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

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

Re: Notice of Exempt Modification Application
237 Godfrey Road, Weston, CT 06883

October 30, 2017

Dear Ms. Bachman:

Sprint Spectrum Realty Company, L.P. ("Sprint"), is submitting to the Connecticut Siting Council for a Notice of Exempt Modification for Proposed Modifications to an Existing Telecommunications Facility located at the above-referenced site. Sprint currently maintains 3 existing panel antenna and 6 remote radio units at the 174' level of the Tower. Sprint proposes to add 3 panel antennas (1 per sector) and 3 remote radio units (1 per sector) at 174' tower level as well as 1 hybrid cable and 27 Antenna-RRH jumper cables, new battery string in existing ground based battery cabinet and new 2.5 equipment in existing radio cabinet.

The Sprint installation was initially approved on 7/28/2006 by the CT Siting Council and a BP was issued by the Town of Weston on 10/24/2006. The documents enclosed reflect the reality of the current installations on the Tower.

If you have any questions, please feel free to contact me.

Thank you,

By: *Paul F. Sagristano*

Paul F. Sagristano
Cherundolo Consulting
917.841.0247
psagristano@lrivassoc.com

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

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

Re: Notice of Exempt Modification Application
237 Godfrey Road Road, Weston CT 06883

Latitude : N41.3680
Longitude: W72.8093

Dear Ms. Bachman:

Sprint currently maintains 3 existing panel antenna and 6 remote radio units at the 174' centerline level of the existing monopole. Sprint proposes to add 3 panel antenna and 3 remote radio unit at 174' centerline on the tower. Sprint further proposes to add 1 hybrid cable, 27 Antenna to RRH jumper cables, a new 2.5 radio equipment in the existing ground based radio cabinet, and a new battery string the existing ground based battery cabinet. Sprint is performing a new high-performance upgrade for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

The original CT Siting Council approval for a Tower Share was approved July 28, 2006. The original building permit was issued by Weston on October 24, 2006.

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 and to Jonathan Ruiz, Town Manager for Weston as well as James Pjura, Zoning Enforcement official for the Town Weston. This tower is owned by the Town of Weston
.
Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the site. Also included is documentation of the structural sufficiency of the tower with proposed modifications to accommodate the revised antenna configuration.

Existing Facility

The Northford facility is located at 237 Godfrey Road, and is owned by The Town of Weston, the Site coordinates are: N41.24438, W73.36338.

The existing facility consists of a 185' Self Support Lattice Tower. Sprint currently operates wireless communications equipment on a platform on a concrete slab at the facility and has 3 antennas and 3 RRU's mounted on at a centerline of 174' 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,

Paul F. Sagristano

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

PFS/mtf

Additional Recipients:
Jonathan Ruiz, Town Administrator for Weston – Via Fed Ex
James Pjura, Zoning Enforcement official Town of Weston - Via Fed Ex

November 2,2017

Dear Customer:

The following is the proof-of-delivery for tracking number 770631594362.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	D.ANASTASIA	**Delivery location:**	56 NORFIELD RD WESTON, CT 06883
Service type:	FedEx Express Saver	**Delivery date:**	Nov 2, 2017 12:24
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	770631594362	**Ship date:**	Oct 31, 2017
		Weight:	2.0 lbs/0.9 kg

Recipient:
Nina Daniel 1st Selectman
Town of Weston
56 Norfield Road
WESTON, CT 06883 US

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

Reference
CT33XC522 CSC to 1st Selectman

Thank you for choosing FedEx.

November 2,2017

Dear Customer:

The following is the proof-of-delivery for tracking number 770631563180.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	D.ANASTASIA	**Delivery location:**	56 NORFIELD RD WESTON, CT 06883
Service type:	FedEx Express Saver	**Delivery date:**	Nov 2, 2017 12:24
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	770631563180	**Ship date:**	Oct 31, 2017
		Weight:	2.0 lbs/0.9 kg

Recipient:
James Pjura, ZEO
Town of Weston
56 Norfield Road
WESTON, CT 06883 US

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

Reference
CT33XC522 CSC to ZEO

Thank you for choosing FedEx.

November 2,2017

Dear Customer:

The following is the proof-of-delivery for tracking number 770631514928.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	D.ANASTASIA	**Delivery location:**	56 NORFIELD RD WESTON, CT 06883
Service type:	FedEx Express Saver	**Delivery date:**	Nov 2, 2017 12:24
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	770631514928	**Ship date:**	Oct 31, 2017
		Weight:	2.0 lbs/0.9 kg

Recipient:
Jonathan Ruiz, Town Admin
Town of Weston
56 Norfield Road
WESTON, CT 06883 US

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

Reference
CT33XC522 CSC to Town Admin

Thank you for choosing FedEx.

TAX MAP
TOWN OF
WESTON, CONNECTICUT
SCALE: 1"=200' JAN. 5. 1988

COMPILED FROM MAPS OF RECORD, 1988

PREPARED BY B.G. ROOT, SURVEYOR-WESTPORT, CONN.

SCALE IN FEET
0 100 200 400

SHEET 16

GODFREY ROAD
GODFREY STREET
RAVENWOOD DRIVE
TUBBS SPRINGS DRIVE
TUBBS SPRINGS CT
CATBRIER ROAD
50' ROAD RESERVE
LORDS HIGHWAY EAST
ALEXANDER LANE
TIFFANY LANE
TREADWELL LANE
CHURCH LANE
GREENFIELD DRIVE
TREADWELL COURT
DEEPWOOD ROAD
HILL FARM ROAD
DAVIS HILL ROAD
STEEP HILL ROAD
OLD TOWN RD
LORDS LANE
BLOCK LIMIT
OPEN SPACE
ACCESS

Town of Weston, CT

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Owner and Parcel Information

Owner Name	TOWN OF WESTON LANDFILL/TRANSFER STATION	**Today's Date**	October 31, 2017
Mailing Address	237 GODFREY RD	**Parcel ID**	13105 (Account #: E00131)
	WESTON, CT 06883	**Map/Block/Lot**	16/1/35
Location Address	237 GODFREY ROAD		
Subdivision Map / Lot	1957 /	**Acreage**	57.35
Use Class / Description	901 Municipal	**Subdivision**	

Current Appraised Value Information

Building Value	XF Value	OB Value	Land Value	Special Land Value	Total Appraised Value	Net Appraised Value	Current Assessment
$ 27,300	$ 0	$ 71,800	$ 2,007,000		$ 2,106,100	$ 2,106,100	$ 1,474,400

Assessment History

Year	Building	OB/Misc	Land	Total Assessment
2016	$ 19,100	$ 50,400	$ 1,404,900	$ 1,474,400
2015	$ 19,100	$ 50,400	$ 1,404,900	$ 1,474,400
2014	$ 19,100	$ 50,400	$ 1,404,900	$ 1,474,400

Land Information

Use	Class	Area	Value
Municipal	E	2 AC	$ 900,000
Municipal	E	55.35 AC	$ 1,107,000

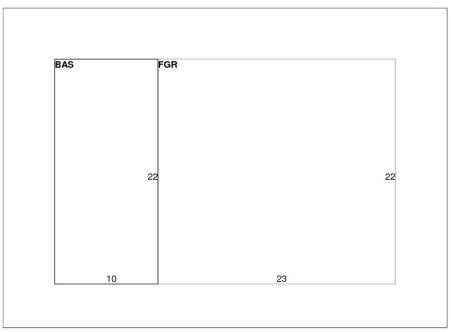
Commercial Building Information

Style	Year Built	Eff Year Built	Gross Area	Stories	Grade	Exterior Wall	Interior Wall	Wall Height	# Units
Warehouse	1980	2002	726	1	C	Concrete	Minimum	10	0
Roof Cover	**Roof Structure**	**Floor Type**	**Heat Type**	**Heat Fuel**	**AC Type**	**Sprinkler**	**Construction**	**Plumbing**	**Comm Walls**
Asphalt Shingl	Gable	Concr Abv Grad	Oil	Forced Air	Heat/AC Split	%	Reinforced Cnc	Light	0%

Building Sub Areas

Code	Description	Living Area	Gross Area
BAS	First Floor	220	220
FGR	Garage	0	506
	Totals	**220**	**726**

Building Sketch Enlarge



Building Photo Enlarge

Out Buildings / Extra Features

Description	Sub Description	Area	Year Built	Value
Garage	Masonary	912 S.F.	1992	$ 21,500
Studio/Office		207 S.F.	1980	$ 12,400
Shed		460 S.F.	1980	$ 2,800
Shed		676 S.F.	1980	$ 3,000
Shed		288 S.F.	1980	$ 1,300
Paving Asph.		19,000 S.F.	1980	$ 30,800

Sale Information

Sale Date	Sale Price	Deed Book/Page	Sale Qualification	Reason	Vacant or Improved	Owner
00/00/0000		74/ 498				TOWN OF WESTON LANDFILL/TRANSFER STATION

Permit Information

Permit ID	Issue Date	Type	Description	Amount	Inspection Date	% Complete	Date Complete	Comments
7891	04/17/2017			$ 23,500		100		ADD 3 ANTENNA
7486	11/24/2014			$ 25,000	04/30/2015	100	12/15/2014	SEE PERMIT
7293	06/03/2014			$ 25,000	12/24/2014	100	08/01/2014	ANTENNAS
7392	06/03/2014			$ 10,000	12/24/2014	100	08/01/2014	ANTENNAS & FIBER CABLE
7169	03/14/2013			$ 25,000	11/06/2013	100	10/01/2013	SEE PERMIT
7043	06/20/2012			$ 15,000	11/06/2013	100	10/01/2012	ELECTRICAL
6932	08/30/2011			$ 20,000	11/06/2013	100	10/01/2011	SEE PERMIT
6565	04/08/2009				10/30/2009	100	10/01/2009	SEE PERMIT
6547	02/25/2009			$ 50,000	10/30/2009	100	10/01/2009	INSTALL ANTENNAS, EQUIP SHED, GENERATOR
6110	10/24/2006			$ 285,000		100		CELL TOWER

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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

July 28, 2006

Thomas J. Regan, Esq.
Brown Rudnick Berlack Israels LLP
CityPlace I, 185 Asylum Street
Hartford, CT 06103

RE: **TS-NEXTEL-157-060516** - Sprint Nextel Corporation request for an order to approve tower sharing at a telecommunications facility located at 237 Godfrey Road, Weston, Connecticut.

Dear Attorney Regan:

At a public meeting held July 27, 2006, the Connecticut Siting Council (Council) ruled that the shared use of this tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures. 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. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or 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. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction. Please be advised that the validity of this action shall expire one year from the date of this letter.

The proposed shared use is to be implemented as specified in your letter dated May 15, 2006, and additional information dated June 27, 2006, including the placement of all necessary equipment and shelters within the tower compound.

Thank you for your attention and cooperation.

Very truly yours,

Colin C. Tait
Chairman

CCT/laf

c: The Honorable Woody Bliss, First Selectman, Town of Weston
Robert P. Turner, Zoning Enforcement Officer, Town of Weston

TOWN OF WESTON
P.O. Box 1007/56 Norfield Road
Weston, CT 06883
(203) 222-2659

Building Official R.E. Olen

Building Permit

Permit Number: 6110

Printed: 10/24/2006

Applicant

Approval Date: 10/24/2006

Name: Town of Weston
Address: 56 Norfield Road
Weston, CT 06883
Phone: 203-222-2677

Parcel

Parcel Number: Map 16 Block 1 Lot 35
Address: 237 Godfrey Road
Section: **Township:**
Addition: **Block:**
Legal Description:

Zoning:
Weston, CT 06883
Range:
Lot(s):

Owners

Name: Town of Weston
Address: 56 Norfield Road
Weston, CT 06883

Phone: 203-222-2677

Contractors

Contractor Type: Major Contractor

Name: McPhee Electric ltd,LLC
Address: McPhee Electric ltd,LLC
505 Main St.

Farmington, Ct 06032

Phone: 860-655-9438

Fees and Receipts:

Number	Description	Amount
052419	Building Permit fee (Auto)	$2,381.25
	Total Fees:	**$2,381.25**
052419		$2,381.25
	Total Receipts:	**$2,381.25**

Description

Structure Use: Commercial
Purpose: Other
Construction Value: $285,000.00

Start Date:
End Date:

Floor Areas

Living Space:
Basement/Storage:
Garage:
Decks:
Porches:
Other:
Total Area:

Impervious Surfaces

House:
Garage:
Driveways:
Porch/Walk:
Other:
Total:

Structure Area: **Site Area:** **Percentage of Site:**

Conditions

Date: **Status:** **Code:**

Condition Description:

Condition Comments:

Other Fields:

EBI Consulting
environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT33XC522

Transfer Station
237 Godfrey Road
Weston, CT 06883

October 18, 2017

EBI Project Number: 6217004505

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	6.34 %

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

EBI Consulting
environmental | engineering | due diligence

October 18, 2017

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

Emissions Analysis for Site: **CT33XC522 – Transfer Station**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **237 Godfrey Road, Weston, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **237 Godfrey Road, Weston, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **RFS APXVSPP18-C-A20 and the RFS APXV9TM14-C-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **174 feet** above ground level (AGL) for **Sector A**, **174 feet** above ground level (AGL) for **Sector B** and **174 feet** above ground level (AGL) for Sector C.

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**174 feet**	Height (AGL):	**174 feet**	Height (AGL):	**174 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	**1.09 %**	Antenna B1 MPE%	**1.09 %**	Antenna C1 MPE%	**1.09 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXV9TM14-C-I20	Make / Model:	RFS APXV9TM14-C-I20	Make / Model:	RFS APXV9TM14-C-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**174 feet**	Height (AGL):	**174 feet**	Height (AGL):	**174 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%	**0.79 %**	Antenna B2 MPE%	**0.79 %**	Antenna C2 MPE%	**0.79 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**1.88 %**
Weston Police	0.02 %
Weston FD	0.02 %
Weston EMS	0.02 %
Weston Public Works	0.02 %
Verizon Wireless	2.10 %
AT&T	0.97 %
T-Mobile	1.31 %
Site Total MPE %:	**6.34 %**

SPRINT Sector A Total:	1.88 %
SPRINT Sector B Total:	1.88 %
SPRINT Sector C Total:	1.88 %
Site Total:	6.34 %

SPRINT _ Max Values per 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	437.55	174	0.56	850 MHz	567	0.10%
Sprint 850 MHz LTE	2	437.55	174	1.11	850 MHz	567	0.20%
Sprint 1900 MHz (PCS) CDMA	5	622.47	174	3.96	1900 MHz (PCS)	1000	0.40%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	174	3.96	1900 MHz (PCS)	1000	0.40%
Sprint 2500 MHz (BRS) LTE	8	778.09	174	7.93	2500 MHz (BRS)	1000	0.79%
						Total:	**1.88%**

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:	1.88 %
Sector B:	1.88 %
Sector C:	1.88 %
SPRINT Maximum Total (per sector):	1.88 %
Site Total:	6.34 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **6.34 %** 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.

RAMAKER & ASSOCIATES, INC.

September 27, 2017

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

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

SUBJECT: **MOUNT ASSESSMENT**

CARRIER: **SPRINT**

SITE: **TRANSFER STATION (CT33XC522)**
237 GODFREY ROAD
WESTON, FAIRFIELD COUNTY, CONNECTICUT 06883
RAMAKER & ASSOCIATES PROJECT NUMBER: 28737

RESULTS: **MOUNT:** **PASS**

Dear Tom Jupin:

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

RAMAKER developed a finite element model of the mount(s) using RISA 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 mount loading occur.

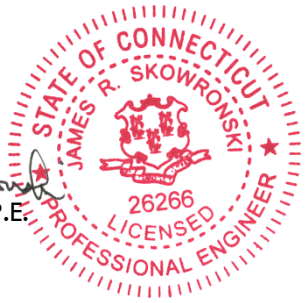
If you have any questions or comments, please do not hesitate to contact our office.

Sincerely,

RAMAKER & ASSOCIATES, INC.

Ryan J. Nelson
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	B
Topographic Category	1
Crest Height	N/A

SUPPORTING DOCUMENTATION

- Construction drawings by RAMAKER, project number 28737
- Site visit(s) conducted by RAMAKER
- Other pertinent data procured or assumed by RAMAKER during site due diligence activities

MOUNT LOADING

RAMAKER understands that the loading to be used for this analysis will consist of the antennas and equipment configurations as shown in the following chart(s):

Antenna Mount – All Sectors				
Elevation	**Position**	**Appurtenance**	**Mount Type**	**Status**
174	1	**(1) RFS APXV9TM14-ALU-120**	T-Frame	**Proposed**
		(1) ALU TD-RRH8x20		
	2	(3) ALU 800MHz RRH		Existing
		(3) ALU 1900MHz RRH		
	3	(3) RFS APXVSPP18-C		
	4	---		

MOUNT RESULTS

By engineering calculation and inspection, the antenna and equipment mounting structure(s) are capable of supporting the proposed loading configurations without causing an overstress condition in the antenna and equipment mounting structure(s).

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
- Member grades less than assumed grades show below:

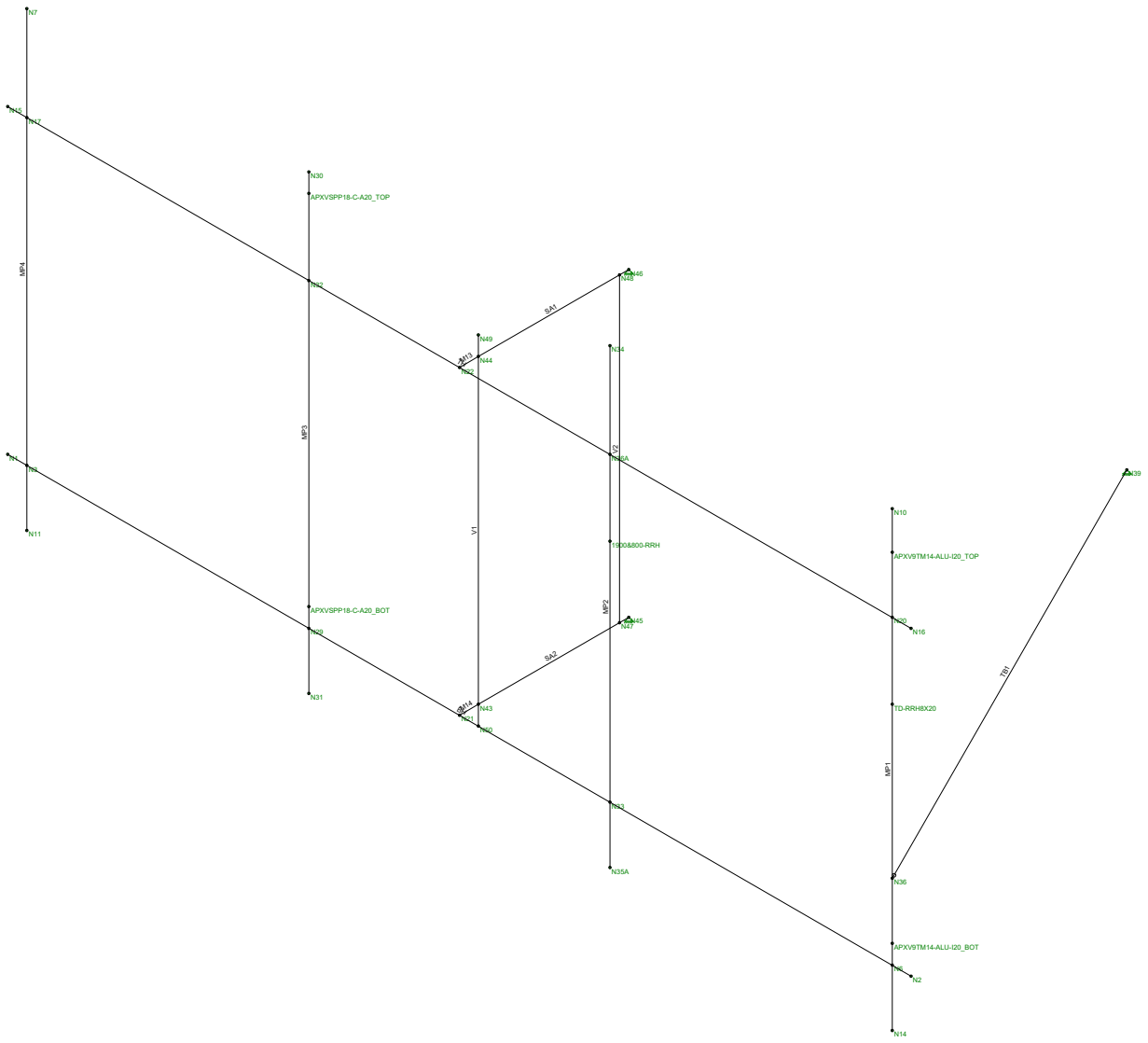
Assumed Steel Member Grades	
Angles/Plates/Solid Rods	ASTM A36, 36 ksi
Pipes	ASTM A53 Gr. B, 35 ksi
HSS (Square Tube)	ASTM A36, 36 ksi

RAMAKER is not 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 mounting structure, and no analyses or conclusions were made regarding the supporting structure. Analysis and certification of the supporting structure is performed and submitted separately.

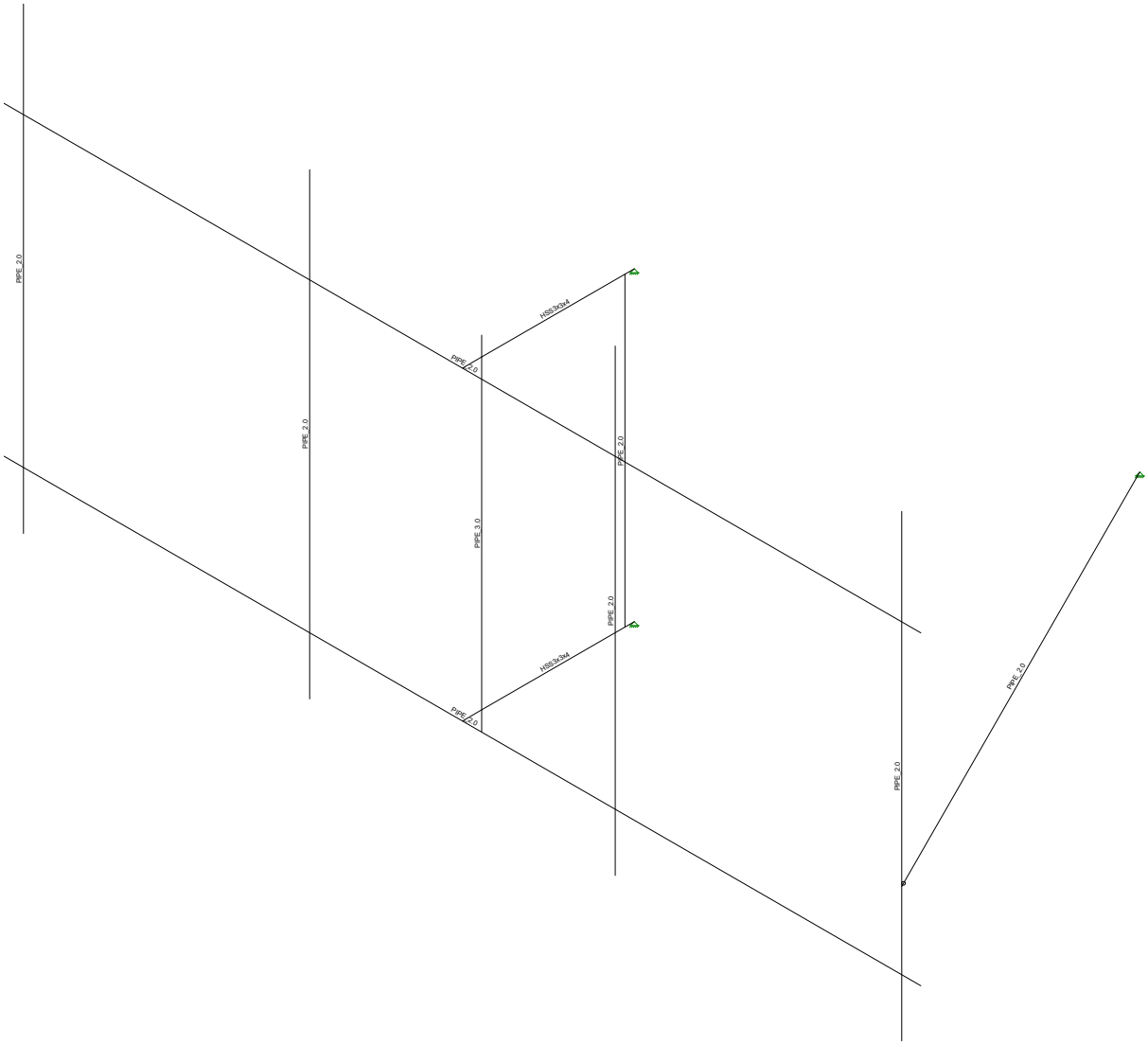
ATTACHMENTS

- Analysis Figures
- Analysis Calculations



Envelope Only Solution

Ramaker & Associates, Inc.	Transfer Station (CT33XC522-C)	SK - 1
RJN		Aug 17, 2017 at 8:43 AM
28737		28737 Mount Rev1.r3d



Envelope Only Solution

Ramaker & Associates, Inc.	Transfer Station (CT33XC522-C)	SK - 2
RJN		Aug 17, 2017 at 8:45 AM
28737		28737 Mount Rev1.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.4	58	1.3
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	60	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	pipe 2.0	PIPE_2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	.627	.627	1.25
2	HSS3x3x1/4	HSS3x3x4	Beam	SquareTube	A36 Gr.36	Typical	2.44	3.02	3.02	5.08
3	pipe 3.0	PIPE_3.0	Beam	Pipe	A53 Gr. B	Typical	2.07	2.85	2.85	5.69

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	BH	N1	N2			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
2	MP4	N11	N7			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
3	MP1	N14	N10			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
4	TH	N15	N16			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
5	V1	N49	N50			pipe 3.0	Beam	Pipe	A53 Gr. B	Typical
6	V2	N48	N47			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
7	SA1	N44	N46			HSS3x3x1/4	Beam	SquareTube	A36 Gr.36	Typical
8	SA2	N43	N45			HSS3x3x1/4	Beam	SquareTube	A36 Gr.36	Typical
9	M13	N44	N22			RIGID	None	None	RIGID	Typical
10	M14	N43	N21			RIGID	None	None	RIGID	Typical
11	MP3	N31	N30			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
12	MP2	N35A	N34			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical
13	TB1	N36	N39			pipe 2.0	Beam	Pipe	A53 Gr. B	Typical

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead Load	None		-1			7			
2	Antenna Wind 0	None					14			
3	Antenna Wind 30	None					14			
4	Antenna Wind 45	None					14			
5	Antenna Wind 60	None					14			
6	Antenna Wind 90	None					14			
7	Antenna Wind 120	None					14			
8	Antenna Wind 135	None					14			
9	Antenna Wind 150	None					14			
10	Antenna Wind 180	None					14			
11	Antenna Wind 210	None					14			
12	Antenna Wind 225	None					14			
13	Antenna Wind 240	None					14			
14	Antenna Wind 270	None					14			
15	Antenna Wind 300	None					14			
16	Antenna Wind 315	None					14			
17	Antenna Wind 330	None					14			
18	Antenna Ice Dead Load	None					7			
19	Antenna Wind w/Ice 0	None					14			
20	Antenna Wind w/Ice 30	None					14			

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
21	Antenna Wind w/Ice 45	None					14			
22	Antenna Wind w/Ice 60	None					14			
23	Antenna Wind w/Ice 90	None					14			
24	Antenna Wind w/Ice 1...	None					14			
25	Antenna Wind w/Ice 1...	None					14			
26	Antenna Wind w/Ice 1...	None					14			
27	Antenna Wind w/Ice 1...	None					14			
28	Antenna Wind w/Ice 2...	None					14			
29	Antenna Wind w/Ice 2...	None					14			
30	Antenna Wind w/Ice 2...	None					14			
31	Antenna Wind w/Ice 2...	None					14			
32	Antenna Wind w/Ice 3...	None					14			
33	Antenna Wind w/Ice 3...	None					14			
34	Antenna Wind w/Ice 3...	None					14			
35	Member Wind 0	None						22		
36	Member Wind 30	None						22		
37	Member Wind 45	None						22		
38	Member Wind 60	None						22		
39	Member Wind 90	None						22		
40	Member Wind 120	None						22		
41	Member Wind 135	None						22		
42	Member Wind 150	None						22		
43	Member Wind 180	None						22		
44	Member Wind 210	None						22		
45	Member Wind 225	None						22		
46	Member Wind 240	None						22		
47	Member Wind 270	None						22		
48	Member Wind 300	None						22		
49	Member Wind 315	None						22		
50	Member Wind 330	None						22		
51	Member Ice Dead Load	None						11		
52	Member Wind w/Ice 0	None						22		
53	Member Wind w/Ice 30	None						22		
54	Member Wind w/Ice 45	None						22		
55	Member Wind w/Ice 60	None						22		
56	Member Wind w/Ice 90	None						22		
57	Member Wind w/Ice 1...	None						22		
58	Member Wind w/Ice 1...	None						22		
59	Member Wind w/Ice 1...	None						22		
60	Member Wind w/Ice 1...	None						22		
61	Member Wind w/Ice 2...	None						22		
62	Member Wind w/Ice 2...	None						22		
63	Member Wind w/Ice 2...	None						22		
64	Member Wind w/Ice 2...	None						22		
65	Member Wind w/Ice 3...	None						22		
66	Member Wind w/Ice 3...	None						22		
67	Member Wind w/Ice 3...	None						22		
68	Live Load - Area	None								
69	Live Load - Point 1	None					2			
70	Live Load - Point 2	None					2			
71	Live Load - Point 3	None					2			
72	Railing Dist. LL z	None								
73	Railing Dist. LL x	None								
74	Railing Point LL z	None								
75	Railing Point LL x	None								

