0000		242.00	6.00	No Ice	28.30	198.00
				0.00					1/2" Ice	29.05	347.13
				0.00					1" Ice	29.80	496.25

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 lb-ft
Leg Weight	28848.80			
Bracing Weight	12922.83			
Total Member Self-Weight	41771.63			
Guy Weight	11498.55			
Total Weight	70806.03			
Wind 0 deg - No Ice		110.64	-64904.25	-9431.01
Wind 30 deg - No Ice		29953.79	-51904.54	-3454.60
Wind 60 deg - No Ice		50704.81	-29465.13	-1963.53
Wind 90 deg - No Ice		61141.21	-212.20	1295.66
Wind 120 deg - No Ice		58760.43	33898.18	9048.55
Wind 150 deg - No Ice		33193.14	57614.68	13173.74
Wind 180 deg - No Ice		-143.72	61494.74	9403.03
Wind 210 deg - No Ice		-30056.81	51845.31	3658.29
Wind 240 deg - No Ice		-53601.50	31047.44	2039.30
Wind 270 deg - No Ice		-61141.05	-26.76	-1162.91
Wind 300 deg - No Ice		-55950.20	-32327.61	-9096.34
Wind 330 deg - No Ice		-33221.37	-57597.94	-13510.18
Member Ice	58869.82			
Guy Ice	48884.79			
Total Weight Ice	263638.35			
Wind 0 deg - Ice		608.59	-42885.30	-6499.55
Wind 30 deg - Ice		20990.56	-35517.33	-3502.97
Wind 60 deg - Ice		35105.94	-20358.55	-1043.07
Wind 90 deg - Ice		41098.37	-406.31	2425.51
Wind 120 deg - Ice		37153.99	21960.97	8499.00
Wind 150 deg - Ice		20938.39	37535.64	11073.13
Wind 180 deg - Ice		-109.51	42434.39	7395.59
Wind 210 deg - Ice		-20228.37	36180.72	2091.49
Wind 240 deg - Ice		-35336.12	21614.16	-1182.53
Wind 270 deg - Ice		-40894.38	39.75	-3497.95
Wind 300 deg - Ice		-36330.64	-20939.18	-7169.44
Wind 330 deg - Ice		-21320.65	-36856.04	-8589.22
Total Weight	70806.03			
Wind 0 deg - Service		46.05	-27015.30	-3925.50
Wind 30 deg - Service		12467.76	-21604.39	-1437.92
Wind 60 deg - Service		21105.02	-12264.36	-817.28
Wind 90 deg - Service		25448.99	-88.33	539.29
Wind 120 deg - Service		24458.03	14109.54	3766.30
Wind 150 deg - Service		13816.08	23981.14	5483.35
Wind 180 deg - Service		-59.82	25596.15	3913.85
Wind 210 deg - Service		-12510.64	21579.73	1522.70

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Wind 240 deg - Service		-22310.72	12922.97	848.82
Wind 270 deg - Service		-25448.93	-11.14	-484.04
Wind 300 deg - Service		-23288.32	-13455.82	-3786.20
Wind 330 deg - Service		-13827.83	-23974.17	-5623.38

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
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+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+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 lb-ft	Minor Axis Moment lb-ft
L1	495 - 454	Pole	Max Tension	5	0.32	-3.89	5.93
			Max. Compression	14	-5795.17	-11.36	-2654.15
			Max. Mx	5	-3046.18	-83850.22	-1018.82
			Max. My	8	-3058.46	140.48	-84325.07
			Max. Vy	11	-3705.40	83843.81	-960.42
			Max. Vx	2	-3720.55	-29.64	83479.10
			Max. Torque	11			2546.69
T1	454 - 442	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-32035.84	74.42	138.99
			Max. Mx	6	-28699.24	-206.35	-25.97
			Max. My	2	-29776.23	71.63	173.03
			Max. Vy	6	-211.46	-153.36	-9.45
			Max. Vx	8	-181.02	57.11	-109.92
		Diagonal	Max Tension	6	2481.99	0.00	0.00
			Max. Compression	10	-2991.66	0.00	0.00
			Max. Mx	23	61.48	-44.71	0.00
			Max. My	19	-90.93	0.00	0.75
			Max. Vy	23	31.62	0.00	0.00
			Max. Vx	19	0.53	0.00	0.00
		Horizontal	Max Tension	2	554.88	0.00	0.00
			Max. Compression	2	-554.88	0.00	0.00
			Max. Mx	14	303.32	-31.19	0.00
			Max. My	20	413.06	0.00	0.00
			Max. Vy	14	31.19	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Guy A	Bottom Tension	9	45361.18		
			Top Tension	9	46275.66		
			Top Cable Vert	9	44287.21		
			Top Cable Norm	9	13418.45		
			Top Cable Tan	9	159.63		
			Bot Cable Vert	9	-42642.12		
			Bot Cable Norm	9	15428.26		
			Bot Cable Tan	9	1120.23		
		Guy B	Bottom Tension	11	44360.92		
			Top Tension	11	45276.68		
			Top Cable Vert	11	43342.51		
			Top Cable Norm	11	13090.77		
			Top Cable Tan	11	189.77		
			Bot Cable Vert	11	-41697.42		
			Bot Cable Norm	11	15100.59		
			Bot Cable Tan	11	1090.09		
		Guy C	Bottom Tension	3	45489.38		
			Top Tension	3	46403.72		
			Top Cable Vert	3	44408.31		
			Top Cable Norm	3	13460.39		
			Top Cable Tan	3	156.05		
			Bot Cable Vert	3	-42763.22		
			Bot Cable Norm	3	15470.21		
			Bot Cable Tan	3	1123.81		
		Top Guy Pull-Off	Max Tension	23	0.59	0.00	0.00
			Max. Compression	23	-0.59	0.00	0.00
			Max. Mx	14	0.00	-43.11	0.00
			Max. My	20	0.55	0.00	0.00
			Max. Vy	14	43.11	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T2	442 - 422	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	10	-32924.35	-161.55	-3.39
			Max. Mx	6	-30289.56	-170.68	-13.45
			Max. My	2	-30172.92	74.59	153.70
			Max. Vy	6	-589.32	-136.02	-5.41
			Max. Vx	7	-551.18	53.68	-101.33

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Diagonal	Max Tension	7	2466.27	0.00	0.00
			Max. Compression	13	-2707.17	0.00	0.00
			Max. Mx	23	936.79	-44.68	0.00
			Max. My	19	133.36	0.00	0.74
			Max. Vy	23	31.59	0.00	0.00
			Max. Vx	19	-0.52	0.00	0.00
		Horizontal	Max Tension	4	819.38	0.00	0.00
			Max. Compression	10	-648.23	0.00	0.00
			Max. Mx	14	334.77	-31.16	0.00
			Max. My	20	499.05	0.00	0.00
			Max. Vy	14	31.16	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T3	422 - 402	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-49909.19	218.44	49.98
			Max. Mx	13	-47432.80	223.71	23.09
			Max. My	2	-22805.42	-56.14	213.68
			Max. Vy	13	-114.57	223.71	23.09
			Max. Vx	2	-118.46	-56.14	213.68
		Diagonal	Max Tension	13	4548.63	0.00	0.00
			Max. Compression	7	-5005.27	0.00	0.00
			Max. Mx	23	1521.50	-44.63	0.00
			Max. My	19	138.59	0.00	0.73
			Max. Vy	23	31.56	0.00	0.00
			Max. Vx	19	-0.52	0.00	0.00
		Horizontal	Max Tension	2	864.45	0.00	0.00
			Max. Compression	2	-864.45	0.00	0.00
			Max. Mx	14	362.85	-31.13	0.00
			Max. My	20	693.04	0.00	0.00
			Max. Vy	14	31.13	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T4	402 - 382	Leg	Max Tension	8	19187.75	-85.11	-22.64
			Max. Compression	2	-81435.42	-371.59	27.12
			Max. Mx	2	-81435.42	-371.59	27.12
			Max. My	2	-11116.26	-38.78	335.54
			Max. Vy	13	179.95	336.89	71.87
			Max. Vx	2	180.04	-38.78	335.54
		Diagonal	Max Tension	13	6134.51	0.00	0.00
			Max. Compression	7	-6660.46	0.00	0.00
			Max. Mx	16	2414.77	-47.14	0.00
			Max. My	19	178.95	0.00	0.72
			Max. Vy	16	33.33	0.00	0.00
			Max. Vx	19	-0.51	0.00	0.00
		Horizontal	Max Tension	2	1410.50	0.00	0.00
			Max. Compression	2	-1410.50	0.00	0.00
			Max. Mx	14	649.76	-31.10	0.00
			Max. My	20	1082.97	0.00	0.00
			Max. Vy	14	-31.10	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Guy A	Bottom Tension	9	46436.45		
			Top Tension	9	47216.71		
			Top Cable Vert	9	44389.57		
			Top Cable Norm	9	16092.74		
			Top Cable Tan	9	84.62		
			Bot Cable Vert	9	-42901.16		
			Bot Cable Norm	9	17743.34		
			Bot Cable Tan	9	1004.12		
		Guy B	Bottom Tension	13	45965.69		
			Top Tension	13	46746.23		
			Top Cable Vert	13	43951.84		
			Top Cable Norm	13	15919.70		
			Top Cable Tan	13	95.74		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Bot Cable Vert	13	-42463.43		
			Bot Cable Norm	13	17570.30		
			Bot Cable Tan	13	993.00		
		Guy C	Bottom Tension	3	46455.97		
			Top Tension	3	47236.22		
			Top Cable Vert	3	44407.72		
			Top Cable Norm	3	16099.92		
			Top Cable Tan	3	84.46		
			Bot Cable Vert	3	-42919.31		
			Bot Cable Norm	3	17750.52		
			Bot Cable Tan	3	1004.27		
		Top Guy Pull-Off	Max Tension	9	9706.68	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	2922.58	-43.01	0.00
			Max. My	20	4849.50	0.00	0.00
			Max. Vy	14	43.01	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T5	382 - 362	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-79372.32	380.58	37.15
			Max. Mx	2	-72519.82	384.66	29.11
			Max. My	2	-53961.66	-162.91	348.05
			Max. Vy	6	-197.15	-363.28	-31.21
			Max. Vx	2	-190.23	-162.91	348.05
		Diagonal	Max Tension	2	2416.28	0.00	0.00
			Max. Compression	6	-3032.70	0.00	0.00
			Max. Mx	23	-281.91	-40.73	0.00
			Max. My	20	-730.24	0.00	0.58
			Max. Vy	23	28.80	0.00	0.00
			Max. Vx	20	-0.41	0.00	0.00
		Horizontal	Max Tension	2	1410.50	0.00	0.00
			Max. Compression	2	-1410.50	0.00	0.00
			Max. Mx	14	675.90	-31.06	0.00
			Max. My	20	1107.76	0.00	0.00
			Max. Vy	14	31.06	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T6	362 - 342	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-79277.42	-319.96	53.82
			Max. Mx	6	-53417.81	-396.82	-49.55
			Max. My	7	-68374.79	175.53	-363.38
			Max. Vy	10	244.26	393.16	-38.46
			Max. Vx	9	-226.02	-165.54	-334.59
		Diagonal	Max Tension	7	2028.98	0.00	0.00
			Max. Compression	13	-2642.05	0.00	0.00
			Max. Mx	16	135.52	-46.90	0.00
			Max. My	20	-406.45	0.00	0.64
			Max. Vy	16	33.16	0.00	0.00
			Max. Vx	20	0.45	0.00	0.00
		Horizontal	Max Tension	2	1374.77	0.00	0.00
			Max. Compression	2	-1374.77	0.00	0.00
			Max. Mx	14	703.85	-31.03	0.00
			Max. My	20	1207.23	0.00	0.00
			Max. Vy	14	31.03	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T7	342 - 322	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-92789.47	-248.53	384.73
			Max. Mx	2	-92319.29	557.21	-23.21
			Max. My	2	-46004.33	152.62	496.41
			Max. Vy	6	-277.39	-490.81	-107.29
			Max. Vx	2	-285.84	-171.14	411.81
		Diagonal	Max Tension	2	5917.90	0.00	0.00
			Max. Compression	9	-6661.99	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	22	797.80	-46.77	0.00
			Max. My	20	129.16	0.00	0.61
			Max. Vy	22	33.07	0.00	0.00
			Max. Vx	20	-0.43	0.00	0.00
		Horizontal	Max Tension	19	1607.16	0.00	0.00
			Max. Compression	19	-1607.16	0.00	0.00
			Max. Mx	14	946.89	-30.98	0.00
			Max. My	20	1454.80	0.00	0.00
			Max. Vy	14	30.98	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Guy A	Bottom Tension	7	38406.69		
			Top Tension	7	38900.99		
			Top Cable Vert	7	35686.53		
			Top Cable Norm	7	15484.11		
			Top Cable Tan	7	34.73		
			Bot Cable Vert	7	-34603.80		
			Bot Cable Norm	7	16645.07		
			Bot Cable Tan	7	769.42		
		Guy B	Bottom Tension	13	38436.85		
			Top Tension	13	38931.11		
			Top Cable Vert	13	35713.78		
			Top Cable Norm	13	15496.97		
			Top Cable Tan	13	33.34		
			Bot Cable Vert	13	-34631.06		
			Bot Cable Norm	13	16657.93		
			Bot Cable Tan	13	770.81		
		Guy C	Bottom Tension	3	37809.26		
			Top Tension	3	38304.04		
			Top Cable Vert	3	35146.81		
			Top Cable Norm	3	15228.24		
			Top Cable Tan	3	47.57		
			Bot Cable Vert	3	-34064.09		
			Bot Cable Norm	3	16389.20		
			Bot Cable Tan	3	756.58		
		Top Guy Pull-Off	Max Tension	7	9525.23	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	2881.65	-42.88	0.00
			Max. My	20	2320.82	0.00	0.00
			Max. Vy	14	-42.88	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
T8	322 - 302	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-95612.96	-311.21	-575.47
			Max. Mx	6	-93603.14	-646.06	27.86
			Max. My	2	-92742.41	-370.25	618.59
			Max. Vy	2	447.73	638.87	26.80
			Max. Vx	2	517.38	-370.25	618.59
		Diagonal	Max Tension	9	5476.20	0.00	0.00
			Max. Compression	2	-6505.76	0.00	0.00
			Max. Mx	16	-2181.47	-60.97	0.00
			Max. My	20	677.52	0.00	0.73
			Max. Vy	16	-43.12	0.00	0.00
			Max. Vx	20	-0.51	0.00	0.00
		Horizontal	Max Tension	6	1656.07	0.00	0.00
			Max. Compression	6	-1656.07	0.00	0.00
			Max. Mx	14	966.62	-30.93	0.00
			Max. My	20	1427.59	0.00	0.00
			Max. Vy	14	-30.93	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
T9	302 - 282	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	13	-99504.44	-269.19	709.58
			Max. Mx	10	-94158.51	826.59	-77.10