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.4D	Yes	Y		1	1.4																		
2	0.9D + 1.6 (0-W...	Yes	Y		1	.9	2	1.6	35	1.6														
3	0.9D + 1.6 (30-...	Yes	Y		1	.9	3	1.6	36	1.6														
4	0.9D + 1.6 (45-...	Yes	Y		1	.9	4	1.6	37	1.6														
5	0.9D + 1.6 (60-...	Yes	Y		1	.9	5	1.6	38	1.6														
6	0.9D + 1.6 (90-...	Yes	Y		1	.9	6	1.6	39	1.6														
7	0.9D + 1.6 (120-...	Yes	Y		1	.9	7	1.6	40	1.6														
8	0.9D + 1.6 (135-...	Yes	Y		1	.9	8	1.6	41	1.6														
9	0.9D + 1.6 (150-...	Yes	Y		1	.9	9	1.6	42	1.6														
10	0.9D + 1.6 (180-...	Yes	Y		1	.9	10	1.6	43	1.6														
11	0.9D + 1.6 (210-...	Yes	Y		1	.9	11	1.6	44	1.6														
12	0.9D + 1.6 (225-...	Yes	Y		1	.9	12	1.6	45	1.6														
13	0.9D + 1.6 (240-...	Yes	Y		1	.9	13	1.6	46	1.6														
14	0.9D + 1.6 (270-...	Yes	Y		1	.9	14	1.6	47	1.6														
15	0.9D + 1.6 (300-...	Yes	Y		1	.9	15	1.6	48	1.6														
16	0.9D + 1.6 (315-...	Yes	Y		1	.9	16	1.6	49	1.6														
17	0.9D + 1.6 (330-...	Yes	Y		1	.9	17	1.6	50	1.6														
18	1.2D + 1.6 (0-W...	Yes	Y		1	1.2	2	1.6	35	1.6														
19	1.2D + 1.6 (30-...	Yes	Y		1	1.2	3	1.6	36	1.6														
20	1.2D + 1.6 (45-...	Yes	Y		1	1.2	4	1.6	37	1.6														
21	1.2D + 1.6 (60-...	Yes	Y		1	1.2	5	1.6	38	1.6														
22	1.2D + 1.6 (90-...	Yes	Y		1	1.2	6	1.6	39	1.6														
23	1.2D + 1.6 (120-...	Yes	Y		1	1.2	7	1.6	40	1.6														
24	1.2D + 1.6 (135-...	Yes	Y		1	1.2	8	1.6	41	1.6														
25	1.2D + 1.6 (150-...	Yes	Y		1	1.2	9	1.6	42	1.6														
26	1.2D + 1.6 (180-...	Yes	Y		1	1.2	10	1.6	43	1.6														
27	1.2D + 1.6 (210-...	Yes	Y		1	1.2	11	1.6	44	1.6														
28	1.2D + 1.6 (225-...	Yes	Y		1	1.2	12	1.6	45	1.6														
29	1.2D + 1.6 (240-...	Yes	Y		1	1.2	13	1.6	46	1.6														
30	1.2D + 1.6 (270-...	Yes	Y		1	1.2	14	1.6	47	1.6														
31	1.2D + 1.6 (300-...	Yes	Y		1	1.2	15	1.6	48	1.6														
32	1.2D + 1.6 (315-...	Yes	Y		1	1.2	16	1.6	49	1.6														
33	1.2D + 1.6 (330-...	Yes	Y		1	1.2	17	1.6	50	1.6														
34	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	19	1	52	1										
35	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	20	1	53	1										
36	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	21	1	54	1										
37	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	22	1	55	1										
38	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	23	1	56	1										
39	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	24	1	57	1										
40	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	25	1	58	1										
41	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	26	1	59	1										
42	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	27	1	60	1										
43	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	28	1	61	1										
44	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	29	1	62	1										
45	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	30	1	63	1										
46	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	31	1	64	1										
47	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	32	1	65	1										
48	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	33	1	66	1										
49	1.2D + 1.0Di + 1...	Yes	Y		1	1.2	18	1	51	1	34	1	67	1										
50	1.0D + 1.5LL + ...	Yes	Y		1	1	68	1.5	72	1.5														
51	1.0D + 1.5LL + ...	Yes	Y		1	1	68	1.5	73	1.5														
52	1.0D + 1.5LL + ...	Yes	Y		1	1	68	1.5	74	1.5														
53	1.0D + 1.5LL + ...	Yes	Y		1	1	68	1.5	75	1.5														
54	1.0D + 1.5LL + ...	Yes	Y		1	1	69	1.5	72	1.5														
55	1.0D + 1.5LL + ...	Yes	Y		1	1	69	1.5	73	1.5														
56	1.0D + 1.5LL + ...	Yes	Y		1	1	69	1.5	74	1.5														

Load Combinations (Continued)

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
57	1.0D + 1.5LL + ...	Yes	Y		1	1	69	1.5	75	1.5														
58	1.0D + 1.5LL + ...	Yes	Y		1	1	70	1.5	72	1.5														
59	1.0D + 1.5LL + ...	Yes	Y		1	1	70	1.5	73	1.5														
60	1.0D + 1.5LL + ...	Yes	Y		1	1	70	1.5	74	1.5														
61	1.0D + 1.5LL + ...	Yes	Y		1	1	70	1.5	75	1.5														
62	1.0D + 1.5LL + ...	Yes	Y		1	1	71	1.5	72	1.5														
63	1.0D + 1.5LL + ...	Yes	Y		1	1	71	1.5	73	1.5														
64	1.0D + 1.5LL + ...	Yes	Y		1	1	71	1.5	74	1.5														
65	1.0D + 1.5LL + ...	Yes	Y		1	1	71	1.5	75	1.5														
66	Serviceability (0...	Yes	Y		1	1	2	.372	35	.372														
67	Serviceability (3...	Yes	Y		1	1	3	.372	36	.372														
68	Serviceability (4...	Yes	Y		1	1	4	.372	37	.372														
69	Serviceability (6...	Yes	Y		1	1	5	.372	38	.372														
70	Serviceability (9...	Yes	Y		1	1	6	.372	39	.372														
71	Serviceability (1...	Yes	Y		1	1	7	.372	40	.372														
72	Serviceability (1...	Yes	Y		1	1	8	.372	41	.372														
73	Serviceability (1...	Yes	Y		1	1	9	.372	42	.372														
74	Serviceability (1...	Yes	Y		1	1	10	.372	43	.372														
75	Serviceability (2...	Yes	Y		1	1	11	.372	44	.372														
76	Serviceability (2...	Yes	Y		1	1	12	.372	45	.372														
77	Serviceability (2...	Yes	Y		1	1	13	.372	46	.372														
78	Serviceability (2...	Yes	Y		1	1	14	.372	47	.372														
79	Serviceability (3...	Yes	Y		1	1	15	.372	48	.372														
80	Serviceability (3...	Yes	Y		1	1	16	.372	49	.372														
81	Serviceability (3...	Yes	Y		1	1	17	.372	50	.372														

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N46	max	434.957	13	935.286	42	498.039	2	0	1	0	1	0	1
2		min	-905.002	21	234.211	2	-1206.62	42	0	1	0	1	0	1
3	N45	max	829.731	29	930.837	35	1122.753	49	0	1	0	1	0	1
4		min	-376.155	5	232.415	10	-154.817	8	0	1	0	1	0	1
5	N39	max	314.228	3	47.97	44	659.167	3	0	1	0	1	0	1
6		min	-298.098	11	8.47	4	-650.705	11	0	1	0	1	0	1
7	Totals:	max	960.891	14	1900.088	43	1402.202	2						
8		min	-960.891	22	512.296	3	-1402.202	26						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code C...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-...	phi*Mn z-...	Cb	Eqn
1	BH	PIPE_2.0	.817	6	31	.152	6		35	20866.733	32130	1871.625	1871.625	1....	H1-1b
2	MP4	PIPE_2.0	.214	4.75	54	.023	.75		54	20866.733	32130	1871.625	1871.625	1....	H1-1b
3	MP1	PIPE_2.0	.319	4.75	37	.170	1.75		27	20866.733	32130	1871.625	1871.625	1....	H1-1b
4	TH	PIPE_2.0	.808	6	24	.189	8		19	20866.733	32130	1871.625	1871.625	1....	H1-1b
5	V1	PIPE_3.0	.231	.281	43	.167	.281		58	58506.375	65205	5748.75	5748.75	2....	H1-1b
6	V2	PIPE_2.0	.334	0	39	.168	0		58	29628.564	32130	1871.625	1871.625	2....	H1-1b
7	SA1	HSS3x3x4	.353	0	37	.102	1.875	z	58	77142.698	79056	6696	6696	2....	H1-1b
8	SA2	HSS3x3x4	.359	0	45	.102	1.875	z	58	77142.698	79056	6696	6696	2....	H1-1b
9	MP3	PIPE_2.0	.253	.75	54	.049	.75		39	20866.733	32130	1871.625	1871.625	1....	H1-1b
10	MP2	PIPE_2.0	.418	4.75	38	.150	4.75		19	20866.733	32130	1871.625	1871.625	1....	H1-1b
11	TB1	PIPE_2.0	.051	3.5	21	.005	7		45	17855.085	32130	1871.625	1871.625	1....	H1-1b

RAMAKER & ASSOCIATES, INC.
855 Community Drive, Sauk City, WI 53583
Phone: 608-643-4100 Fax: 608-643-7999

Job: Transfer Station (CT33XC522)
Project: 28737
By: RJN
Date: 8/17/17

Wind Load on Antennas TIA-222-G

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

$F = q_z\ G_h\ C_a\ A_a$

Occupancy:	II		Classification of Structures (Table 2-1)
Exposure:	B		Exposure Category
V:	93	mph	Basic Wind Speed (Annex B)
z:	174	ft	Height above ground level to the center of the antenna
I:	1.00		Importance Factor (Table 2-3)
K_z:	1.16		Velocity Pressure Coefficient (2.6.5.2)
K_{zt}:	1.00		Topographic Factor (2.6.6.4)
K_d:	0.95		Wind Direction Probability Factor (Table 2-2)
q_z:	24.4	psf	Velocity Pressure at Height z
G_h:	1.00		Strength Design of Appurtenances and their Connections

Mount & Antenna Wind Loads

Appurtenance	Height	Width	h/D	Shape	C_a	A_f	Force	Force
	in	*in*				*sq ft*	*lb*	*plf*
APXVTM14-C-120	56.3	12.6	4.5	Flat	1.287	4.93	154.4	
TD-RRH8x20	26.1	18.6	1.4	Flat	1.200	3.37	98.5	
APXVSPP18-C-A20	72.0	11.9	6.1	Flat	1.358	5.95	196.6	
1900MHz 4x40W RRH	25.1	11.1	2.3	Flat	1.200	1.93	56.5	
800MHz 2x50W RRH	19.0	13.0	1.5	Flat	1.200	1.72	50.1	
Pipe2STD x 12 ft	144.0	2.4	60.6	Round	1.200	2.38	69.4	5.8
Pipe2STD x 7 ft	84.0	2.4	35.4	Round	1.200	1.39	40.5	5.8
Pipe2STD x 6 ft	72.0	2.4	30.3	Round	1.200	1.19	34.7	5.8
Pipe2STD x 4 ft	48.0	2.4	20.2	Round	1.094	0.79	21.1	5.3
Pipe3STD x 4.5 ft	54.0	3.5	15.4	Round	0.987	1.31	31.6	7.0
HSS3X3X1/4 x 2.25 ft	27.0	3.0	9.0	Flat	1.467	0.56	20.1	8.9

RAMAKER & ASSOCIATES, INC.
855 Community Drive, Sauk City, WI 53583
Phone: 608-643-4100 Fax: 608-643-7999

Job: Transfer Station (CT33XC522)
Project: 28737
By: RJN
Date: 8/17/17

Wind Load on Antennas TIA-222-G

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

$F = q_z\ G_h\ C_a\ A_a$

Occupancy:	II		Classification of Structures (Table 2-1)
Exposure:	B		Exposure Category
V:	93	mph	Basic Wind Speed (Annex B)
z:	174	ft	Height above ground level to the center of the antenna
I:	1.00		Importance Factor (Table 2-3)
K_z:	1.16		Velocity Pressure Coefficient (2.6.5.2)
K_{zt}:	1.00		Topographic Factor (2.6.6.4)
K_d:	0.95		Wind Direction Probability Factor (Table 2-2)
q_z:	24.4	psf	Velocity Pressure at Height z
G_h:	1.00		Strength Design of Appurtenances and their Connections

Mount & Antenna Wind Loads

Appurtenance	Height	Depth	h/D	Shape	C_a	A_f	Force	Force
	in	*in*				*sq ft*	*lb*	*plf*
APXVTM14-C-120	56.3	6.3	8.9	Flat	1.465	2.46	87.8	
TD-RRH8x20	26.1	6.7	3.9	Flat	1.262	1.21	37.3	
APXVSPP18-C-A20	72.0	7.0	10.3	Flat	1.509	3.50	128.8	
1900MHz 4x40W RRH	25.1	10.7	2.3	Flat	1.200	1.86	54.4	
800MHz 2x50W RRH	19.0	12.2	1.6	Flat	1.200	1.61	47.0	
Pipe2STD x 12 ft	144.0	2.4	60.6	Round	1.200	2.38	69.4	5.8
Pipe2STD x 7 ft	84.0	2.4	35.4	Round	1.200	1.39	40.5	5.8
Pipe2STD x 6 ft	72.0	2.4	30.3	Round	1.200	1.19	34.7	5.8
Pipe2STD x 4 ft	48.0	2.4	20.2	Round	1.094	0.79	21.1	5.3
Pipe3STD x 4.5 ft	54.0	3.5	15.4	Round	0.987	1.31	31.6	7.0
HSS3X3X1/4 x 2.25 ft	27.0	3.0	9.0	Flat	1.467	0.56	20.1	8.9

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Ice Wind Load on Antennas TIA-222-G

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

$F = q_z\ G_h\ C_a\ A_a$

Occupancy:	II		Classification of Structures (Table 2-1)
Exposure:	B		Exposure Category
V_i:	50	mph	Basic Wind Speed (Annex B)
z:	174	ft	Height above ground level to the center of the antenna
I:	1.00		Importance Factor (Table 2-3)
K_z:	1.16		Velocity Pressure Coefficient (2.6.5.2)
K_{zt}:	1.00		Topographic Factor (2.6.6.4)
K_d:	0.95		Wind Direction Probability Factor (Table 2-2)
q_z:	7.04	psf	Velocity Pressure at Height z
G_h:	1.00		Strength Design of Appurtenances and their Connections
K_{iz}:	1.18		Height Escalation Factor for Ice Thickness
t_{iz}:	1.77	in	Factored Thickness of Radial Glaze Ice at Height z

Mount & Antenna Ice Wind Loads

Appurtenance	Height	Width	h/D	Shape	C_a	A_f	Force	Force
	in	*in*				*sq ft*	*lb*	*plf*
APXVTM14-C-120	59.8	16.1	3.7	Flat	1.254	6.71	59.2	
TD-RRH8x20	29.6	22.1	1.3	Flat	1.200	4.56	38.5	
APXVSPP18-C-A20	75.6	15.4	4.9	Flat	1.306	8.10	74.5	
1900MHz 4x40W RRH	28.6	14.6	2.0	Flat	1.200	2.91	24.6	
800MHz 2x50W RRH	22.5	16.5	1.4	Flat	1.200	2.59	21.9	
Pipe2STD x 12 ft	147.5	5.9	24.9	Round	1.199	6.06	51.1	4.2
Pipe2STD x 7 ft	87.5	5.9	14.8	Round	0.973	3.60	24.6	3.4
Pipe2STD x 6 ft	75.5	5.9	12.8	Round	0.928	3.10	20.3	3.2
Pipe2STD x 4 ft	51.5	5.9	8.7	Round	0.838	2.12	12.5	2.9
Pipe3STD x 4.5 ft	57.5	7.0	8.2	Round	0.826	2.81	16.4	3.4
HSS3X3X1/4 x 2.25 ft	30.5	6.5	4.7	Flat	1.296	1.39	12.7	5.0

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Ice Wind Load on Antennas TIA-222-G

$q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2\ I$

$F = q_z\ G_h\ C_a\ A_a$

Occupancy:	II		Classification of Structures (Table 2-1)
Exposure:	B		Exposure Category
V_i:	50	mph	Basic Wind Speed (Annex B)
z:	174	ft	Height above ground level to the center of the antenna
I:	1.00		Importance Factor (Table 2-3)
K_z:	1.16		Velocity Pressure Coefficient (2.6.5.2)
K_{zt}:	1.00		Topographic Factor (2.6.6.4)
K_d:	0.95		Wind Direction Probability Factor (Table 2-2)
q_z:	7.04	psf	Velocity Pressure at Height z
G_h:	1.00		Strength Design of Appurtenances and their Connections
K_{iz}:	1.18		Height Escalation Factor for Ice Thickness
t_{iz}:	1.77	in	Factored Thickness of Radial Glaze Ice at Height z

Mount & Antenna Ice Wind Loads

Appurtenance	Height	Depth	h/D	Shape	C_a	A_f	Force	Force
	in	*in*				*sq ft*	*lb*	*plf*
APXVTM14-C-120	59.8	9.8	6.1	Flat	1.359	4.09	39.1	
TD-RRH8x20	29.6	10.2	2.9	Flat	1.218	2.11	18.1	
APXVSPP18-C-A20	75.6	10.6	7.2	Flat	1.405	5.54	54.8	
1900MHz 4x40W RRH	28.6	14.2	2.0	Flat	1.200	2.83	23.9	
800MHz 2x50W RRH	22.5	15.7	1.4	Flat	1.200	2.46	20.8	
Pipe2STD x 12 ft	147.5	5.9	24.9	Round	1.199	6.06	51.1	4.2
Pipe2STD x 7 ft	87.5	5.9	14.8	Round	0.973	3.60	24.6	3.4
Pipe2STD x 6 ft	75.5	5.9	12.8	Round	0.928	3.10	20.3	3.2
Pipe2STD x 4 ft	51.5	5.9	8.7	Round	0.838	2.12	12.5	2.9
Pipe3STD x 4.5 ft	57.5	7.0	8.2	Round	0.826	2.81	16.4	3.4
HSS3X3X1/4 x 2.25 ft	30.5	6.5	4.7	Flat	1.296	1.39	12.7	5.0

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By: RJN
Date: 8/17/17

Ice Load on Antennas TIA-222-G

Ice Weight:	56	pcf	Ice Density
t_i:	0.75		Design Ice Thickness
Occupancy:	II		Classification of Structures (Table 2-1)
Exposure:	B		Exposure Category
V_i:	50	mph	Basic Wind Speed (Annex B)
z:	174	ft	Height above ground level to the center of the antenna
I:	1.00		Importance Factor (Table 2-3)
K_{iz}:	1.18		Height Escalation Factor for Ice Thickness
K_{zt}:	1.00		Topographic Factor (2.6.6.4)
t_{iz}:	1.77	in	Factored Thickness of Radial Glaze Ice at Height z

Platform Grating: None
Ice Load: psf

Mount & Antenna Ice Wind Loads

Appurtenance	Height	Width	Depth	Diam.	Area	Perim.	Ice Weight	
	in	*in*	*in*	*in*	*sq in*	*in*	*lb*	*plf*
APXVTM14-C-120	59.8	16.1	9.8	14.09	88.25	44.89	161.0	
TD-RRH8x20	29.6	22.1	10.2	19.77	119.87	57.69	101.4	
APXVSPP18-C-A20	75.6	15.4	10.6	13.80	86.66	44.88	202.2	
1900MHz 4x40W RRH	28.6	14.6	14.2	15.41	95.61	50.67	77.8	
800MHz 2x50W RRH	22.5	16.5	15.7	17.83	109.07	57.49	67.2	
Pipe2STD x 12 ft	147.5	5.9	5.9	2.38	23.07	13.03	107.7	9.0
Pipe2STD x 7 ft	87.5	5.9	5.9	2.38	23.07	13.03	62.8	9.0
Pipe2STD x 6 ft	75.5	5.9	5.9	2.38	23.07	13.03	53.8	9.0
Pipe2STD x 4 ft	51.5	5.9	5.9	2.38	23.07	13.03	35.9	9.0
Pipe3STD x 4.5 ft	57.5	7.0	7.0	3.50	29.33	16.56	51.3	11.4
HSS3X3X1/4 x 2.25 ft	30.5	6.5	6.5	3.78	30.87	23.55	27.0	12.0

RAMAKER & ASSOCIATES, INC.

September 27, 2017

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**
185-FOOT SELF-SUPPORT TOWER

CARRIER: **SPRINT**

SITE: **TRANSFER STATION (CT33XC522)**
237 GODFREY ROAD
WESTON, FAIRFIELD COUNTY, CONNECTICUT 06883
RAMAKER & ASSOCIATES PROJECT NUMBER: 28737

RESULTS:			
	TOWER:	**98.8%**	**PASS WITH MODIFICATIONS**
	FOUNDATION:	**97.3%**	**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 structure(s) with the proposed loading configurations. 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

STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED
PROFESSIONAL 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	B
Topographic Category	1
Crest Height	N/A

SUPPORTING DOCUMENTATION

- Tower and foundation drawings by Sabre, proposal number 06-8653-MJB-R3, dated June 20, 2006
- Tower member data from Sabre, by email, on September 26, 2017
- Geotechnical report by JGI Eastern, Inc., job number 06113G, dated February 16, 2006
- Structural analysis by CHA, job number 22702-1018-28000-R1, dated July 22, 2011
- Structural analysis by Centek Engineering, job number 14001.010, dated April 09, 2014
- Structural analysis by RAMAKER, job number 28737, dated October 15, 2014
- Structural analysis by Destek Engineering, job number 1675003, dated January 24, 2017
- Construction drawings by RAMAKER, project number 28737
- 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
185	(1) 12' Omni	Leg Mount	(3) 7/8	Municipal	Existing
	(2) 6' Dipole				
	(2) Ericsson AIR 21 B2A B4P	(3) T-Frame	(12) 1-5/8 (1) 1-1/4 Hybrid	T-Mobile	Existing
	(4) Ericsson AIR 21 B2A B2P				
	(3) Ericsson KRY 112 71				
	(3) Commscope LNX-6515DS-A1M				
	(3) Ericsson RRUS-11				
174	(3) RFS APXVSPP18-C	(3) T-Frame	(3) 1-1/4 Hybrid **(1) 1-1/4 Hybrid**	Sprint	Existing
	(3) ALU 1900MHz RRH				
	(3) ALU 800MHz RRH				
	(3) RFS APXV9TM14-ALU-120				**Proposed**
	(3) ALU TD-RRH8x20				
164	(3) Antel BXA-70063-6CF	(3) T-Frame	(18) 1-5/8 (1) 1-5/8 Hybrid	Verizon	Existing
	(4) Decibel DB846F65ZAXY				
	(2) Decibel DB846H80E-SX				
	(6) Kathrein Scala 742 213				
	(3) ALU RRH2x40-AWS				
	(1) RFS DB-T1-6Z-8AB-0Z				
154	(6) Powerwave 7770	(3) T-Frame	(12) 1-5/8 (2) Power (1) Fiber	AT&T	Existing
	(3) Powerwave P65-16-XLH-RR				
	(6) Powerwave LGP214nn				
	(3) Powerwave TT19-08BP111-001				
	(3) Ericsson RRUS-11				
	(1) Raycap DC6-48-60-18-8F				
146	(1) 15' Omni	(2) 6' Standoff	(4) 7/8	Municipal	Existing
	(2) 8' Dipole				
138	(1) 3' Dish w/Radome	(1) 2' Standoff	(1) 1/2	Municipal	Existing

TOWER RESULTS

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

Component Type	Percent Capacity	Pass/Fail
Leg	89.9	Pass
Diagonal	98.8	Pass
Horizontal	23.4	Pass
Secondary Horizontal	46.1	Pass
Redundant Bracing	15.4	Pass
Bolt	86.1	Pass
Anchor Rod	79.9	Pass
RATING	**98.8**	**PASS**

Results of the analysis show that the modified tower will be stressed to a maximum of 98.8 percent of capacity. Therefore, the modified tower will pass the TIA-222-G analysis requirements under proposed loading conditions. The required tower modifications are included in the attachments.

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)
138	Andrew 3' Dish	3.836	0.2864	0.0089

FOUNDATION RESULTS

The maximum foundation stress capacities are as follows:

Component Type	Percent Capacity	Pass/Fail
Soil Interaction	65.6	Pass
Structural	97.3	Pass
RATING	**97.3**	**PASS**

Results of the analysis show that the existing foundation will be stressed to a maximum of 97.3 percent of capacity. Therefore, the existing foundation 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

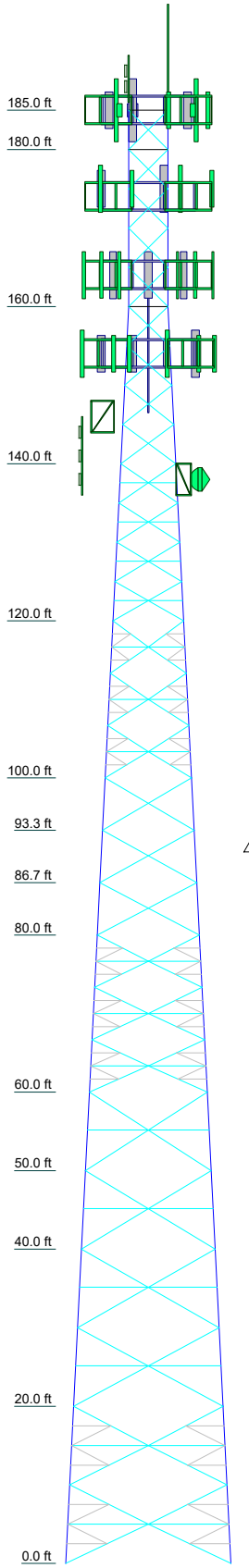
The tower owner is responsible for verifying that the existing loading on the structure is consistent with the loading applied to the structure within this report. If there is any information contrary to that contained herein, or if there are any defects arising from the original design, material, fabrication 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	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P8x.322		P5x.5		P5x.375				P5x.258	P3.5x.318	P2.5x.375	P2.5x.203	A
Leg Grade	A572-50												
Diagonals	L3 1/2x3 1/2x1/4		C	L3x3x1/4	L3x3x3/16	B			L2 1/2x2 1/2x3/16	L2x2x3/16	L2x2x1/8		
Diagonal Grade	A36												
Top Girts					N.A.					L2x2x1/8			
Horizontals	L3 1/2x3 1/2x1/2		N.A.		L3x3x3/8		N.A.		L2 1/2x2 1/2x3/8		N.A.		
Sec. Horizontals	N.A.	L3x3x1/2		L3x3x7/16			N.A.			L2x2x1/4	N.A.		
Red. Horizontals	L3x3x1/2		N.A.		L3x3x1/2		N.A.		L3x3x1/2				
Red. Diagonals	L3x3x1/2		N.A.		L3x3x1/2		N.A.		L3x3x1/2		N.A.		
Face Width (ft)	19		17	16	15	13	12.3333	11.6667	11	9	7		5
# Panels @ (ft)	4 @ 5		4 @ 10		6 @ 3.33333		3 @ 6.66667		6 @ 3.33333		13 @ 5		
Weight (lb) 30434.0	6966.8	4148.8	2354.8	1739.7	5675.4	944.1	669.5	658.8	3928.5	1609.6	936.4	652.3	149.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
6' Dipole (Muncipal)	185	DB846H80E-SX w/Mount Pipe (Verizon)	164
12' Omni (Muncipal)	185	DB846H80E-SX w/Mount Pipe (Verizon)	164
6' Dipole (Muncipal)	185	DB846F65ZAXY w/Mount Pipe (Verizon)	164
(2) AIR 21 B2A B4P w/Mount Pipe (T-Mobile)	185	DB846F65ZAXY w/Mount Pipe (Verizon)	164
(2) AIR 21 B2A B4P w/Mount Pipe (T-Mobile)	185	742 213 w/Mount Pipe (Verizon)	164
(2) AIR 21 B2A B2P w/Mount Pipe (T-Mobile)	185	742 213 w/Mount Pipe (Verizon)	164
KRY 112 71 (T-Mobile)	185	742 213 w/Mount Pipe (Verizon)	164
KRY 112 71 (T-Mobile)	185	742 213 w/Mount Pipe (Verizon)	164
KRY 112 71 (T-Mobile)	185	742 213 w/Mount Pipe (Verizon)	164
LNX-6515DS-A1M w/Mount Pipe (T-Mobile)	185	742 213 w/Mount Pipe (Verizon)	164
LNX-6515DS-A1M w/Mount Pipe (T-Mobile)	185	RRH 2x40 AWS (Verizon)	164
LNX-6515DS-A1M w/Mount Pipe (T-Mobile)	185	RRH 2x40 AWS (Verizon)	164
RRUS-11 (T-Mobile)	185	RRH 2x40 AWS (Verizon)	164
RRUS-11 (T-Mobile)	185	DB-T1-6Z-8AB-0Z (Verizon)	164
RRUS-11 (T-Mobile)	185	Sector Mount [SM 104-1] (Verizon)	164
Sector Mount [SM 403-1] (T-Mobile)	185	Sector Mount [SM 104-1] (Verizon)	164
Sector Mount [SM 403-1] (T-Mobile)	185	Sector Mount [SM 104-1] (Verizon)	164
Sector Mount [SM 403-1] (T-Mobile)	185	7770.00 w/Mount Pipe (ATT)	154
APXVSPP18-C w/Mount Pipe (Sprint)	174	7770.00 w/Mount Pipe (ATT)	154
APXVSPP18-C w/Mount Pipe (Sprint)	174	7770.00 w/Mount Pipe (ATT)	154
APXVSPP18-C w/Mount Pipe (Sprint)	174	7770.00 w/Mount Pipe (ATT)	154
1900MHz 4x40W RRH (Sprint)	174	7770.00 w/Mount Pipe (ATT)	154
1900MHz 4x40W RRH (Sprint)	174	7770.00 w/Mount Pipe (ATT)	154
1900MHz 4x40W RRH (Sprint)	174	P65-16-XLH-RR w/Mount Pipe (ATT)	154
800MHz 2x50W RRH (Sprint)	174	P65-16-XLH-RR w/Mount Pipe (ATT)	154
800MHz 2x50W RRH (Sprint)	174	P65-16-XLH-RR w/Mount Pipe (ATT)	154
800MHz 2x50W RRH (Sprint)	174	(2) LGP214nn (ATT)	154
APXV9TM14-ALU-120 w/Mount Pipe (Sprint)	174	(2) LGP214nn (ATT)	154
APXV9TM14-ALU-120 w/Mount Pipe (Sprint)	174	(2) LGP214nn (ATT)	154
APXV9TM14-ALU-120 w/Mount Pipe (Sprint)	174	TT19-08BP111-001 (ATT)	154
TD-RRH8x20-25 (Sprint)	174	TT19-08BP111-001 (ATT)	154
TD-RRH8x20-25 (Sprint)	174	TT19-08BP111-001 (ATT)	154
TD-RRH8x20-25 (Sprint)	174	RRUS-11 (ATT)	154
Sector Mount [SM 403-1] (Sprint)	174	RRUS-11 (ATT)	154
Sector Mount [SM 403-1] (Sprint)	174	RRUS-11 (ATT)	154
Sector Mount [SM 403-1] (Sprint)	174	DC6-48-60-18-8F (ATT)	154
BXA-70063-6CF-EDIN-X w/Mount Pipe (Verizon)	164	Sector Mount [SM 104-1] (ATT)	154
BXA-70063-6CF-EDIN-X w/Mount Pipe (Verizon)	164	Sector Mount [SM 104-1] (ATT)	154
BXA-70063-6CF-EDIN-X w/Mount Pipe (Verizon)	164	Sector Mount [SM 104-1] (ATT)	154
DB846F65ZAXY w/Mount Pipe (Verizon)	164	15' Omni (Municipal)	146
DB846F65ZAXY w/Mount Pipe (Verizon)	164	8' Dipole (Municipal)	146
		8' Dipole (Municipal)	146
		Side Arm Mount [SO 308-1] (Municipal)	146
		Side Arm Mount [SO 308-1] (Municipal)	146
		2' Standoff (Dish)	138
		Andrew 3' w/Radome (Sprint)	138

ALL REAC
ARE FACT

MAX. COR
DOWN:
SHEAR

UPLIFT
SHEAR

AXIA
18798

SHEAR
16366 lb

TORQUE 2
50 mph WIND - (

AXIA
68998

SHEAR
56818 lb

TORQUE 10
REACTIONS - 97

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P2x.154	C	2L3x3x1/4x3/8
B	2L2 1/2x2 1/2x3/16x3/8		

MATERIAL STRENGTH

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

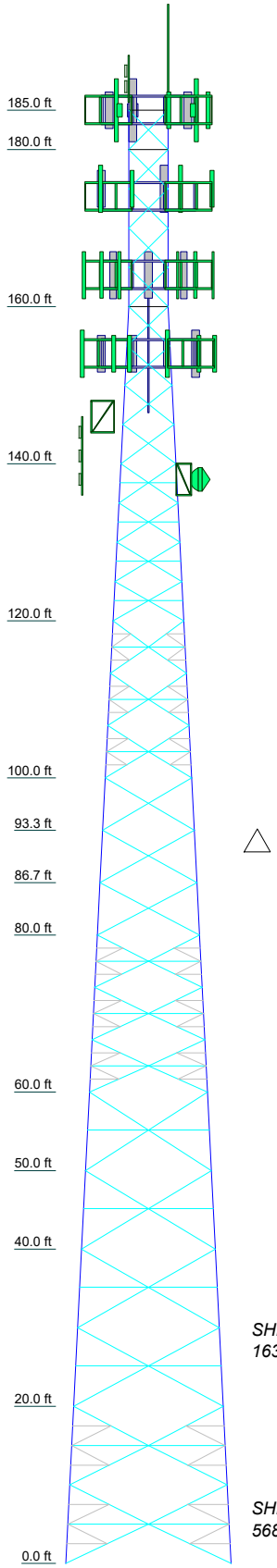
TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 98.8%

Ramaker & Associates, Inc.
855 Community Drive
Sauk City, WI 53583
Phone: (608) 643-4100
FAX: (608) 643-7999

Job: Transfer Station (CT33XC522)			
Project: 28737			
Client: Transcend Wireless / Sprint	Drawn by: TEM	App'd:	
Code: TIA-222-G	Date: 09/26/17	Scale: NTS	
Path: I:\28700\28737\Structural\tnx\28737 rev3.eri		Dwg No. E-1	

Section	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P8x.322		P5x.5		P5x.375				P5x.258	P3.5x.318	P2.5x.375	P2.5x.203	A
Leg Grade	A572-50												
Diagonals	L3 1/2x3 1/2x1/4		C	L3x3x1/4	L3x3x3/16	B		L2 1/2x2 1/2x3/16		L2x2x3/16	L2x2x1/8		
Diagonal Grade	A36												
Top Girts					N.A.					L2x2x1/8			
Horizontals	L3 1/2x3 1/2x1/2		N.A.		L3x3x3/8		N.A.		L2 1/2x2 1/2x3/8		N.A.		
Sec. Horizontals	N.A.	L3x3x1/2		L3x3x7/16			N.A.			L2x2x1/4	N.A.		
Red. Horizontals	L3x3x1/2		N.A.		L3x3x1/2		N.A.		L3x3x1/2		N.A.		
Red. Diagonals	L3x3x1/2		N.A.		L3x3x1/2		N.A.		L3x3x1/2		N.A.		
Face Width (ft)	21	19	17	16	15	13	12.3333	11	9	7	5		
# Panels @ (ft)	4 @ 5		4 @ 10		6 @ 3.33333		3 @ 6.66667		6 @ 3.33333		13 @ 5		
Weight (lb) 30434.0	6966.8	4148.8	2354.8	1739.7	5675.4	944.1	669.5	658.8	3928.5	1609.6	936.4	652.3	149.5



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	P2x.154	C	2L3x3x1/4x3/8
B	2L2 1/2x2 1/2x3/16x3/8		

MATERIAL STRENGTH

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A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 98.8%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 347561 lb
SHEAR: 37351 lb

UPLIFT: -293401 lb
SHEAR: 31868 lb

AXIAL 187984 lb
SHEAR 16366 lb *MOMENT 1833725 lb-ft*
TORQUE 2811 lb-ft
50 mph WIND - 0.7500 in ICE

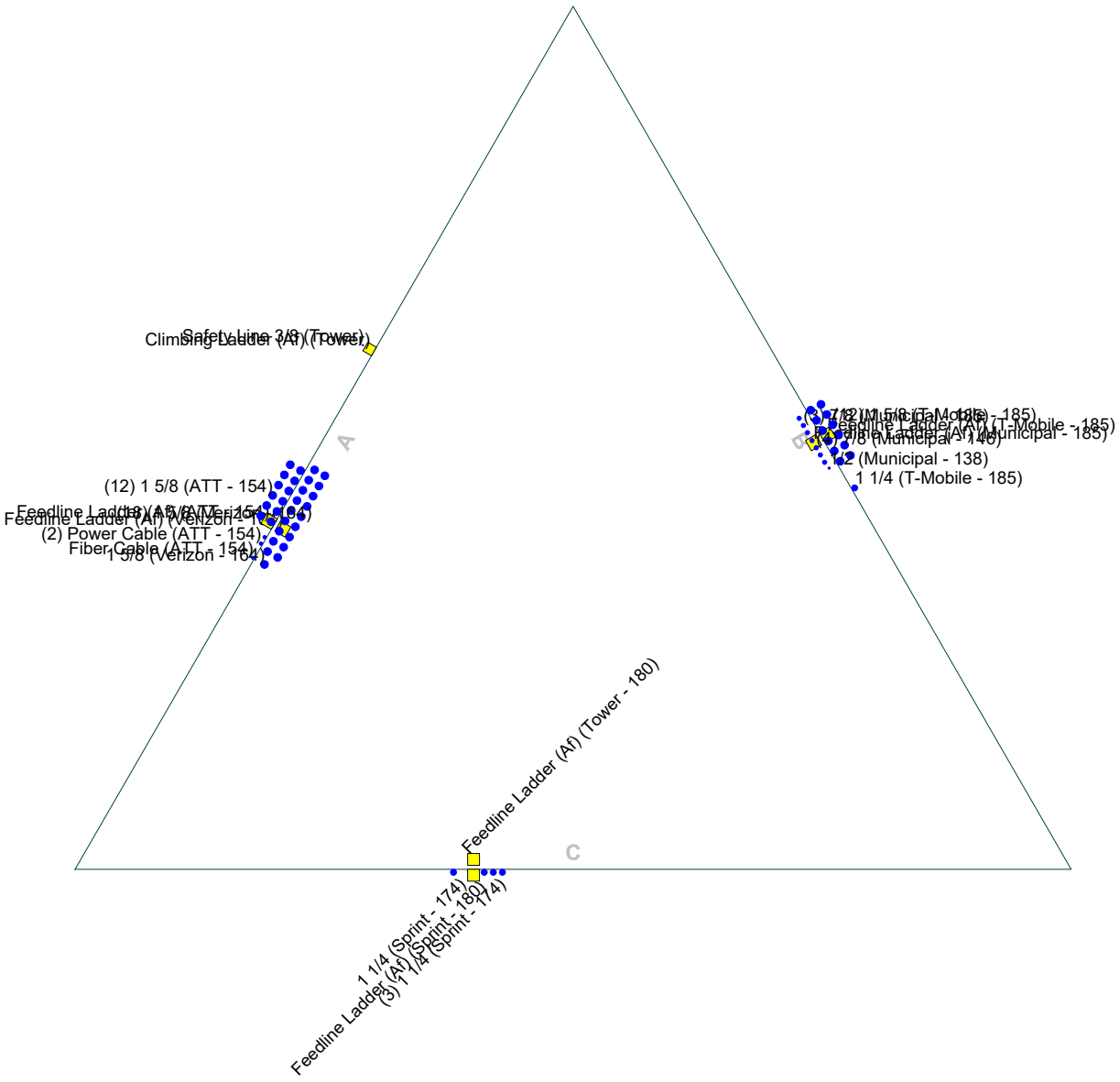
AXIAL 68998 lb
SHEAR 56818 lb *MOMENT 5902702 lb-ft*
TORQUE 10383 lb-ft
REACTIONS - 93 mph WIND

Ramaker & Associates, Inc.
855 Community Drive
Sauk City, WI 53583
Phone: (608) 643-4100
FAX: (608) 643-7999

Job: *Transfer Station (CT33XC522)*			
Project: *28737*			
Client: Transcend Wireless / Sprint	Drawn by: TEM	App'd:	
Code: TIA-222-G	Date: 09/26/17	Scale: NTS	
Path: I:\28700\28737\Structural\tnx\28737 rev3.eri		Dwg No. E-1	

Feed Line Plan

Round Flat App In Face App Out Face

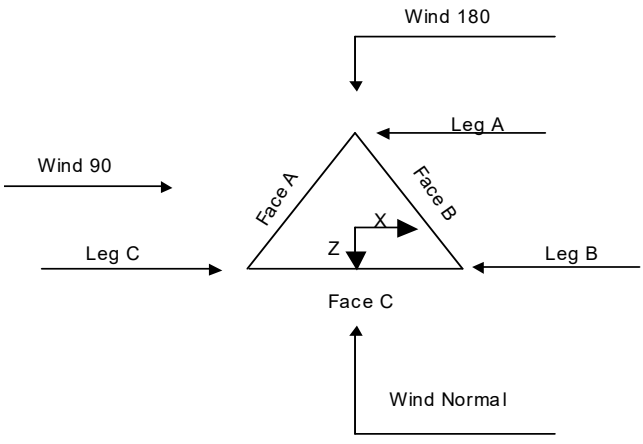


Ramaker & Associates, Inc. 855 Community Drive Sauk City, WI 53583 Phone: (608) 643-4100 FAX: (608) 643-7999	Job: ***Transfer Station (CT33XC522)***	
	Project: ***28737***	
	Client: Transcend Wireless / Sprint	Drawn by: TEM / App'd:
	Code: TIA-222-G	Date: 09/26/17 / Scale: NTS
	Path: I:\28700\28737\Structural\tnx\28737 rev3.eri	Dwg No. E-7

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 185.00 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 5.00 ft at the top and 21.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 93 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	185.00-180.00			5.00	1	5.00
T2	180.00-160.00			5.00	1	20.00
T3	160.00-140.00			5.00	1	20.00
T4	140.00-120.00			7.00	1	20.00
T5	120.00-100.00			9.00	1	20.00
T6	100.00-93.33			11.00	1	6.67
T7	93.33-86.67			11.67	1	6.67
T8	86.67-80.00			12.33	1	6.67
T9	80.00-60.00			13.00	1	20.00
T10	60.00-50.00			15.00	1	10.00
T11	50.00-40.00			16.00	1	10.00
T12	40.00-20.00			17.00	1	20.00
T13	20.00-0.00			19.00	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	185.00-180.00	5.00	X Brace	No	Yes	0.0000	0.0000
T2	180.00-160.00	5.00	X Brace	No	Yes	0.0000	0.0000
T3	160.00-140.00	5.00	X Brace	No	Yes	0.0000	0.0000
T4	140.00-120.00	5.00	X Brace	No	Yes	0.0000	0.0000
T5	120.00-100.00	3.33	Double K1	No	Yes	0.0000	0.0000
T6	100.00-93.33	6.67	X Brace	No	Yes	0.0000	0.0000
T7	93.33-86.67	6.67	X Brace	No	Yes	0.0000	0.0000
T8	86.67-80.00	6.67	X Brace	No	Yes	0.0000	0.0000
T9	80.00-60.00	3.33	Double K1	No	Yes	0.0000	0.0000
T10	60.00-50.00	10.00	X Brace	No	Yes	0.0000	0.0000
T11	50.00-40.00	10.00	X Brace	No	Yes	0.0000	0.0000
T12	40.00-20.00	10.00	X Brace	No	Yes	0.0000	0.0000
T13	20.00-0.00	5.00	Double K1	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 185.00-180.00	Pipe	P2x.154	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T2 180.00-160.00	Pipe	P2.5x.203	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T3 160.00-140.00	Pipe	P2.5x.375	A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T4 140.00-120.00	Pipe	P3.5x.318	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T5 120.00-100.00	Pipe	P5x.258	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 100.00-93.33	Pipe	P5x.375	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 93.33-86.67	Pipe	P5x.375	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T8 86.67-80.00	Pipe	P5x.375	A572-50 (50 ksi)	Double Equal Angle	2L2 1/2x2 1/2x3/16x3/8	A36 (36 ksi)
T9 80.00-60.00	Pipe	P5x.375	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T10 60.00-50.00	Pipe	P5x.5	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T11 50.00-40.00	Pipe	P5x.5	A572-50 (50 ksi)	Double Equal Angle	2L3x3x1/4x3/8	A36 (36 ksi)
T12 40.00-20.00	Pipe	P8x.322	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T13 20.00-0.00	Pipe	P8x.322	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 185.00-180.00	Equal Angle	L2x2x1/8	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T2 180.00-160.00	Equal Angle	L2x2x1/8	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T3 160.00-140.00	Equal Angle	L2x2x1/8	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T5 120.00-100.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A36 (36 ksi)
T9 80.00-60.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L3x3x3/8	A36 (36 ksi)
T13 20.00-0.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/2	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T4 140.00-120.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T10 60.00-50.00	Equal Angle	L3x3x7/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T11 50.00-40.00	Equal Angle	L3x3x7/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T12 40.00-20.00	Equal Angle	L3x3x1/2	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T5 120.00-100.00	A36 (36 ksi)	Horizontal (1)	Equal Angle	L3x3x1/2	1
		Diagonal (1)	Equal Angle	L3x3x1/2	1
T9 80.00-60.00	A36 (36 ksi)	Horizontal (1)	Equal Angle	L3x3x1/2	1
		Diagonal (1)	Equal Angle	L3x3x1/2	1
T13 20.00-0.00	A36 (36 ksi)	Horizontal (1)	Equal Angle	L3x3x1/2	1
		Diagonal (1)	Equal Angle	L3x3x1/2	1

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 185.00-180.00	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 180.00-160.00	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 160.00-140.00	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 140.00-120.00	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 120.00-100.00	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 100.00-93.33	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 93.33-86.67	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 86.67-80.00	0.00	0.3750	A36 (36 ksi)	1	1	1	Third-Pt	36.0000	36.0000
T9 80.00-60.00	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 60.00-50.00	0.00	0.3750	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T11 50.00-40.00	0.00	0.3750	A36 (36 ksi)	1	1	1	Third-Pt	36.0000	36.0000
T12 40.00-20.00	0.00	0.3750	A36	1	1	1	36.0000	36.0000	36.0000

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
T13 20.00-0.00	0.00	0.3750	(36 ksi) A36 (36 ksi)	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 185.00-180.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 180.00-160.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 160.00-140.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 140.00-120.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 100.00-93.33	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 93.33-86.67	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 86.67-80.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 60.00-50.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 50.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T12 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T13 20.00-0.00	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 Net Width Deduct in	U	Diagonal Net Width Deduct in	U	Top Girt Net Width Deduct in	U	Bottom Girt Net Width Deduct in	U	Mid Girt Net Width Deduct in	U	Long Horizontal Net Width Deduct in	U	Short Horizontal Net Width Deduct in	U
T1 185.00-180.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2 180.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

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
T3 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 100.00-93.33	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 93.33-86.67	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 86.67-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 60.00-50.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T11 50.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T12 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T13 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

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 185.00-180.00	Flange	0.7500 A325X	6	0.6250 A325X	1	0.6250 A325X	1	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T2 180.00-160.00	Flange	0.7500 A325X	6	0.6250 A325X	1	0.6250 A325X	1	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.00-140.00	Flange	1.0000 A325X	6	0.6250 A325X	1	0.6250 A325X	1	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T4 140.00-120.00	Flange	1.0000 A325X	6	0.6250 A325X	1	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0	0.7500 A325N	1
T5 120.00-100.00	Flange	1.0000 A325X	6	0.6250 A325X	1	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.7500 A325N	1	0.6250 A325N	0
T6 100.00-93.33	Flange	1.0000 A325X	0	0.6250 A325X	1	0.6250 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T7 93.33-86.67	Flange	1.0000 A325X	0	0.6250 A325X	1	0.6250 A325N	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T8 86.67-80.00	Flange	1.0000 A325X	6	0.6250 A325X	1	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325N	0
T9 80.00-60.00	Flange	1.0000 A325X	6	0.7500 A325X	1	0.7500 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.7500 A325N	1	0.7500 A325N	0
T10 60.00-50.00	Flange	1.2500 A325X	0	0.7500 A325X	1	0.7500 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.7500 A325N	0	0.7500 A325N	1
T11 50.00-40.00	Flange	1.2500 A325X	6	0.7500 A325X	1	0.7500 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.7500 A325N	0	0.7500 A325N	1
T12 40.00-20.00	Flange	1.2500 A325X	6	0.7500 A325X	1	0.7500 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.7500 A325N	0	0.7500 A325N	1
T13 20.00-0.00	Flange	1.5000 A572-50	0	0.7500 A325X	1	0.7500 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.7500 A325N	1	0.7500 A325N	0

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) (Tower)	A	No	Af (CaAa)	185.00 - 0.00	0.0000	0.1	1	1	1.8000	2.5000		7.90
Safety Line 3/8 (Tower)	A	No	Ar (CaAa)	185.00 - 0.00	3.0000	0.1	1	1	0.3750	0.3750		0.22
**********												
Feedline Ladder (Af) (Municipal - 185)	B	No	Af (CaAa)	185.00 - 0.00	-1.0000	0	1	1	3.0000	3.0000		8.40
7/8 (Municipal - 185)	B	No	Ar (CaAa)	185.00 - 0.00	-2.0000	-0.02	3	3	1.0000	1.1100		0.54
**********												
Feedline Ladder (Af) (T-Mobile - 185)	B	No	Af (CaAa)	185.00 - 0.00	0.0000	0	1	1	3.0000	3.0000		8.40
1 5/8 (T-Mobile - 185)	B	No	Ar (CaAa)	185.00 - 0.00	0.0000	0	12	6	1.0000	1.9800		1.04
1 1/4 (T-Mobile - 185)	B	No	Ar (CaAa)	185.00 - 0.00	0.0000	0.06	1	1	1.5500	1.5500		0.66
**********												
Feedline Ladder (Af) (Tower - 180)	C	No	Af (CaAa)	180.00 - 0.00	-1.0000	0.1	1	1	3.0000	3.0000		8.40
**********												
Feedline Ladder (Af) (Sprint - 180)	C	No	Af (CaAa)	180.00 - 0.00	0.0000	0.1	1	1	3.0000	3.0000		8.40
1 1/4 (Sprint - 174)	C	No	Ar (CaAa)	174.00 - 0.00	0.0000	0.08	3	3	0.7500	1.5500		0.66
1 1/4 (Sprint - 174)	C	No	Ar (CaAa)	174.00 - 0.00	0.0000	0.12	1	1	1.5500	1.5500		0.66
**********												
Feedline Ladder (Af) (Verizon - 164)	A	No	Af (CaAa)	164.00 - 0.00	-1.0000	-0.1	1	1	3.0000	3.0000		8.40
1 5/8 (Verizon - 164)	A	No	Ar (CaAa)	164.00 - 0.00	-4.0000	-0.08	18	9	1.0000	1.9800		1.04
1 5/8 (Verizon - 164)	A	No	Ar (CaAa)	164.00 - 0.00	-2.0000	-0.14	1	1	1.9800	1.9800		1.04
**********												
Feedline Ladder (Af) (ATT - 154)	A	No	Af (CaAa)	154.00 - 0.00	0.0000	-0.1	1	1	3.0000	3.0000		8.40
1 5/8 (ATT - 154)	A	No	Ar (CaAa)	154.00 - 0.00	0.0000	-0.07	12	6	1.0000	1.9800		1.04
Power Cable (ATT - 154)	A	No	Ar (CaAa)	154.00 - 0.00	0.0000	-0.12	2	2	1.0000	0.8750		0.60
Fiber Cable (ATT - 154)	A	No	Ar (CaAa)	154.00 - 0.00	0.0000	-0.14	1	1	0.7875	0.7875		0.17
**********												
7/8 (Municipal - 146)	B	No	Ar (CaAa)	146.00 - 0.00	-2.0000	0.01	4	4	1.0000	1.1100		0.54
**********												
1/2 (Municipal - 138)	B	No	Ar (CaAa)	138.00 - 0.00	-2.0000	0.03	1	1	0.5800	0.5800		0.25
**********												

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight plf

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight plf
**********							

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	185.00-180.00	A	0.000	0.000	2.271	0.000	40.60
		B	0.000	0.000	19.320	0.000	157.80
		C	0.000	0.000	0.000	0.000	0.00
T2	180.00-160.00	A	0.000	0.000	26.131	0.000	275.04
		B	0.000	0.000	77.280	0.000	631.20
		C	0.000	0.000	28.680	0.000	372.96
T3	160.00-140.00	A	0.000	0.000	138.140	0.000	1037.10
		B	0.000	0.000	79.944	0.000	644.16
		C	0.000	0.000	32.400	0.000	388.80
T4	140.00-120.00	A	0.000	0.000	156.918	0.000	1170.60
		B	0.000	0.000	87.204	0.000	678.90
		C	0.000	0.000	32.400	0.000	388.80
T5	120.00-100.00	A	0.000	0.000	156.918	0.000	1170.60
		B	0.000	0.000	87.320	0.000	679.40
		C	0.000	0.000	32.400	0.000	388.80
T6	100.00-93.33	A	0.000	0.000	52.306	0.000	390.20
		B	0.000	0.000	29.107	0.000	226.47
		C	0.000	0.000	10.800	0.000	129.60
T7	93.33-86.67	A	0.000	0.000	52.306	0.000	390.20
		B	0.000	0.000	29.107	0.000	226.47
		C	0.000	0.000	10.800	0.000	129.60
T8	86.67-80.00	A	0.000	0.000	52.306	0.000	390.20
		B	0.000	0.000	29.107	0.000	226.47
		C	0.000	0.000	10.800	0.000	129.60
T9	80.00-60.00	A	0.000	0.000	156.918	0.000	1170.60
		B	0.000	0.000	87.320	0.000	679.40
		C	0.000	0.000	32.400	0.000	388.80
T10	60.00-50.00	A	0.000	0.000	78.459	0.000	585.30
		B	0.000	0.000	43.660	0.000	339.70
		C	0.000	0.000	16.200	0.000	194.40
T11	50.00-40.00	A	0.000	0.000	78.459	0.000	585.30
		B	0.000	0.000	43.660	0.000	339.70
		C	0.000	0.000	16.200	0.000	194.40
T12	40.00-20.00	A	0.000	0.000	156.918	0.000	1170.60
		B	0.000	0.000	87.320	0.000	679.40
		C	0.000	0.000	32.400	0.000	388.80
T13	20.00-0.00	A	0.000	0.000	156.918	0.000	1170.60
		B	0.000	0.000	87.320	0.000	679.40
		C	0.000	0.000	32.400	0.000	388.80

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
T1	185.00-180.00	A	1.780	0.000	0.000	5.830	0.000	121.95
		B		0.000	0.000	31.230	0.000	643.61
		C		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T2	180.00-160.00	A	1.767	0.000	0.000	44.120	0.000	972.18
		B		0.000	0.000	124.603	0.000	2560.43
		C		0.000	0.000	60.397	0.000	1194.05
T3	160.00-140.00	A	1.745	0.000	0.000	197.025	0.000	4282.74
		B		0.000	0.000	132.941	0.000	2646.73
		C		0.000	0.000	71.239	0.000	1325.94
T4	140.00-120.00	A	1.720	0.000	0.000	225.855	0.000	4826.54
		B		0.000	0.000	160.143	0.000	2963.94
		C		0.000	0.000	70.774	0.000	1308.40
T5	120.00-100.00	A	1.692	0.000	0.000	224.610	0.000	4769.95
		B		0.000	0.000	159.927	0.000	2934.17
		C		0.000	0.000	70.240	0.000	1288.40
T6	100.00-93.33	A	1.670	0.000	0.000	74.554	0.000	1575.69
		B		0.000	0.000	53.050	0.000	967.97
		C		0.000	0.000	23.278	0.000	424.43
T7	93.33-86.67	A	1.658	0.000	0.000	74.381	0.000	1567.90
		B		0.000	0.000	52.908	0.000	962.48
		C		0.000	0.000	23.203	0.000	421.68
T8	86.67-80.00	A	1.646	0.000	0.000	74.196	0.000	1559.59
		B		0.000	0.000	52.756	0.000	956.62
		C		0.000	0.000	23.124	0.000	418.76
T9	80.00-60.00	A	1.617	0.000	0.000	221.346	0.000	4623.30
		B		0.000	0.000	157.252	0.000	2830.78
		C		0.000	0.000	68.840	0.000	1236.77
T10	60.00-50.00	A	1.579	0.000	0.000	109.832	0.000	2274.38
		B		0.000	0.000	77.937	0.000	1389.15
		C		0.000	0.000	34.059	0.000	605.32
T11	50.00-40.00	A	1.547	0.000	0.000	109.148	0.000	2244.30
		B		0.000	0.000	77.377	0.000	1367.98
		C		0.000	0.000	33.766	0.000	594.80
T12	40.00-20.00	A	1.486	0.000	0.000	215.616	0.000	4372.00
		B		0.000	0.000	152.560	0.000	2654.03
		C		0.000	0.000	66.381	0.000	1148.97
T13	20.00-0.00	A	1.331	0.000	0.000	208.884	0.000	4086.69
		B		0.000	0.000	147.054	0.000	2454.06
		C		0.000	0.000	63.493	0.000	1050.43

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	185.00-180.00	2.4367	-1.8693	1.6105	-1.8668
T2	180.00-160.00	1.0705	-0.5760	0.5346	-0.2669
T3	160.00-140.00	-1.2764	-0.8055	-1.1451	-0.4684
T4	140.00-120.00	-1.8019	-1.1270	-1.4390	-0.7044
T5	120.00-100.00	-2.0796	-1.2909	-1.7049	-0.7902
T6	100.00-93.33	-2.5637	-1.5844	-2.0528	-1.0311
T7	93.33-86.67	-2.7141	-1.6743	-2.1685	-1.0906
T8	86.67-80.00	-2.8635	-1.7635	-2.2834	-1.1498
T9	80.00-60.00	-2.7703	-1.7015	-2.2000	-1.0560
T10	60.00-50.00	-3.4191	-2.0946	-2.7266	-1.3819
T11	50.00-40.00	-3.6283	-2.2196	-2.8915	-1.4697
T12	40.00-20.00	-3.7451	-2.2868	-3.0456	-1.5568
T13	20.00-0.00	-3.8295	-2.3336	-3.0913	-1.6030

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)	180.00 - 185.00	0.6000	0.5100
T1	3	Safety Line 3/8	180.00 - 185.00	0.6000	0.5100
T1	8	Feedline Ladder (Af)	180.00 - 185.00	0.6000	0.5100
T1	9	7/8	180.00 - 185.00	0.6000	0.5100
T1	11	Feedline Ladder (Af)	180.00 - 185.00	0.6000	0.5100
T1	12	1 5/8	180.00 - 185.00	0.6000	0.5100
T1	13	1 1/4	180.00 - 185.00	0.6000	0.5100
T2	2	Climbing Ladder (Af)	160.00 - 180.00	0.6000	0.5623
T2	3	Safety Line 3/8	160.00 - 180.00	0.6000	0.5623
T2	8	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.5623
T2	9	7/8	160.00 - 180.00	0.6000	0.5623
T2	11	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.5623
T2	12	1 5/8	160.00 - 180.00	0.6000	0.5623
T2	13	1 1/4	160.00 - 180.00	0.6000	0.5623
T2	15	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.5623
T2	17	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.5623
T2	18	1 1/4	160.00 - 174.00	0.6000	0.5623
T2	19	1 1/4	160.00 - 174.00	0.6000	0.5623
T2	21	Feedline Ladder (Af)	160.00 - 164.00	0.6000	0.5623
T2	22	1 5/8	160.00 - 164.00	0.6000	0.5623
T2	23	1 5/8	160.00 - 164.00	0.6000	0.5623
T3	2	Climbing Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	3	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T3	8	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	9	7/8	140.00 - 160.00	0.6000	0.6000
T3	11	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	12	1 5/8	140.00 - 160.00	0.6000	0.6000
T3	13	1 1/4	140.00 - 160.00	0.6000	0.6000
T3	15	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	17	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	18	1 1/4	140.00 - 160.00	0.6000	0.6000
T3	19	1 1/4	140.00 - 160.00	0.6000	0.6000
T3	21	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	22	1 5/8	140.00 - 160.00	0.6000	0.6000
T3	23	1 5/8	140.00 - 160.00	0.6000	0.6000
T3	25	Feedline Ladder (Af)	140.00 - 154.00	0.6000	0.6000
T3	26	1 5/8	140.00 - 154.00	0.6000	0.6000
T3	27	Power Cable	140.00 - 154.00	0.6000	0.6000
T3	28	Fiber Cable	140.00 - 154.00	0.6000	0.6000
T3	30	7/8	140.00 - 146.00	0.6000	0.6000
T4	2	Climbing Ladder (Af)	120.00 - 140.00	0.6000	0.5847
T4	3	Safety Line 3/8	120.00 - 140.00	0.6000	0.5847
T4	8	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.5847
T4	9	7/8	120.00 - 140.00	0.6000	0.5847
T4	11	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.5847
T4	12	1 5/8	120.00 - 140.00	0.6000	0.5847
T4	13	1 1/4	120.00 - 140.00	0.6000	0.5847
T4	15	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.5847
T4	17	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.5847
T4	18	1 1/4	120.00 - 140.00	0.6000	0.5847
T4	19	1 1/4	120.00 - 140.00	0.6000	0.5847
T4	21	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.5847
T4	22	1 5/8	120.00 - 140.00	0.6000	0.5847
T4	23	1 5/8	120.00 - 140.00	0.6000	0.5847
T4	25	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.5847