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	2	-99256.42	-388.84	789.16
			Max. Vy	10	-405.23	826.59	-77.10
			Max. Vx	2	-382.30	-388.84	789.16
		Diagonal	Max Tension	2	3224.38	0.00	0.00
			Max. Compression	9	-4327.95	0.00	0.00
			Max. Mx	16	-1594.91	-46.51	0.00
			Max. My	20	95.09	0.00	0.56
			Max. Vy	16	32.89	0.00	0.00
			Max. Vx	20	-0.40	0.00	0.00
		Horizontal	Max Tension	13	1723.47	0.00	0.00
			Max. Compression	13	-1723.47	0.00	0.00
			Max. Mx	17	1305.74	-30.88	0.00
			Max. My	20	1427.59	0.00	0.00
			Max. Vy	17	30.88	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T10	282 - 262	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-128773.58	597.78	849.13
			Max. Mx	10	-122810.71	-1041.35	105.51
			Max. My	2	-124059.05	451.96	-946.12
			Max. Vy	5	764.63	-877.55	23.10
			Max. Vx	2	-779.05	391.39	882.66
		Diagonal	Max Tension	9	8018.36	0.00	0.00
			Max. Compression	3	-9570.97	0.00	0.00
			Max. Mx	16	-599.66	-60.71	0.00
			Max. My	20	-919.52	0.00	0.74
			Max. Vy	16	42.93	0.00	0.00
			Max. Vx	20	-0.52	0.00	0.00
		Horizontal	Max Tension	6	2230.42	0.00	0.00
			Max. Compression	6	-2230.42	0.00	0.00
			Max. Mx	25	1546.41	-30.81	0.00
			Max. My	20	1612.63	0.00	0.00
			Max. Vy	25	-30.81	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Guy A	Bottom Tension	7	43630.25		
			Top Tension	7	44034.17		
			Top Cable Vert	7	38743.75		
			Top Cable Norm	7	20926.61		
			Top Cable Tan	7	81.77		
			Bot Cable Vert	7	-37786.49		
			Bot Cable Norm	7	21799.91		
			Bot Cable Tan	7	737.22		
		Guy B	Bottom Tension	13	43667.24		
			Top Tension	13	44071.17		
			Top Cable Vert	13	38775.89		
			Top Cable Norm	13	20944.96		
			Top Cable Tan	13	81.44		
			Bot Cable Vert	13	-37818.63		
			Bot Cable Norm	13	21818.26		
			Bot Cable Tan	13	736.89		
		Guy C	Bottom Tension	5	41415.99		
			Top Tension	5	41820.98		
			Top Cable Vert	5	36821.57		
			Top Cable Norm	5	19828.39		
			Top Cable Tan	5	34.46		
			Bot Cable Vert	5	-35864.31		
			Bot Cable Norm	5	20701.69		
			Bot Cable Tan	5	689.92		
		Top Guy Pull-Off	Max Tension	13	13023.36	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	25	2367.99	-42.70	0.00
			Max. My	13	2315.82	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	25	-42.70	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
T11	262 - 242	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	7	-143467.19	-1144.50	-36.26
			Max. Mx	5	-98603.60	1594.58	35.78
			Max. My	2	-129327.53	553.75	-1349.78
			Max. Vy	11	2136.23	1356.27	25.11
			Max. Vx	2	1762.44	-517.79	1245.93
		Diagonal	Max Tension	3	7820.56	0.00	0.00
			Max. Compression	9	-9558.40	0.00	0.00
			Max. Mx	17	-717.11	-60.58	0.00
			Max. My	20	-44.67	0.00	0.76
			Max. Vy	17	42.84	0.00	0.00
			Max. Vx	20	-0.54	0.00	0.00
		Horizontal	Max Tension	12	3001.27	0.00	0.00
			Max. Compression	7	-2484.92	0.00	0.00
			Max. Mx	25	1654.87	-30.74	0.00
			Max. My	20	1741.69	0.00	0.00
			Max. Vy	25	-30.74	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
T12	242 - 222	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	7	-136670.57	-930.49	69.60
			Max. Mx	6	-133620.84	1098.83	-34.10
			Max. My	2	-127585.78	-540.51	-961.91
			Max. Vy	9	879.34	853.81	70.09
			Max. Vx	6	-852.18	-408.11	-886.48
		Diagonal	Max Tension	7	10339.32	0.00	0.00
			Max. Compression	13	-12061.98	0.00	0.00
			Max. Mx	17	1555.60	-60.45	0.00
			Max. My	20	-1969.27	0.00	0.78
			Max. Vy	17	42.74	0.00	0.00
			Max. Vx	20	-0.55	0.00	0.00
		Horizontal	Max Tension	7	2484.92	0.00	0.00
			Max. Compression	7	-2484.92	0.00	0.00
			Max. Mx	14	1467.01	-30.65	0.00
			Max. My	13	2278.53	0.00	0.00
			Max. Vy	14	30.65	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
T13	222 - 202	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	10	-159583.81	-629.65	-1202.13
			Max. Mx	2	-152728.27	-1354.84	44.83
			Max. My	2	-123991.14	377.44	1239.60
			Max. Vy	2	-687.81	-1354.84	44.87
			Max. Vx	2	628.01	377.44	1239.60
		Diagonal	Max Tension	7	11762.71	0.00	0.00
			Max. Compression	13	-13847.45	0.00	0.00
			Max. Mx	21	2007.57	-60.27	0.00
			Max. My	20	-2630.07	0.00	0.78
			Max. Vy	21	42.62	0.00	0.00
			Max. Vx	20	-0.55	0.00	0.00
		Horizontal	Max Tension	10	2764.07	0.00	0.00
			Max. Compression	10	-2764.07	0.00	0.00
			Max. Mx	14	1695.05	-30.54	0.00
			Max. My	7	2163.89	0.00	0.00
			Max. Vy	14	30.54	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
		Guy A	Bottom Tension	7	42154.49		
			Top Tension	7	42480.24		
			Top Cable Vert	7	37299.05		
			Top Cable Norm	7	20330.70		
			Top Cable Tan	7	120.13		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Bot Cable Vert	7	-36534.63		
			Bot Cable Norm	7	21019.38		
			Bot Cable Tan	7	638.00		
		Guy B	Bottom Tension	13	42135.80		
			Top Tension	13	42461.57		
			Top Cable Vert	13	37282.82		
			Top Cable Norm	13	20321.45		
			Top Cable Tan	13	119.98		
			Bot Cable Vert	13	-36518.40		
			Bot Cable Norm	13	21010.14		
			Bot Cable Tan	13	637.85		
		Guy C	Bottom Tension	5	38879.07		
			Top Tension	5	39205.97		
			Top Cable Vert	5	34455.92		
			Top Cable Norm	5	18705.46		
			Top Cable Tan	5	58.67		
			Bot Cable Vert	5	-33691.49		
			Bot Cable Norm	5	19394.15		
			Bot Cable Tan	5	576.54		
		Top Guy Pull-Off	Max Tension	7	12873.40	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	3572.45	-42.40	0.00
			Max. My	7	2310.32	0.00	0.00
			Max. Vy	14	-42.40	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
T14	202 - 182	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	10	-178257.44	809.13	1186.31
			Max. Mx	2	-174903.65	-1439.54	71.81
			Max. My	2	-116215.20	511.37	1265.44
			Max. Vy	2	723.06	-1439.54	71.81
			Max. Vx	2	-634.58	511.37	1265.44
		Diagonal	Max Tension	7	4982.73	0.00	0.00
			Max. Compression	13	-7411.65	0.00	0.00
			Max. Mx	21	-942.91	-60.05	0.00
			Max. My	20	-947.09	0.00	0.75
			Max. Vy	21	42.46	0.00	0.00
			Max. Vx	20	-0.53	0.00	0.00
		Horizontal	Max Tension	10	3087.51	0.00	0.00
			Max. Compression	10	-3087.51	0.00	0.00
			Max. Mx	14	1756.10	-30.42	0.00
			Max. My	7	2489.54	0.00	0.00
			Max. Vy	14	30.42	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
T15	182 - 162	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	10	-222171.19	-495.35	-1609.59
			Max. Mx	2	-221009.54	1628.65	415.42
			Max. My	10	-222171.19	-495.35	-1609.59
			Max. Vy	2	-814.39	-1580.48	75.37
			Max. Vx	10	746.58	-495.35	-1609.59
		Diagonal	Max Tension	13	8302.87	0.00	0.00
			Max. Compression	7	-11238.36	0.00	0.00
			Max. Mx	21	547.20	-59.79	0.00
			Max. My	20	-2563.63	0.00	0.73
			Max. Vy	21	42.28	0.00	0.00
			Max. Vx	20	-0.52	0.00	0.00
		Horizontal	Max Tension	10	3848.12	0.00	0.00
			Max. Compression	10	-3848.12	0.00	0.00
			Max. Mx	14	1811.22	-30.26	0.00
			Max. My	7	3174.20	0.00	0.00
			Max. Vy	14	-30.26	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T16	162 - 142	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-223399.42	-1705.70	40.28
			Max. Mx	2	-223399.42	-1705.70	40.28
			Max. My	10	-223005.58	-495.31	-1609.60
			Max. Vy	2	-858.30	-1705.70	40.33
			Max. Vx	10	-775.65	-495.31	-1609.60
		Diagonal	Max Tension	5	6436.61	0.00	0.00
			Max. Compression	11	-9071.42	0.00	0.00
			Max. Mx	21	-4225.35	-59.43	0.00
			Max. My	20	73.86	0.00	0.69
			Max. Vy	21	42.03	0.00	0.00
			Max. Vx	20	-0.49	0.00	0.00
		Horizontal	Max Tension	2	3869.39	0.00	0.00
			Max. Compression	2	-3869.39	0.00	0.00
			Max. Mx	14	2025.47	-30.07	0.00
			Max. My	7	3236.01	0.00	0.00
			Max. Vy	14	-30.07	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
		Guy A	Bottom Tension	7	41770.35		
			Top Tension	7	42018.77		
			Top Cable Vert	7	34060.44		
			Top Cable Norm	7	24605.85		
			Top Cable Tan	7	124.08		
			Bot Cable Vert	7	-33422.58		
			Bot Cable Norm	7	25048.52		
			Bot Cable Tan	7	514.54		
		Guy B	Bottom Tension	13	41733.90		
			Top Tension	13	41982.33		
			Top Cable Vert	13	34031.23		
			Top Cable Norm	13	24584.06		
			Top Cable Tan	13	123.06		
			Bot Cable Vert	13	-33393.37		
			Bot Cable Norm	13	25026.73		
			Bot Cable Tan	13	513.52		
		Guy C	Bottom Tension	5	37312.28		
			Top Tension	5	37561.58		
			Top Cable Vert	5	30486.52		
			Top Cable Norm	5	21941.76		
			Top Cable Tan	5	57.67		
			Bot Cable Vert	5	-29848.66		
			Bot Cable Norm	5	22384.43		
			Bot Cable Tan	5	448.13		
		Top Guy Pull-Off	Max Tension	13	15464.53	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	4133.70	-41.88	0.00
			Max. My	13	2035.29	0.00	0.00
			Max. Vy	14	-41.88	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
T17	142 - 122	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	10	-194787.97	-710.55	-1447.47
			Max. Mx	2	-191950.18	-1695.02	85.95
			Max. My	2	-137699.92	649.97	1523.26
			Max. Vy	2	-974.95	-1665.63	67.83
			Max. Vx	2	941.44	671.67	1503.12
		Diagonal	Max Tension	11	2293.89	0.00	0.00
			Max. Compression	5	-5262.53	0.00	0.00
			Max. Mx	22	-1112.35	-59.06	0.00
			Max. My	20	-2082.67	0.00	0.66
			Max. Vy	22	41.76	0.00	0.00
			Max. Vx	20	-0.47	0.00	0.00
		Horizontal	Max Tension	2	3869.39	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	2	-3869.39	0.00	0.00
			Max. Mx	17	2456.29	-29.83	0.00
			Max. My	7	3236.01	0.00	0.00
			Max. Vy	17	29.83	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
T18	122 - 102	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-207131.42	-1742.49	266.48
			Max. Mx	2	-207131.42	-1742.49	266.48
			Max. My	6	-202938.37	584.35	-1666.21
			Max. Vy	2	-953.54	-1722.81	100.47
			Max. Vx	2	873.03	645.54	1541.48
		Diagonal	Max Tension	12	6287.96	0.00	0.00
			Max. Compression	6	-8777.23	0.00	0.00
			Max. Mx	20	-765.71	-58.59	0.00
			Max. My	20	-3735.73	0.00	0.63
			Max. Vy	20	41.43	0.00	0.00
			Max. Vx	20	-0.45	0.00	0.00
		Horizontal	Max Tension	2	3587.62	0.00	0.00
			Max. Compression	2	-3587.62	0.00	0.00
			Max. Mx	17	2547.80	-29.52	0.00
			Max. My	7	3076.33	0.00	0.00
			Max. Vy	17	29.52	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
T19	102 - 82	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-204477.21	-869.73	1542.08
			Max. Mx	2	-201965.06	-1742.48	266.51
			Max. My	6	-204387.09	584.29	-1666.23
			Max. Vy	2	-884.69	-1742.48	266.51
			Max. Vx	6	-803.41	584.29	-1666.23
		Diagonal	Max Tension	7	9528.35	0.00	0.00
			Max. Compression	13	-12828.00	0.00	0.00
			Max. Mx	26	-5090.00	-57.98	0.00
			Max. My	20	-1367.90	0.00	0.56
			Max. Vy	26	41.00	0.00	0.00
			Max. Vx	20	-0.40	0.00	0.00
		Horizontal	Max Tension	6	3541.65	0.00	0.00
			Max. Compression	6	-3541.65	0.00	0.00
			Max. Mx	14	2290.60	-29.12	0.00
			Max. My	7	3152.32	0.00	0.00
			Max. Vy	14	29.12	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
		Guy A	Bottom Tension	7	26111.31		
			Top Tension	7	26210.70		
			Top Cable Vert	7	17215.39		
			Top Cable Norm	7	19764.31		
			Top Cable Tan	7	53.78		
			Bot Cable Vert	7	-16890.93		
			Bot Cable Norm	7	19910.66		
			Bot Cable Tan	7	250.76		
		Guy B	Bottom Tension	13	26085.80		
			Top Tension	13	26185.17		
			Top Cable Vert	13	17198.84		
			Top Cable Norm	13	19744.88		
			Top Cable Tan	13	54.47		
			Bot Cable Vert	13	-16874.37		
			Bot Cable Norm	13	19891.23		
			Bot Cable Tan	13	251.46		
		Guy C	Bottom Tension	5	22830.81		
			Top Tension	5	22930.52		
			Top Cable Vert	5	15086.57		
			Top Cable Norm	5	17268.58		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Top Cable Tan	5	18.86		
			Bot Cable Vert	5	-14762.10		
			Bot Cable Norm	5	17414.93		
			Bot Cable Tan	5	215.84		
		Top Guy Pull-Off	Max Tension	7	12734.82	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	4046.10	-40.83	0.00
			Max. My	7	1786.94	0.00	0.00
			Max. Vy	14	-40.83	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
T20	82 - 62	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-179404.94	1749.79	-21.04
			Max. Mx	6	-179404.94	1749.79	-21.04
			Max. My	6	-178931.77	-874.61	-1500.14
			Max. Vy	6	878.12	-1716.12	28.70
			Max. Vx	2	784.79	830.34	1485.79
		Diagonal	Max Tension	13	5717.27	0.00	0.00
			Max. Compression	7	-8634.39	0.00	0.00
			Max. Mx	19	-2156.96	-57.18	0.00
			Max. My	20	169.13	0.00	0.51
			Max. Vy	19	40.43	0.00	0.00
			Max. Vx	20	-0.36	0.00	0.00
		Horizontal	Max Tension	6	3541.65	0.00	0.00
			Max. Compression	6	-3541.65	0.00	0.00
			Max. Mx	23	2810.19	-28.59	0.00
			Max. My	7	2999.20	0.00	0.00
			Max. Vy	23	28.59	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
T21	62 - 42	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-186328.26	1793.52	-36.39
			Max. Mx	6	-186328.26	1793.52	-36.39
			Max. My	2	-178738.87	-799.82	1565.96
			Max. Vy	6	-881.02	-1686.32	73.12
			Max. Vx	6	791.29	-884.00	-1541.31
		Diagonal	Max Tension	13	8209.65	0.00	0.00
			Max. Compression	7	-11136.31	0.00	0.00
			Max. Mx	19	-226.76	-56.03	0.00
			Max. My	20	1307.44	0.00	0.46
			Max. Vy	19	-39.62	0.00	0.00
			Max. Vx	20	-0.33	0.00	0.00
		Horizontal	Max Tension	6	3227.30	0.00	0.00
			Max. Compression	6	-3227.30	0.00	0.00
			Max. Mx	14	2471.20	-27.82	0.00
			Max. My	20	3006.20	0.00	0.00
			Max. Vy	14	27.82	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Guy A	Bottom Tension	7	13329.72		
			Top Tension	7	13355.06		
			Top Cable Vert	7	5256.18		
			Top Cable Norm	7	12277.22		
			Top Cable Tan	7	5.96		
			Bot Cable Vert	7	-5138.09		
			Bot Cable Norm	7	12299.33		
			Bot Cable Tan	7	89.45		
		Guy B	Bottom Tension	13	13327.70		
			Top Tension	13	13353.04		
			Top Cable Vert	13	5255.39		
			Top Cable Norm	13	12275.36		
			Top Cable Tan	13	5.77		
			Bot Cable Vert	13	-5137.30		
			Bot Cable Norm	13	12297.47		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Bot Cable Tan	13	89.27		
		Guy C	Bottom Tension	5	11723.76		
			Top Tension	5	11749.16		
			Top Cable Vert	5	4632.93		
			Top Cable Norm	5	10797.16		
			Top Cable Tan	5	5.42		
			Bot Cable Vert	5	-4514.84		
			Bot Cable Norm	5	10819.27		
			Bot Cable Tan	5	78.07		
		Top Guy Pull-Off	Max Tension	13	8266.40	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	3874.25	-39.40	0.00
			Max. My	13	1678.46	0.00	0.00
			Max. Vy	14	39.40	0.00	0.00
			Max. Vx	13	-0.00	0.00	0.00
T22	42 - 22	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-191565.08	1843.26	-33.67
			Max. Mx	6	-191565.08	1843.26	-33.67
			Max. My	6	-186088.41	901.36	1587.38
			Max. Vy	6	914.73	-1773.65	62.14
			Max. Vx	6	-818.87	-856.35	-1571.99
		Diagonal	Max Tension	13	6602.77	0.00	0.00
			Max. Compression	7	-9585.30	0.00	0.00
			Max. Mx	15	1667.45	-54.19	0.00
			Max. My	19	361.72	0.00	0.38
			Max. Vy	15	38.32	0.00	0.00
			Max. Vx	19	-0.27	0.00	0.00
		Horizontal	Max Tension	6	3318.00	0.00	0.00
			Max. Compression	6	-3318.00	0.00	0.00
			Max. Mx	19	2967.72	-26.63	0.00
			Max. My	20	3081.96	0.00	0.00
			Max. Vy	19	26.63	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T23	22 - 2	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	6	-191477.40	-864.64	-1568.89
			Max. Mx	6	-190586.76	1837.37	-31.37
			Max. My	6	-174021.04	-421.98	1891.37
			Max. Vy	6	912.45	-1775.10	59.08
			Max. Vx	6	-864.41	701.91	-1561.76
		Diagonal	Max Tension	13	7174.21	0.00	0.00
			Max. Compression	13	-10358.78	0.00	0.00
			Max. Mx	19	3560.65	-50.41	0.00
			Max. My	19	512.61	0.00	0.33
			Max. Vy	19	35.64	0.00	0.00
			Max. Vx	19	0.23	0.00	0.00
		Horizontal	Max Tension	6	3318.00	0.00	0.00
			Max. Compression	6	-3318.00	0.00	0.00
			Max. Mx	19	2967.72	-24.22	0.00
			Max. My	20	3081.96	0.00	0.00
			Max. Vy	19	24.22	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Base Beam	Max Tension	2	60140.86	-147599.29	961.93
			Max. Compression	6	-166278.14	2942.32	1574.60
			Max. Mx	6	-58086.58	-150761.22	-2543.86
			Max. My	7	-50318.55	-135457.89	-7720.66
			Max. Vy	6	-58086.58	-150761.22	-2543.86
			Max. Vx	13	2514.51	-134665.18	6176.01