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	26	1 5/8	120.00 - 140.00	0.6000	0.5847
T4	27	Power Cable	120.00 - 140.00	0.6000	0.5847
T4	28	Fiber Cable	120.00 - 140.00	0.6000	0.5847
T4	30	7/8	120.00 - 140.00	0.6000	0.5847
T4	32	1/2	120.00 - 138.00	0.6000	0.5847
T5	2	Climbing Ladder (Af)	100.00 - 120.00	0.6000	0.4900
T5	3	Safety Line 3/8	100.00 - 120.00	0.6000	0.4900
T5	8	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.4900
T5	9	7/8	100.00 - 120.00	0.6000	0.4900
T5	11	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.4900
T5	12	1 5/8	100.00 - 120.00	0.6000	0.4900
T5	13	1 1/4	100.00 - 120.00	0.6000	0.4900
T5	15	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.4900
T5	17	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.4900
T5	18	1 1/4	100.00 - 120.00	0.6000	0.4900
T5	19	1 1/4	100.00 - 120.00	0.6000	0.4900
T5	21	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.4900
T5	22	1 5/8	100.00 - 120.00	0.6000	0.4900
T5	23	1 5/8	100.00 - 120.00	0.6000	0.4900
T5	25	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.4900
T5	26	1 5/8	100.00 - 120.00	0.6000	0.4900
T5	27	Power Cable	100.00 - 120.00	0.6000	0.4900
T5	28	Fiber Cable	100.00 - 120.00	0.6000	0.4900
T5	30	7/8	100.00 - 120.00	0.6000	0.4900
T5	32	1/2	100.00 - 120.00	0.6000	0.4900
T6	2	Climbing Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T6	3	Safety Line 3/8	93.33 - 100.00	0.6000	0.6000
T6	8	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T6	9	7/8	93.33 - 100.00	0.6000	0.6000
T6	11	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T6	12	1 5/8	93.33 - 100.00	0.6000	0.6000
T6	13	1 1/4	93.33 - 100.00	0.6000	0.6000
T6	15	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T6	17	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T6	18	1 1/4	93.33 - 100.00	0.6000	0.6000
T6	19	1 1/4	93.33 - 100.00	0.6000	0.6000
T6	21	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T6	22	1 5/8	93.33 - 100.00	0.6000	0.6000
T6	23	1 5/8	93.33 - 100.00	0.6000	0.6000
T6	25	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T6	26	1 5/8	93.33 - 100.00	0.6000	0.6000
T6	27	Power Cable	93.33 - 100.00	0.6000	0.6000
T6	28	Fiber Cable	93.33 - 100.00	0.6000	0.6000
T6	30	7/8	93.33 - 100.00	0.6000	0.6000
T6	32	1/2	93.33 - 100.00	0.6000	0.6000
T7	2	Climbing Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T7	3	Safety Line 3/8	86.67 - 93.33	0.6000	0.6000
T7	8	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T7	9	7/8	86.67 - 93.33	0.6000	0.6000
T7	11	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T7	12	1 5/8	86.67 - 93.33	0.6000	0.6000
T7	13	1 1/4	86.67 - 93.33	0.6000	0.6000
T7	15	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T7	17	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T7	18	1 1/4	86.67 - 93.33	0.6000	0.6000
T7	19	1 1/4	86.67 - 93.33	0.6000	0.6000
T7	21	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T7	22	1 5/8	86.67 - 93.33	0.6000	0.6000
T7	23	1 5/8	86.67 - 93.33	0.6000	0.6000
T7	25	Feedline Ladder (Af)	86.67 - 93.33	0.6000	0.6000
T7	26	1 5/8	86.67 - 93.33	0.6000	0.6000
T7	27	Power Cable	86.67 - 93.33	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	28	Fiber Cable	86.67 - 93.33	0.6000	0.6000
T7	30	7/8	86.67 - 93.33	0.6000	0.6000
T7	32	1/2	86.67 - 93.33	0.6000	0.6000
T8	2	Climbing Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T8	3	Safety Line 3/8	80.00 - 86.67	0.6000	0.6000
T8	8	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T8	9	7/8	80.00 - 86.67	0.6000	0.6000
T8	11	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T8	12	1 5/8	80.00 - 86.67	0.6000	0.6000
T8	13	1 1/4	80.00 - 86.67	0.6000	0.6000
T8	15	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T8	17	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T8	18	1 1/4	80.00 - 86.67	0.6000	0.6000
T8	19	1 1/4	80.00 - 86.67	0.6000	0.6000
T8	21	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T8	22	1 5/8	80.00 - 86.67	0.6000	0.6000
T8	23	1 5/8	80.00 - 86.67	0.6000	0.6000
T8	25	Feedline Ladder (Af)	80.00 - 86.67	0.6000	0.6000
T8	26	1 5/8	80.00 - 86.67	0.6000	0.6000
T8	27	Power Cable	80.00 - 86.67	0.6000	0.6000
T8	28	Fiber Cable	80.00 - 86.67	0.6000	0.6000
T8	30	7/8	80.00 - 86.67	0.6000	0.6000
T8	32	1/2	80.00 - 86.67	0.6000	0.6000
T9	2	Climbing Ladder (Af)	60.00 - 80.00	0.6000	0.5244
T9	3	Safety Line 3/8	60.00 - 80.00	0.6000	0.5244
T9	8	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5244
T9	9	7/8	60.00 - 80.00	0.6000	0.5244
T9	11	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5244
T9	12	1 5/8	60.00 - 80.00	0.6000	0.5244
T9	13	1 1/4	60.00 - 80.00	0.6000	0.5244
T9	15	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5244
T9	17	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5244
T9	18	1 1/4	60.00 - 80.00	0.6000	0.5244
T9	19	1 1/4	60.00 - 80.00	0.6000	0.5244
T9	21	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5244
T9	22	1 5/8	60.00 - 80.00	0.6000	0.5244
T9	23	1 5/8	60.00 - 80.00	0.6000	0.5244
T9	25	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5244
T9	26	1 5/8	60.00 - 80.00	0.6000	0.5244
T9	27	Power Cable	60.00 - 80.00	0.6000	0.5244
T9	28	Fiber Cable	60.00 - 80.00	0.6000	0.5244
T9	30	7/8	60.00 - 80.00	0.6000	0.5244
T9	32	1/2	60.00 - 80.00	0.6000	0.5244
T10	2	Climbing Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T10	3	Safety Line 3/8	50.00 - 60.00	0.6000	0.6000
T10	8	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T10	9	7/8	50.00 - 60.00	0.6000	0.6000
T10	11	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T10	12	1 5/8	50.00 - 60.00	0.6000	0.6000
T10	13	1 1/4	50.00 - 60.00	0.6000	0.6000
T10	15	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T10	17	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T10	18	1 1/4	50.00 - 60.00	0.6000	0.6000
T10	19	1 1/4	50.00 - 60.00	0.6000	0.6000
T10	21	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T10	22	1 5/8	50.00 - 60.00	0.6000	0.6000
T10	23	1 5/8	50.00 - 60.00	0.6000	0.6000
T10	25	Feedline Ladder (Af)	50.00 - 60.00	0.6000	0.6000
T10	26	1 5/8	50.00 - 60.00	0.6000	0.6000
T10	27	Power Cable	50.00 - 60.00	0.6000	0.6000
T10	28	Fiber Cable	50.00 - 60.00	0.6000	0.6000
T10	30	7/8	50.00 - 60.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	32	1/2	50.00 - 60.00	0.6000	0.6000
T11	2	Climbing Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T11	3	Safety Line 3/8	40.00 - 50.00	0.6000	0.6000
T11	8	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T11	9	7/8	40.00 - 50.00	0.6000	0.6000
T11	11	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T11	12	1 5/8	40.00 - 50.00	0.6000	0.6000
T11	13	1 1/4	40.00 - 50.00	0.6000	0.6000
T11	15	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T11	17	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T11	18	1 1/4	40.00 - 50.00	0.6000	0.6000
T11	19	1 1/4	40.00 - 50.00	0.6000	0.6000
T11	21	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T11	22	1 5/8	40.00 - 50.00	0.6000	0.6000
T11	23	1 5/8	40.00 - 50.00	0.6000	0.6000
T11	25	Feedline Ladder (Af)	40.00 - 50.00	0.6000	0.6000
T11	26	1 5/8	40.00 - 50.00	0.6000	0.6000
T11	27	Power Cable	40.00 - 50.00	0.6000	0.6000
T11	28	Fiber Cable	40.00 - 50.00	0.6000	0.6000
T11	30	7/8	40.00 - 50.00	0.6000	0.6000
T11	32	1/2	40.00 - 50.00	0.6000	0.6000
T12	2	Climbing Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	3	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T12	8	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	9	7/8	20.00 - 40.00	0.6000	0.6000
T12	11	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	12	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	13	1 1/4	20.00 - 40.00	0.6000	0.6000
T12	15	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	17	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	18	1 1/4	20.00 - 40.00	0.6000	0.6000
T12	19	1 1/4	20.00 - 40.00	0.6000	0.6000
T12	21	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	22	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	23	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	25	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	26	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	27	Power Cable	20.00 - 40.00	0.6000	0.6000
T12	28	Fiber Cable	20.00 - 40.00	0.6000	0.6000
T12	30	7/8	20.00 - 40.00	0.6000	0.6000
T12	32	1/2	20.00 - 40.00	0.6000	0.6000
T13	2	Climbing Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	3	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T13	8	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	9	7/8	0.00 - 20.00	0.6000	0.6000
T13	11	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	12	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	13	1 1/4	0.00 - 20.00	0.6000	0.6000
T13	15	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	17	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	18	1 1/4	0.00 - 20.00	0.6000	0.6000
T13	19	1 1/4	0.00 - 20.00	0.6000	0.6000
T13	21	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	22	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	23	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	25	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	26	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	27	Power Cable	0.00 - 20.00	0.6000	0.6000
T13	28	Fiber Cable	0.00 - 20.00	0.6000	0.6000
T13	30	7/8	0.00 - 20.00	0.6000	0.6000
T13	32	1/2	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

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
**********									
6' Dipole	A	From Leg	0.00	0.0000	185.00	No Ice	1.77	1.77	12.00
(Muncipal)			0.00			1/2" Ice	2.13	2.13	25.00
			4.00			1" Ice	2.49	2.49	38.00
12' Omni	B	From Leg	0.00	0.0000	185.00	No Ice	3.30	3.30	35.00
(Muncipal)			0.00			1/2" Ice	4.53	4.53	59.18
			7.50			1" Ice	5.78	5.78	91.13
6' Dipole	C	From Leg	0.00	0.0000	185.00	No Ice	1.77	1.77	12.00
(Muncipal)			0.00			1/2" Ice	2.13	2.13	25.00
			4.00			1" Ice	2.49	2.49	38.00
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**********									
(2) AIR 21 B2A B4P w/Mount Pipe	A	From Leg	3.00	0.0000	185.00	No Ice	6.37	5.74	104.90
(T-Mobile)			0.00			1/2" Ice	6.85	6.59	162.47
			0.00			1" Ice	7.30	7.31	226.82
(2) AIR 21 B2A B4P w/Mount Pipe	B	From Leg	3.00	0.0000	185.00	No Ice	6.37	5.74	104.90
(T-Mobile)			0.00			1/2" Ice	6.85	6.59	162.47
			0.00			1" Ice	7.30	7.31	226.82
(2) AIR 21 B2A B2P w/Mount Pipe	C	From Leg	3.00	0.0000	185.00	No Ice	6.69	5.64	119.15
(T-Mobile)			0.00			1/2" Ice	7.15	6.35	176.73
			0.00			1" Ice	7.63	7.09	241.60
KRY 112 71	A	From Leg	2.00	0.0000	185.00	No Ice	0.58	0.40	13.20
(T-Mobile)			0.00			1/2" Ice	0.69	0.49	18.38
			0.00			1" Ice	0.80	0.59	25.16
KRY 112 71	B	From Leg	2.00	0.0000	185.00	No Ice	0.58	0.40	13.20
(T-Mobile)			0.00			1/2" Ice	0.69	0.49	18.38
			0.00			1" Ice	0.80	0.59	25.16
KRY 112 71	C	From Leg	2.00	0.0000	185.00	No Ice	0.58	0.40	13.20
(T-Mobile)			0.00			1/2" Ice	0.69	0.49	18.38
			0.00			1" Ice	0.80	0.59	25.16
LNX-6515DS-A1M w/Mount Pipe	A	From Leg	3.00	0.0000	185.00	No Ice	11.70	9.85	76.55
(T-Mobile)			-2.00			1/2" Ice	12.42	11.38	166.25
			0.00			1" Ice	13.14	12.92	265.92
LNX-6515DS-A1M w/Mount Pipe	B	From Leg	3.00	0.0000	185.00	No Ice	11.70	9.85	76.55
(T-Mobile)			-2.00			1/2" Ice	12.42	11.38	166.25
			0.00			1" Ice	13.14	12.92	265.92
LNX-6515DS-A1M w/Mount Pipe	C	From Leg	3.00	0.0000	185.00	No Ice	11.70	9.85	76.55
(T-Mobile)			-2.00			1/2" Ice	12.42	11.38	166.25
			0.00			1" Ice	13.14	12.92	265.92
RRUS-11	A	From Leg	2.50	0.0000	185.00	No Ice	2.78	1.19	50.71
(T-Mobile)			-2.00			1/2" Ice	2.99	1.33	71.49
			0.00			1" Ice	3.21	1.49	95.32
RRUS-11	B	From Leg	2.50	0.0000	185.00	No Ice	2.78	1.19	50.71
(T-Mobile)			-2.00			1/2" Ice	2.99	1.33	71.49
			0.00			1" Ice	3.21	1.49	95.32
RRUS-11	C	From Leg	2.50	0.0000	185.00	No Ice	2.78	1.19	50.71
(T-Mobile)			-2.00			1/2" Ice	2.99	1.33	71.49

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
			0.00			1" Ice	3.21	1.49	95.32
Sector Mount [SM 403-1] (T-Mobile)	A	From Leg	3.00 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice 1" Ice	10.22 14.32 18.42	7.05 10.13 13.21	291.16 422.38 553.60
Sector Mount [SM 403-1] (T-Mobile)	B	From Leg	3.00 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice 1" Ice	10.22 14.32 18.42	7.05 10.13 13.21	291.16 422.38 553.60
Sector Mount [SM 403-1] (T-Mobile)	C	From Leg	3.00 0.00 0.00	0.0000	185.00	No Ice 1/2" Ice 1" Ice	10.22 14.32 18.42	7.05 10.13 13.21	291.16 422.38 553.60
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APXVSPP18-C w/Mount Pipe (Sprint)	A	From Leg	3.00 2.00 1.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	8.31 8.87 9.40	6.95 8.13 9.03	82.55 150.82 227.06
APXVSPP18-C w/Mount Pipe (Sprint)	B	From Leg	3.00 2.00 1.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	8.31 8.87 9.40	6.95 8.13 9.03	82.55 150.82 227.06
APXVSPP18-C w/Mount Pipe (Sprint)	C	From Leg	3.00 2.00 1.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	8.31 8.87 9.40	6.95 8.13 9.03	82.55 150.82 227.06
1900MHz 4x40W RRH (Sprint)	A	From Leg	2.00 -2.00 1.00	0.0000	174.00	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 4x40W RRH (Sprint)	B	From Leg	2.00 -2.00 1.00	0.0000	174.00	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 4x40W RRH (Sprint)	C	From Leg	2.00 -2.00 1.00	0.0000	174.00	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 (Sprint)	A	From Leg	2.50 -2.00 1.00	0.0000	174.00	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 (Sprint)	B	From Leg	2.50 -2.00 1.00	0.0000	174.00	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 (Sprint)	C	From Leg	2.50 -2.00 1.00	0.0000	174.00	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
APXV9TM14-ALU-120 w/Mount Pipe (Sprint)	A	From Leg	3.00 -6.00 1.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	6.65 7.14 7.60	5.03 5.89 6.63	77.02 132.43 194.59
APXV9TM14-ALU-120 w/Mount Pipe (Sprint)	B	From Leg	3.00 -6.00 1.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	6.65 7.14 7.60	5.03 5.89 6.63	77.02 132.43 194.59
APXV9TM14-ALU-120 w/Mount Pipe (Sprint)	C	From Leg	3.00 -6.00 1.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	6.65 7.14 7.60	5.03 5.89 6.63	77.02 132.43 194.59
TD-RRH8x20-25 (Sprint)	A	From Leg	2.00 -6.00 1.00	0.0000	174.00	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 (Sprint)	B	From Leg	2.00 -6.00 1.00	0.0000	174.00	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 (Sprint)	C	From Leg	2.00 -6.00 1.00	0.0000	174.00	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

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
Sector Mount [SM 403-1] (Sprint)	A	From Leg	3.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	10.22 14.32 18.42	7.05 10.13 13.21	291.16 422.38 553.60
Sector Mount [SM 403-1] (Sprint)	B	From Leg	3.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	10.22 14.32 18.42	7.05 10.13 13.21	291.16 422.38 553.60
Sector Mount [SM 403-1] (Sprint)	C	From Leg	3.00 0.00 0.00	0.0000	174.00	No Ice 1/2" Ice 1" Ice	10.22 14.32 18.42	7.05 10.13 13.21	291.16 422.38 553.60
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BXA-70063-6CF-EDIN-X w/Mount Pipe (Verizon)	A	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	7.83 8.39 8.91	5.82 6.99 7.87	42.55 103.53 172.25
BXA-70063-6CF-EDIN-X w/Mount Pipe (Verizon)	B	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	7.83 8.39 8.91	5.82 6.99 7.87	42.55 103.53 172.25
BXA-70063-6CF-EDIN-X w/Mount Pipe (Verizon)	C	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	7.83 8.39 8.91	5.82 6.99 7.87	42.55 103.53 172.25
DB846F65ZAXY w/Mount Pipe (Verizon)	A	From Leg	4.00 -4.50 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	7.27 7.83 8.35	7.82 9.01 9.91	46.55 113.93 189.25
DB846F65ZAXY w/Mount Pipe (Verizon)	A	From Leg	4.00 4.50 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	7.27 7.83 8.35	7.82 9.01 9.91	46.55 113.93 189.25
DB846H80E-SX w/Mount Pipe (Verizon)	B	From Leg	4.00 -4.50 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	5.32 5.87 6.39	7.73 8.92 9.82	40.55 98.56 164.31
DB846H80E-SX w/Mount Pipe (Verizon)	B	From Leg	4.00 4.50 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	5.32 5.87 6.39	7.73 8.92 9.82	40.55 98.56 164.31
DB846F65ZAXY w/Mount Pipe (Verizon)	C	From Leg	4.00 -4.50 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	7.27 7.83 8.35	7.82 9.01 9.91	46.55 113.93 189.25
DB846F65ZAXY w/Mount Pipe (Verizon)	C	From Leg	4.00 4.50 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	7.27 7.83 8.35	7.82 9.01 9.91	46.55 113.93 189.25
742 213 w/Mount Pipe (Verizon)	A	From Leg	4.00 -6.00 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	5.31 5.85 6.37	4.65 5.96 6.86	49.85 93.89 145.56
742 213 w/Mount Pipe (Verizon)	A	From Leg	4.00 6.00 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	5.31 5.85 6.37	4.65 5.96 6.86	49.85 93.89 145.56
742 213 w/Mount Pipe (Verizon)	B	From Leg	4.00 -6.00 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	5.31 5.85 6.37	4.65 5.96 6.86	49.85 93.89 145.56
742 213 w/Mount Pipe (Verizon)	B	From Leg	4.00 6.00 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	5.31 5.85 6.37	4.65 5.96 6.86	49.85 93.89 145.56
742 213 w/Mount Pipe (Verizon)	C	From Leg	4.00 -6.00 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	5.31 5.85 6.37	4.65 5.96 6.86	49.85 93.89 145.56
742 213 w/Mount Pipe (Verizon)	C	From Leg	4.00 6.00 0.00	0.0000	164.00	No Ice 1/2" Ice 1" Ice	5.31 5.85 6.37	4.65 5.96 6.86	49.85 93.89 145.56
RRH 2x40 AWS	A	From Leg	3.00	0.0000	164.00	No Ice	2.16	1.42	44.00

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
(Verizon)			-6.00			1/2" Ice	2.36	1.59	61.40
			0.00			1" Ice	2.57	1.77	81.69
RRH 2x40 AWS	B	From Leg	3.00	0.0000	164.00	No Ice	2.16	1.42	44.00
(Verizon)			-6.00			1/2" Ice	2.36	1.59	61.40
			0.00			1" Ice	2.57	1.77	81.69
RRH 2x40 AWS	C	From Leg	3.00	0.0000	164.00	No Ice	2.16	1.42	44.00
(Verizon)			-6.00			1/2" Ice	2.36	1.59	61.40
			0.00			1" Ice	2.57	1.77	81.69
DB-T1-6Z-8AB-0Z	C	From Leg	1.50	0.0000	164.00	No Ice	5.60	2.33	44.00
(Verizon)			0.00			1/2" Ice	5.92	2.56	80.13
			0.00			1" Ice	6.24	2.79	120.22
Sector Mount [SM 104-1]	A	From Leg	3.00	0.0000	164.00	No Ice	16.40	10.28	317.50
(Verizon)			0.00			1/2" Ice	21.70	14.27	468.20
			0.00			1" Ice	27.00	18.26	618.90
Sector Mount [SM 104-1]	B	From Leg	3.00	0.0000	164.00	No Ice	16.40	10.28	317.50
(Verizon)			0.00			1/2" Ice	21.70	14.27	468.20
			0.00			1" Ice	27.00	18.26	618.90
Sector Mount [SM 104-1]	C	From Leg	3.00	0.0000	164.00	No Ice	16.40	10.28	317.50
(Verizon)			0.00			1/2" Ice	21.70	14.27	468.20
			0.00			1" Ice	27.00	18.26	618.90
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7770.00 w/Mount Pipe	A	From Leg	3.00	0.0000	154.00	No Ice	5.66	4.11	30.35
(ATT)			-6.00			1/2" Ice	6.04	4.76	76.38
			0.00			1" Ice	6.44	5.43	128.70
7770.00 w/Mount Pipe	B	From Leg	3.00	0.0000	154.00	No Ice	5.66	4.11	30.35
(ATT)			-6.00			1/2" Ice	6.04	4.76	76.38
			0.00			1" Ice	6.44	5.43	128.70
7770.00 w/Mount Pipe	C	From Leg	3.00	0.0000	154.00	No Ice	5.66	4.11	30.35
(ATT)			-6.00			1/2" Ice	6.04	4.76	76.38
			0.00			1" Ice	6.44	5.43	128.70
7770.00 w/Mount Pipe	A	From Leg	3.00	0.0000	154.00	No Ice	5.66	4.11	30.35
(ATT)			-2.00			1/2" Ice	6.04	4.76	76.38
			0.00			1" Ice	6.44	5.43	128.70
7770.00 w/Mount Pipe	B	From Leg	3.00	0.0000	154.00	No Ice	5.66	4.11	30.35
(ATT)			-2.00			1/2" Ice	6.04	4.76	76.38
			0.00			1" Ice	6.44	5.43	128.70
7770.00 w/Mount Pipe	C	From Leg	3.00	0.0000	154.00	No Ice	5.66	4.11	30.35
(ATT)			-2.00			1/2" Ice	6.04	4.76	76.38
			0.00			1" Ice	6.44	5.43	128.70
P65-16-XLH-RR w/Mount Pipe	A	From Leg	3.00	0.0000	154.00	No Ice	8.13	6.13	85.90
(ATT)			6.00			1/2" Ice	8.59	7.07	149.07
			0.00			1" Ice	9.05	7.90	219.94
P65-16-XLH-RR w/Mount Pipe	B	From Leg	3.00	0.0000	154.00	No Ice	8.13	6.13	85.90
(ATT)			6.00			1/2" Ice	8.59	7.07	149.07
			0.00			1" Ice	9.05	7.90	219.94
P65-16-XLH-RR w/Mount Pipe	C	From Leg	3.00	0.0000	154.00	No Ice	8.13	6.13	85.90
(ATT)			6.00			1/2" Ice	8.59	7.07	149.07
			0.00			1" Ice	9.05	7.90	219.94
(2) LGP214nn	A	From Leg	3.00	0.0000	154.00	No Ice	1.11	0.21	14.10
(ATT)			-6.00			1/2" Ice	1.25	0.28	21.30
			0.00			1" Ice	1.39	0.35	30.39
(2) LGP214nn	B	From Leg	3.00	0.0000	154.00	No Ice	1.11	0.21	14.10
(ATT)			-6.00			1/2" Ice	1.25	0.28	21.30
			0.00			1" Ice	1.39	0.35	30.39
(2) LGP214nn	C	From Leg	3.00	0.0000	154.00	No Ice	1.11	0.21	14.10
(ATT)			-6.00			1/2" Ice	1.25	0.28	21.30

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
			0.00			1" Ice	1.39	0.35	30.39
TT19-08BP111-001	A	From Leg	3.00	0.0000	154.00	No Ice	0.55	0.45	16.00
(ATT)			-2.00			1/2" Ice	0.65	0.53	21.80
			0.00			1" Ice	0.75	0.63	29.22
TT19-08BP111-001	B	From Leg	3.00	0.0000	154.00	No Ice	0.55	0.45	16.00
(ATT)			-2.00			1/2" Ice	0.65	0.53	21.80
			0.00			1" Ice	0.75	0.63	29.22
TT19-08BP111-001	C	From Leg	3.00	0.0000	154.00	No Ice	0.55	0.45	16.00
(ATT)			-2.00			1/2" Ice	0.65	0.53	21.80
			0.00			1" Ice	0.75	0.63	29.22
RRUS-11	A	From Leg	1.00	0.0000	154.00	No Ice	2.78	1.19	50.71
(ATT)			0.00			1/2" Ice	2.99	1.33	71.49
			3.00			1" Ice	3.21	1.49	95.32
RRUS-11	B	From Leg	1.00	0.0000	154.00	No Ice	2.78	1.19	50.71
(ATT)			0.00			1/2" Ice	2.99	1.33	71.49
			3.00			1" Ice	3.21	1.49	95.32
RRUS-11	C	From Leg	1.00	0.0000	154.00	No Ice	2.78	1.19	50.71
(ATT)			0.00			1/2" Ice	2.99	1.33	71.49
			3.00			1" Ice	3.21	1.49	95.32
DC6-48-60-18-8F	C	From Leg	1.00	0.0000	154.00	No Ice	0.92	0.92	32.80
(ATT)			0.00			1/2" Ice	1.46	1.46	50.52
			0.00			1" Ice	1.64	1.64	70.72
Sector Mount [SM 104-1]	A	From Leg	3.00	0.0000	154.00	No Ice	16.40	10.28	317.50
(ATT)			0.00			1/2" Ice	21.70	14.27	468.20
			0.00			1" Ice	27.00	18.26	618.90
Sector Mount [SM 104-1]	B	From Leg	3.00	0.0000	154.00	No Ice	16.40	10.28	317.50
(ATT)			0.00			1/2" Ice	21.70	14.27	468.20
			0.00			1" Ice	27.00	18.26	618.90
Sector Mount [SM 104-1]	C	From Leg	3.00	0.0000	154.00	No Ice	16.40	10.28	317.50
(ATT)			0.00			1/2" Ice	21.70	14.27	468.20
			0.00			1" Ice	27.00	18.26	618.90
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15' Omni	A	From Leg	6.00	0.0000	146.00	No Ice	4.13	4.13	40.00
(Municipal)			0.00			1/2" Ice	5.66	5.66	70.14
			8.00			1" Ice	7.20	7.20	109.87
8' Dipole	A	From Leg	6.00	0.0000	146.00	No Ice	2.80	2.80	45.00
(Municipal)			0.00			1/2" Ice	3.41	3.41	65.06
			-5.00			1" Ice	3.89	3.89	90.52
8' Dipole	C	From Leg	6.00	0.0000	146.00	No Ice	2.80	2.80	45.00
(Municipal)			0.00			1/2" Ice	3.41	3.41	65.06
			-5.00			1" Ice	3.89	3.89	90.52
Side Arm Mount [SO 308-1]	A	From Leg	3.00	0.0000	146.00	No Ice	0.98	3.03	53.00
(Municipal)			0.00			1/2" Ice	1.70	5.22	78.75
			0.00			1" Ice	2.42	7.41	104.50
Side Arm Mount [SO 308-1]	C	From Leg	3.00	0.0000	146.00	No Ice	0.98	3.03	53.00
(Municipal)			0.00			1/2" Ice	1.70	5.22	78.75
			0.00			1" Ice	2.42	7.41	104.50
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2' Standoff	B	From Leg	1.00	0.0000	138.00	No Ice	1.80	1.80	33.00
(Dish)			0.00			1/2" Ice	3.30	3.30	59.00
			0.00			1" Ice	4.80	4.80	85.00
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Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight lb
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Andrew 3' w/Radome (Sprint)	B	Paraboloid w/Radome	From Leg	2.00 0.00 0.00	0.0000		138.00	3.00	No Ice 1/2" Ice 1" Ice	7.07 7.47 7.87	100.00 138.35 176.70
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Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	10198.44					
Bracing Weight	20235.60					
Total Member Self-Weight	30434.04			-9964.80	19662.86	
Total Weight	57498.63			-9964.80	19662.86	
Wind 0 deg - No Ice		25.23	-31111.28	-3250552.60	14772.07	-5219.85
Wind 30 deg - No Ice		14853.63	-25697.40	-2735962.83	-1557639.79	-6129.76
Wind 60 deg - No Ice		26974.54	-15587.21	-1657611.29	-2829964.47	-6002.59
Wind 90 deg - No Ice		33650.75	-36.14	-16360.82	-3475382.33	-4241.52
Wind 120 deg - No Ice		30507.54	17577.51	1784848.15	-3099506.61	-837.98
Wind 150 deg - No Ice		15719.35	27236.60	2825480.73	-1616037.26	2616.40
Wind 180 deg - No Ice		-42.84	29194.43	3080817.56	26984.04	4870.62
Wind 210 deg - No Ice		-14881.82	25681.12	2713787.26	1600855.66	6129.76
Wind 240 deg - No Ice		-28643.39	16530.38	1710479.65	3000240.71	6380.59
Wind 270 deg - No Ice		-33684.83	35.81	-3614.29	3519410.97	4197.10
Wind 300 deg - No Ice		-28893.22	-16645.48	-1733517.30	3015405.62	809.21
Wind 330 deg - No Ice		-15736.68	-27265.95	-2849460.40	1657753.86	-2571.98
Member Ice	45792.11					
Total Weight Ice	176483.82			-46148.48	69984.66	
Wind 0 deg - Ice		-3.53	-15206.29	-1670208.51	70112.69	-2150.14
Wind 30 deg - Ice		7498.36	-12978.37	-1443473.66	-737848.65	-2596.92
Wind 60 deg - Ice		13409.57	-7733.18	-875532.09	-1368561.62	-2449.77
Wind 90 deg - Ice		16076.32	-0.24	-46540.74	-1638646.56	-1600.34
Wind 120 deg - Ice		14102.22	8130.12	810532.78	-1417266.65	-239.56
Wind 150 deg - Ice		7682.13	13285.89	1371197.92	-749851.40	1113.55
Wind 180 deg - Ice		-2.56	14750.28	1543105.75	70696.71	2089.87
Wind 210 deg - Ice		-7508.11	12972.74	1350400.36	879162.63	2596.92
Wind 240 deg - Ice		-13807.53	7955.91	799910.49	1539093.69	2506.51
Wind 270 deg - Ice		-16088.10	0.13	-45771.95	1780241.48	1584.99
Wind 300 deg - Ice		-13732.06	-7916.41	-887461.72	1530617.76	242.95
Wind 330 deg - Ice		-7688.12	-13296.04	-1464894.83	890647.15	-1098.19
Total Weight	57498.63			-9964.80	19662.86	
Wind 0 deg - Service		10.50	-12949.54	-1348988.61	-1584.40	-2172.67
Wind 30 deg - Service		6182.57	-10696.11	-1134799.31	-656074.25	-2551.41
Wind 60 deg - Service		11227.70	-6487.91	-685953.72	-1185657.88	-2498.48
Wind 90 deg - Service		14006.56	-15.04	-2810.97	-1454302.15	-1765.46
Wind 120 deg - Service		12698.25	7316.34	746911.81	-1297850.24	-348.79
Wind 150 deg - Service		6542.92	11336.77	1180057.52	-680381.21	1089.03
Wind 180 deg - Service		-17.83	12151.69	1286337.17	3498.63	2027.31