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Guy C @ 148 ft Elev 0 ft Azimuth 240 deg	Max. Vert	23	-4478.54	-937.58	539.69
	Max. H_x	23	-4478.54	-937.58	539.69
	Max. H_z	3	-155380.16	-58990.97	38184.87
	Min. Vert	3	-155380.16	-58990.97	38184.87
	Min. H_x	5	-153761.35	-62038.04	31766.88
	Min. H_z	9	-17193.26	-4318.10	262.70
Guy B @ 148 ft Elev 0 ft Azimuth 120 deg	Max. Vert	19	-4531.21	947.55	546.36
	Max. H_x	11	-153796.00	62072.99	31774.18
	Max. H_z	13	-156597.88	59815.93	38684.77
	Min. Vert	13	-156597.88	59815.93	38684.77
	Min. H_x	19	-4531.21	947.55	546.36
	Min. H_z	7	-17233.71	4309.71	257.93
Guy A @ 148 ft Elev 0 ft Azimuth 0 deg	Max. Vert	15	-4483.49	-0.69	-1076.41
	Max. H_x	10	-138455.26	5574.96	-61453.61
	Max. H_z	15	-4483.49	-0.69	-1076.41
	Min. Vert	7	-156482.15	-3583.15	-71092.17
	Min. H_x	6	-138954.89	-5591.82	-62035.68
	Min. H_z	7	-156482.15	-3583.15	-71092.17
Guy C @ 120 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-2698.49	-926.68	534.78
	Max. H_x	10	-2698.49	-926.68	534.78
	Max. H_z	3	-79809.71	-57466.43	34639.09
	Min. Vert	5	-82817.09	-61292.15	33864.47
	Min. H_x	5	-82817.09	-61292.15	33864.47
	Min. H_z	10	-2698.49	-926.68	534.78
Guy B @ 120 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-2504.87	805.55	465.53
	Max. H_x	13	-91923.43	66999.28	40404.98
	Max. H_z	13	-91923.43	66999.28	40404.98
	Min. Vert	13	-91923.43	66999.28	40404.98
	Min. H_x	6	-2504.87	805.55	465.53
	Min. H_z	7	-3515.13	1923.22	431.02
Guy A @ 120 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-2604.06	-0.46	-1002.07
	Max. H_x	10	-69795.57	1993.62	-58129.89
	Max. H_z	2	-2604.06	-0.46	-1002.07
	Min. Vert	7	-91986.23	-1492.76	-78277.89
	Min. H_x	6	-79588.94	-2249.02	-67139.41
	Min. H_z	7	-91986.23	-1492.76	-78277.89
Mast	Max. Vert	6	537144.91	2563.62	1483.65
	Max. H_x	6	537144.91	2563.62	1483.65
	Max. H_z	11	469667.00	-645.60	1606.65
	Max. M_x	1	0.00	-17.28	-4.21
	Max. M_z	1	0.00	-17.28	-4.21
	Max. Torsion	13	15280.03	1135.03	-1920.10
	Min. Vert	1	220021.29	-17.28	-4.21
	Min. H_x	10	516290.26	-1756.36	1002.07
	Min. H_z	2	527843.36	-19.98	-2451.00
	Min. M_x	1	0.00	-17.28	-4.21

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. M_z	1	0.00	-17.28	-4.21
	Min. Torsion	7	-14681.26	2220.26	-49.68

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	220021.29	17.28	4.21	0.00	0.00	-56.69
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	527843.36	19.98	2451.00	0.00	0.00	-10147.52
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	467509.71	1057.86	1213.82	0.00	0.00	-3413.63
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	389241.83	1459.06	-822.64	0.00	0.00	-2063.28
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	468959.99	-594.65	-1597.15	0.00	0.00	1031.58
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	537144.91	-2563.62	-1483.65	0.00	0.00	9468.92
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	486743.90	-2220.26	49.68	0.00	0.00	14681.26
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	393506.60	53.60	1747.17	0.00	0.00	10747.26
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	467800.76	1597.38	288.51	0.00	0.00	3135.41
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	516290.26	1756.36	-1002.07	0.00	0.00	1438.13
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	469667.00	645.60	-1606.65	0.00	0.00	-1304.36
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	397822.81	-1566.82	-946.75	0.00	0.00	-10789.32
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	487162.43	-1135.03	1920.10	0.00	0.00	-15280.03
1.2 Dead+1.0 Ice+1.0 Temp+Guy	449765.91	125.00	-57.22	0.00	0.00	-133.60
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	493484.76	118.22	-123.61	0.00	0.00	-5106.44
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	503366.07	376.12	-127.68	0.00	0.00	-2233.31
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	505634.42	417.19	-238.03	0.00	0.00	-881.36
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	502808.93	296.14	-258.57	0.00	0.00	1104.33
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	493792.06	145.91	-38.91	0.00	0.00	5694.55
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	505050.54	-61.92	182.94	0.00	0.00	7988.68
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	507081.21	132.09	306.29	0.00	0.00	5222.71
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	503982.41	220.89	186.93	0.00	0.00	1276.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	491680.14	-17.98	17.34	0.00	0.00	-524.17
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	503232.17	-39.79	-276.44	0.00	0.00	-1977.35
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	506463.96	-189.34	-261.07	0.00	0.00	-5414.90
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	504844.72	-174.49	-33.67	0.00	0.00	-7185.91
Dead+Wind 0 deg - Service+Guy	227514.11	17.36	-977.46	0.00	0.00	-3259.12
Dead+Wind 30 deg - Service+Guy	229439.09	433.60	-721.67	0.00	0.00	-1007.20
Dead+Wind 60 deg - Service+Guy	230783.94	719.90	-400.30	0.00	0.00	-651.74
Dead+Wind 90 deg - Service+Guy	229534.34	894.29	5.95	0.00	0.00	218.11
Dead+Wind 120 deg - Service+Guy	227942.42	928.81	531.41	0.00	0.00	3058.21
Dead+Wind 150 deg - Service+Guy	230220.32	493.73	849.25	0.00	0.00	4657.84
Dead+Wind 180 deg - Service+Guy	230993.37	18.09	872.67	0.00	0.00	3134.27
Dead+Wind 210 deg - Service+Guy	229442.51	-402.83	727.09	0.00	0.00	945.28
Dead+Wind 240 deg - Service+Guy	227264.40	-781.89	464.57	0.00	0.00	564.32
Dead+Wind 270 deg - Service+Guy	229546.41	-859.33	4.01	0.00	0.00	-292.77
Dead+Wind 300 deg - Service+Guy	231231.28	-797.31	-467.30	0.00	0.00	-3169.71
Dead+Wind 330 deg - Service+Guy	230231.03	-475.56	-831.53	0.00	0.00	-4845.34

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-70803.40	0.00	0.80	70801.18	-0.91	0.004%
2	177.03	-83056.75	-131933.77	-177.03	83055.88	131924.37	0.006%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
3	61965.33	-82664.89	-107363.99	-61965.97	82664.46	107355.44	0.006%
4	105451.73	-82273.04	-61187.70	-105453.81	82273.03	61183.81	0.003%
5	125904.48	-82664.89	-339.52	-125898.27	82664.53	343.84	0.005%
6	118340.71	-83056.75	68280.58	-118331.60	83055.79	-68275.33	0.007%
7	67148.29	-82664.89	116500.21	-67140.80	82664.45	-116496.72	0.005%
8	-229.95	-82273.04	126478.56	223.52	82272.97	-126477.46	0.004%
9	-62130.17	-82664.89	107269.22	62122.58	82664.47	-107265.56	0.006%
10	-110086.43	-83056.75	63719.38	110078.06	83055.95	-63714.56	0.006%
11	-125904.22	-82664.89	-42.82	125898.02	82664.53	47.11	0.005%
12	-113844.34	-82273.04	-65767.65	113845.63	82273.03	65764.90	0.002%
13	-67193.47	-82664.89	-116473.43	67194.18	82664.43	116465.09	0.005%
14	0.00	-275486.30	0.00	1.28	275486.30	-1.54	0.001%
15	608.59	-275911.03	-70511.64	-608.60	275910.95	70508.95	0.001%
16	34798.10	-275486.30	-59432.69	-34798.71	275486.23	59429.79	0.001%
17	59031.06	-275061.58	-34171.72	-59029.56	275061.49	34169.24	0.001%
18	68713.46	-275486.30	-406.31	-68711.55	275486.25	408.04	0.001%
19	61079.10	-275911.03	35774.14	-61076.84	275910.95	-35772.88	0.001%
20	34745.93	-275486.30	61451.00	-34743.40	275486.24	-61450.23	0.001%
21	-109.51	-275061.58	70060.74	109.39	275061.46	-70057.42	0.001%
22	-34035.92	-275486.30	60096.09	34033.19	275486.24	-60095.23	0.001%
23	-59261.23	-275911.03	35427.33	59259.02	275910.95	-35426.11	0.001%
24	-68509.46	-275486.30	39.75	68507.31	275486.24	-37.81	0.001%
25	-60255.75	-275061.58	-34752.36	60254.20	275061.49	34750.03	0.001%
26	-35128.19	-275486.30	-60771.40	35128.74	275486.24	60768.77	0.001%
27	46.05	-70905.34	-34322.00	-46.05	70905.33	34320.91	0.001%
28	16120.01	-70803.40	-27930.28	-16119.93	70803.39	27929.24	0.001%
29	27432.81	-70701.46	-15917.71	-27431.73	70701.45	15916.99	0.002%
30	32753.51	-70803.40	-88.33	-32752.26	70803.39	88.86	0.002%
31	30785.82	-70905.34	17762.90	-30784.99	70905.33	-17762.42	0.001%
32	17468.34	-70803.40	30307.03	-17467.21	70803.39	-30306.22	0.002%
33	-59.82	-70701.46	32902.85	59.81	70701.45	-32901.58	0.002%
34	-16162.90	-70803.40	27905.62	16162.07	70803.39	-27905.05	0.001%
35	-28638.51	-70905.34	16576.32	28637.62	70905.33	-16575.81	0.001%
36	-32753.44	-70803.40	-11.14	32752.19	70803.39	11.68	0.002%
37	-29616.11	-70701.46	-17109.17	29615.09	70701.45	17108.50	0.002%
38	-17480.09	-70803.40	-30300.06	17479.97	70803.39	30298.63	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	8	0.00000001	0.00005723
2	Yes	49	0.00008888	0.00007345
3	Yes	48	0.00009712	0.00006956
4	Yes	32	0.00009220	0.00004028
5	Yes	48	0.00008624	0.00005992
6	Yes	47	0.00009783	0.00007842
7	Yes	47	0.00009072	0.00006337
8	Yes	24	0.00009122	0.00003461
9	Yes	48	0.00009535	0.00006803
10	Yes	49	0.00009321	0.00007638
11	Yes	48	0.00008570	0.00005969
12	Yes	28	0.00008984	0.00004473
13	Yes	47	0.00009166	0.00006443
14	Yes	14	0.00010000	0.00003181
15	Yes	59	0.00009890	0.00002099

16	Yes	53	0.00009920	0.00002360
17	Yes	31	0.00008915	0.00002485
18	Yes	53	0.00008870	0.00002060
19	Yes	59	0.00009557	0.00002025
20	Yes	53	0.00008957	0.00002130
21	Yes	30	0.00009704	0.00002925
22	Yes	53	0.00009532	0.00002275
23	Yes	60	0.00009197	0.00001962
24	Yes	52	0.00009944	0.00002308
25	Yes	31	0.00008693	0.00002445
26	Yes	53	0.00009121	0.00002153
27	Yes	22	0.00000001	0.00001571
28	Yes	22	0.00000001	0.00001446
29	Yes	20	0.00000001	0.00001811
30	Yes	21	0.00009691	0.00001850
31	Yes	22	0.00000001	0.00001382
32	Yes	21	0.00009602	0.00001878
33	Yes	20	0.00000001	0.00001765
34	Yes	22	0.00000001	0.00001394
35	Yes	22	0.00000001	0.00001480
36	Yes	21	0.00009719	0.00001847
37	Yes	20	0.00000001	0.00001700
38	Yes	21	0.00009931	0.00001944

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	495 - 454	13.651	33	0.5471	0.1873
T1	454 - 442	9.810	29	0.1596	0.1735
T2	442 - 422	9.415	29	0.1602	0.1861
T3	422 - 402	8.734	29	0.1621	0.1817
T4	402 - 382	8.072	33	0.1513	0.2089
T5	382 - 362	7.511	33	0.1198	0.2379
T6	362 - 342	7.079	37	0.1058	0.2500
T7	342 - 322	6.724	37	0.0943	0.2893
T8	322 - 302	6.440	37	0.0745	0.3067
T9	302 - 282	6.206	37	0.0804	0.3203
T10	282 - 262	5.906	37	0.0965	0.3521
T11	262 - 242	5.530	37	0.1054	0.3738
T12	242 - 222	5.072	37	0.1299	0.3889
T13	222 - 202	4.518	38	0.1385	0.4157
T14	202 - 182	3.982	32	0.1305	0.4127
T15	182 - 162	3.468	32	0.1238	0.4351
T16	162 - 142	2.995	32	0.0987	0.4102
T17	142 - 122	2.656	32	0.0829	0.4359
T18	122 - 102	2.344	31	0.0805	0.3831
T19	102 - 82	2.048	31	0.0731	0.3761
T20	82 - 62	1.782	31	0.0743	0.2932
T21	62 - 42	1.446	31	0.0890	0.2720
T22	42 - 22	1.045	31	0.1011	0.1642
T23	22 - 2	0.587	31	0.1184	0.1356

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
479.00	FMH-2AC-Radomes	29	11.822	0.3405	0.2005	8198
460.00	DB436-C	29	10.142	0.1798	0.1885	3747
454.00	Guy	29	9.810	0.1596	0.1735	3578
446.00	Work Platform w/ handrail	29	9.528	0.1571	0.1815	17941
438.00	GP6F-21A	29	9.292	0.1624	0.1853	17310
386.00	Guy	33	7.613	0.1256	0.2302	30148
353.00	P3F-52-N7A	37	6.914	0.1020	0.2568	112755
340.00	DB496-A	37	6.692	0.0923	0.2893	51877
326.00	Guy	37	6.490	0.0772	0.2964	55307
305.00	4' Standoff	37	6.243	0.0781	0.3136	67498
280.00	APX16DWV-16DWVS-C-A20 w/Mount Pipe	37	5.872	0.0974	0.3531	63934
266.00	Guy	37	5.610	0.1027	0.3661	76849
257.00	APXVTM14-C-120	37	5.425	0.1106	0.3712	52931
248.00	GP8F-21A	37	5.222	0.1225	0.3726	32414
242.00	GP6F-21A	37	5.072	0.1299	0.3889	27785
239.00	Large Beacon	37	4.991	0.1328	0.3889	31723
214.00	Guy	38	4.298	0.1358	0.4057	79815
162.00	Guy	32	2.995	0.0987	0.4102	24837
140.00	4' Standoff	32	2.624	0.0824	0.4329	131448
125.00	4' Standoff	31	2.387	0.0811	0.3848	113081
108.00	4' Standoff	31	2.134	0.0753	0.3784	64164
102.00	Guy	31	2.048	0.0731	0.3761	47628
50.00	Guy	31	1.211	0.0963	0.1999	93566

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	495 - 454	123.743	2	2.8682	0.6714
T1	454 - 442	102.195	2	1.3824	0.6567
T2	442 - 422	98.743	2	1.3892	0.5831
T3	422 - 402	92.855	2	1.4077	0.6390
T4	402 - 382	86.944	2	1.3686	0.6066
T5	382 - 362	81.448	2	1.2435	0.6863
T6	362 - 342	76.513	2	1.1918	0.6372
T7	342 - 322	71.763	2	1.1503	0.7247
T8	322 - 302	67.858	6	1.0751	0.6879
T9	302 - 282	64.176	6	1.1108	0.7426
T10	282 - 262	60.128	6	1.1920	0.8727
T11	262 - 242	55.654	6	1.2393	0.9180
T12	242 - 222	50.751	6	1.3404	1.0285
T13	222 - 202	45.285	6	1.3607	1.0933
T14	202 - 182	39.835	6	1.2944	1.1575
T15	182 - 162	34.543	6	1.2254	1.2051
T16	162 - 142	29.586	6	1.0825	1.1944
T17	142 - 122	25.385	6	0.9678	1.2631
T18	122 - 102	21.479	6	0.9063	1.1723
T19	102 - 82	17.800	6	0.8234	1.1058
T20	82 - 62	14.536	6	0.7844	0.9146
T21	62 - 42	11.228	6	0.8077	0.8037
T22	42 - 22	7.806	6	0.8309	0.5197
T23	22 - 2	4.229	6	0.8865	0.3774

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
479.00	FMH-2AC-Radomes	2	114.050	2.0898	0.7084	2183
460.00	DB436-C	2	104.450	1.4606	0.6888	997
454.00	Guy	2	102.195	1.3824	0.6567	951
446.00	Work Platform w/ handrail	2	99.825	1.3752	0.6004	4731
438.00	GP6F-21A	2	97.624	1.4000	0.5823	4588
386.00	Guy	2	82.499	1.2666	0.6777	7091
353.00	P3F-52-N7A	2	74.353	1.1787	0.6791	9662
340.00	DB496-A	2	71.303	1.1426	0.7217	7770
326.00	Guy	6	68.600	1.0847	0.6591	8155
305.00	4' Standoff	6	64.742	1.0992	0.7319	12390
280.00	APX16DWV-16DWVS-C-A20 w/Mount Pipe	6	59.699	1.1973	0.8789	11395
266.00	Guy	6	56.578	1.2264	0.8953	13687
257.00	APXVTM14-C-120	6	54.478	1.2621	0.9225	10650
248.00	GP8F-21A	6	52.286	1.3114	0.9780	7190
242.00	GP6F-21A	6	50.751	1.3404	1.0285	6399
239.00	Large Beacon	6	49.959	1.3512	1.0354	7268
214.00	Guy	6	43.085	1.3378	1.0863	14374
162.00	Guy	6	29.586	1.0825	1.1944	4697
140.00	4' Standoff	6	24.988	0.9605	1.2586	15950
125.00	4' Standoff	6	22.056	0.9162	1.1778	17534
108.00	4' Standoff	6	18.859	0.8477	1.1208	9058
102.00	Guy	6	17.800	0.8234	1.1058	8048
50.00	Guy	6	9.187	0.8197	0.6117	23712

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	454	Diagonal	A325N	0.6250	1	2481.99	6830.86	0.363 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	1	554.88	6830.86	0.081 ✔	1	Member Block Shear
		Top Guy Pull-Off@454	A325N	0.7500	2	0.29	15700.80	0.000 ✔	1	Member Block Shear
T2	442	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	2466.27	6830.86	0.361 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	1	819.39	6830.86	0.120 ✔	1	Member Block Shear
T3	422	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	4548.63	6830.86	0.666 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	1	864.45	6830.86	0.127 ✔	1	Member Block Shear
T4	402	Leg	A325N	0.6250	3	535.02	20708.70	0.026 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6134.51	9107.81	0.674 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	1	1410.50	6830.86	0.206 ✔	1	Member Block Shear
		Top Guy Pull-Off@386	A325N	0.7500	2	4853.34	15700.80	0.309 ✔	1	Member Block Shear
T5	382	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	2416.28	5811.33	0.416 ✔	1	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Horizontal	A325N	0.6250	1	1410.50	6830.86	0.206 ✔	1	Member Block Shear
T6	362	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	2028.98	9107.81	0.223 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	1	1374.77	6830.86	0.201 ✔	1	Member Block Shear
T7	342	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	5917.90	9107.81	0.650 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	1	1607.16	6830.86	0.235 ✔	1	Member Block Shear
		Top Guy Pull-Off@326	A325N	0.7500	2	4762.61	15700.80	0.303 ✔	1	Member Block Shear
T8	322	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	5476.20	10440.00	0.525 ✔	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	1656.07	6830.86	0.242 ✔	1	Member Block Shear
T9	302	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	3224.38	9107.81	0.354 ✔	1	Member Block Shear
		Horizontal	A325N	0.6250	1	1723.47	6830.86	0.252 ✔	1	Member Block Shear
T10	282	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	8018.36	12615.00	0.636 ✔	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	2230.42	6830.86	0.327 ✔	1	Member Block Shear
		Top Guy Pull-Off@266	A325N	0.7500	2	6511.68	15700.80	0.415 ✔	1	Member Block Shear
T11	262	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	7820.56	10440.00	0.749 ✔	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	3001.27	6830.86	0.439 ✔	1	Member Block Shear
T12	242	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	10339.30	12615.00	0.820 ✔	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	2484.92	6830.86	0.364 ✔	1	Member Block Shear
T13	222	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	11762.70	12615.00	0.932 ✔	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	2764.07	6830.86	0.405 ✔	1	Member Block Shear
		Top Guy Pull-Off@214	A325N	0.7500	2	6436.70	15700.80	0.410 ✔	1	Member Block Shear
T14	202	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	7411.65	15186.40	0.488 ✔	1	Bolt Shear
		Horizontal	A325N	0.6250	1	3087.51	6830.86	0.452 ✔	1	Member Block Shear
T15	182	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	8302.87	10440.00	0.795 ✔	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	3848.12	6830.86	0.563 ✔	1	Member Block Shear
T16	162	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	6436.61	10440.00	0.617 ✔	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	3869.39	6830.86	0.566 ✔	1	Member Block Shear
		Top Guy Pull-Off@162	A325X	0.6250	2	7732.27	13920.00	0.555 ✔	1	Gusset Bearing
T17	142	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	5262.53	15186.40	0.347 ✔	1	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Horizontal	A325N	0.6250	1	3869.39	6830.86	0.566 ✔	1	Member Block Shear
T18	122	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	6287.96	10440.00	0.602 ✔	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	3587.62	6830.86	0.525 ✔	1	Member Block Shear
T19	102	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	9528.35	10440.00	0.913 ✔	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	3541.65	6830.86	0.518 ✔	1	Member Block Shear
		Top Guy Pull-Off@102	A325X	0.6250	2	6367.41	13920.00	0.457 ✔	1	Gusset Bearing
T20	82	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	8634.39	15186.40	0.569 ✔	1	Bolt Shear
		Horizontal	A325N	0.6250	1	3541.65	6830.86	0.518 ✔	1	Member Block Shear
T21	62	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	8209.65	10440.00	0.786 ✔	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	3227.30	6830.86	0.472 ✔	1	Member Block Shear
		Top Guy Pull-Off@50	A325N	0.7500	2	4133.20	15700.80	0.263 ✔	1	Member Block Shear
T22	42	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	6602.77	10440.00	0.632 ✔	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	3318.00	6830.86	0.486 ✔	1	Member Block Shear
T23	22	Leg	A325N	0.6250	3	0.00	20708.70	0.000 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	7174.21	10440.00	0.687 ✔	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	3318.00	6830.86	0.486 ✔	1	Member Block Shear

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	454.00 (A) (751)	1 EHS	10450.00	104500.20	46275.70	62700.00	1.000	1.355 ✔
	454.00 (B) (750)	1 EHS	10450.00	104500.20	45276.70	62700.00	1.000	1.385 ✔
	454.00 (C) (749)	1 EHS	10450.00	104500.20	46403.70	62700.00	1.000	1.351 ✔
T4	386.00 (A) (754)	1 EHS	10450.00	104500.20	47216.70	62700.00	1.000	1.328 ✔
	386.00 (B) (753)	1 EHS	10450.00	104500.20	46746.20	62700.00	1.000	1.341 ✔
	386.00 (C) (752)	1 EHS	10450.00	104500.20	47236.20	62700.00	1.000	1.327 ✔
T7	326.00 (A) (757)	7/8 EHS	7970.00	79699.84	38901.00	47820.00	1.000	1.229 ✔
	326.00 (B) (756)	7/8 EHS	7970.00	79699.84	38931.10	47820.00	1.000	1.228 ✔
	326.00 (C) (755)	7/8 EHS	7970.00	79699.84	38304.00	47820.00	1.000	1.248 ✔
T10	266.00 (A) (760)	7/8 EHS	7970.00	79699.84	44034.20	47820.00	1.000	1.086 ✔
	266.00 (B) (759)	7/8 EHS	7970.00	79699.84	44071.20	47820.00	1.000	1.085 ✔