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 210 deg - Service		-6194.31	10689.33	1133567.01	658596.07	2551.41
Wind 240 deg - Service		-11922.32	6880.49	715957.18	1241066.44	2655.81
Wind 270 deg - Service		-14020.74	14.91	2494.56	1457162.28	1746.97
Wind 300 deg - Service		-12026.31	-6928.40	-717548.31	1247378.58	336.82
Wind 330 deg - Service		-6550.13	-11348.99	-1182040.76	682278.99	-1070.54

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service

Comb. No.	Description
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	185 - 180	Leg	Max Tension	6	1688.83	0.00	-0.00
			Max. Compression	31	-2848.82	-4.74	-5.08
			Max. Mx	10	213.50	29.32	7.43
			Max. My	2	219.11	-10.66	-32.87
			Max. Vy	20	927.45	-0.00	-0.00
			Max. Vx	14	-937.03	0.00	0.00
		Diagonal	Max Tension	25	1342.17	0.00	0.00
			Max. Compression	12	-1559.68	0.00	0.00
			Max. Mx	30	100.53	15.20	-0.17
			Max. My	14	-1262.94	2.27	0.99
			Max. Vy	30	-19.41	15.20	-0.17
			Max. Vx	27	0.32	0.00	0.00
		Top Girt	Max Tension	18	499.07	0.00	0.00
			Max. Compression	7	-358.31	0.00	0.00
			Max. Mx	37	98.41	-37.49	0.00
			Max. My	18	-126.94	0.00	-0.00
			Max. Vy	37	29.99	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
T2	180 - 160	Leg	Max Tension	7	27179.27	-340.41	199.23
			Max. Compression	2	-32295.55	-14.69	343.97
			Max. Mx	20	-26997.01	-556.51	27.07
			Max. My	2	-31563.98	-13.18	-557.56
			Max. Vy	8	-947.18	-404.72	-7.90
			Max. Vx	2	973.26	1.30	428.80
		Diagonal	Max Tension	8	4967.68	0.00	0.00
			Max. Compression	18	-5144.57	0.00	0.00
			Max. Mx	27	1059.03	30.06	0.18
			Max. My	4	-5097.63	-14.31	-3.97
			Max. Vy	27	-23.49	30.06	0.18
			Max. Vx	4	-1.13	0.00	0.00
		Top Girt	Max Tension	6	406.67	0.00	0.00
			Max. Compression	19	-290.03	0.00	0.00
			Max. Mx	37	283.31	-37.19	0.00
			Max. My	18	226.20	0.00	-0.00
			Max. Vy	37	29.75	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
T3	160 - 140	Leg	Max Tension	7	68498.83	-123.58	60.67
			Max. Compression	18	-78888.14	50.55	15.96
			Max. Mx	6	46746.39	405.62	33.90
			Max. My	12	-3652.32	-30.01	354.81
			Max. Vy	6	-675.34	-265.93	-3.94
			Max. Vx	24	678.05	-29.58	319.51
		Diagonal	Max Tension	16	5175.93	0.00	0.00
			Max. Compression	16	-5272.29	0.00	0.00
			Max. Mx	27	1319.93	30.10	2.86
			Max. My	35	6.09	20.53	-4.31
			Max. Vy	27	-26.58	30.10	2.86
			Max. Vx	35	1.80	0.00	0.00
		Top Girt	Max Tension	7	401.92	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	18	-427.02	0.00	0.00
			Max. Mx	26	-24.54	-36.64	0.00
			Max. My	29	-89.60	0.00	1.06
			Max. Vy	26	-29.31	0.00	0.00
			Max. Vx	29	-0.85	0.00	0.00
T4	140 - 120	Leg	Max Tension	7	105414.32	546.01	5.87
			Max. Compression	18	-119664.33	1518.91	1.35
			Max. Mx	18	-119613.67	-2017.78	1.39
			Max. My	20	-6365.15	-155.12	-868.84
			Max. Vy	18	1388.68	1518.94	1.40
			Max. Vx	20	409.41	-155.12	-868.84
		Diagonal	Max Tension	5	5835.35	19.26	1.34
			Max. Compression	16	-6053.98	0.00	0.00
			Max. Mx	27	1152.97	41.93	3.58
			Max. My	18	-5372.21	-10.82	-5.14
			Max. Vy	37	35.52	38.23	-2.92
			Max. Vx	29	1.82	0.00	0.00
		Secondary Horizontal	Max Tension	18	2075.23	0.00	0.00
			Max. Compression	18	-2075.23	4.34	-1.37
			Max. Mx	29	-50.03	32.51	7.36
			Max. My	36	-117.36	32.24	8.10
			Max. Vy	29	-36.69	32.51	7.36
			Max. Vx	27	-2.80	0.00	0.00
T5	120 - 100	Leg	Max Tension	23	136914.83	1412.04	0.66
			Max. Compression	18	-156555.59	2941.82	61.98
			Max. Mx	18	-154281.28	5821.80	-59.00
			Max. My	20	-6820.16	-411.93	-1465.46
			Max. Vy	18	-6508.54	5821.80	-59.00
			Max. Vx	20	1252.85	-411.93	-1465.46
		Diagonal	Max Tension	7	8468.07	35.65	-2.15
			Max. Compression	18	-9430.09	0.00	0.00
			Max. Mx	18	2192.43	100.94	1.82
			Max. My	36	-960.13	5.91	-6.20
			Max. Vy	18	-40.23	100.94	1.82
			Max. Vx	36	-2.68	0.00	0.00
		Horizontal	Max Tension	18	2715.01	0.00	0.00
			Max. Compression	18	-2715.01	20.79	14.41
			Max. Mx	27	-75.92	60.54	36.30
			Max. My	27	86.34	60.39	36.55
			Max. Vy	27	-58.98	60.54	36.30
			Max. Vx	27	-8.38	0.00	0.00
		Redund Horz 1 Bracing	Max Tension	18	6294.35	0.00	0.00
			Max. Compression	7	-5643.10	0.00	0.00
			Max. Mx	26	839.04	-20.88	0.00
			Max. My	29	2004.31	0.00	0.60
			Max. Vy	26	31.32	0.00	0.00
			Max. Vx	29	-0.90	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	7	3458.35	0.00	0.00
			Max. Compression	18	-3974.55	0.00	0.00
			Max. Mx	38	279.19	-26.03	0.00
			Max. My	35	17.70	0.00	0.92
			Max. Vy	38	32.38	0.00	0.00
			Max. Vx	35	-1.14	0.00	0.00
T6	100 - 93.3333	Leg	Max Tension	23	149511.17	511.23	-2.94
			Max. Compression	18	-171097.72	770.89	4.84
			Max. Mx	18	-170871.59	-870.94	-17.88
			Max. My	20	-9299.09	-180.79	-1247.23
			Max. Vy	18	-294.01	770.89	4.84
			Max. Vx	20	-190.19	-180.79	-1247.23
		Diagonal	Max Tension	16	6757.32	0.00	0.00
			Max. Compression	4	-6795.90	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	27	1940.90	77.82	-7.86
			Max. My	35	133.49	64.07	-10.52
			Max. Vy	37	52.93	75.42	9.40
			Max. Vx	35	3.00	0.00	0.00
T7	93.3333 - 86.6667	Leg	Max Tension	23	160479.51	-645.83	3.24
			Max. Compression	18	-183428.74	1457.68	-36.44
			Max. Mx	19	-180157.44	1458.59	-36.57
			Max. My	20	-10023.04	-12.69	-972.49
			Max. Vy	6	167.80	-1396.94	35.88
			Max. Vx	8	-148.59	-7.48	968.79
		Diagonal	Max Tension	16	6721.37	0.00	0.00
			Max. Compression	4	-6949.55	0.00	0.00
			Max. Mx	27	1724.06	80.89	9.11
			Max. My	35	105.70	67.59	-11.32
			Max. Vy	37	55.13	79.51	-10.37
			Max. Vx	35	-3.10	0.00	0.00
T8	86.6667 - 80	Leg	Max Tension	23	171293.01	-1385.38	-5.80
			Max. Compression	18	-195841.04	-1793.00	37.48
			Max. Mx	18	-195841.04	-1793.00	37.48
			Max. My	20	-10442.47	-12.70	-972.49
			Max. Vy	10	536.05	1455.91	6.87
			Max. Vx	8	136.35	-7.50	968.79
		Diagonal	Max Tension	4	7296.79	0.00	0.00
			Max. Compression	4	-7580.82	0.00	0.00
			Max. Mx	27	1958.88	-143.14	13.84
			Max. My	35	101.92	-117.71	18.58
			Max. Vy	37	-88.65	-137.84	-16.33
			Max. Vx	35	-4.87	0.00	0.00
T9	80 - 60	Leg	Max Tension	23	201488.23	916.61	0.21
			Max. Compression	18	-233199.76	1986.40	75.70
			Max. Mx	18	-231399.83	5851.04	-77.14
			Max. My	20	-13723.23	-343.45	-2069.56
			Max. Vy	18	-6069.67	5851.04	-77.14
			Max. Vx	8	-1726.41	-355.02	2059.94
		Diagonal	Max Tension	7	8672.76	25.73	-2.56
			Max. Compression	18	-9881.02	0.00	0.00
			Max. Mx	18	3872.47	123.82	2.68
			Max. My	29	-1884.45	18.15	-10.09
			Max. Vy	35	-47.75	75.16	7.94
			Max. Vx	28	-3.46	0.00	0.00
		Horizontal	Max Tension	18	4044.18	0.00	0.00
			Max. Compression	18	-4044.18	49.58	25.58
			Max. Mx	31	-149.58	129.25	61.87
			Max. My	27	151.67	121.02	65.40
			Max. Vy	27	-90.53	121.17	65.11
			Max. Vx	27	-11.19	0.00	0.00
		Redund Horz 1 Bracing	Max Tension	18	5840.87	0.00	0.00
			Max. Compression	7	-5235.94	0.00	0.00
			Max. Mx	37	1514.80	-38.31	0.00
			Max. My	36	2374.35	0.00	1.11
			Max. Vy	37	41.79	0.00	0.00
			Max. Vx	36	-1.21	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	7	2934.14	0.00	0.00
			Max. Compression	18	-3445.90	0.00	0.00
			Max. Mx	38	254.27	-43.90	0.00
			Max. My	35	34.77	0.00	1.42
			Max. Vy	38	42.79	0.00	0.00
			Max. Vx	35	-1.38	0.00	0.00
T10	60 - 50	Leg	Max Tension	23	214462.03	1157.80	-5.31
			Max. Compression	18	-248555.61	-1949.65	-26.21
			Max. Mx	18	-248341.05	3169.89	11.50

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	20	-14837.49	-274.50	-2482.63
			Max. Vy	18	-1072.61	3169.79	11.32
			Max. Vx	20	640.25	-274.50	-2482.63
		Diagonal	Max Tension	5	8924.50	77.08	4.31
			Max. Compression	16	-9491.07	0.00	0.00
			Max. Mx	37	1553.87	173.02	-9.81
			Max. My	18	-9398.23	3.20	-21.03
			Max. Vy	37	86.64	173.02	-9.81
			Max. Vx	28	4.16	0.00	0.00
		Secondary Horizontal	Max Tension	18	4310.48	0.00	0.00
			Max. Compression	18	-4310.48	56.41	2.81
			Max. Mx	34	-90.66	168.90	38.98
			Max. My	36	-104.01	168.71	39.65
			Max. Vy	34	-103.65	168.90	38.98
			Max. Vx	38	-7.59	0.00	0.00
T11	50 - 40	Leg	Max Tension	23	229950.03	1400.37	-0.37
			Max. Compression	18	-267241.85	-3215.47	26.12
			Max. Mx	18	-267027.70	3645.69	-3.12
			Max. My	20	-15706.95	-274.52	-2482.62
			Max. Vy	18	1360.82	3645.69	-3.12
			Max. Vx	20	-698.85	-274.52	-2482.62
		Diagonal	Max Tension	5	9292.66	-167.66	7.57
			Max. Compression	4	-10003.93	0.00	0.00
			Max. Mx	27	2471.97	-290.96	44.60
			Max. My	36	2724.64	-284.23	46.13
			Max. Vy	37	-141.78	-280.30	-38.55
			Max. Vx	36	-8.53	0.00	0.00
		Secondary Horizontal	Max Tension	18	4634.54	0.00	0.00
			Max. Compression	18	-4634.54	82.62	-18.49
			Max. Mx	36	858.61	169.09	10.47
			Max. My	20	-1594.62	78.35	30.51
			Max. Vy	36	106.48	169.09	10.47
			Max. Vx	38	-5.20	0.00	0.00
T12	40 - 20	Leg	Max Tension	23	258493.15	3249.99	5.84
			Max. Compression	18	-301887.24	7949.47	7.36
			Max. Mx	18	-301659.41	7949.54	7.48
			Max. My	20	-17564.77	-601.86	-3660.21
			Max. Vy	18	3091.97	7949.54	7.48
			Max. Vx	20	822.47	-601.86	-3660.21
		Diagonal	Max Tension	5	10417.51	115.71	-4.71
			Max. Compression	18	-11453.08	0.00	0.00
			Max. Mx	27	1566.71	245.45	-24.16
			Max. My	28	855.30	226.87	26.56
			Max. Vy	37	109.04	224.31	22.39
			Max. Vx	36	-5.33	0.00	0.00
		Secondary Horizontal	Max Tension	18	5235.37	0.00	0.00
			Max. Compression	18	-5235.37	114.46	4.46
			Max. Mx	34	40.42	227.29	36.34
			Max. My	36	-370.50	225.01	39.51
			Max. Vy	35	122.41	207.99	33.60
			Max. Vx	38	-7.32	0.00	0.00
T13	20 - 0	Leg	Max Tension	23	285152.43	1459.40	2.66
			Max. Compression	18	-337052.77	5406.85	147.43
			Max. Mx	18	-317327.67	12450.87	-106.56
			Max. My	20	-20400.49	-1326.08	-5036.04
			Max. Vy	18	-9528.69	12090.26	-114.53
			Max. Vx	20	2389.57	-1326.08	-5036.04
		Diagonal	Max Tension	7	11518.53	71.32	-5.09
			Max. Compression	18	-13341.06	0.00	0.00
			Max. Mx	18	4161.74	188.54	8.20
			Max. My	34	-5713.15	29.27	-18.70

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	35	-68.26	142.46	15.42
			Max. Vx	34	-4.74	0.00	0.00
		Horizontal	Max Tension	18	5845.21	0.00	0.00
			Max. Compression	18	-5845.21	191.02	70.22
			Max. Mx	27	-592.68	342.76	133.97
			Max. My	27	307.05	342.70	134.11
			Max. Vy	27	-149.60	342.76	133.97
			Max. Vx	27	-17.09	0.00	0.00
		Redund Horz 1 Bracing	Max Tension	18	8655.74	0.00	0.00
			Max. Compression	7	-7354.63	0.00	0.00
			Max. Mx	32	2527.17	-66.60	0.00
			Max. My	27	2893.17	0.00	1.92
			Max. Vy	32	51.98	0.00	0.00
			Max. Vx	27	-1.50	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	7	4142.50	0.00	0.00
			Max. Compression	18	-5133.24	0.00	0.00
			Max. Mx	38	673.78	-77.44	0.00
			Max. My	35	111.16	0.00	2.50
			Max. Vy	38	53.27	0.00	0.00
			Max. Vx	35	-1.72	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	347561.47	32194.28	-18936.92
	Max. H_x	18	347561.47	32194.28	-18936.92
	Max. H_z	7	-292030.36	-27453.56	16142.73
	Min. Vert	7	-292030.36	-27453.56	16142.73
	Min. H_x	7	-292030.36	-27453.56	16142.73
	Min. H_z	18	347561.47	32194.28	-18936.92
Leg B	Max. Vert	10	344328.24	-32225.17	-18646.68
	Max. H_x	23	-293400.85	27579.14	15968.24
	Max. H_z	23	-293400.85	27579.14	15968.24
	Min. Vert	23	-293400.85	27579.14	15968.24
	Min. H_x	10	344328.24	-32225.17	-18646.68
	Min. H_z	10	344328.24	-32225.17	-18646.68
Leg A	Max. Vert	2	346618.74	-253.17	37286.31
	Max. H_x	21	17184.85	2613.33	1573.79
	Max. H_z	2	346618.74	-253.17	37286.31
	Min. Vert	15	-291330.44	199.52	-31788.41
	Min. H_x	9	18315.48	-2656.51	1656.16
	Min. H_z	15	-291330.44	199.52	-31788.41

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	57498.63	0.00	-0.00	-9969.18	19670.08	0.08
1.2 Dead+1.6 Wind 0 deg - No Ice	68998.36	40.37	-56731.25	-5885512.91	15869.28	-8533.08
0.9 Dead+1.6 Wind 0 deg - No Ice	51748.77	40.37	-56731.25	-5870841.24	9922.54	-8489.78

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.6 Wind 30 deg - No Ice	68998.36	26934.34	-46603.91	-4890402.17	-2798303.77	-9993.14
0.9 Dead+1.6 Wind 30 deg - No Ice	51748.77	26934.34	-46603.90	-4877636.61	-2798634.31	-9943.34
1.2 Dead+1.6 Wind 60 deg - No Ice	68998.36	46540.20	-26891.52	-2838480.73	-4864900.05	-9772.68
0.9 Dead+1.6 Wind 60 deg - No Ice	51748.77	46540.20	-26891.51	-2829794.05	-4861096.58	-9729.82
1.2 Dead+1.6 Wind 90 deg - No Ice	68998.36	53841.22	-57.82	-22445.63	-5612612.76	-6893.55
0.9 Dead+1.6 Wind 90 deg - No Ice	51748.77	53841.22	-57.82	-19384.77	-5607335.41	-6868.96
1.2 Dead+1.6 Wind 120 deg - No Ice	68998.36	49145.44	28316.49	2915844.57	-5064440.90	-1340.17
0.9 Dead+1.6 Wind 120 deg - No Ice	51748.77	49145.44	28316.49	2913077.24	-5060327.00	-1340.75
1.2 Dead+1.6 Wind 150 deg - No Ice	68998.36	26870.53	46556.94	4857469.58	-2785447.22	4298.05
0.9 Dead+1.6 Wind 150 deg - No Ice	51748.77	26870.53	46556.93	4850785.77	-2785820.63	4272.54
1.2 Dead+1.6 Wind 180 deg - No Ice	68998.36	-68.55	53664.29	5620227.27	35632.16	7966.12
0.9 Dead+1.6 Wind 180 deg - No Ice	51748.77	-68.55	53664.29	5612001.08	29630.91	7924.83
1.2 Dead+1.6 Wind 210 deg - No Ice	68998.36	-26979.46	46577.86	4862648.18	2852154.53	9992.24
0.9 Dead+1.6 Wind 210 deg - No Ice	51748.77	-26979.46	46577.86	4855946.58	2840534.84	9942.49
1.2 Dead+1.6 Wind 240 deg - No Ice	68998.36	-49210.36	28400.58	2931494.03	5123303.44	10382.93
0.9 Dead+1.6 Wind 240 deg - No Ice	51748.77	-49210.36	28400.58	2928681.47	5107218.91	10338.50
1.2 Dead+1.6 Wind 270 deg - No Ice	68998.36	-53895.75	57.30	-1825.65	5667709.17	6824.91
0.9 Dead+1.6 Wind 270 deg - No Ice	51748.77	-53895.74	57.30	1177.37	5650476.57	6800.31
1.2 Dead+1.6 Wind 300 deg - No Ice	68998.36	-46562.52	-26825.24	-2825247.09	4913231.37	1297.18
0.9 Dead+1.6 Wind 300 deg - No Ice	51748.77	-46562.52	-26825.24	-2816603.84	4897492.36	1296.95
1.2 Dead+1.6 Wind 330 deg - No Ice	68998.36	-26898.25	-46603.90	-4888073.05	2836853.86	-4228.45
0.9 Dead+1.6 Wind 330 deg - No Ice	51748.77	-26898.25	-46603.89	-4875320.59	2825274.92	-4202.88
1.2 Dead+1.0 Ice+1.0 Temp	187983.55	0.00	0.00	-49263.73	75430.71	1.03
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	187983.54	-3.53	-16348.27	-1821880.59	75660.03	-2325.50
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	187983.54	8030.51	-13900.07	-1562960.39	-799468.53	-2811.25
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	187983.54	13791.22	-7953.52	-919321.35	-1433337.35	-2647.07
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	187983.54	16076.30	-0.25	-49771.26	-1675977.81	-1728.38
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	187983.54	14178.44	8174.13	836585.88	-1462483.58	-264.98
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	187983.54	8037.94	13902.18	1464181.64	-799849.57	1198.30
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	187983.54	-2.56	15902.62	1689300.40	76297.53	2261.93
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	187983.54	-8040.25	13894.45	1463472.59	951940.12	2811.11
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	187983.54	-14180.21	8171.08	836822.44	1614212.11	2706.98
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	187983.54	-16088.08	0.12	-48943.87	1828732.17	1712.86
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	187983.54	-13808.29	-7960.42	-919622.54	1586456.02	268.11
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	187983.54	-8043.93	-13912.32	-1564302.84	951789.83	-1182.76
Dead+Wind 0 deg - Service	57498.63	10.50	-14758.38	-1536037.72	17724.76	-2212.62
Dead+Wind 30 deg - Service	57498.63	7006.85	-12123.80	-1277476.65	-713417.11	-2594.94
Dead+Wind 60 deg - Service	57498.63	12107.23	-6995.71	-744367.06	-1250369.64	-2534.22
Dead+Wind 90 deg - Service	57498.63	14006.56	-15.04	-12709.05	-1444611.30	-1786.66
Dead+Wind 120 deg - Service	57498.63	12784.97	7366.41	750682.44	-1302206.87	-348.82
Dead+Wind 150 deg - Service	57498.63	6990.25	12111.58	1255116.00	-710096.09	1110.33
Dead+Wind 180 deg - Service	57498.63	-17.83	13960.53	1453316.69	22853.52	2065.39
Dead+Wind 210 deg - Service	57498.63	-7018.59	12117.03	1256464.71	754625.76	2594.86
Dead+Wind 240 deg - Service	57498.63	-12801.86	7388.29	754752.69	1344706.40	2694.78
Dead+Wind 270 deg - Service	57498.63	-14020.74	14.91	-7351.64	1486146.98	1768.00
Dead+Wind 300 deg - Service	57498.63	-12113.04	-6978.47	-740933.95	1290133.56	338.57
Dead+Wind 330 deg - Service	57498.63	-6997.46	-12123.80	-1276890.50	750642.04	-1093.19

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.00	-57498.63	0.00	-0.00	57498.63	0.00	0.000%
2	40.37	-68998.36	-56731.23	-40.37	68998.36	56731.25	0.000%
3	40.37	-51748.77	-56731.23	-40.37	51748.77	56731.25	0.000%
4	26934.34	-68998.36	-46603.89	-26934.34	68998.36	46603.91	0.000%
5	26934.34	-51748.77	-46603.89	-26934.34	51748.77	46603.90	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
6	46540.19	-68998.36	-26891.50	-46540.20	68998.36	26891.52	0.000%
7	46540.19	-51748.77	-26891.50	-46540.20	51748.77	26891.51	0.000%
8	53841.20	-68998.36	-57.83	-53841.22	68998.36	57.82	0.000%
9	53841.20	-51748.77	-57.83	-53841.22	51748.77	57.82	0.000%
10	49145.42	-68998.36	28316.48	-49145.44	68998.36	-28316.49	0.000%
11	49145.42	-51748.77	28316.48	-49145.44	51748.77	-28316.49	0.000%
12	26870.52	-68998.36	46556.92	-26870.53	68998.36	-46556.94	0.000%
13	26870.52	-51748.77	46556.92	-26870.53	51748.77	-46556.93	0.000%
14	-68.55	-68998.36	53664.27	68.55	68998.36	-53664.29	0.000%
15	-68.55	-51748.77	53664.27	68.55	51748.77	-53664.29	0.000%
16	-26979.44	-68998.36	46577.85	26979.46	68998.36	-46577.86	0.000%
17	-26979.44	-51748.77	46577.85	26979.46	51748.77	-46577.86	0.000%
18	-49210.34	-68998.36	28400.58	49210.36	68998.36	-28400.58	0.000%
19	-49210.34	-51748.77	28400.58	49210.36	51748.77	-28400.58	0.000%
20	-53895.73	-68998.36	57.30	53895.75	68998.36	-57.30	0.000%
21	-53895.73	-51748.77	57.30	53895.74	51748.77	-57.30	0.000%
22	-46562.51	-68998.36	-26825.23	46562.52	68998.36	26825.24	0.000%
23	-46562.51	-51748.77	-26825.23	46562.52	51748.77	26825.24	0.000%
24	-26898.24	-68998.36	-46603.88	26898.25	68998.36	46603.90	0.000%
25	-26898.24	-51748.77	-46603.88	26898.25	51748.77	46603.89	0.000%
26	0.00	-187983.55	0.00	-0.00	187983.55	-0.00	0.000%
27	-3.53	-187983.55	-16348.29	3.53	187983.54	16348.27	0.000%
28	8030.52	-187983.55	-13900.09	-8030.51	187983.54	13900.07	0.000%
29	13791.23	-187983.55	-7953.53	-13791.22	187983.54	7953.52	0.000%
30	16076.32	-187983.55	-0.24	-16076.30	187983.54	0.25	0.000%
31	14178.46	-187983.55	8174.14	-14178.44	187983.54	-8174.13	0.000%
32	8037.95	-187983.55	13902.19	-8037.94	187983.54	-13902.18	0.000%
33	-2.56	-187983.55	15902.63	2.56	187983.54	-15902.62	0.000%
34	-8040.26	-187983.55	13894.46	8040.25	187983.54	-13894.45	0.000%
35	-14180.23	-187983.55	8171.09	14180.21	187983.54	-8171.08	0.000%
36	-16088.10	-187983.55	0.13	16088.08	187983.54	-0.12	0.000%
37	-13808.30	-187983.55	-7960.43	13808.29	187983.54	7960.42	0.000%
38	-8043.94	-187983.55	-13912.34	8043.93	187983.54	13912.32	0.000%
39	10.50	-57498.63	-14758.38	-10.50	57498.63	14758.38	0.000%
40	7006.85	-57498.63	-12123.80	-7006.85	57498.63	12123.80	0.000%
41	12107.23	-57498.63	-6995.71	-12107.23	57498.63	6995.71	0.000%
42	14006.56	-57498.63	-15.04	-14006.56	57498.63	15.04	0.000%
43	12784.97	-57498.63	7366.41	-12784.97	57498.63	-7366.41	0.000%
44	6990.25	-57498.63	12111.58	-6990.25	57498.63	-12111.58	0.000%
45	-17.83	-57498.63	13960.53	17.83	57498.63	-13960.53	0.000%
46	-7018.59	-57498.63	12117.03	7018.59	57498.63	-12117.03	0.000%
47	-12801.86	-57498.63	7388.29	12801.86	57498.63	-7388.29	0.000%
48	-14020.74	-57498.63	14.91	14020.74	57498.63	-14.91	0.000%
49	-12113.04	-57498.63	-6978.47	12113.04	57498.63	6978.47	0.000%
50	-6997.46	-57498.63	-12123.80	6997.46	57498.63	12123.80	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000111
3	Yes	4	0.00000001	0.00000050
4	Yes	4	0.00000001	0.00000138
5	Yes	4	0.00000001	0.00000079
6	Yes	4	0.00000001	0.00000150

7	Yes	4	0.00000001	0.00000083
8	Yes	4	0.00000001	0.00000151
9	Yes	4	0.00000001	0.00000093
10	Yes	4	0.00000001	0.00000110
11	Yes	4	0.00000001	0.00000047
12	Yes	4	0.00000001	0.00000147
13	Yes	4	0.00000001	0.00000087
14	Yes	4	0.00000001	0.00000149
15	Yes	4	0.00000001	0.00000080
16	Yes	4	0.00000001	0.00000138
17	Yes	4	0.00000001	0.00000079
18	Yes	4	0.00000001	0.00000112
19	Yes	4	0.00000001	0.00000052
20	Yes	4	0.00000001	0.00000151
21	Yes	4	0.00000001	0.00000093
22	Yes	4	0.00000001	0.00000148
23	Yes	4	0.00000001	0.00000082
24	Yes	4	0.00000001	0.00000146
25	Yes	4	0.00000001	0.00000087
26	Yes	4	0.00000001	0.00000331
27	Yes	4	0.00000001	0.00004629
28	Yes	4	0.00000001	0.00004590
29	Yes	4	0.00000001	0.00004565
30	Yes	4	0.00000001	0.00004504
31	Yes	4	0.00000001	0.00004480
32	Yes	4	0.00000001	0.00004474
33	Yes	4	0.00000001	0.00004523
34	Yes	4	0.00000001	0.00004552
35	Yes	4	0.00000001	0.00004604
36	Yes	4	0.00000001	0.00004635
37	Yes	4	0.00000001	0.00004667
38	Yes	4	0.00000001	0.00004646
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	185 - 180	7.326	47	0.3819	0.0106
T2	180 - 160	6.923	47	0.3804	0.0107
T3	160 - 140	5.350	47	0.3462	0.0112
T4	140 - 120	3.962	47	0.2921	0.0092
T5	120 - 100	2.821	47	0.2345	0.0066
T6	100 - 93.3333	1.919	47	0.1803	0.0050
T7	93.3333 - 86.6667	1.664	47	0.1669	0.0044
T8	86.6667 - 80	1.428	47	0.1533	0.0039
T9	80 - 60	1.217	47	0.1393	0.0036
T10	60 - 50	0.684	47	0.0973	0.0023