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.
	266.00 (C) (758)	7/8 EHS	7970.00	79699.84	41821.00	47820.00	1.000	1.143 ✔
T13	214.00 (A) (763)	7/8 EHS	7970.00	79699.84	42480.20	47820.00	1.000	1.126 ✔
	214.00 (B) (762)	7/8 EHS	7970.00	79699.84	42461.60	47820.00	1.000	1.126 ✔
	214.00 (C) (761)	7/8 EHS	7970.00	79699.84	39206.00	47820.00	1.000	1.220 ✔
T16	162.00 (A) (766)	7/8 EHS	6774.50	79699.84	42018.80	47820.00	1.000	1.138 ✔
	162.00 (B) (765)	7/8 EHS	6774.50	79699.84	41982.30	47820.00	1.000	1.139 ✔
	162.00 (C) (764)	7/8 EHS	6774.50	79699.84	37561.60	47820.00	1.000	1.273 ✔
T19	102.00 (A) (769)	11/16 EHS	4000.00	49999.96	26210.70	30000.00	1.000	1.145 ✔
	102.00 (B) (768)	11/16 EHS	4000.00	49999.96	26185.20	30000.00	1.000	1.146 ✔
	102.00 (C) (767)	11/16 EHS	4000.00	49999.96	22930.50	30000.00	1.000	1.308 ✔
T21	50.00 (A) (772)	1/2 EHS	2690.00	26900.04	13355.10	16140.00	1.000	1.209 ✔
	50.00 (B) (771)	1/2 EHS	2690.00	26900.04	13353.00	16140.00	1.000	1.209 ✔
	50.00 (C) (770)	1/2 EHS	2690.00	26900.04	11749.20	16140.00	1.000	1.374 ✔

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	495 - 454 (1)	P10x.5	41.00	0.00	0.0	16.1007	-3040.93	507171.00	0.006

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	495 - 454 (1)	P10x.5	84484.17	138004.17	0.612	0.00	138004.17	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	495 - 454 (1)	P10x.5	3711.53	253585.00	0.015	1276.48	207020.83	0.006

Pole Interaction Design Data

Section No.	Elevation	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	ft								
L1	495 - 454 (1)	0.006	0.612	0.000	0.015	0.006	0.619 ✔	1.000	4.8.2 ✔

Leg Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio P_u / ϕP_n
	ft		ft	ft		in^2	lb	lb	
T1	454 - 442	2	12.00	4.00	96.0 K=1.00	3.1416	-31888.90	72063.20	0.443 [1]
T2	442 - 422	2	20.00	4.00	96.0 K=1.00	3.1416	-32924.40	72063.20	0.457 [1]
T3	422 - 402	2 1/4	20.00	4.00	85.3 K=1.00	3.9761	-49909.20	105060.00	0.475 [1]
T4	402 - 382	2 1/4	20.00	4.00	85.3 K=1.00	3.9761	-81435.40	105060.00	0.775 [1]
T5	382 - 362	2 1/4	20.00	4.00	85.3 K=1.00	3.9761	-79372.30	105060.00	0.755 [1]
T6	362 - 342	2 1/4	20.00	4.00	85.3 K=1.00	3.9761	-79277.40	105060.00	0.755 [1]
T7	342 - 322	2 1/4	20.00	4.00	85.3 K=1.00	3.9761	-92789.50	105060.00	0.883 [1]
T8	322 - 302	2 1/2	20.00	4.00	76.8 K=1.00	4.9087	-95613.00	143512.00	0.666 [1]
T9	302 - 282	2 1/2	20.00	4.00	76.8 K=1.00	4.9087	-99504.40	143512.00	0.693 [1]
T10	282 - 262	2 3/4	20.00	4.00	69.8 K=1.00	5.9396	-128774.00	187145.00	0.688 [1]
T11	262 - 242	2 3/4	20.00	4.00	69.8 K=1.00	5.9396	-143467.00	187145.00	0.767 [1]
T12	242 - 222	2 3/4	20.00	4.00	69.8 K=1.00	5.9396	-136671.00	187145.00	0.730 [1]
T13	222 - 202	3	20.00	4.00	64.0 K=1.00	7.0686	-159584.00	235765.00	0.677 [1]
T14	202 - 182	3	20.00	4.00	64.0 K=1.00	7.0686	-178257.00	235765.00	0.756 [1]
T15	182 - 162	3	20.00	4.00	64.0 K=1.00	7.0686	-222171.00	235765.00	0.942 [1]
T16	162 - 142	3	20.00	4.00	64.0 K=1.00	7.0686	-223399.00	235765.00	0.948 [1]
T17	142 - 122	3	20.00	4.00	64.0 K=1.00	7.0686	-194788.00	235765.00	0.826 [1]
T18	122 - 102	3	20.00	4.00	64.0 K=1.00	7.0686	-207131.00	235765.00	0.879 [1]
T19	102 - 82	3	20.00	4.00	64.0 K=1.00	7.0686	-204477.00	235765.00	0.867 [1]
T20	82 - 62	3	20.00	4.00	64.0 K=1.00	7.0686	-179405.00	235765.00	0.761 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T21	62 - 42	3	20.00	4.00	64.0 K=1.00	7.0686	-186328.00	235765.00	0.790 [1]
T22	42 - 22	3	20.00	4.00	64.0 K=1.00	7.0686	-191565.00	235765.00	0.813 [1]
T23	22 - 2	3	20.00	4.00	64.0 K=1.00	7.0686	-191477.00	235765.00	0.812 [1]

[1] P_u / ϕP_n controls

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	454 - 442	2	0.00	5000.00	0.000	0.00	5000.00	0.000
T2	442 - 422	2	0.00	5000.00	0.000	0.00	5000.00	0.000
T3	422 - 402	2 1/4	0.00	7119.14	0.000	0.00	7119.14	0.000
T4	402 - 382	2 1/4	0.00	7119.14	0.000	0.00	7119.14	0.000
T5	382 - 362	2 1/4	0.00	7119.14	0.000	0.00	7119.14	0.000
T6	362 - 342	2 1/4	0.00	7119.14	0.000	0.00	7119.14	0.000
T7	342 - 322	2 1/4	0.00	7119.14	0.000	0.00	7119.14	0.000
T8	322 - 302	2 1/2	0.00	9765.67	0.000	0.00	9765.67	0.000
T9	302 - 282	2 1/2	0.00	9765.67	0.000	0.00	9765.67	0.000
T10	282 - 262	2 3/4	0.00	12998.08	0.000	0.00	12998.08	0.000
T11	262 - 242	2 3/4	0.00	12998.08	0.000	0.00	12998.08	0.000
T12	242 - 222	2 3/4	0.00	12998.08	0.000	0.00	12998.08	0.000
T13	222 - 202	3	0.00	16875.00	0.000	0.00	16875.00	0.000
T14	202 - 182	3	0.00	16875.00	0.000	0.00	16875.00	0.000
T15	182 - 162	3	0.00	16875.00	0.000	0.00	16875.00	0.000
T16	162 - 142	3	0.00	16875.00	0.000	0.00	16875.00	0.000
T17	142 - 122	3	0.00	16875.00	0.000	0.00	16875.00	0.000
T18	122 - 102	3	0.00	16875.00	0.000	0.00	16875.00	0.000
T19	102 - 82	3	0.00	16875.00	0.000	0.00	16875.00	0.000
T20	82 - 62	3	0.00	16875.00	0.000	0.00	16875.00	0.000
T21	62 - 42	3	0.00	16875.00	0.000	0.00	16875.00	0.000
T22	42 - 22	3	0.00	16875.00	0.000	0.00	16875.00	0.000
T23	22 - 2	3	0.00	16875.00	0.000	0.00	16875.00	0.000

Leg Interaction Design Data (Compression)

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	454 - 442	2	0.443	0.000	0.000	0.443 [1] ✔	1.000	4.8.1 ✔
T2	442 - 422	2	0.457	0.000	0.000	0.457 [1] ✔	1.000	4.8.1 ✔
T3	422 - 402	2 1/4	0.475	0.000	0.000	0.475 [1] ✔	1.000	4.8.1 ✔
T4	402 - 382	2 1/4	0.775	0.000	0.000	0.775 [1] ✔	1.000	4.8.1 ✔
T5	382 - 362	2 1/4	0.755	0.000	0.000	0.755 [1] ✔	1.000	4.8.1 ✔
T6	362 - 342	2 1/4	0.755	0.000	0.000	0.755 [1] ✔	1.000	4.8.1 ✔

Section No.	Elevation ft	Size	Ratio $P_u / \phi P_n$	Ratio $M_{ux} / \phi M_{nx}$	Ratio $M_{uy} / \phi M_{ny}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T7	342 - 322	2 1/4	0.883	0.000	0.000	0.883 [1] ✔	1.000	4.8.1 ✔
T8	322 - 302	2 1/2	0.666	0.000	0.000	0.666 [1] ✔	1.000	4.8.1 ✔
T9	302 - 282	2 1/2	0.693	0.000	0.000	0.693 [1] ✔	1.000	4.8.1 ✔
T10	282 - 262	2 3/4	0.688	0.000	0.000	0.688 [1] ✔	1.000	4.8.1 ✔
T11	262 - 242	2 3/4	0.767	0.000	0.000	0.767 [1] ✔	1.000	4.8.1 ✔
T12	242 - 222	2 3/4	0.730	0.000	0.000	0.730 [1] ✔	1.000	4.8.1 ✔
T13	222 - 202	3	0.677	0.000	0.000	0.677 [1] ✔	1.000	4.8.1 ✔
T14	202 - 182	3	0.756	0.000	0.000	0.756 [1] ✔	1.000	4.8.1 ✔
T15	182 - 162	3	0.942	0.000	0.000	0.942 [1] ✔	1.000	4.8.1 ✔
T16	162 - 142	3	0.948	0.000	0.000	0.948 [1] ✔	1.000	4.8.1 ✔
T17	142 - 122	3	0.826	0.000	0.000	0.826 [1] ✔	1.000	4.8.1 ✔
T18	122 - 102	3	0.879	0.000	0.000	0.879 [1] ✔	1.000	4.8.1 ✔
T19	102 - 82	3	0.867	0.000	0.000	0.867 [1] ✔	1.000	4.8.1 ✔
T20	82 - 62	3	0.761	0.000	0.000	0.761 [1] ✔	1.000	4.8.1 ✔
T21	62 - 42	3	0.790	0.000	0.000	0.790 [1] ✔	1.000	4.8.1 ✔
T22	42 - 22	3	0.813	0.000	0.000	0.813 [1] ✔	1.000	4.8.1 ✔
T23	22 - 2	3	0.812	0.000	0.000	0.812 [1] ✔	1.000	4.8.1 ✔

[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 $P_u / \phi P_n$
T1	454 - 442	L2x2x3/16	5.66	5.18	157.8 K=1.00	0.7150	-2991.66	6485.65	0.461 [1] ✔
T2	442 - 422	L2x2x3/16	5.66	5.18	157.8 K=1.00	0.7150	-2707.17	6485.65	0.417 [1] ✔
T3	422 - 402	L2x2x3/16	5.66	5.15	156.9 K=1.00	0.7150	-5005.27	6560.04	0.763 [1] ✔
T4	402 - 382	L2x2x1/4	5.66	5.15	158.1 K=1.00	0.9380	-6660.46	8475.48	0.786 [1] ✔
T5	382 - 362	L1 3/4x1 3/4x3/16	5.66	5.15	180.0 K=1.00	0.6211	-3032.70	4330.01	0.700 [1] ✔
T6	362 - 342	L2x2x1/4	5.66	5.15	158.1 K=1.00	0.9380	-2642.05	8475.48	0.312 [1] ✔
T7	342 - 322	L2x2x1/4	5.66	5.15	158.1 K=1.00	0.9380	-6661.99	8475.48	0.786 [1] ✔
T8	322 - 302	L2 1/2x2 1/2x3/8	5.66	5.12	126.2 K=1.00	1.7300	-6505.76	24529.80	0.265 [1] ✔
T9	302 - 282	L2x2x1/4	5.66	5.12	157.2 K=1.00	0.9380	-4327.95	8573.25	0.505 [1] ✔
T10	282 - 262	L2 1/2x2 1/2x3/8	5.66	5.06	124.7 K=1.00	1.7300	-9570.97	24711.50	0.387 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T11	262 - 242	L2 1/2x2 1/2x3/8	5.66	5.09	125.5 K=1.00	1.7300	-9558.40	24814.40	0.385 [1]
T12	242 - 222	L2 1/2x2 1/2x3/8	5.66	5.06	124.7 K=1.00	1.7300	-12062.00	24711.50	0.488 [1]
T13	222 - 202	L2 1/2x2 1/2x3/8	5.66	5.03	124.0 K=1.00	1.7300	-13847.40	24947.60	0.555 [1]
T14	202 - 182	L2 1/2x2 1/2x3/8	5.66	5.06	124.8 K=1.00	1.7300	-7411.65	25104.00	0.295 [1]
T15	182 - 162	L2 1/2x2 1/2x3/8	5.66	5.06	124.8 K=1.00	1.7300	-11238.40	25104.00	0.448 [1]
T16	162 - 142	L2 1/2x2 1/2x3/8	5.66	5.06	124.8 K=1.00	1.7300	-9071.42	25104.00	0.361 [1]
T17	142 - 122	L2 1/2x2 1/2x3/8	5.66	5.06	124.8 K=1.00	1.7300	-5262.53	25104.00	0.210 [1]
T18	122 - 102	L2 1/2x2 1/2x3/8	5.66	5.06	124.8 K=1.00	1.7300	-8777.23	25104.00	0.350 [1]
T19	102 - 82	L2 1/2x2 1/2x3/8	5.66	5.06	124.8 K=1.00	1.7300	-12828.00	25104.00	0.511 [1]
T20	82 - 62	L2 1/2x2 1/2x3/8	5.66	5.06	124.8 K=1.00	1.7300	-8634.39	25104.00	0.344 [1]
T21	62 - 42	L2 1/2x2 1/2x3/8	5.66	5.06	124.8 K=1.00	1.7300	-11136.30	25104.00	0.444 [1]
T22	42 - 22	L2 1/2x2 1/2x3/8	5.66	5.06	124.8 K=1.00	1.7300	-9585.30	25104.00	0.382 [1]
T23	22 - 2	L2 1/2x2 1/2x3/8	5.66	5.06	124.8 K=1.00	1.7300	-10358.80	25104.00	0.413 [1]

[1] P_u / ϕP_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 $\frac{P_u}{\phi P_n}$
T1	454 - 442	L2x2x3/16	4.00	3.59	114.7 K=1.05	0.7150	-554.88	11585.60	0.048 [1]
T2	442 - 422	L2x2x3/16	4.00	3.59	114.7 K=1.05	0.7150	-648.23	11585.60	0.056 [1]
T3	422 - 402	L2x2x3/16	4.00	3.59	114.7 K=1.05	0.7150	-864.45	11585.60	0.075 [1]
T4	402 - 382	L2x2x3/16	4.00	3.57	114.4 K=1.05	0.7150	-1410.50	11630.00	0.121 [1]
T5	382 - 362	L2x2x3/16	4.00	3.57	114.4 K=1.05	0.7150	-1410.50	11630.00	0.121 [1]
T6	362 - 342	L2x2x3/16	4.00	3.57	114.4 K=1.05	0.7150	-1374.77	11630.00	0.118 [1]
T7	342 - 322	L2x2x3/16	4.00	3.57	114.4 K=1.05	0.7150	-1607.16	11630.00	0.138 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T8	322 - 302	L2x2x3/16	4.00	3.57	114.4 K=1.05	0.7150	-1656.07	11630.00	0.142 [1] ✓
T9	302 - 282	L2x2x3/16	4.00	3.55	114.1 K=1.05	0.7150	-1723.47	11674.50	0.148 [1] ✓
T10	282 - 262	L2x2x3/16	4.00	3.55	114.1 K=1.05	0.7150	-2230.42	11674.50	0.191 [1] ✓
T11	262 - 242	L2x2x3/16	4.00	3.53	113.8 K=1.06	0.7150	-2484.92	11719.00	0.212 [1] ✓
T12	242 - 222	L2x2x3/16	4.00	3.53	113.8 K=1.06	0.7150	-2484.92	11719.00	0.212 [1] ✓
T13	222 - 202	L2x2x3/16	4.00	3.53	113.8 K=1.06	0.7150	-2764.07	11719.00	0.236 [1] ✓
T14	202 - 182	L2x2x3/16	4.00	3.51	113.5 K=1.06	0.7150	-3087.51	11763.60	0.262 [1] ✓
T15	182 - 162	L2x2x3/16	4.00	3.51	113.5 K=1.06	0.7150	-3848.12	11763.60	0.327 [1] ✓
T16	162 - 142	L2x2x3/16	4.00	3.51	113.5 K=1.06	0.7150	-3869.39	11763.60	0.329 [1] ✓
T17	142 - 122	L2x2x3/16	4.00	3.51	113.5 K=1.06	0.7150	-3869.39	11763.60	0.329 [1] ✓
T18	122 - 102	L2x2x3/16	4.00	3.51	113.5 K=1.06	0.7150	-3587.62	11763.60	0.305 [1] ✓
T19	102 - 82	L2x2x3/16	4.00	3.51	113.5 K=1.06	0.7150	-3541.65	11763.60	0.301 [1] ✓
T20	82 - 62	L2x2x3/16	4.00	3.51	113.5 K=1.06	0.7150	-3541.65	11763.60	0.301 [1] ✓
T21	62 - 42	L2x2x3/16	4.00	3.51	113.5 K=1.06	0.7150	-3227.30	11763.60	0.274 [1] ✓
T22	42 - 22	L2x2x3/16	4.00	3.51	113.5 K=1.06	0.7150	-3318.00	11763.60	0.282 [1] ✓
T23	22 - 2	L2x2x3/16	4.00	3.51	113.5 K=1.06	0.7150	-3318.00	11763.60	0.282 [1] ✓

[1] P_u / ϕP_n controls

Top Guy Pull-Off 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	454 - 442	L2 1/2x2 1/2x3/8	4.00	3.83	94.5 K=1.00	1.7300	-0.59	35043.50	0.000 [1] ✓

[1] P_u / ϕP_n controls

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 $\frac{P_u}{\phi P_n}$
T4	402 - 382	2 1/4	20.00	4.00	85.3	3.9761	19187.80	178924.00	0.107 [1]

[1] P_u / ϕP_n controls

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T4	402 - 382	2 1/4	0.00	7119.14	0.000	0.00	7119.14	0.000

Leg Interaction Design Data (Tension)

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
T4	402 - 382	2 1/4	0.107	0.000	0.000	0.107 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_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	454 - 442	L2x2x3/16	5.66	5.18	105.4	0.4308	2481.99	18739.00	0.132 [1] ✔
T2	442 - 422	L2x2x3/16	5.66	5.18	105.4	0.4308	2466.27	18739.00	0.132 [1] ✔
T3	422 - 402	L2x2x3/16	5.66	5.15	104.9	0.4308	4548.63	18739.00	0.243 [1] ✔
T4	402 - 382	L2x2x1/4	5.66	5.15	106.2	0.5629	6134.51	24485.10	0.251 [1] ✔
T5	382 - 362	L1 3/4x1 3/4x3/16	5.66	5.15	120.5	0.3604	2416.28	15675.30	0.154 [1] ✔
T6	362 - 342	L2x2x1/4	5.66	5.15	106.2	0.5629	2028.98	24485.10	0.083 [1] ✔
T7	342 - 322	L2x2x1/4	5.66	5.15	106.2	0.5629	5917.90	24485.10	0.242 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T8	322 - 302	L2 1/2x2 1/2x3/8	5.66	5.12	85.5	1.0866	5476.20	52969.90	0.103 [1]
T9	302 - 282	L2x2x1/4	5.66	5.12	105.7	0.5629	3224.38	24485.10	0.132 [1]
T10	282 - 262	L2 1/2x2 1/2x3/8	5.66	5.06	85.0	1.0514	8018.36	45736.20	0.175 [1]
T11	262 - 242	L2 1/2x2 1/2x3/8	5.66	5.09	85.0	1.0866	7820.56	52969.90	0.148 [1]
T12	242 - 222	L2 1/2x2 1/2x3/8	5.66	5.06	85.0	1.0514	10339.30	45736.20	0.226 [1]
T13	222 - 202	L2 1/2x2 1/2x3/8	5.66	5.03	84.5	1.0514	11762.70	45736.20	0.257 [1]
T14	202 - 182	L2 1/2x2 1/2x3/8	5.66	5.06	84.5	1.0866	4982.73	52969.90	0.094 [1]
T15	182 - 162	L2 1/2x2 1/2x3/8	5.66	5.06	84.5	1.0866	8302.87	52969.90	0.157 [1]
T16	162 - 142	L2 1/2x2 1/2x3/8	5.66	5.06	84.5	1.0866	6436.61	52969.90	0.122 [1]
T17	142 - 122	L2 1/2x2 1/2x3/8	5.66	5.06	84.5	1.0866	2293.89	52969.90	0.043 [1]
T18	122 - 102	L2 1/2x2 1/2x3/8	5.66	5.06	84.5	1.0866	6287.96	52969.90	0.119 [1]
T19	102 - 82	L2 1/2x2 1/2x3/8	5.66	5.06	84.5	1.0866	9528.35	52969.90	0.180 [1]
T20	82 - 62	L2 1/2x2 1/2x3/8	5.66	5.06	84.5	1.0866	5717.27	52969.90	0.108 [1]
T21	62 - 42	L2 1/2x2 1/2x3/8	5.66	5.06	84.5	1.0866	8209.65	52969.90	0.155 [1]
T22	42 - 22	L2 1/2x2 1/2x3/8	5.66	5.06	84.5	1.0866	6602.77	52969.90	0.125 [1]
T23	22 - 2	L2 1/2x2 1/2x3/8	5.66	5.06	84.5	1.0866	7174.21	52969.90	0.135 [1]

[1] P_u / ϕP_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 $\frac{P_u}{\phi P_n}$
T1	454 - 442	L2x2x3/16	4.00	3.59	74.6	0.7150	554.88	23166.00	0.024 [1]
T2	442 - 422	L2x2x3/16	4.00	3.59	74.6	0.7150	819.39	23166.00	0.035 [1]
T3	422 - 402	L2x2x3/16	4.00	3.59	74.6	0.7150	864.45	23166.00	0.037 [1]
T4	402 - 382	L2x2x3/16	4.00	3.57	74.1	0.7150	1410.50	23166.00	0.061 [1]
T5	382 - 362	L2x2x3/16	4.00	3.57	74.1	0.7150	1410.50	23166.00	0.061 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	362 - 342	L2x2x3/16	4.00	3.57	74.1	0.7150	1374.77	23166.00	0.059 [1]
T7	342 - 322	L2x2x3/16	4.00	3.57	74.1	0.7150	1607.16	23166.00	0.069 [1]
T8	322 - 302	L2x2x3/16	4.00	3.57	74.1	0.7150	1656.07	23166.00	0.071 [1]
T9	302 - 282	L2x2x3/16	4.00	3.55	73.7	0.7150	1723.47	23166.00	0.074 [1]
T10	282 - 262	L2x2x3/16	4.00	3.55	73.7	0.7150	2230.42	23166.00	0.096 [1]
T11	262 - 242	L2x2x3/16	4.00	3.53	73.3	0.7150	3001.27	23166.00	0.130 [1]
T12	242 - 222	L2x2x3/16	4.00	3.53	73.3	0.7150	2484.92	23166.00	0.107 [1]
T13	222 - 202	L2x2x3/16	4.00	3.53	73.3	0.7150	2764.07	23166.00	0.119 [1]
T14	202 - 182	L2x2x3/16	4.00	3.51	72.9	0.7150	3087.51	23166.00	0.133 [1]
T15	182 - 162	L2x2x3/16	4.00	3.51	72.9	0.7150	3848.12	23166.00	0.166 [1]
T16	162 - 142	L2x2x3/16	4.00	3.51	72.9	0.7150	3869.39	23166.00	0.167 [1]
T17	142 - 122	L2x2x3/16	4.00	3.51	72.9	0.7150	3869.39	23166.00	0.167 [1]
T18	122 - 102	L2x2x3/16	4.00	3.51	72.9	0.7150	3587.62	23166.00	0.155 [1]
T19	102 - 82	L2x2x3/16	4.00	3.51	72.9	0.7150	3541.65	23166.00	0.153 [1]
T20	82 - 62	L2x2x3/16	4.00	3.51	72.9	0.7150	3541.65	23166.00	0.153 [1]
T21	62 - 42	L2x2x3/16	4.00	3.51	72.9	0.7150	3227.30	23166.00	0.139 [1]
T22	42 - 22	L2x2x3/16	4.00	3.51	72.9	0.7150	3318.00	23166.00	0.143 [1]
T23	22 - 2	L2x2x3/16	4.00	3.51	72.9	0.7150	3318.00	23166.00	0.143 [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	454 - 442	L2 1/2x2 1/2x3/8	4.00	3.83	61.1	1.0514	0.59	45736.20	0.000 [1]
T4	402 - 382	L2 1/2x2 1/2x3/8	4.00	3.81	60.8	1.0514	9706.68	45736.20	0.212 [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	342 - 322	L2 1/2x2 1/2x3/8	4.00	3.81	60.8	1.0514	9525.23	45736.20	0.208 [1] ✓
T10	282 - 262	L2 1/2x2 1/2x3/8	4.00	3.77	60.1	1.0514	13023.40	45736.20	0.285 [1] ✓
T13	222 - 202	L2 1/2x2 1/2x3/8	4.00	3.75	59.8	1.0514	12873.40	45736.20	0.281 [1] ✓
T16	162 - 142	L2 1/2x2 1/2x3/8	4.00	3.75	59.8	1.0866	15464.50	47265.50	0.327 [1] ✓
T19	102 - 82	L2 1/2x2 1/2x3/8	4.00	3.75	59.8	1.0866	12734.80	47265.50	0.269 [1] ✓
T21	62 - 42	L2 1/2x2 1/2x3/8	4.00	3.75	59.8	1.0514	8266.40	45736.20	0.181 [1] ✓