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T11	50 - 40	0.481	47	0.0807	0.0018
T12	40 - 20	0.324	47	0.0638	0.0015
T13	20 - 0	0.095	47	0.0319	0.0007

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	6' Dipole	47	7.326	0.3819	0.0106	297187
174.00	APXVSPP18-C w/Mount Pipe	47	6.441	0.3744	0.0109	69374
164.00	BXA-70063-6CF-EDIN-X w/Mount Pipe	47	5.655	0.3557	0.0112	28096
154.00	7770.00 w/Mount Pipe	47	4.910	0.3309	0.0108	21299
146.00	15' Omni	47	4.353	0.3091	0.0100	19706
138.00	Andrew 3' w/Radome	47	3.836	0.2864	0.0089	18744

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	185 - 180	28.090	18	1.4668	0.0408
T2	180 - 160	26.544	18	1.4608	0.0413
T3	160 - 140	20.507	18	1.3280	0.0431
T4	140 - 120	15.182	18	1.1199	0.0354
T5	120 - 100	10.808	18	0.8985	0.0255
T6	100 - 93.3333	7.352	18	0.6907	0.0193
T7	93.3333 - 86.6667	6.377	18	0.6393	0.0171
T8	86.6667 - 80	5.472	18	0.5872	0.0149
T9	80 - 60	4.662	18	0.5334	0.0138
T10	60 - 50	2.622	18	0.3725	0.0089
T11	50 - 40	1.845	18	0.3089	0.0069
T12	40 - 20	1.240	18	0.2441	0.0060
T13	20 - 0	0.366	18	0.1220	0.0028

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	6' Dipole	18	28.090	1.4668	0.0408	80514
174.00	APXVSPP18-C w/Mount Pipe	18	24.694	1.4377	0.0422	18180
164.00	BXA-70063-6CF-EDIN-X w/Mount Pipe	18	21.675	1.3648	0.0433	7322
154.00	7770.00 w/Mount Pipe	18	18.816	1.2688	0.0418	5548
146.00	15' Omni	18	16.683	1.1849	0.0384	5129
138.00	Andrew 3' w/Radome	18	14.701	1.0981	0.0343	4890

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	185	Leg	A325X	0.7500	6	281.47	29820.60	0.009 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	1342.17	6009.38	0.223 ✔	1	Member Block Shear
		Top Girt	A325X	0.6250	1	499.07	4553.91	0.110 ✔	1	Member Block Shear
T2	180	Leg	A325X	0.7500	6	4529.88	29820.60	0.152 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	4967.68	6009.38	0.827 ✔	1	Member Block Shear
		Top Girt	A325X	0.6250	1	406.67	4553.91	0.089 ✔	1	Member Block Shear
T3	160	Leg	A325X	1.0000	6	11416.50	53014.40	0.215 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	5175.93	6009.38	0.861 ✔	1	Member Block Shear
		Top Girt	A325X	0.6250	1	401.92	4553.91	0.088 ✔	1	Member Block Shear
T4	140	Leg	A325X	1.0000	6	17541.50	53014.40	0.331 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	5835.35	8634.38	0.676 ✔	1	Member Block Shear
		Secondary Horizontal	A325N	0.7500	1	2075.23	9243.75	0.225 ✔	1	Member Block Shear
T5	120	Leg	A325X	1.0000	6	22774.40	53014.40	0.430 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	8468.07	10673.40	0.793 ✔	1	Member Block Shear
		Horizontal	A325N	0.7500	1	2715.01	17892.40	0.152 ✔	1	Bolt Shear
T6	100	Diagonal	A325X	0.6250	1	6757.32	10673.40	0.633 ✔	1	Member Block Shear
T7	93.3333	Diagonal	A325X	0.6250	1	6721.37	10673.40	0.630 ✔	1	Member Block Shear
T8	86.6667	Leg	A325X	1.0000	6	28548.80	53014.40	0.539 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	7296.79	15660.00	0.466 ✔	1	Gusset Bearing
T9	80	Leg	A325X	1.0000	6	33543.50	53014.40	0.633 ✔	1	Bolt Tension
		Diagonal	A325X	0.7500	1	8672.76	11183.20	0.776 ✔	1	Member Block Shear
		Horizontal	A325N	0.7500	1	4044.18	17892.40	0.226 ✔	1	Bolt Shear
T10	60	Diagonal	A325X	0.7500	1	8924.50	14910.90	0.599 ✔	1	Member Block Shear
		Secondary Horizontal	A325N	0.7500	1	4310.48	17892.40	0.241 ✔	1	Bolt Shear
T11	50	Leg	A325X	1.2500	6	38285.10	82835.00	0.462 ✔	1	Bolt Tension
		Diagonal	A325X	0.7500	1	9292.66	18922.50	0.491 ✔	1	Gusset Bearing
		Secondary Horizontal	A325N	0.7500	1	4634.54	17892.40	0.259 ✔	1	Bolt Shear
T12	40	Leg	A325X	1.2500	6	43014.60	82835.00	0.519 ✔	1	Bolt Tension
		Diagonal	A325X	0.7500	1	10417.50	17629.70	0.591 ✔	1	Member Block Shear
		Secondary Horizontal	A325N	0.7500	1	5235.37	17892.40	0.293 ✔	1	Bolt Shear
T13	20	Diagonal	A325X	0.7500	1	11518.50	17629.70	0.653 ✔	1	Member Block Shear
		Horizontal	A325N	0.7500	1	5845.21	17892.40	0.327 ✔	1	Bolt Shear

Compression Checks

Leg 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	185 - 180	P2x.154	5.00	5.00	76.2 K=1.00	1.0745	-2848.82	31617.20	0.090 [1] ✓
T2	180 - 160	P2.5x.203	20.00	5.00	63.3 K=1.00	1.7040	-32295.60	57192.30	0.565 [1] ✓
T3	160 - 140	P2.5x.375	20.03	5.01	67.2 K=1.00	2.9452	-78888.10	95225.20	0.828 [1] ✓
T4	140 - 120	P3.5x.318	20.03	2.59	23.8 K=1.00	3.6784	-119664.00	158818.00	0.753 [1] ✓
T5	120 - 100	P5x.258	20.03	1.67	10.7 K=1.00	4.2999	-156556.00	191890.00	0.816 [1] ✓
T6	100 - 93.3333	P5x.375	6.68	6.68	43.6 K=1.00	6.1120	-171098.00	239388.00	0.715 [1] ✓
T7	93.3333 - 86.6667	P5x.375	6.68	6.68	43.6 K=1.00	6.1120	-183429.00	239388.00	0.766 [1] ✓
T8	86.6667 - 80	P5x.375	6.68	6.68	43.6 K=1.00	6.1120	-195841.00	239388.00	0.818 [1] ✓
T9	80 - 60	P5x.375	20.03	1.67	10.9 K=1.00	6.1120	-233200.00	272663.00	0.855 [1] ✓
T10	60 - 50	P5x.5	10.02	5.17	34.5 K=1.00	7.9529	-248556.00	328070.00	0.758 [1] ✓
T11	50 - 40	P5x.5	10.02	5.16	34.4 K=1.00	7.9529	-267242.00	328178.00	0.814 [1] ✓
T12	40 - 20	P8x.322	20.03	5.15	21.0 K=1.00	8.3993	-301887.00	365926.00	0.825 [1] ✓
T13	20 - 0	P8x.322	20.03	2.50	10.2 K=1.00	8.3993	-337053.00	375086.00	0.899 [1] ✓

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L2x2x1/8	7.07	3.22	102.9 K=1.06	0.4844	-1559.68	8852.07	0.176 [1] ✓
T2	180 - 160	L2x2x1/8	7.07	3.19	102.2 K=1.06	0.4844	-5144.57	8913.86	0.577 [1] ✓
T3	160 - 140	L2x2x1/8	8.40	4.03	121.7 K=1.00	0.4844	-5272.29	7142.85	0.738 [1] ✓
T4	140 - 120	L2x2x3/16	10.08	4.82	146.9 K=1.00	0.7150	-6053.98	7480.29	0.809 [1] ✓
T5	120 - 100	L2 1/2x2 1/2x3/16	6.15	5.55	102.8 K=1.20	0.9020	-9430.09	16761.30	0.563 [1] ✓
T6	100 - 93.3333	L2 1/2x2 1/2x3/16	13.15	6.33	153.5 K=1.00	0.9020	-6795.90	8645.55	0.786 [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	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	13.73	6.62	160.6 K=1.00	0.9020	-6949.55	7904.00	0.879 [1] ✓
T8	86.6667 - 80	2L2 1/2x2 1/2x3/16x3/8	14.32	6.92	106.7 K=1.00	1.8047	-7580.82	32125.70	0.236 [1] ✓
T9	80 - 60	L3x3x3/16	7.90	7.32	106.8 K=1.14	1.0900	-9881.02	19110.00	0.517 [1] ✓
T10	60 - 50	L3x3x1/4	18.45	9.08	184.0 K=1.00	1.4400	-9491.07	9604.97	0.988 [1] ✓
T11	50 - 40	2L3x3x1/4x3/8	19.30	9.50	122.6 K=1.00	2.8750	-10003.90	42238.70	0.237 [1] ✓
T12	40 - 20	L3 1/2x3 1/2x1/4	21.03	10.22	176.8 K=1.00	1.6900	-11453.10	12214.20	0.938 [1] ✓
T13	20 - 0	L3 1/2x3 1/2x1/4	11.18	10.45	117.5 K=1.02	1.6900	-13341.10	26464.10	0.504 [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 $\frac{P_u}{\phi P_n}$
T5	120 - 100	L2 1/2x2 1/2x3/8	10.67	4.97	122.4 K=1.00	1.7300	-2715.01	25482.20	0.107 [1] ✓
T9	80 - 60	L3x3x3/8	14.67	6.97	142.4 K=1.00	2.1100	-4044.18	23504.60	0.172 [1] ✓
T13	20 - 0	L3 1/2x3 1/2x1/2	20.50	9.76	171.4 K=1.00	3.2500	-5845.21	24993.60	0.234 [1] ✓

[1] P_u / ϕP_n controls

Secondary 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 $\frac{P_u}{\phi P_n}$
T4	140 - 120	L2x2x1/4	8.74	8.14	160.4 K=1.00	0.9380	-2075.23	8239.59	0.252 [1] ✓
T10	60 - 50	L3x3x7/16	15.48	14.75	195.6 K=1.00	2.4300	-4310.48	14352.50	0.300 [1] ✓
T11	50 - 40	L3x3x7/16	16.48	15.75	208.8 K=1.00	2.4300	-4634.54	12586.20	0.368 [1] ✓
T12	40 - 20	L3x3x1/2	18.49	17.50	233.8 K=1.00	2.7500	-5235.37	11364.20	0.461 [1] ✓

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation (ft)	Size	L (ft)	L_u (ft)	Kl/r	A (in^2)	P_u (lb)	ϕP_n (lb)	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L2x2x1/8	5.00	4.56	137.7 K=1.00	0.4844	-358.31	5769.26	0.062 [1] ✓
T2	180 - 160	L2x2x1/8	5.00	4.56	137.7 K=1.00	0.4844	-290.03	5769.26	0.050 [1] ✓
T3	160 - 140	L2x2x1/8	5.00	4.52	136.5 K=1.00	0.4844	-427.02	5876.09	0.073 [1] ✓

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation (ft)	Size	L (ft)	L_u (ft)	Kl/r	A (in^2)	ϕP_{Tr} (lb)	ϕP_n (lb)	Ratio $\frac{P_u}{\phi P_n}$
T5	120 - 100	L3x3x1/2	2.67	2.43	85.0 K=1.70	2.7500	-5643.10	60901.70	0.093 [1] ✓
T9	80 - 60	L3x3x1/2	3.67	3.43	95.3 K=1.35	2.7500	-5235.94	55242.90	0.095 [1] ✓
T13	20 - 0	L3x3x1/2	5.13	4.77	109.0 K=1.11	2.7500	-7354.63	47690.30	0.154 [1] ✓

[1] P_u / ϕP_n controls

Redundant Diagonal (1) 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 $\frac{P_u}{\phi P_n}$
T5	120 - 100	L3x3x1/2	3.22	2.94	90.2 K=1.49	2.7500	-3926.00	58054.10	0.068 [1] ✓
T9	80 - 60	L3x3x1/2	4.10	3.85	99.5 K=1.26	2.7500	-3445.90	52887.70	0.065 [1] ✓
T13	20 - 0	L3x3x1/2	5.82	5.41	115.6 K=1.04	2.7500	-5133.24	44081.10	0.116 [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 $\frac{P_u}{\phi P_n}$
T1	185 - 180	P2x.154	5.00	5.00	76.2	1.0745	1688.83	48353.90	0.035 [1] ✓
T2	180 - 160	P2.5x.203	20.00	5.00	63.3	1.7040	27179.30	76682.30	0.354 [1] ✓
T3	160 - 140	P2.5x.375	20.03	5.01	67.2	2.9452	68498.80	132536.00	0.517 [1] ✓
T4	140 - 120	P3.5x.318	20.03	2.59	23.8	3.6784	105414.00	165529.00	0.637 [1] ✓
T5	120 - 100	P5x.258	20.03	1.67	10.7	4.2999	136915.00	193494.00	0.708 [1] ✓
T6	100 - 93.3333	P5x.375	6.68	6.68	43.6	6.1120	149511.00	275039.00	0.544 [1] ✓
T7	93.3333 - 86.6667	P5x.375	6.68	6.68	43.6	6.1120	160480.00	275039.00	0.583 [1] ✓
T8	86.6667 - 80	P5x.375	6.68	6.68	43.6	6.1120	171293.00	275039.00	0.623 [1] ✓
T9	80 - 60	P5x.375	20.03	1.67	10.9	6.1120	201488.00	275039.00	0.733 [1] ✓
T10	60 - 50	P5x.5	10.02	5.17	34.5	7.9529	214462.00	357882.00	0.599 [1] ✓
T11	50 - 40	P5x.5	10.02	5.16	34.4	7.9529	229950.00	357882.00	0.643 [1] ✓
T12	40 - 20	P8x.322	20.03	5.15	21.0	8.3993	258493.00	377967.00	0.684 [1] ✓
T13	20 - 0	P8x.322	20.03	2.50	10.2	8.3993	285152.00	377967.00	0.754 [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	185 - 180	L2x2x1/8	7.07	3.22	65.1	0.4844	1342.17	15693.80	0.086 [1] ✓
T2	180 - 160	L2x2x1/8	7.07	3.19	64.5	0.4844	4967.68	15693.80	0.317 [1] ✓
T3	160 - 140	L2x2x1/8	8.40	4.03	80.6	0.4844	5175.93	15693.80	0.330 [1] ✓
T4	140 - 120	L2x2x3/16	10.08	4.82	97.1	0.7150	5835.35	23166.00	0.252 [1] ✓
T5	120 - 100	L2 1/2x2 1/2x3/16	6.15	5.55	90.7	0.9020	8468.07	29224.80	0.290 [1] ✓
T6	100 - 93.3333	L2 1/2x2 1/2x3/16	13.15	6.33	100.3	0.9020	6757.32	29224.80	0.231 [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	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	13.73	6.62	104.7	0.9020	6721.37	29224.80	0.230 [1]
T8	86.6667 - 80	2L2 1/2x2 1/2x3/16x3/8	14.32	6.92	109.2	1.8047	7296.79	58471.90	0.125 [1]
T9	80 - 60	L3x3x3/16	7.90	7.32	97.8	1.0900	8672.76	35316.00	0.246 [1]
T10	60 - 50	L3x3x1/4	18.45	9.08	119.3	1.4400	8924.50	46656.00	0.191 [1]
T11	50 - 40	2L3x3x1/4x3/8	19.30	9.50	124.7	2.8750	9292.66	93150.00	0.100 [1]
T12	40 - 20	L3 1/2x3 1/2x1/4	21.03	10.22	114.4	1.6900	10417.50	54756.00	0.190 [1]
T13	20 - 0	L3 1/2x3 1/2x1/4	11.18	10.45	118.7	1.6900	11518.50	54756.00	0.210 [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 $\frac{P_u}{\phi P_n}$
T5	120 - 100	L2 1/2x2 1/2x3/8	10.67	4.97	121.9	1.7300	2715.01	56052.00	0.048 [1]
T9	80 - 60	L3x3x3/8	14.67	6.97	140.0	2.1100	4044.18	68364.00	0.059 [1]
T13	20 - 0	L3 1/2x3 1/2x1/2	20.50	9.76	168.0	3.2500	5845.21	105300.00	0.056 [1]

[1] P_u / ϕP_n controls

Secondary 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 $\frac{P_u}{\phi P_n}$
T4	140 - 120	L2x2x1/4	8.74	8.14	165.7	0.9380	2075.23	30391.20	0.068 [1]
T10	60 - 50	L3x3x7/16	15.48	14.75	199.2	2.4300	4310.48	78732.00	0.055 [1]
T11	50 - 40	L3x3x7/16	16.48	15.75	212.4	2.4300	4634.54	78732.00	0.059 [1]
T12	40 - 20	L3x3x1/2	18.49	17.50	237.4	2.7500	5235.37	89100.00	0.059 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L2x2x1/8	5.00	4.56	92.0	0.4844	499.07	15693.80	0.032 [1] ✔
T2	180 - 160	L2x2x1/8	5.00	4.56	92.0	0.4844	406.67	15693.80	0.026 [1] ✔
T3	160 - 140	L2x2x1/8	5.00	4.52	91.2	0.4844	401.92	15693.80	0.026 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) 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 $\frac{P_u}{\phi P_n}$
T5	120 - 100	L3x3x1/2	2.67	2.43	32.5	2.7500	6294.35	89100.00	0.071 [1] ✔
T9	80 - 60	L3x3x1/2	3.67	3.43	45.9	2.7500	5840.87	89100.00	0.066 [1] ✔
T13	20 - 0	L3x3x1/2	5.13	4.77	63.7	2.7500	8655.74	89100.00	0.097 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) 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 $\frac{P_u}{\phi P_n}$
T5	120 - 100	L3x3x1/2	3.07	2.80	37.4	2.7500	3458.35	89100.00	0.039 [1] ✔
T9	80 - 60	L3x3x1/2	4.10	3.85	51.4	2.7500	2934.14	89100.00	0.033 [1] ✔
T13	20 - 0	L3x3x1/2	5.82	5.41	72.3	2.7500	4142.50	89100.00	0.046 [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
T1	185 - 180	Leg	P2x.154	2	-2848.82	31617.20	9.0	Pass
		Diagonal	L2x2x1/8	9	-1559.68	8852.07	17.6	Pass
		Top Girt	L2x2x1/8	5	-358.31	5769.26	6.2	Pass
T2	180 - 160	Leg	P2.5x.203	15	-32295.60	57192.30	56.5	Pass
		Diagonal	L2x2x1/8	19	-5144.57	8913.86	57.7	Pass
		Top Girt	L2x2x1/8	17	-290.03	5769.26	5.0	Pass
T3	160 - 140	Leg	P2.5x.375	43	-78888.10	95225.20	82.8	Pass
		Diagonal	L2x2x1/8	54	-5272.29	7142.85	73.8	Pass
		Top Girt	L2x2x1/8	47	-427.02	5876.09	7.3	Pass
T4	140 - 120	Leg	P3.5x.318	73	-119664.00	158818.00	75.3	Pass
		Diagonal	L2x2x3/16	81	-6053.98	7480.29	80.9	Pass
		Secondary Horizontal	L2x2x1/4	82	-2075.23	8239.59	25.2	Pass
T5	120 - 100	Leg	P5x.258	112	-156556.00	191890.00	81.6	Pass
		Diagonal	L2 1/2x2 1/2x3/16	172	-9430.09	16761.30	56.3	Pass
		Horizontal	L2 1/2x2 1/2x3/8	115	-2715.01	25482.20	10.7	Pass
		Redund Horz 1 Bracing	L3x3x1/2	152	-5643.10	60901.70	9.3	Pass
		Redund Diag 1 Bracing	L3x3x1/2	153	-3926.00	58054.10	6.8	Pass
T6	100 - 93.3333	Leg	P5x.375	232	-171098.00	239388.00	71.5	Pass
		Diagonal	L2 1/2x2 1/2x3/16	239	-6795.90	8645.55	78.6	Pass
T7	93.3333 - 86.6667	Leg	P5x.375	241	-183429.00	239388.00	76.6	Pass
		Diagonal	L2 1/2x2 1/2x3/16	248	-6949.55	7904.00	87.9	Pass
T8	86.6667 - 80	Leg	P5x.375	250	-195841.00	239388.00	81.8	Pass
		Diagonal	2L2 1/2x2 1/2x3/16x3/8	257	-7580.82	32125.70	23.6	Pass
T9	80 - 60	Leg	P5x.375	259	-233200.00	272663.00	85.5	Pass
		Diagonal	L3x3x3/16	319	-9881.02	19110.00	51.7	Pass
		Horizontal	L3x3x3/8	262	-4044.18	23504.60	17.2	Pass
		Redund Horz 1 Bracing	L3x3x1/2	299	-5235.94	55242.90	9.5	Pass
		Redund Diag 1 Bracing	L3x3x1/2	300	-3445.90	52887.70	6.5	Pass
T10	60 - 50	Leg	P5x.5	379	-248556.00	328070.00	75.8	Pass
		Diagonal	L3x3x1/4	387	-9491.07	9604.97	98.8	Pass
		Secondary Horizontal	L3x3x7/16	388	-4310.48	14352.50	30.0	Pass
T11	50 - 40	Leg	P5x.5	391	-267242.00	328178.00	81.4	Pass
		Diagonal	2L3x3x1/4x3/8	398	-10003.90	42238.70	23.7	Pass
		Secondary Horizontal	L3x3x7/16	402	-4634.54	12586.20	36.8	Pass
T12	40 - 20	Leg	P8x.322	403	-301887.00	365926.00	82.5	Pass
		Diagonal	L3 1/2x3 1/2x1/4	411	-11453.10	12214.20	93.8	Pass
		Secondary Horizontal	L3x3x1/2	412	-5235.37	11364.20	46.1	Pass
T13	20 - 0	Leg	P8x.322	424	-337053.00	375086.00	89.9	Pass
		Diagonal	L3 1/2x3 1/2x1/4	484	-13341.10	26464.10	50.4	Pass
		Horizontal	L3 1/2x3 1/2x1/2	441	-5845.21	24993.60	23.4	Pass
		Redund Horz 1 Bracing	L3x3x1/2	464	-7354.63	47690.30	15.4	Pass
		Redund Diag 1 Bracing	L3x3x1/2	465	-5133.24	44081.10	11.6	Pass
							Summary	
						Leg (T13)	89.9	Pass
						Diagonal (T10)	98.8	Pass
						Horizontal (T13)	23.4	Pass
						Secondary Horizontal (T12)	46.1	Pass
						Top Girt (T3)	7.3	Pass
						Redund Horz 1 Bracing (T13)	15.4	Pass
						Redund Diag 1 Bracing (T13)	11.6	Pass
						Bolt Checks	86.1	Pass
						RATING =	**98.8**	**Pass**

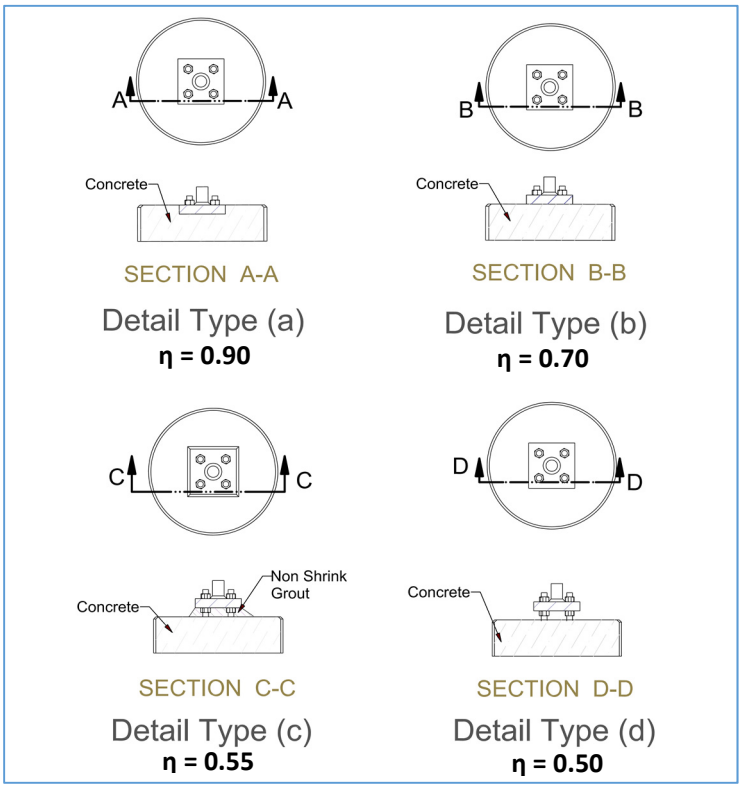
Ramaker & Associates, Inc.
855 Community Drive
Sauk City, WI 53583

Site:	Transfer Station (CT33XC522)
Project:	28737
Date:	9/26/17

Self Support Tower Anchor Rod Check - TIA-222-G

Eta, η:	0.55	
Tension, Pu:	293.401	kip
Shear, Vu:	31.868	kip
Quantity:	6	
Diameter:	1.5	in
Grade:	A572 Gr. 50 (1/4 to 4)	
Fy:	50	ksi
Fu:	65	ksi
Anchor Force:	58.6	kip
Design Capacity:	73.3	kip
Stress Ratio:	79.9%	
Length, lar:		in
Moment, Mu:		kip-in
Stress Ratio:		
Maximum Acceptable:	105%	
Governing Stress Ratio:	**79.9%**	**Pass**

Anchor Rod Detail Types



SST Unit Base Foundation

Project #:	28737
Site Name:	CT33XC522

TIA-222 Revision:	G

Tower Centroid Offset?:	☐
Block Foundation?:	☐

Superstructure Analysis Reactions		
Global Moment, **M**:	5902.702	ft-kips
Global Axial, **P**:	68.998	kips
Global Shear, **V**:	56.818	kips
Leg Compression, P_{comp}:	347.561	kips
Leg Comp. Shear, V_{u_comp}:	37.351	kips
Leg Uplift, P_{uplift}:	293.401	kips
Leg Uplift. Shear, V_{u_uplift}:	31.868	kips
Tower Height, **H**:	185	ft
Base Face Width, **BW**:	21	ft
BP Dist. Above Fdn, bp_{dist}:	1	in

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Lateral (Sliding) (kips)	241.39	56.82	**23.5%**	**Pass**
Bearing Pressure (ksf)	9.47	2.09	**22.1%**	**Pass**
*Overturning (kip*ft)*	9476.85	6219.94	**65.6%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	889.65	149.40	**16.8%**	**Pass**
*Pier Flexure (Tension) (kip*ft)*	193.19	127.47	**66.0%**	**Pass**
Pier Compression (kip)	4101.51	354.49	**8.6%**	**Pass**
*Pad Flexure (kip*ft)*	3236.15	1357.71	**42.0%**	**Pass**
Pad Shear - 1-way (kips)	393.77	288.21	**73.2%**	**Pass**
Pad Shear - 2-way (ksi)	0.16	0.16	**97.3%**	**Pass**

Soil Rating:	**65.6%**
Structural Rating:	**97.3%**

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	3.5	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	7	
Pier Rebar Quantity, **mc**:	12	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	7	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	5	ft
Pad Width, **W**:	30.5	ft
Pad Thickness, **T**:	1.5	ft
Pad Rebar Size (Bottom), **Sp**:	10	
Pad Rebar Quantity (Bottom), **mp**:	58	
Pad Clear Cover, cc_{pad}:	3	in

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:	125	pcf
Ultimate Net Bearing, Qnet:	12	ksf
Cohesion, **Cu**:		ksf
Friction Angle, φ:	32	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:		
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	No	

<-- Toggle between Gross and Net

Sprint®

PROJECT: 2.5 EQUIPMENT DEPLOYMENT

SITE NAME: TRANSFER STATION

SITE CASCADE: CT33XC522-C

SITE ADDRESS: 237 GODFREY ROAD
WESTON, CT 06883

SITE TYPE: 185'-0' SELF SUPPORT TOWER

SITE INFORMATION

PROPERTY OWNER:
TOWN OF WESTON
56 NORFIELD ROAD
WESTON, CT 06883

SITE ADDRESS:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

GEOGRAPHIC COORDINATES:
LATITUDE: 41.244386 (41° 14' 39.789"N)
LONGITUDE: -73.363386 (73° 21' 48.1896"W)

ZONING JURISDICTION:
TOWN OF WESTON

ZONING DISTRICT:
R-2A

POWER COMPANY:
CONNECTICUT LIGHT & POWER
PH.: (800) 286-2000

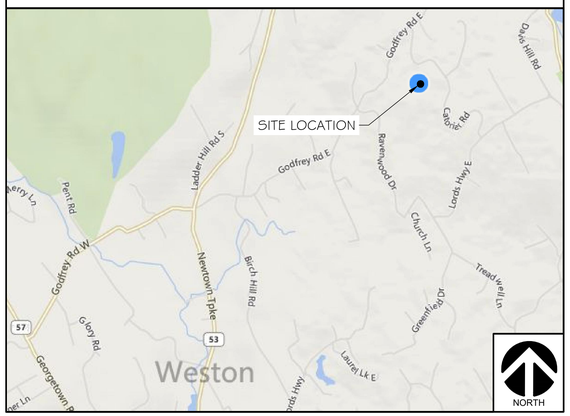
AAV PROVIDER:
AT&T
PH.: (210) 821-4105

SPRINT CONSTRUCTION MANAGER:
NAME: GARY WOOD
PHONE: (860) 940-9168
E-MAIL: gary.wood@sprint.com

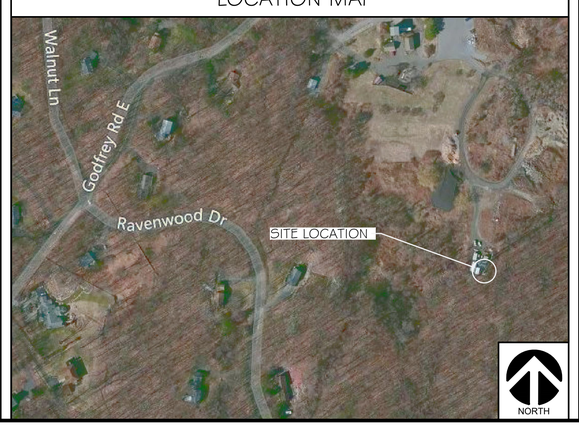
EQUIPMENT SUPPLIER:
ALCATEL-LUCENT
600-700 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974
PH.: (908) 508-8080

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

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

- INSTALL NEW 2.5 EQUIPMENT IN EXISTING BTS CABINET
  - (1) RECTIFIER SHELF AND (3) RECTIFIERS
  - (1) BASE BAND UNIT
- INSTALL NEW BATTERY STRING IN EXISTING BATTERY CABINET
- INSTALL (3) PANEL ANTENNAS
- INSTALL (3) RRH'S ON TOWER
- INSTALL (1) HYBRID CABLE AND (3) SECTOR JUMPERS
- INSTALL (27) ANTENNA / RRH JUMPERS

APPLICABLE CODES

* ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH 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. 2016 CT STATE BUILDING CODE
2. 2016 CT FIRE SAFETY CODE
3. 2014 NATIONAL ELECTRIC CODE W/ CT AMENDMENTS
4. 2012 IECC W/ CT AMENDMENTS

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SHEET INDEX

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Sprint®
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

RAMAKER & ASSOCIATES, INC.
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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: 10/06/2017

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL DATE ISSUED: 10/06/17

PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
TITLE SHEET

SCALE: NONE

PROJECT NUMBER: 28737
SHEET NUMBER: T-1

DRAWN BY: TWS CHECKED BY: KAB

SECTION 01 100 - SCOPE OF WORK

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

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

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

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

SECTION 01 300 - CELL SITE CONSTRUCTION

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

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

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

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

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

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

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

TESTING BY THIRD PARTY AGENCY:
A. EMPLOY AN AGENCY OF ENGINEERS AND SCIENTISTS WHO IS REGULARLY ENGAGED IN FIELD AND LABORATORY TESTING AND ANALYSIS. AGENCY SHALL HAVE BEEN IN BUSINESS A MINIMUM OF FIVE YEARS, AND BE LICENSED AS PROFESSIONAL ENGINEERS IN THE STATE WHERE THE PROJECT IS LOCATED. AGENCY IS SUBJECT TO APPROVAL BY COMPANY.
   1. AGENCY MUST HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
   2. AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
   3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
B. REQUIRED THIRD PARTY TESTS:
   1. SITE RESISTANCE TO EARTH TEST PER NP-312-201
   2. CONCRETE CYLINDER BREAK TESTS FOR TOWER PIER AND ANCHORS PER NATIONALLY RECOGNIZED STANDARDS
   3. STRUCTURAL SOILS COMPACTION TESTS PER NATIONALLY RECOGNIZED STANDARDS
   4. REBAR PLACEMENT VERIFICATION WITH REPORT
   5. TESTING TENSION STUDY FOR ROCK ANCHORS
   6. ALL THIRD PARTY TESTS AS REQUIRED BY LOCAL JURISDICTION
C. REQUIRED TESTS BY CONTRACTOR
   1. COAX SWEEP TESTS PER SPRINT STANDARD TS-0200
   2. FIBER TESTS PER SPRINT STANDARD EL-0568
   3. MICROWAVE LINK TESTS PER NP-760-500
   4. ANTENNA AZIMUTHS AND DOWN TILT USING ELECTRONIC ALIGNMENT TOOL PER ANTENNA INSTALLATION SPECIFICATION HEREIN.

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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: Date: 10/06/2017

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL DATE ISSUED: 10/06/17

PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 28737
SHEET NUMBER: SP-1

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DRAWN BY: TWS CHECKED BY: KAB

5. POST CONSTRUCTION HEIGHT VERIFICATION AS REQUIRED HEREWITH IN THE TOWER INSTALLATION SPECIFICATIONS.
6. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED HEREWITH IN THE ASPHALT PAVING SPECIFICATIONS.
7. FIELD QUALITY CONTROL TESTING AS SPECIFIED HEREWITH IN THE CONCRETE PAVING SPECIFICATIONS.
8. TESTING REQUIRED HEREWITH UNDER SPECIFICATIONS FOR AGGREGATE BASE FOR ROADWAYS
9. ALL OTHER TESTS REQUIRED BY LOCAL JURISDICTION

D. INSPECTIONS BY COMPANY: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN INSPECTION ACTIVITIES, FINAL ACCEPTANCE / PUNCH WALK REVIEW, AND/OR AS A RESULT OF TESTING

E. SPRINT RESERVES THE RIGHT TO INSPECT THE CONSTRUCTION SITE AT ANY TIME VIA SITE WALKS AND/OR PHOTO REVIEWS. CONTRACTOR SHALL GIVE SPRINT 24 HOURS NOTICE PRIOR TO THE COMMENCEMENT OF THE FOLLOWING CONSTRUCTION ACTIVITIES AND PHOTOGRAPHS OF THE IN-PROGRESS WORK.
1. GROUNDING SYSTEM AND BURIED UTILITIES INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS, AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS, ASPHALT PAVING, AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE AND POST CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES. PRIOR TO CONSTRUCTION ACTIVITIES AND AFTER CONSTRUCTION IS COMPLETE, PROVIDE PHOTOGRAPHIC DOCUMENTATION OF ROOF, FLASHINGS, AND PARAPETS, BOTH BEFORE AND AFTER CONSTRUCTION IS COMPLETE.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. TOWER TOP AND INACCESSIBLE EQUIPMENT (RRUS, ANTENNAS, AND CABLING): PROVIDE PHOTOS OF THE BACKS OF ALL ANTENNAS, RRUS, COMBINERS, FILTERS, FIBER AND DC CABLING, CABLE COLOR CODING, EQUIPMENT GROUNDING AND CONNECTOR WATER PROOFING INCLUDING NAME PLATE AND SERIAL NUMBER FOR ALL SERIALIZED EQUIPMENT.

PROJECT CLOSEOUT:

A. FINAL ACCEPTANCE PUNCH WALK AND INSPECTION: AS IDENTIFIED IN THE SCOPE OF SERVICES, SPRINT WILL CONDUCT A FINAL PUNCH WALK OR FINAL DESK TOP PHOTO REVIEW (SITE MODIFICATIONS). PUNCH WALKS MUST BE SCHEDULED IN ADVANCE AS REQUIRED. AT THE PUNCH WALK / REVIEW, SPRINT MAY IDENTIFY CRITICAL DEFICIENCIES WHICH MUST BE CORRECTED PRIOR TO PUTTING SITE ON AIR. MINOR DEFICIENCIES MUST BE CORRECTED WITHIN 30 DAYS EXCEPT AS OTHERWISE REQUIRED. VERIFICATIONS OF CORRECTIONS MAY BE MADE BY COMPANY DURING A REPEAT SITE WALK OR DESK TOP PHOTO REVIEW AT COMPANY'S SOLE DISCRETION.

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

PROJECT PHOTOGRAPHS:

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

DEFICIENCY CORRECTIONS:

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

SECTION 01 500 - PROJECT REPORTING

WEEKLY REPORTS:

A. CONTRACTOR SHALL REPORT TO SPRINT AT MINIMUM ON A WEEKLY BASIS VIA SITERRA BY UPDATING ALL APPLICABLE POST END KEEPING MILESTONES WITH ACTUAL AND FORECASTED COMPLETION DATES.

B. ADDITIONAL REQUIREMENTS FOR REPORTING MAY BE IDENTIFIED ELSEWHERE OR REQUIRED BY THE SCOPE OF SERVICES OR SPRINTS LOCAL MARKET CONSTRUCTION MANAGER. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

PROJECT CONFERENCE CALLS:

SPRINT MAY HOLD PERIODIC PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

FINAL PROJECT ACCEPTANCE: PRIOR TO SPRINTS FINAL PROJECT ACCEPTANCE. ALL REQUIRED MILESTONE ACTUALS MUST BE UPDATED IN SITERRA AND ALL REQUIRED REPORTING TASKS MUST BE COMPLETE.

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

SUMMARY:

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

ANTENNAS AND RRU'S:

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

HYBRID CABLE:

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

JUMPERS AND CONNECTORS:

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

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:

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

ANTENNA INSTALLATION:

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

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

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

HYBRID CABLE INSTALLATION:

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

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

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

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

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

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

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

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

SUMMARY:

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

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

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

DC CIRCUIT BREAKER LABELING

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

SECTION 26 100 - BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS

QUALITY ASSURANCE:

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

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

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

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
1. ALLIED TUBE AND CONDUIT.
2. B-LINE SYSTEM.
3. UNISTRUT DIVERSIFIED PRODUCTS.
4. THOMAS & BETTS.

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

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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: Date: 10/06/2017

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL DATE ISSUED: 10/06/17

PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 28737
SHEET NUMBER: SP-2

DRAWN BY: TWS CHECKED BY: KAB

SUPPORTING DEVICES:

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

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

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

1. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.

2. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

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

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

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

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

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

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

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

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

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

HUBS AND BOXES:

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

B. CABLE TERMINATION FITTINGS FOR CONDUIT

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

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

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

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

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

SUPPLEMENTAL GROUNDING SYSTEM:

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

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

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

EXISTING STRUCTURE:

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

CONDUIT AND CONDUCTOR INSTALLATION:

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

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

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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: 10/06/2017

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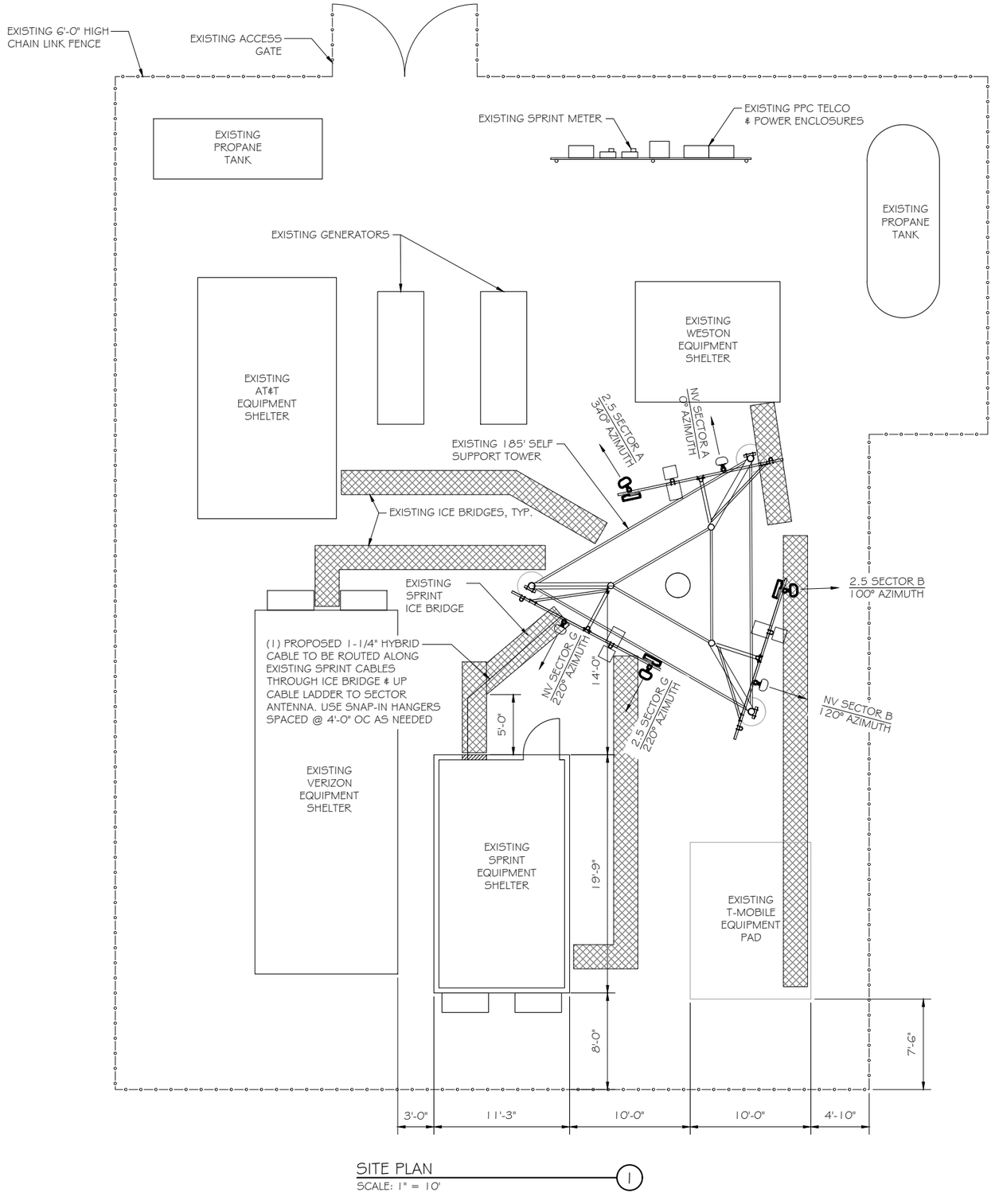
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
SPRINT SPECIFICATIONS

SCALE: NONE

PROJECT NUMBER: 28737
SHEET NUMBER: SP-3



SITE PLAN
SCALE: 1" = 10'

NORTH

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STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED PROFESSIONAL ENGINEER

Signature: 10/06/2017 Date:

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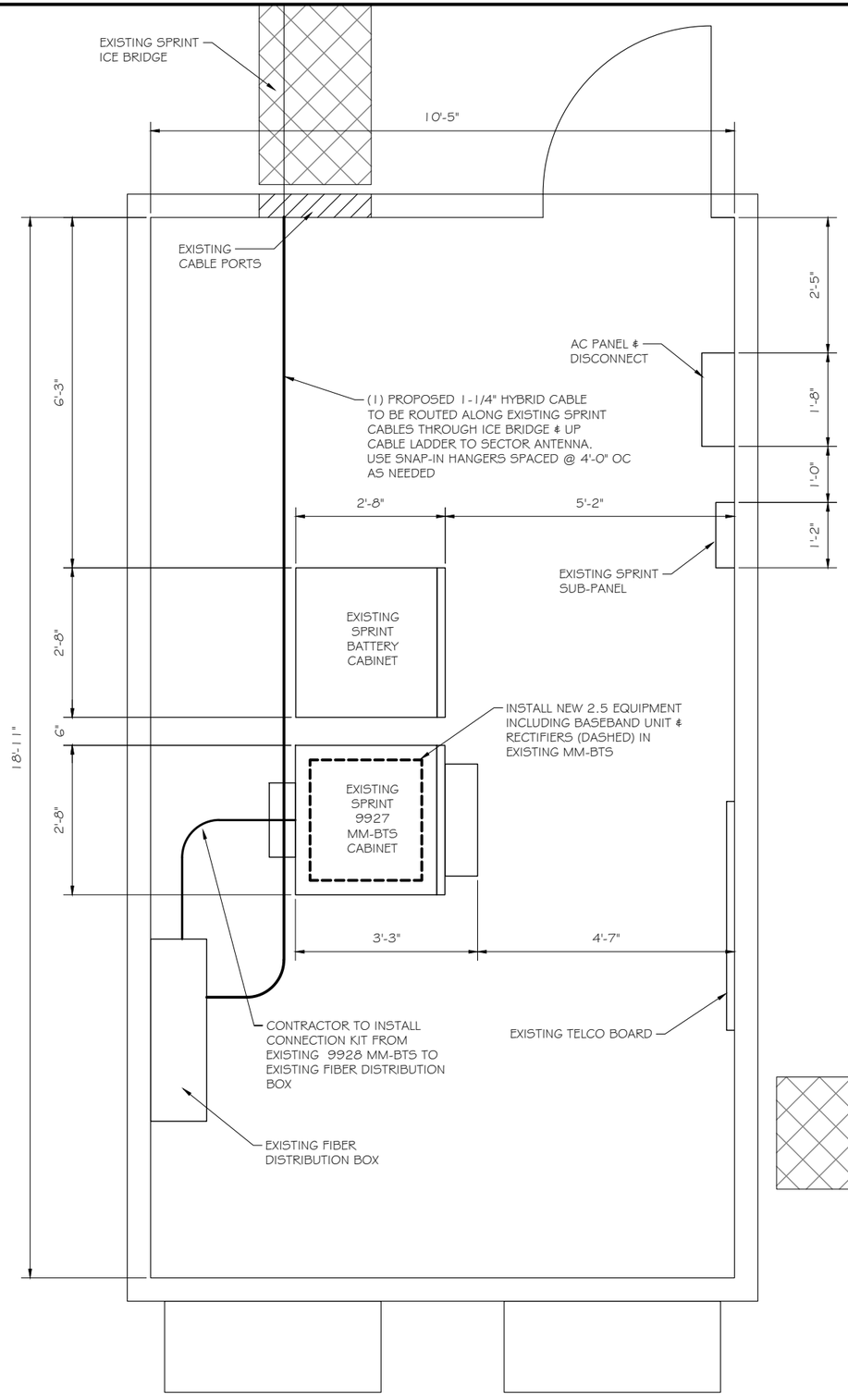
PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
SITE PLAN

0 5' 10' 20'
11" x 17" - 1" = 10'
22" x 34" - 1" = 5'

PROJECT NUMBER: 28737
SHEET NUMBER: A-1



EQUIPMENT PLAN
SCALE: 1" = 2.5'
1

NORTH

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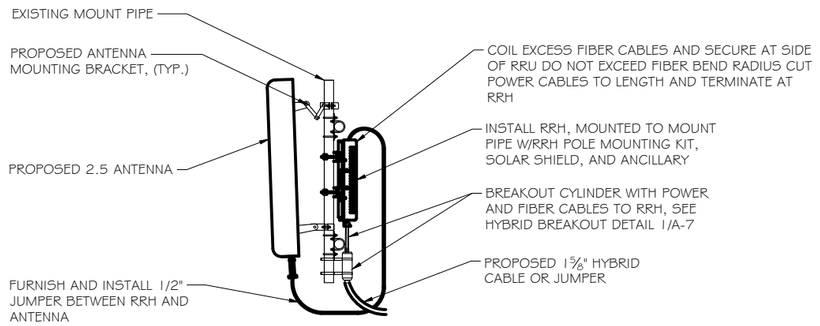
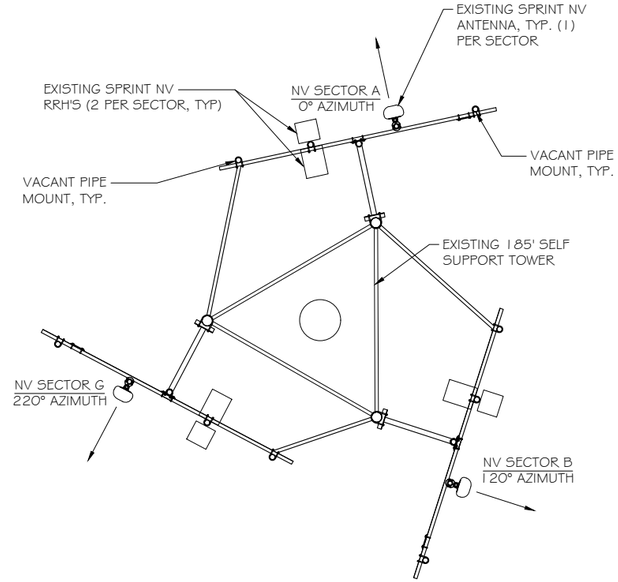
SHEET TITLE:
EQUIPMENT PLAN

0 1.25' 2.5' 5'
11" x 17" - 1" = 2.5'
22" x 34" - 1" = 1.25'

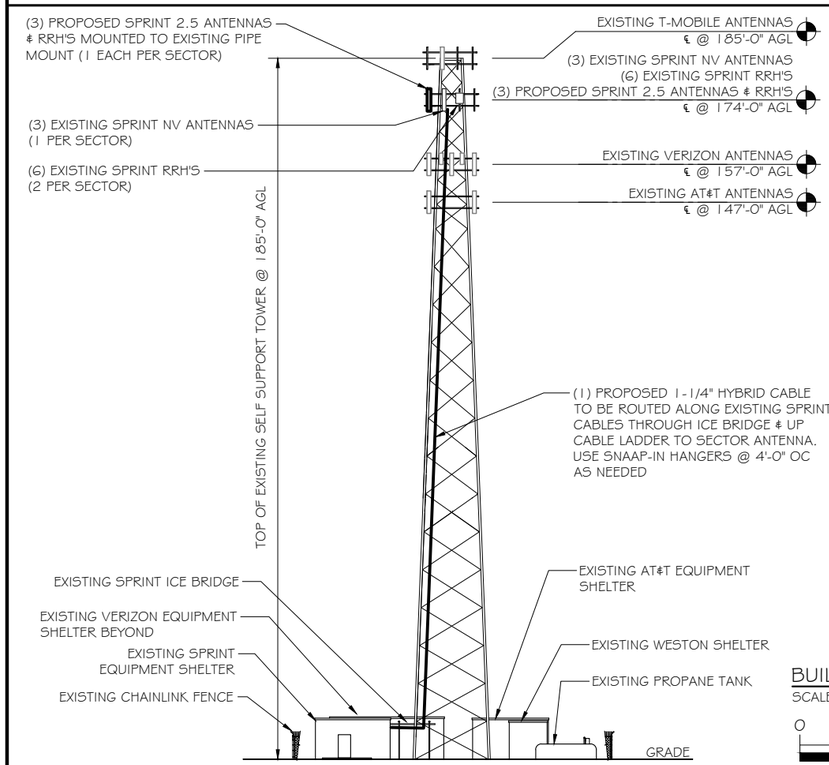
PROJECT NUMBER: 28737
SHEET NUMBER: A-2



ANTENNA & RRH MOUNTING DETAILS (1)
SCALE: NTS



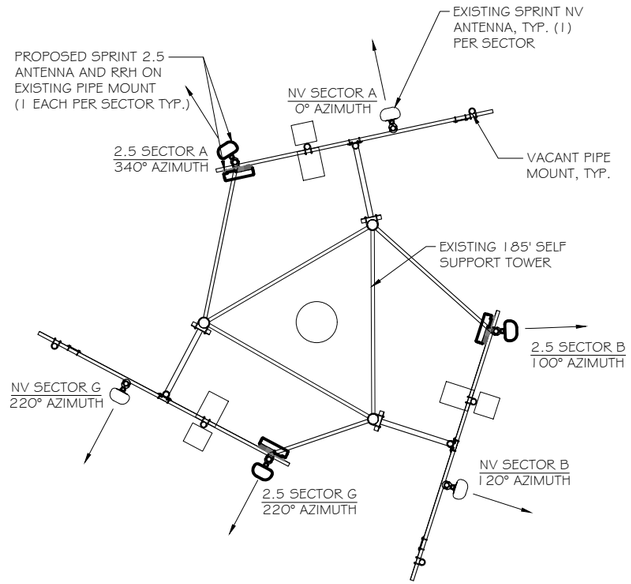
NORTH
EXISTING ANTENNA ARRAY (3)
SCALE: NTS



BUILDING ELEVATION (2)
SCALE: 1" = 40'

0 20' 40' 80'

11" x 17" - 1" = 40'
22" x 34" - 1" = 20'



NORTH
PROPOSED ANTENNA ARRAY (4)
SCALE: NTS

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Certification & Seal:
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STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 10/06/2017

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 10/06/17

PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
BUILDING ELEVATIONS & ANTENNA DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 28737
SHEET NUMBER: A-3

RFDS Sheet

General Site Information

Site ID	**CT33XC522**	Equipment Vendor	Alcatel-Lucent
Market	Southern Connecticut	Lattitude	41.244386
Region	Northeast	Longitude	-73.363386
MLA	N/A	LL SITE ID	N/A
Structure Type	Lattice Tower		
BTS Type			

Solution ID		Siterra SR Equipment type		Incremental Power Draw needed by added Equipment
		Equipment Vendor	Alcatel-Lucent	TBD

Base Equipment

BBU Kit	ALU BBU Kit	Top Hat	None
BBU Kit Qty	1	Top Hat Qty	N/A
		Top Hat Dimenstions	N/A
Growth Cabinet	None	Top Hat Weight (lbs)	N/A
Growth Cabinet Qty	N/A		
Growth Cabinet Dimensions	N/A		
Growth Cabinet Weight	N/A		

RF Path Information

RRH	TD-RRH8x20-25	
RRH Qty	3	
RRH Dimensions	26.1"x18.6"x6.7"	
RRH Weight. lbs.	70	
RRH Mount Weight. Lbs.	10	
Power and Fiber Cable	ALU Hybrid	
Cable Qty	1	
Weight per foot. Lbs.	0.992	
Diameter. Inches.	1.25	
Length Ft.	209	(calculated as antenna height plus 20%)
Coax Jumper	TBD	
Coax Jumper Qty	27	
Coax Jumper Length. Feet.	8	
Coax Jumper Weight	1.7	
Coax Jumper Diameter. Inches	0.5	
AISG Cable	Commscope ATCB-B01-006	
AISG Cable Qty	3	
AISG Diameter. Inches.	0.315	
AISG Cable length.	8	
Weight of entire AISG cable. Lbs.	1.3	

Antenna Sector Information

	Sector 1	Sector 2	Sector 3
Antenna make/model	RFS APXV9TM14-ALU-I20	RFS APXV9TM14-ALU-I20	RFS APXV9TM14-ALU-I20
Antenna qty	1	1	1
Antenna Dimensions. Inches	56.3"x12.6"x6.3"	56.3"x12.6"x6.3"	56.3"x12.6"x6.3"
Antenna Weight. Lbs	55.12	55.12	55.12
Antenna Mounting Kit Weight. Lbs.	11.5	11.5	11.5
CL Height	174	174	174
Antenna Azimuth	340	100	220
Antenna Mechanical Downtilt	0	0	0
Antenna etilt	-2	-2	-2

*RFDS SHEET WAS GENERATED BY RAMAKER & ASSOCIATES FROM PLAN OF RECORD (POR) PROVIDED BY SPRINT. CONTRACTOR SHALL VERIFY AND OBTAIN FINAL RFDS FROM SPRINT CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.

NOTES:

1. GENERAL CONTRACTOR TO FIELD VERIFY AZIMUTH AND C/L HEIGHT AND MECHANICAL DOWNTILT. IF DIFFERENT THAN CALLED OUT BELOW, HALT ANTENNA WORK FOR ONE HOUR, CALL SPRINT RF ENGINEER (OR MANAGER IF RF ENGINEER DOES NOT ANSWER, BUT STILL LEAVE A MESSAGE TO RF ENGINEER) USING CONTACT INFORMATION ABOVE FOR FURTHER INSTRUCTIONS. IF SPRINT DOES NOT RESPOND WITHIN ONE HOUR, PLACE 2.5GHZ ANTENNA AT SAME C/L HEIGHT AS 1.9GHZ ANTENNA AND EMAIL CORRECT C/L HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS-BUILD DRAWING WITH CORRECT C/L HEIGHT. ALSO EMAIL CORRECT 1.9GHZ AND 800MHZ ANTENNA C/L HEIGHT, AZIMUTH AND MECHANICAL DOWNTILT TO RF ENGINEER.
2. AISG TESTS TO VERIFY OPERATION IS TO BE PERFORMED AFTER FINAL INSTALLATION OF ANTENNAS AND AISG CABLES HAVE BEEN CONNECTED. VERIFY OPERATION OF ALL EXISTING SPRINT AISG EQUIPMENT INCLUDING 800MHZ, 1.9GHZ AND 2.5GHZ. TEST TO INCLUDE COMPLETE DOWNTILT, AZIMUTH (IF APPLICABLE) AND BEAMWIDTH SWINGS (IF APPLICABLE). DOCUMENT AISG TEST RESULTS IN COAX SWEEP TEST SPREADSHEET.
3. GENERAL CONTRACTOR MUST ENSURE THAT NO OBJECT IS LOCATED WITHIN 45 DEGREES OF LEFT AND RIGHT OF FRONT OF ANTENNA OR 7 DEGREES UP AND DOWN FROM CENTER OF ANTENNA. IF THIS IS NOT POSSIBLE, CONTACT RF ENGINEER FOR FURTHER INSTRUCTION. IN ADDITION, 2.5GHZ ANTENNA IS NOT TO BE PLACED IN FRONT OF ANY OTHER ANTENNA USING THE SAME 45 DEGREE RULE. THIS INCLUDES SPRINT AND NON-SPRINT ANTENNAS.
4. 2.5GHZ ANTENNA MUST BE AT LEAST 6" FROM 1.9GHZ ANTENNA, 30" FROM 800MHZ ANTENNA AND 30" FROM DUAL BAND 1.9GHZ AND 800MHZ ANTENNA.
5. GENERAL CONTRACT IS REQUIRED TO USE A DIGITAL ALIGNMENT TOOL TO SET AZIMUTH, ROLL AND DOWNTILT. AZIMUTH ACCURACY IS TO BE WITHIN 1 DEGREE. DOWNTILT AND ROLL (LEFT TO RIGHT TILT) IS TO BE WITHIN 0.1 DEGREES. IF FOR SOME REASON THIS ACCURACY CANNOT BE ACHIEVED, UPDATE AS-BUILT DRAWINGS AND EMAIL SPRINT RF ENGINEER WITH AS-BUILT SETTINGS. USE 3Z RF ALIGNMENT TOOL OR EQUIVALENT TOOL.