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	495 - 454	Pole	P10x.5	1	-3040.93	507171.00	61.9	Pass
T1	454 - 442	Leg	2	2	-31888.90	72063.20	44.3	Pass
T2	442 - 422	Leg	2	25	-32924.40	72063.20	45.7	Pass
T3	422 - 402	Leg	2 1/4	58	-49909.20	105060.00	47.5	Pass
T4	402 - 382	Leg	2 1/4	91	-81435.40	105060.00	77.5	Pass
T5	382 - 362	Leg	2 1/4	124	-79372.30	105060.00	75.5	Pass
T6	362 - 342	Leg	2 1/4	157	-79277.40	105060.00	75.5	Pass
T7	342 - 322	Leg	2 1/4	189	-92789.50	105060.00	88.3	Pass
T8	322 - 302	Leg	2 1/2	221	-95613.00	143512.00	66.6	Pass
T9	302 - 282	Leg	2 1/2	255	-99504.40	143512.00	69.3	Pass
T10	282 - 262	Leg	2 3/4	287	-128774.00	187145.00	68.8	Pass
T11	262 - 242	Leg	2 3/4	322	-143467.00	187145.00	76.7	Pass
T12	242 - 222	Leg	2 3/4	355	-136671.00	187145.00	73.0	Pass
T13	222 - 202	Leg	3	386	-159584.00	235765.00	67.7	Pass
T14	202 - 182	Leg	3	419	-178257.00	235765.00	75.6	Pass
T15	182 - 162	Leg	3	452	-222171.00	235765.00	94.2	Pass
T16	162 - 142	Leg	3	487	-223399.00	235765.00	94.8	Pass
T17	142 - 122	Leg	3	518	-194788.00	235765.00	82.6	Pass
T18	122 - 102	Leg	3	553	-207131.00	235765.00	87.9	Pass
T19	102 - 82	Leg	3	585	-204477.00	235765.00	86.7	Pass
T20	82 - 62	Leg	3	619	-179405.00	235765.00	76.1	Pass
T21	62 - 42	Leg	3	652	-186328.00	235765.00	79.0	Pass
T22	42 - 22	Leg	3	685	-191565.00	235765.00	81.3	Pass
T23	22 - 2	Leg	3	716	-191477.00	235765.00	81.2	Pass
T1	454 - 442	Diagonal	L2x2x3/16	22	-2991.66	6485.65	46.1	Pass
T2	442 - 422	Diagonal	L2x2x3/16	30	-2707.17	6485.65	41.7	Pass
T3	422 - 402	Diagonal	L2x2x3/16	63	-5005.27	6560.04	76.3	Pass
T4	402 - 382	Diagonal	L2x2x1/4	102	-6660.46	8475.48	78.6	Pass
T5	382 - 362	Diagonal	L1 3/4x1 3/4x3/16	152	-3032.70	4330.01	70.0	Pass
T6	362 - 342	Diagonal	L2x2x1/4	162	-2642.05	8475.48	31.2	Pass
T7	342 - 322	Diagonal	L2x2x1/4	196	-6661.99	8475.48	78.6	Pass
T8	322 - 302	Diagonal	L2 1/2x2 1/2x3/8	253	-6505.76	24529.80	26.5	Pass
T9	302 - 282	Diagonal	L2x2x1/4	286	-4327.95	8573.25	50.5	Pass
T10	282 - 262	Diagonal	L2 1/2x2 1/2x3/8	295	-9570.97	24711.50	38.7	Pass
T11	262 - 242	Diagonal	L2 1/2x2 1/2x3/8	352	-9558.40	24814.40	38.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T12	242 - 222	Diagonal	L2 1/2x2 1/2x3/8	360	-12062.00	24711.50	48.8	Pass
T13	222 - 202	Diagonal	L2 1/2x2 1/2x3/8	411	-13847.40	24947.60	55.5	Pass
T14	202 - 182	Diagonal	L2 1/2x2 1/2x3/8	426	-7411.65	25104.00	29.5	Pass
T15	182 - 162	Diagonal	L2 1/2x2 1/2x3/8	459	-11238.40	25104.00	44.8	Pass
T16	162 - 142	Diagonal	L2 1/2x2 1/2x3/8	515	-9071.42	25104.00	36.1	Pass
T17	142 - 122	Diagonal	L2 1/2x2 1/2x3/8	548	-5262.53	25104.00	21.0	Pass
T18	122 - 102	Diagonal	L2 1/2x2 1/2x3/8	557	-8777.23	25104.00	35.0	Pass
T19	102 - 82	Diagonal	L2 1/2x2 1/2x3/8	615	-12828.00	25104.00	51.1	Pass
T20	82 - 62	Diagonal	L2 1/2x2 1/2x3/8	648	-8634.39	25104.00	34.4	Pass
T21	62 - 42	Diagonal	L2 1/2x2 1/2x3/8	663	-11136.30	25104.00	44.4	Pass
T22	42 - 22	Diagonal	L2 1/2x2 1/2x3/8	714	-9585.30	25104.00	38.2	Pass
T23	22 - 2	Diagonal	L2 1/2x2 1/2x3/8	722	-10358.80	25104.00	41.3	Pass
T1	454 - 442	Horizontal	L2x2x3/16	11	-554.88	11585.60	4.8	Pass
T2	442 - 422	Horizontal	L2x2x3/16	52	-648.23	11585.60	5.6	Pass
T3	422 - 402	Horizontal	L2x2x3/16	66	-864.45	11585.60	7.5	Pass
T4	402 - 382	Horizontal	L2x2x3/16	94	-1410.50	11630.00	12.1	Pass
T5	382 - 362	Horizontal	L2x2x3/16	127	-1410.50	11630.00	12.1	Pass
T6	362 - 342	Horizontal	L2x2x3/16	159	-1374.77	11630.00	11.8	Pass
T7	342 - 322	Horizontal	L2x2x3/16	191	-1607.16	11630.00	13.8	Pass
T8	322 - 302	Horizontal	L2x2x3/16	224	-1656.07	11630.00	14.2	Pass
T9	302 - 282	Horizontal	L2x2x3/16	257	-1723.47	11674.50	14.8	Pass
T10	282 - 262	Horizontal	L2x2x3/16	292	-2230.42	11674.50	19.1	Pass
T11	262 - 242	Horizontal	L2x2x3/16	325	-2484.92	11719.00	21.2	Pass
T12	242 - 222	Horizontal	L2x2x3/16	357	-2484.92	11719.00	21.2	Pass
T13	222 - 202	Horizontal	L2x2x3/16	391	-2764.07	11719.00	23.6	Pass
T14	202 - 182	Horizontal	L2x2x3/16	422	-3087.51	11763.60	26.2	Pass
T15	182 - 162	Horizontal	L2x2x3/16	455	-3848.12	11763.60	32.7	Pass
T16	162 - 142	Horizontal	L2x2x3/16	496	-3869.39	11763.60	32.9	Pass
T17	142 - 122	Horizontal	L2x2x3/16	523	-3869.39	11763.60	32.9	Pass
T18	122 - 102	Horizontal	L2x2x3/16	556	-3587.62	11763.60	30.5	Pass
T19	102 - 82	Horizontal	L2x2x3/16	599	-3541.65	11763.60	30.1	Pass
T20	82 - 62	Horizontal	L2x2x3/16	620	-3541.65	11763.60	30.1	Pass
T21	62 - 42	Horizontal	L2x2x3/16	655	-3227.30	11763.60	27.4	Pass
T22	42 - 22	Horizontal	L2x2x3/16	687	-3318.00	11763.60	28.2	Pass
T23	22 - 2	Horizontal	L2x2x3/16	720	-3318.00	11763.60	28.2	Pass
T1	454 - 442	Guy A@454	1	751	46275.70	62700.00	73.8	Pass
T4	402 - 382	Guy A@386	1	754	47216.70	62700.00	75.3	Pass
T7	342 - 322	Guy A@326	7/8	757	38901.00	47820.00	81.3	Pass
T10	282 - 262	Guy A@266	7/8	760	44034.20	47820.00	92.1	Pass
T13	222 - 202	Guy A@214	7/8	763	42480.20	47820.00	88.8	Pass
T16	162 - 142	Guy A@162	7/8	766	42018.80	47820.00	87.9	Pass
T19	102 - 82	Guy A@102	11/16	769	26210.70	30000.00	87.4	Pass
T21	62 - 42	Guy A@50	1/2	772	13355.10	16140.00	82.7	Pass
T1	454 - 442	Guy B@454	1	750	45276.70	62700.00	72.2	Pass
T4	402 - 382	Guy B@386	1	753	46746.20	62700.00	74.6	Pass
T7	342 - 322	Guy B@326	7/8	756	38931.10	47820.00	81.4	Pass
T10	282 - 262	Guy B@266	7/8	759	44071.20	47820.00	92.2	Pass
T13	222 - 202	Guy B@214	7/8	762	42461.60	47820.00	88.8	Pass
T16	162 - 142	Guy B@162	7/8	765	41982.30	47820.00	87.8	Pass
T19	102 - 82	Guy B@102	11/16	768	26185.20	30000.00	87.3	Pass
T21	62 - 42	Guy B@50	1/2	771	13353.00	16140.00	82.7	Pass
T1	454 - 442	Guy C@454	1	749	46403.70	62700.00	74.0	Pass
T4	402 - 382	Guy C@386	1	752	47236.20	62700.00	75.3	Pass
T7	342 - 322	Guy C@326	7/8	755	38304.00	47820.00	80.1	Pass
T10	282 - 262	Guy C@266	7/8	758	41821.00	47820.00	87.5	Pass
T13	222 - 202	Guy C@214	7/8	761	39206.00	47820.00	82.0	Pass
T16	162 - 142	Guy C@162	7/8	764	37561.60	47820.00	78.5	Pass
T19	102 - 82	Guy C@102	11/16	767	22930.50	30000.00	76.4	Pass
T21	62 - 42	Guy C@50	1/2	770	11749.20	16140.00	72.8	Pass
T1	454 - 442	Top Guy Pull-Off@454	L2 1/2x2 1/2x3/8	7	-0.59	35043.50	0.2	Pass
T4	402 - 382	Top Guy Pull-Off@386	L2 1/2x2 1/2x3/8	99	9706.68	45736.20	21.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T7	342 - 322	Top Guy Pull-Off@326	L2 1/2x2 1/2x3/8	199	9525.23	45736.20	20.8	Pass
T10	282 - 262	Top Guy Pull-Off@266	L2 1/2x2 1/2x3/8	296	13023.40	45736.20	28.5	Pass
T13	222 - 202	Top Guy Pull-Off@214	L2 1/2x2 1/2x3/8	409	12873.40	45736.20	28.1	Pass
T16	162 - 142	Top Guy Pull-Off@162	L2 1/2x2 1/2x3/8	488	15464.50	47265.50	32.7	Pass
T19	102 - 82	Top Guy Pull-Off@102	L2 1/2x2 1/2x3/8	589	12734.80	47265.50	26.9	Pass
T21	62 - 42	Top Guy Pull-Off@50	L2 1/2x2 1/2x3/8	665	8266.40	45736.20	18.1	Pass
							Summary	
						Pole (L1)	61.9	Pass
						Leg (T16)	94.8	Pass
						Diagonal (T7)	78.6	Pass
						Horizontal (T16)	32.9	Pass
						Guy A (T10)	92.1	Pass
						Guy B (T10)	92.2	Pass
						Guy C (T10)	87.5	Pass
						Top Guy Pull-Off (T16)	32.7	Pass
						Bolt Checks	93.2	Pass
						RATING =	**94.8**	**Pass**

Pier and Pad Foundation

Project #:	28758
Site Name:	CT72XC033

TIA-222 Revision:	G
Tower Type:	Guyed

Block Foundation?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	537.145	kips
Base Shear, Vu_comp:	2.962	kips
Moment, M_u:		ft-kips
Tower Height, **H**:	454	ft
BP Dist. Above Fdn, bp_{dist}:	3	in
Bolt Circle / Bearing Plate Width, **BC**:	10	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, **dpier**:	6	ft
Ext. Above Grade, **E**:	0.67	ft
Pier Rebar Size, **Sc**:	7	
Pier Rebar Quantity, **mc**:	34	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	13	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	7.33	ft
Pad Width, **W**:	13.5	ft
Pad Thickness, **T**:	2	ft
Pad Rebar Size, **Sp**:	7	
Pad Rebar Quantity, **mp**:	12	
Pad Clear Cover, cc_{pad}:	3	in

All rebar is assumed

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	3000	psi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	113	pcf
Ultimate Gross Bearing, Qult:	22.125	ksf
Cohesion, **Cu**:	3.475	ksf
Friction Angle, φ:		degrees
SPT Blow Count, N_{blows}:	21	
Base Friction, μ:	0.3	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	N/A	ft

<--Toggle between Gross and Net

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Lateral (Sliding) (kips)	348.29	2.96	**0.9%**	**Pass**
Bearing Pressure (ksf)	13.28	4.13	**31.1%**	**Pass**
*Overturning (kip*ft)*	3027.78	24.44	**0.8%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	3757.65	17.77	**0.5%**	**Pass**
Pier Compression (kip)	17184.96	576.03	**3.4%**	**Pass**
*Pad Flexure (kip*ft)*	620.93	291.07	**46.9%**	**Pass**
Pad Shear - 1-way (kips)	262.03	87.37	**33.3%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.164	0.056	**34.3%**	**Pass**

Soil Rating:	**31.1%**
Structural Rating:	**46.9%**

Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.

Project #:	28758
Site Name:	CT72XC033
Location:	*Inner A*
TIA-222 Revision:	G

Design Reactions		
Shear, **S**:	78.28	kips
Uplift, **Ua**:	91.99	kips
Resultant Force, **Rf**:	120.8	kips
Tower Height, **H**:	495.00	ft
Guy Anchor Radius, **R**:	120.00	ft
Resultant Angle to Horizontal, **θ**:	49.6	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, **Da**:	10.92	ft
Anchor Width, **Wa**:	7.50	ft
Anchor Thickness, **Ta**:	3.00	ft
Anchor Length, **La**:	17.00	ft
Concrete Volume, **Vc**:	14.2	yd^3
Toe Width, **toe**:	0	ft
Guyed Anchor Top Rebar Size, **Sat**:	6	
No. of Bars in Top of Block:	8	
Guyed Anchor Front Rebar Size, **Saf**:	6	
No. of Bars in Front of Block:	3	
Stirrup Size:	4	
Anchor Shaft Diameter, **ds**:		in
Anchor Shaft Quantity. **n**:		
Anchor Shaft Area Override:		in^2
Shear Lag Factor, **u**:		

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Wt. Avg.Concrete Density, **δx**:	0.131	kcf
Clear Cover, **cc**:	3	in
Anchor Shaft Grade, **Fy'**:	36	ksi
Anchor Shaft Ultimate Strength, **Fu'**:	58	ksi

Design Checks	Capacity	Demand	Rating	Check
Lateral Capacity (kips):	278.95	78.28	**28.1%**	**Pass**
Uplift Capacity (kips):	390.12	91.99	**23.6%**	**Pass**
*Lateral Flexural Capacity (ft*kips):*	509.02	166.34	**32.7%**	**Pass**
*Uplift Flexural Capacity (ft*kips):*	501.57	195.47	**39.0%**	**Pass**
Anchor Shaft (kips):	0.00	120.78	**#DIV/0!**	**#DIV/0!**

Frost Depth, **Fd**:	3.33	ft
Groundwater Level, **gw**:	10	ft

Rebar assumed

Soil Properties:	No. of Soil Layers?			9		
Layer	**φ, deg**	**cu, ksf**	**δ, kcf**	**d, ft**	**Ultimate fs (ksf)**	**N (blows/ft)**
1	28	0.000	0.113	2.00	0.040	
2	0	1.250	0.113	3.30	0.780	
3	0	2.500	0.113	5.00	1.250	
4	37	0.000	0.113	7.00	0.350	
5	41	0.000	0.118	10.00	0.570	
6	45	0.000	0.055	10.92	0.800	
7						
8						
9						

*key: φ = *Internal Angle of Friction*

cu = Cohesion / Undrained Shear Strength

δ = *Buoyant Soil Unit Weight*

d = Depth to Bottom of Layer

Ultimate fs = Geotechnical Report-provided skin friction / adhesion

N = SPT Blow Count

Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.

Project #:	28758
Site Name:	CT72XC033
Location:	*Inner B*
TIA-222 Revision:	G

Design Reactions		
Shear, **S**:	78.23	kips
Uplift, **Ua**:	91.92	kips
Resultant Force, **Rf**:	120.7	kips
Tower Height, **H**:	495.00	ft
Guy Anchor Radius, **R**:	120.00	ft
Resultant Angle to Horizontal, **θ**:	49.6	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, **Da**:	10.79	ft
Anchor Width, **Wa**:	8.00	ft
Anchor Thickness, **Ta**:	3.00	ft
Anchor Length, **La**:	17.00	ft
Concrete Volume, **Vc**:	15.1	yd^3
Toe Width, **toe**:	0	ft
Guyed Anchor Top Rebar Size, **Sat**:	6	
No. of Bars in Top of Block:	8	
Guyed Anchor Front Rebar Size, **Saf**:	6	
No. of Bars in Front of Block:	3	
Stirrup Size:	4	
Anchor Shaft Diameter, **ds**:		in
Anchor Shaft Quantity. **n**:		
Anchor Shaft Area Override:		in^2
Shear Lag Factor, **u**:		

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Wt. Avg.Concrete Density, **δx**:	0.088	kcf
Clear Cover, **cc**:	3	in
Anchor Shaft Grade, **Fy'**:	36	ksi
Anchor Shaft Ultimate Strength, **Fu'**:	58	ksi

Design Checks	Capacity	Demand	Rating	Check
Lateral Capacity (kips):	361.00	78.23	**21.7%**	**Pass**
Uplift Capacity (kips):	331.22	91.92	**27.8%**	**Pass**
*Lateral Flexural Capacity (ft*kips):*	544.66	166.23	**30.5%**	**Pass**
*Uplift Flexural Capacity (ft*kips):*	502.03	195.34	**38.9%**	**Pass**
Anchor Shaft (kips):	0.00	120.70	**#DIV/0!**	**#DIV/0!**

Frost Depth, **Fd**:	3.33	ft
Groundwater Level, **gw**:	2	ft

Rebar assumed

Soil Properties:	**No. of Soil Layers?**			9		
Layer	**φ, deg**	**cu, ksf**	**δ, kcf**	**d, ft**	**Ultimate fs (ksf)**	**N (blows/ft)**
1	28	0.000	0.100	2.00	0.030	
2	0	1.125	0.050	3.30	0.770	
3	0	2.250	0.050	5.00	1.120	
4	36	0.000	0.050	7.00	0.200	
5	0	2.325	0.055	10.00	1.160	
6	0	3.000	0.055	10.79	1.500	
7						
8						
9						

*key: φ = *Internal Angle of Friction*

cu = Cohesion / Undrained Shear Strength

δ = *Buoyant Soil Unit Weight*

d = Depth to Bottom of Layer

Ultimate fs = Geotechnical Report-provided skin friction / adhesion

N = SPT Blow Count

Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.

Project #:	28758
Site Name:	CT72XC033
Location:	*Inner C*
TIA-222 Revision:	G

Design Reactions		
Shear, **S**:	70.01	kips
Uplift, **Ua**:	82.82	kips
Resultant Force, **Rf**:	108.4	kips
Tower Height, **H**:	495.00	ft
Guy Anchor Radius, **R**:	120.00	ft
Resultant Angle to Horizontal, **θ**:	49.8	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, **Da**:	11.92	ft
Anchor Width, **Wa**:	7.50	ft
Anchor Thickness, **Ta**:	3.00	ft
Anchor Length, **La**:	17.00	ft
Concrete Volume, **Vc**:	14.2	yd^3
Toe Width, **toe**:	0	ft
Guyed Anchor Top Rebar Size, **Sat**:	6	
No. of Bars in Top of Block:	8	
Guyed Anchor Front Rebar Size, **Saf**:	6	
No. of Bars in Front of Block:	3	
Stirrup Size:	4	
Anchor Shaft Diameter, **ds**:		in
Anchor Shaft Quantity. **n**:		
Anchor Shaft Area Override:		in^2
Shear Lag Factor, **u**:		

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Wt. Avg.Concrete Density, **δx**:	0.150	kcf
Clear Cover, **cc**:	3	in
Anchor Shaft Grade, **Fy'**:	36	ksi
Anchor Shaft Ultimate Strength, **Fu'**:	58	ksi

Design Checks	Capacity	Demand	Rating	Check
Lateral Capacity (kips):	402.26	70.01	**17.4%**	**Pass**
Uplift Capacity (kips):	452.07	82.82	**18.3%**	**Pass**
*Lateral Flexural Capacity (ft*kips):*	509.02	148.78	**29.2%**	**Pass**
*Uplift Flexural Capacity (ft*kips):*	501.57	175.99	**35.1%**	**Pass**
Anchor Shaft (kips):	0.00	108.45	**#DIV/0!**	**#DIV/0!**

Frost Depth, **Fd**:	3.33	ft
Groundwater Level, **gw**:	13	ft

Rebar assumed

Soil Properties:	No. of Soil Layers?			9		
Layer	**φ, deg**	**cu, ksf**	**δ, kcf**	**d, ft**	**Ultimate fs (ksf)**	**N (blows/ft)**
1	28	0.000	0.110	3.30	0.060	
2	30	0.000	0.110	5.00	0.180	
3	0	2.175	0.112	7.00	1.080	
4	0	2.100	0.112	10.00	1.050	
5	0	3.425	0.118	11.92	1.710	
6						
7						
8						
9						

*key: φ = *Internal Angle of Friction*

cu = Cohesion / Undrained Shear Strength

δ = *Buoyant Soil Unit Weight*

d = Depth to Bottom of Layer

Ultimate fs = Geotechnical Report-provided skin friction / adhesion

N = SPT Blow Count

Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.

Project #:	28758
Site Name:	CT72XC033
Location:	*Outer A*
TIA-222 Revision:	G

Design Reactions		
Shear, **S**:	71.09	kips
Uplift, **Ua**:	156.48	kips
Resultant Force, **Rf**:	171.9	kips
Tower Height, **H**:	495.00	ft
Guy Anchor Radius, **R**:	120.00	ft
Resultant Angle to Horizontal, **θ**:	65.6	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, **Da**:	10.8	ft
Anchor Width, **Wa**:	12.5	ft
Anchor Thickness, **Ta**:	3.0	ft
Anchor Length, **La**:	28.0	ft
Concrete Volume, **Vc**:	38.9	yd^3
Toe Width, **toe**:	0	ft
Guyed Anchor Top Rebar Size, **Sat**:	6	
No. of Bars in Top of Block:	13	
Guyed Anchor Front Rebar Size, **Saf**:	6	
No. of Bars in Front of Block:	3	
Stirrup Size:	4	
Anchor Shaft Diameter, **ds**:		in
Anchor Shaft Quantity. **n**:		
Anchor Shaft Area Override:		in^2
Shear Lag Factor, **u**:		

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Wt. Avg.Concrete Density, **δx**:	0.133	kcf
Clear Cover, **cc**:	3	in
Anchor Shaft Grade, **Fy'**:	36	ksi
Anchor Shaft Ultimate Strength, **Fu'**:	58	ksi

Design Checks	Capacity	Demand	Rating	Check
Lateral Capacity (kips):	506.34	71.09	**14.0%**	**Pass**
Uplift Capacity (kips):	774.65	156.48	**20.2%**	**Pass**
*Lateral Flexural Capacity (ft*kips):*	865.42	248.82	**28.8%**	**Pass**
*Uplift Flexural Capacity (ft*kips):*	815.35	547.69	**67.2%**	**Pass**
Anchor Shaft (kips):	0.00	171.87	**#DIV/0!**	**#DIV/0!**

Frost Depth, **Fd**:	3.33	ft
Groundwater Level, **gw**:	10	ft

Rebar assumed

Soil Properties:	No. of Soil Layers?			9		
Layer	**φ, deg**	**cu, ksf**	**δ, kcf**	**d, ft**	**Ultimate fs (ksf)**	**N (blows/ft)**
1	28	0.000	0.113	2.00	0.040	
2	0	1.250	0.113	3.30	0.780	
3	0	2.500	0.113	5.00	1.250	
4	37	0.000	0.113	7.00	0.350	
5	41	0.000	0.118	10.00	0.570	
6	45	0.000	0.055	10.83	0.800	
7						
8						
9						

*key: φ = *Internal Angle of Friction*

cu = Cohesion / Undrained Shear Strength

δ = *Buoyant Soil Unit Weight*

d = Depth to Bottom of Layer

Ultimate fs = Geotechnical Report-provided skin friction / adhesion

N = SPT Blow Count

Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.

Project #:	28758
Site Name:	CT72XC033
Location:	*Outer B*
TIA-222 Revision:	G

Design Reactions		
Shear, **S**:	71.15	kips
Uplift, **Ua**:	159.60	kips
Resultant Force, **Rf**:	174.7	kips
Tower Height, **H**:	495.00	ft
Guy Anchor Radius, **R**:	120.00	ft
Resultant Angle to Horizontal, **θ**:	66.0	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, **Da**:	10.83	ft
Anchor Width, **Wa**:	12.50	ft
Anchor Thickness, **Ta**:	3.00	ft
Anchor Length, **La**:	28.00	ft
Concrete Volume, **Vc**:	38.9	yd^3
Toe Width, **toe**:	0	ft
Guyed Anchor Top Rebar Size, **Sat**:	6	
No. of Bars in Top of Block:	13	
Guyed Anchor Front Rebar Size, **Saf**:	6	
No. of Bars in Front of Block:	3	
Stirrup Size:	4	
Anchor Shaft Diameter, **ds**:		in
Anchor Shaft Quantity. **n**:		
Anchor Shaft Area Override:		in^2
Shear Lag Factor, **u**:		

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Wt. Avg.Concrete Density, **δx**:	0.088	kcf
Clear Cover, **cc**:	3	in
Anchor Shaft Grade, **Fy'**:	36	ksi
Anchor Shaft Ultimate Strength, **Fu'**:	58	ksi

Design Checks	Capacity	Demand	Rating	Check
Lateral Capacity (kips):	686.24	71.15	**10.4%**	**Pass**
Uplift Capacity (kips):	626.24	159.60	**25.5%**	**Pass**
*Lateral Flexural Capacity (ft*kips):*	865.42	249.01	**28.8%**	**Pass**
*Uplift Flexural Capacity (ft*kips):*	815.35	558.59	**68.5%**	**Pass**
Anchor Shaft (kips):	0.00	174.74	**#DIV/0!**	**#DIV/0!**

Frost Depth, **Fd**:	3.33	ft
Groundwater Level, **gw**:	2	ft

Rebar assumed

Soil Properties:	No. of Soil Layers?			9		
Layer	**φ, deg**	**cu, ksf**	**δ, kcf**	**d, ft**	**Ultimate fs (ksf)**	**N (blows/ft)**
1	28	0.000	0.100	2.00	0.030	
2	0	1.125	0.050	3.30	0.770	
3	0	2.250	0.050	5.00	1.120	
4	36	0.000	0.050	7.00	0.200	
5	0	2.325	0.055	10.00	1.160	
6	0	3.000	0.055	10.83	1.500	
7						
8						
9						

*key: φ = *Internal Angle of Friction*

cu = Cohesion / Undrained Shear Strength

δ = *Buoyant Soil Unit Weight*

d = Depth to Bottom of Layer

Ultimate fs = Geotechnical Report-provided skin friction / adhesion

N = SPT Blow Count

Anchor Block Foundation

Checks capacity of anchor blocks for a guyed tower.

Project #:	28758
Site Name:	CT72XC033
Location:	*Outer C*
TIA-222 Revision:	G

Design Reactions		
Shear, **S**:	70.18	kips
Uplift, **Ua**:	155.38	kips
Resultant Force, **Rf**:	170.5	kips
Tower Height, **H**:	495.00	ft
Guy Anchor Radius, **R**:	120.00	ft
Resultant Angle to Horizontal, **θ**:	65.7	deg

Guy Anchor Properties		
Depth to Bottom of Deadman, **Da**:	10.83	ft
Anchor Width, **Wa**:	12.50	ft
Anchor Thickness, **Ta**:	3.00	ft
Anchor Length, **La**:	28.00	ft
Concrete Volume, **Vc**:	38.9	yd^3
Toe Width, **toe**:	0	ft
Guyed Anchor Top Rebar Size, **Sat**:	6	
No. of Bars in Top of Block:	13	
Guyed Anchor Front Rebar Size, **Saf**:	6	
No. of Bars in Front of Block:	3	
Stirrup Size:	4	
Anchor Shaft Diameter, **ds**:		in
Anchor Shaft Quantity. **n**:		
Anchor Shaft Area Override:		in^2
Shear Lag Factor, **u**:		

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Wt. Avg.Concrete Density, **δx**:	0.150	kcf
Clear Cover, **cc**:	3	in
Anchor Shaft Grade, **Fy'**:	36	ksi
Anchor Shaft Ultimate Strength, **Fu'**:	58	ksi

Design Checks	Capacity	Demand	Rating	Check
Lateral Capacity (kips):	680.43	70.18	**10.3%**	**Pass**
Uplift Capacity (kips):	802.12	155.38	**19.4%**	**Pass**
*Lateral Flexural Capacity (ft*kips):*	865.42	245.63	**28.4%**	**Pass**
*Uplift Flexural Capacity (ft*kips):*	815.35	543.83	**66.7%**	**Pass**
Anchor Shaft (kips):	0.00	170.49	**#DIV/0!**	**#DIV/0!**

Frost Depth, **Fd**:	3.33	ft
Groundwater Level, **gw**:	13	ft

Rebar assumed

Soil Properties:	No. of Soil Layers?			9		
Layer	**φ, deg**	**cu, ksf**	**δ, kcf**	**d, ft**	**Ultimate fs (ksf)**	**N (blows/ft)**
1	28	0.000	0.110	3.30	0.060	
2	30	0.000	0.110	5.00	0.180	
3	0	2.175	0.112	7.00	1.080	
4	0	2.100	0.112	10.00	1.050	
5	0	3.425	0.118	10.83	1.710	
6						
7						
8						
9						

*key: φ = *Internal Angle of Friction*

cu = Cohesion / Undrained Shear Strength

δ = *Buoyant Soil Unit Weight*

d = Depth to Bottom of Layer

Ultimate fs = Geotechnical Report-provided skin friction / adhesion

N = SPT Blow Count

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

SPRINT Existing Facility

Site ID: CT72XC033

Brookfield - WRKI Guyed Tower
39 Carmen Hill Road
Brookfield, CT 06804

November 7, 2018

EBI Project Number: 6218006949

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	5.63 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

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November 7, 2018

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

Emissions Analysis for Site: **CT72XC033 – Brookfield - WRKI Guyed Tower**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **39 Carmen Hill Road, Brookfield, 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.

General population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 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 **39 Carmen Hill Road, Brookfield, 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 for directional panel antennas, 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 50 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 for directional panel antennas, 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 **Commscope NNVV-65B-R4 and the RFS APXVTM14-ALU-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel, 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 panel antennas are **257 feet** above ground level (AGL) for **Sector A**, **257 feet** above ground level (AGL) for **Sector B** and **257 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:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	**257 feet**	Height (AGL):	**257 feet**	Height (AGL):	**257 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	7,378.61	ERP (W):	7,378.61	ERP (W):	7,378.61
Antenna A1 MPE%	**0.51 %**	Antenna B1 MPE%	**0.51 %**	Antenna C1 MPE%	**0.51 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**257 feet**	Height (AGL):	**257 feet**	Height (AGL):	**257 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**0.36 %**	Antenna B2 MPE%	**0.36 %**	Antenna C2 MPE%	**0.36 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**0.87 %**
WRKI FM radio	2.65 %
WINE AM radio	0.00 %
Town Fire Dept	0.12 %
Town Police Dept	0.21 %
Town PW Dept	0.57 %
T-Mobile	0.52 %
Clearwire	0.07 %
AT&T	0.62 %
Site Total MPE %:	**5.63 %**

SPRINT Sector A Total:	0.87 %
SPRINT Sector B Total:	0.87 %
SPRINT Sector C Total:	0.87 %
Site Total:	5.63 %

Sprint Maximum Per Sector MPE Power Values

SPRINT _ Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	376.73	257	0.21	850 MHz	567	0.04%
Sprint 850 MHz LTE	2	941.82	257	1.07	850 MHz	567	0.19%
Sprint 1900 MHz (PCS) CDMA	5	511.82	257	1.46	1900 MHz (PCS)	1000	0.14%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	257	1.46	1900 MHz (PCS)	1000	0.14%
Sprint 2500 MHz (BRS) LTE	8	778.09	257	3.55	2500 MHz (BRS)	1000	0.36%
						Total:	0.87%

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:	0.87 %
Sector B:	0.87 %
Sector C:	0.87 %
SPRINT Maximum MPE % (per sector):	0.87 %
Site Total:	5.63 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.63 %** 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.

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STEVE SOFMAN
CHARLES CHERUNDOLO CONSULTING
1280 ROUTE 46 WEST
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SUITE 200
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