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

Signature: Date: 10/06/2017

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 10/06/17

PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
RF DATA SHEET

SCALE:
AS NOTED

PROJECT NUMBER: 28737
SHEET NUMBER: A-4

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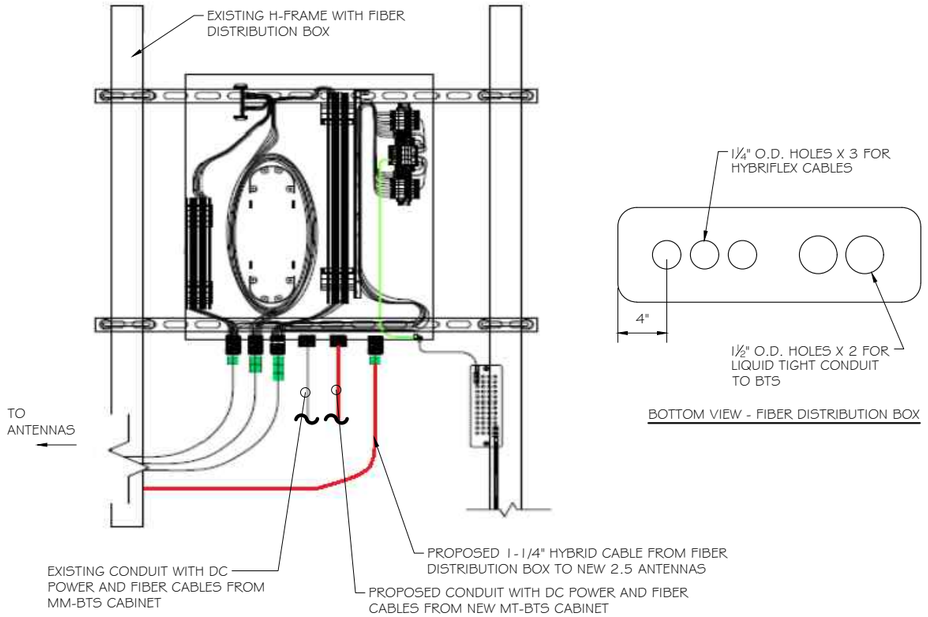
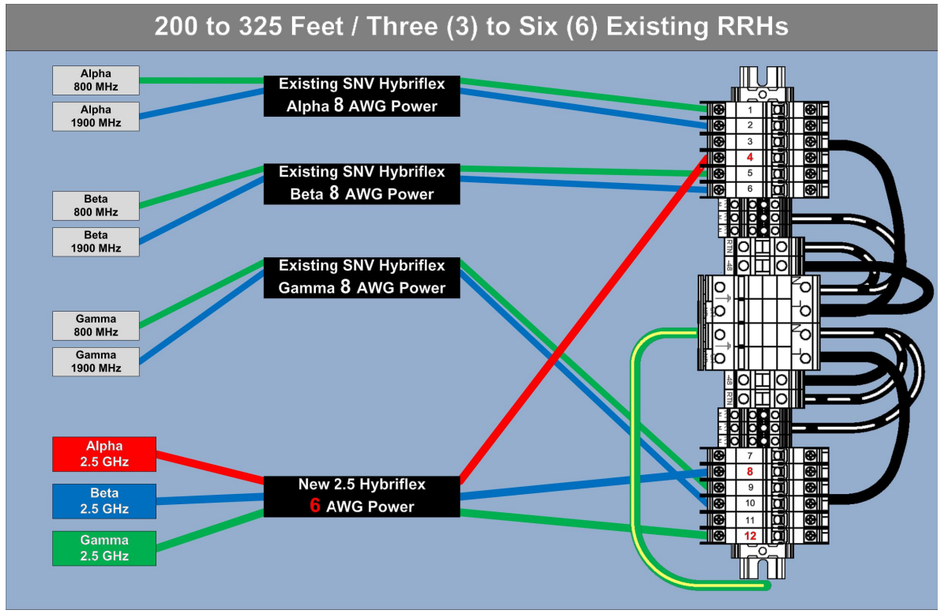
DRAWN BY: TWS CHECKED BY: KAB



TYPICAL FIBER DISTRIBUTION BOX DETAIL (1)
SCALE: NTS

BOTTOM VIEW - FIBER DISTRIBUTION BOX



RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL (2)
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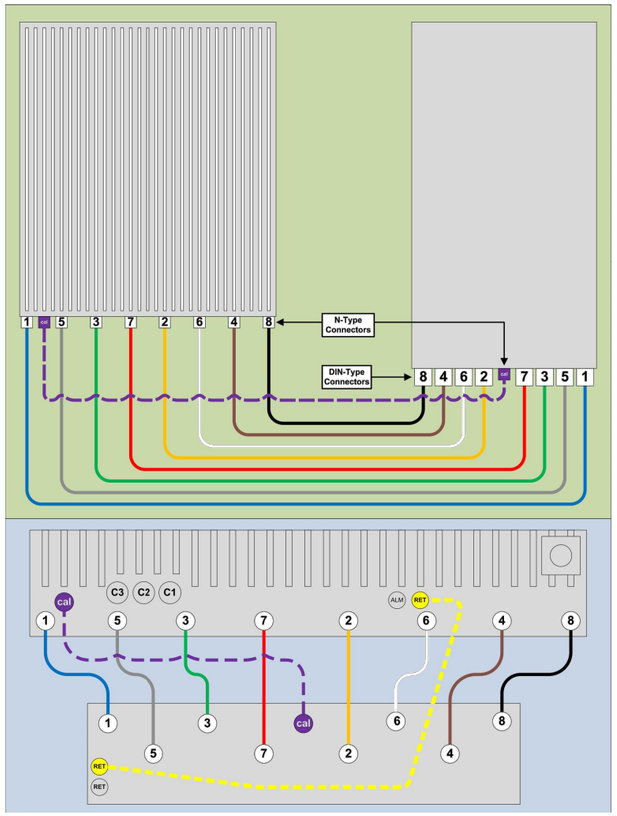
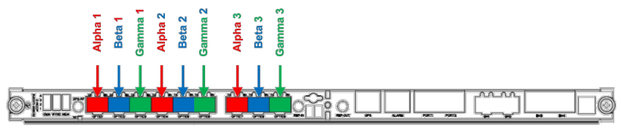
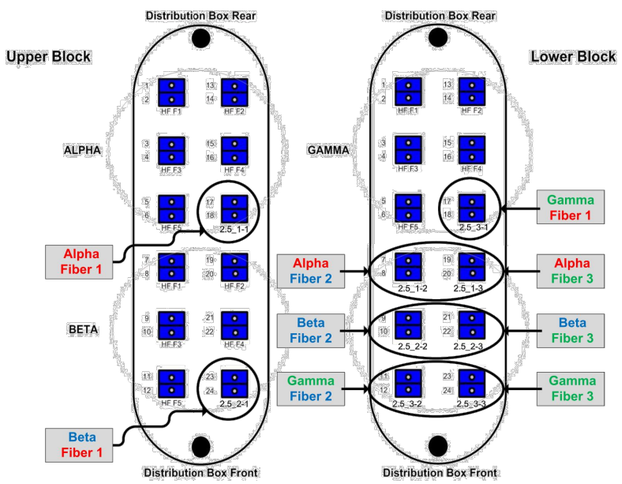


8T8R DETAIL (3)
SCALE: NTS

eCCM2-HR



Distribution Box Fiber Panel



BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (4)
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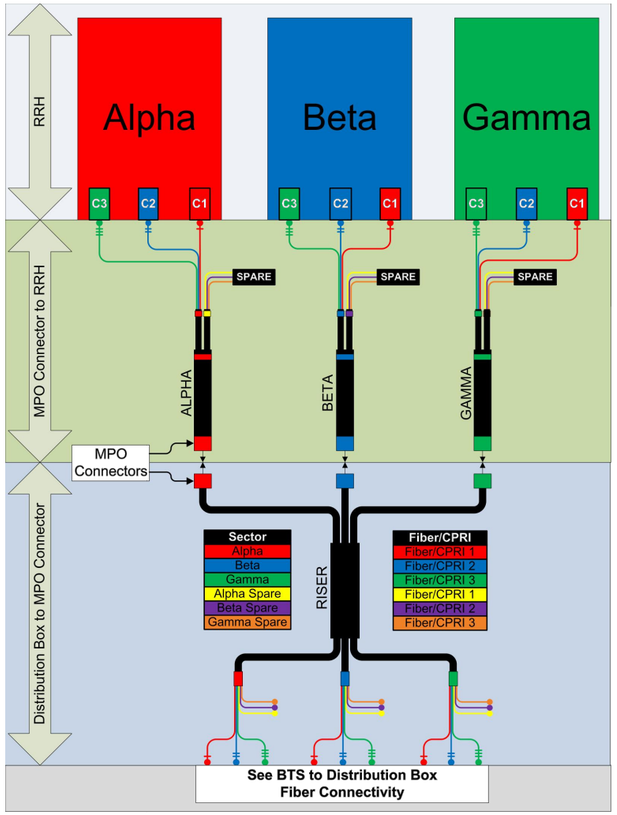

RRH TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (5)
SCALE: NTS

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Signature: Date: 10/06/2017

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL DATE ISSUED: 10/06/17

PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
FIBER PLUMBING DIAGRAM

SCALE:
AS NOTED

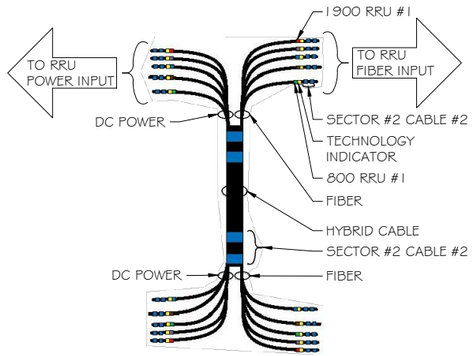
PROJECT NUMBER: 28737
SHEET NUMBER: A-5

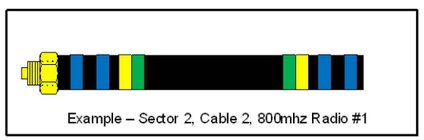
DRAWN BY: TWS CHECKED BY: KAB

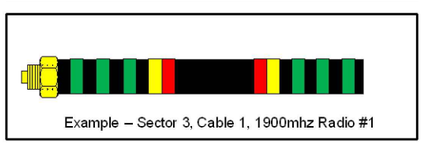
Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue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

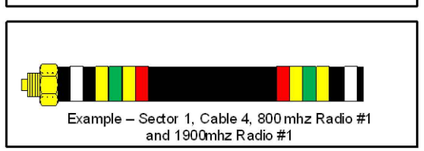
2.5 FREQUENCY	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL

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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MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL DATE ISSUED: 10/06/17

PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
CABLE COLOR CODING

SCALE:
AS NOTED

PROJECT NUMBER: 28737
SHEET NUMBER: A-6

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HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE
MANUF:RFS

CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
Fiber Only	Varies	Use NV Hybriflex	5/8"
Hybriflex	<200'	8 AWG	1-1/4"
Hybriflex	225-300'	6 AWG	1-1/4"
Hybriflex	325-375'	4 AWG	1-1/4"

RFS HYBRIFLEX RISER CABLE SCHEDULE

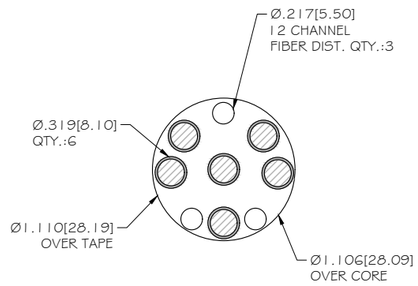
FIBER ONLY (EXISTING DC POWER)	Hybrid cable MN:HB058-M12-050F 12x multi-mode fiber pairs, Top:Outdoor protected connectors, Bottom:LC Connectors, 5/8 cable, 50 ft	50 ft
	MN:HB058-M12-075F	75 ft
	MN:HB058-M12-100F	100 ft
	MN:HB058-M12-125F	125 ft
	MN:HB058-M12-150F	150 ft
	MN:HB058-M12-175F	175 ft
	MN:HB058-M12-200F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

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

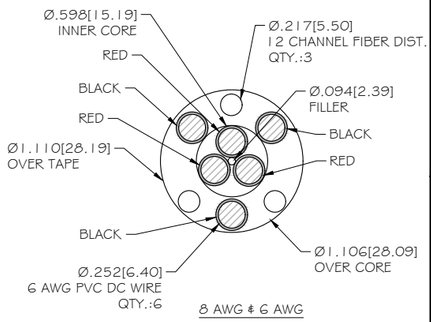
FIBER ONLY	Hybrid Jumper cable MN:HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN:HBF012-M3-10F1	10 ft
	MN:HBF012-M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
8 AWG POWER	Hybrid Jumper cable MN:HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 5/8 cable	5 ft
	MN:HBF058-08U1M3-10F1	10 ft
	MN:HBF058-08U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
6 AWG POWER	Hybrid Jumper cable MN:HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 5/8 cable	5 ft
	MN:HBF058-13U1M3-10F1	10 ft
	MN:HBF058-13U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	
4 AWG POWER	Hybrid Jumper cable MN:HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC connectors, 7/8 cable	5 ft
	MN:HBF078-21U1M3-10F1	10 ft
	MN:HBF078-21U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY	

*NOTE: SPRINT CM TO CONFIRM HYBRID/FIBER RISER CABLE & HYBRID/FIBER JUMPER CABLE MODEL NUMBERS BEFORE PREPARING BOM.

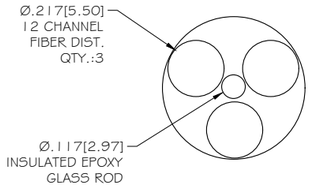
HYBRID CABLE CROSS SECTION & DATA (1)
SCALE: NTS



4 AWG



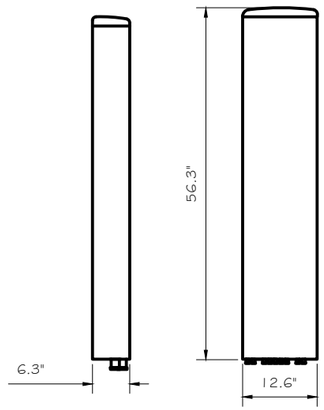
8 AWG & 6 AWG



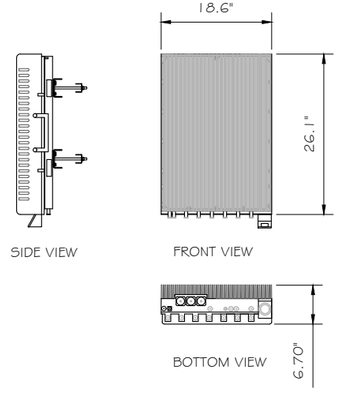
FIBER ONLY

RFS: APXV9TM14-ALU-120

DIMENSIONS, HxWxD:	56.3" x 12.6" x 6.3"
WEIGHT, WITHOUT PRE-MOUNTED BRACKETS:	55.12 lbs.
CONNECTOR:	(9) MINI-DIN FEMALE/BOTTOM



2.5 ANTENNA DETAIL (2)
SCALE: NTS



ALCATEL-LUCENT: TD-RRH8x20

HxWxD = 26.1" x 18.6" x 6.7"

WEIGHT = 70 lbs.

2.5 RRH DETAIL (3)
SCALE: NTS

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Phone:608-643-4100 Fax:608-643-7999
www.Ramaker.com

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: 10/06/2017

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 10/06/17

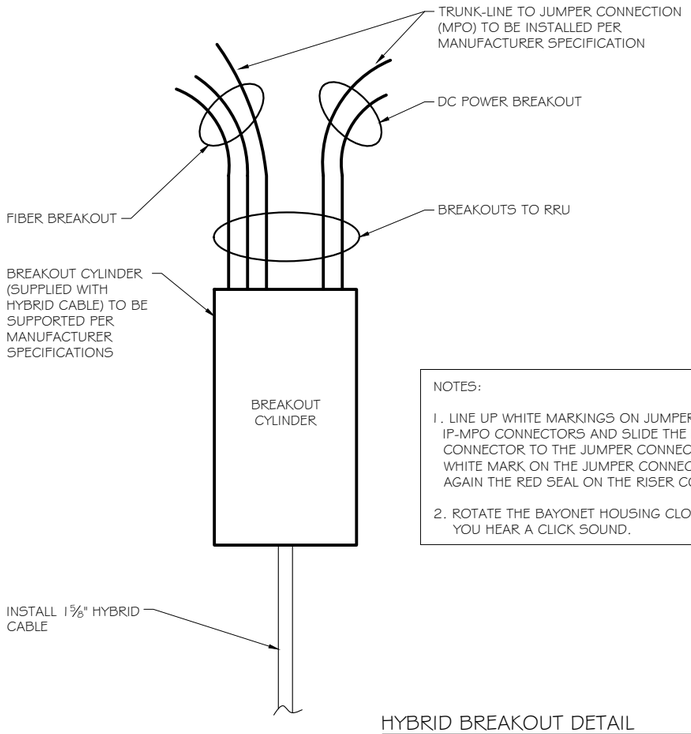
PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
ANTENNA & HYBRID CABLE DETAILS

SCALE:
AS NOTED

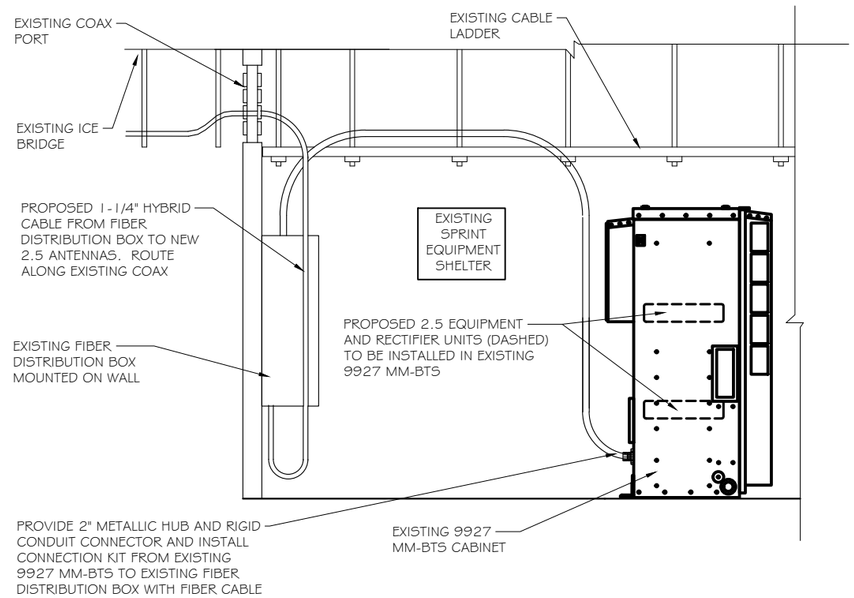
PROJECT NUMBER: 28737
SHEET NUMBER: A-7



NOTES:

1. LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTORS AND SLIDE THE RISER CONNECTOR TO THE JUMPER CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAIN THE RED SEAL ON THE RISER CONNECTOR.
2. ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL YOU HEAR A CLICK SOUND.

HYBRID BREAKOUT DETAIL (1)
SCALE: NTS

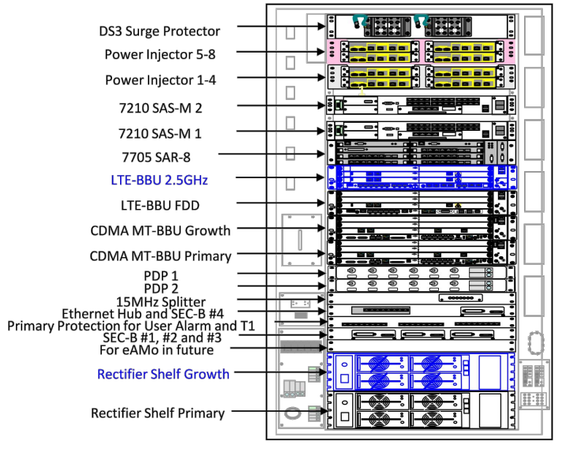


CABLE ROUTE FROM CABINET (2)
SCALE: NTS

(1) PROPOSED BATTERY STRING TO BE INSTALLED IN EXISTING BATTERY CABINET

EXISTING BBU CABINET (3)
SCALE: NTS

INSTALL NEW 2.5 EQUIPMENT, INCLUDING BASE BAND UNIT, CELL SITE ROUTER, RECTIFIERS, AND SURGE ARRESTORS AS NEEDED IN EXISTING MM-BTS CABINET



EXISTING MMBS CABINET (4)
SCALE: NTS

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

Signature: James R. Skowronski Date: 10/06/2017

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ISSUE PHASE: FINAL
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PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
EQUIPMENT DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 28737
SHEET NUMBER: A-8

DRAWN BY: TWS CHECKED BY: KAB

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 100% 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:

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: 10/06/2017

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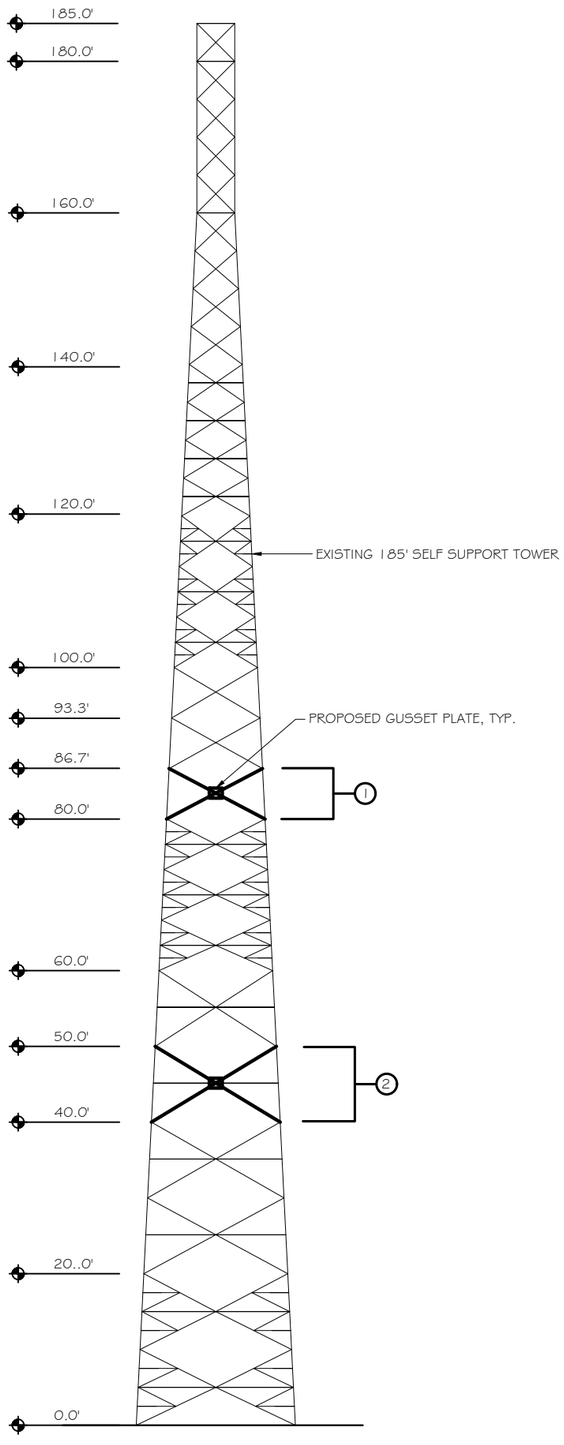
SHEET TITLE:
STRUCTURAL NOTES

SCALE: NONE

PROJECT NUMBER: 28737
SHEET NUMBER: S-1



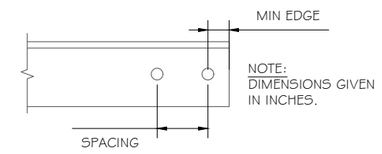
MODIFIED TOWER ELEVATION (1)
SCALE: 1" = 20'

NO.	TOWER MODIFICATION SCHEDULE	ELEVATIONS (FT)
1	INSTALL DOUBLE ANGLE DIAGONALS, SEE DETAIL SHEET S-3	86.7 - 80
2	INSTALL DOUBLE ANGLE DIAGONALS, SEE DETAIL SHEET S-4	50 - 40

NOTES:
1. ALL PROPOSED STEEL AND HARDWARE TO BE HOT-DIPPED GALVANIZED.
2. ALL PROPOSED BOLTS TO BE GRADE A325, UNLESS NOTED OTHERWISE.
3. ALL PROPOSED STEEL GRADE A36, UNLESS NOTED OTHERWISE.
4. DO NOT REUSE EXISTING BOLTS, INSTALL NEW BOLTS.
5. APPLY COLD GALVANIZING COMPOUND TO FIELD INSTALLED BOLT HOLES.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE TOWER DURING CONSTRUCTION.
7. SEE STRUCTURAL NOTES ON PAGE S-1

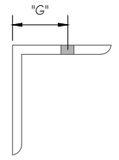
NOMINAL HOLE DIMENSIONS		
BOLT DIA.	STANDARD HOLE	SHORT SLOT
1/2	9/16	9/16 x 1 1/16
5/8	1 1/16	1 1/16 x 7/8
3/4	1 3/16	1 3/16 x 1
7/8	1 5/16	1 5/16 x 1 1/8
1	1 1/16	1 1/16 x 1 5/16
NOTE: DIMENSIONS GIVEN IN INCHES		

BOLT EDGE AND SPACING		
BOLT DIA.	MIN. EDGE	SPACING
1/2	7/8	1 1/2
5/8	1 1/8	1 7/8
3/4	1 1/4	2 1/4
7/8	1 1/2	2 5/8
1	1 3/4	3



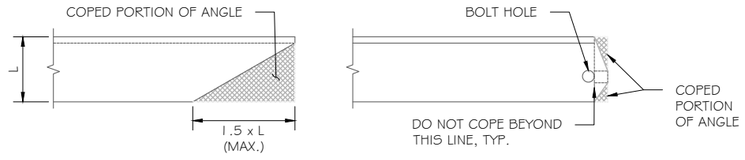
NOTE:
DIMENSIONS GIVEN IN INCHES.

WORKABLE GAGES						
LEG	4	3 1/2	3	2 1/2	2	1 3/4
G	2 1/2	2	1 3/4	1 3/8	1 1/8	1



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

ALLOWABLE ANGLE COPE



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STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED PROFESSIONAL ENGINEER

Signature: Date: 10/06/2017

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL DATE ISSUED: 10/06/17

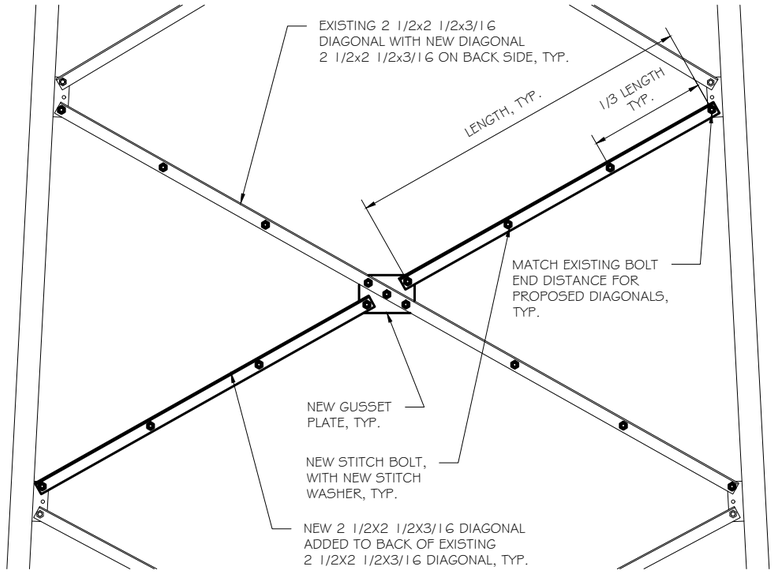
PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

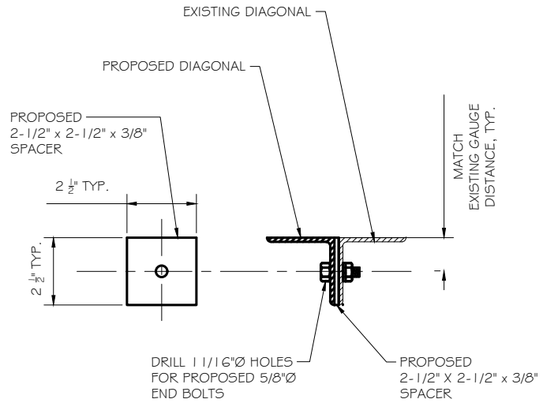
PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
STRUCTURAL DETAILS

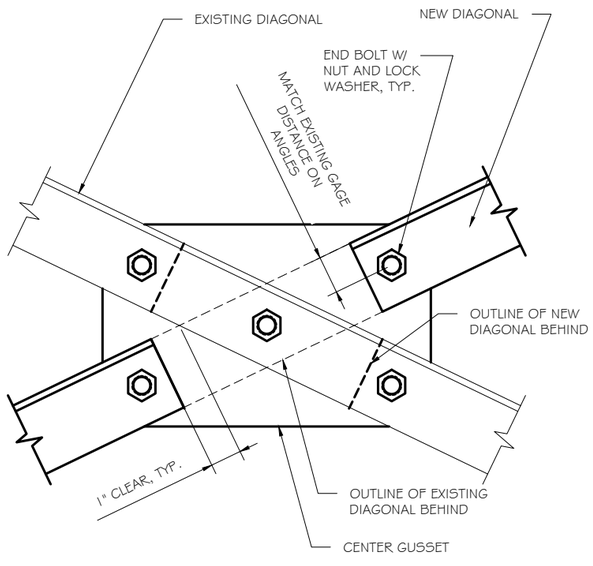
0 10' 20' 40'
11" x 17" - 1" = 20'
22" x 34" - 1" = 10'

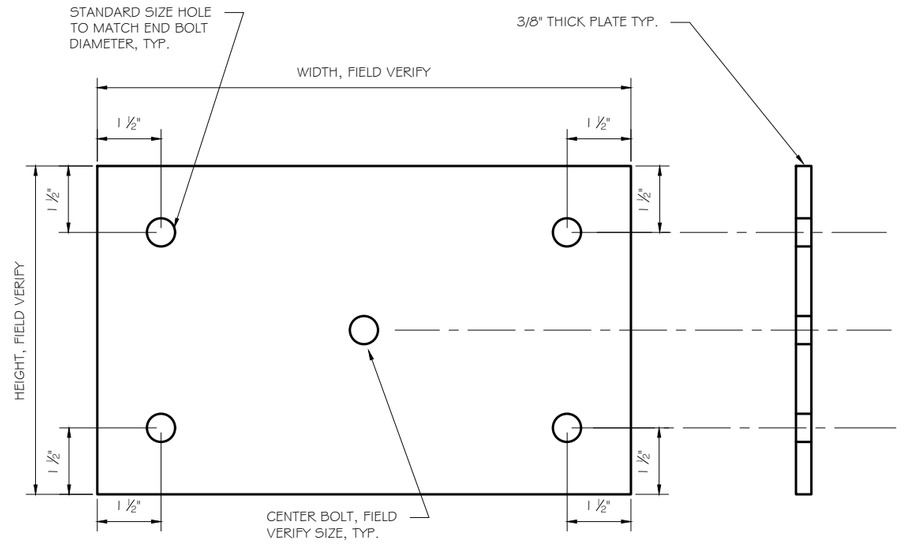
PROJECT NUMBER: 28737
SHEET NUMBER: S-2





DOUBLE ANGLE BOLT STITCHING DETAIL (1)
SCALE: NTS





DOUBLE ANGLE GUSSET DETAIL (2)
SCALE: NTS

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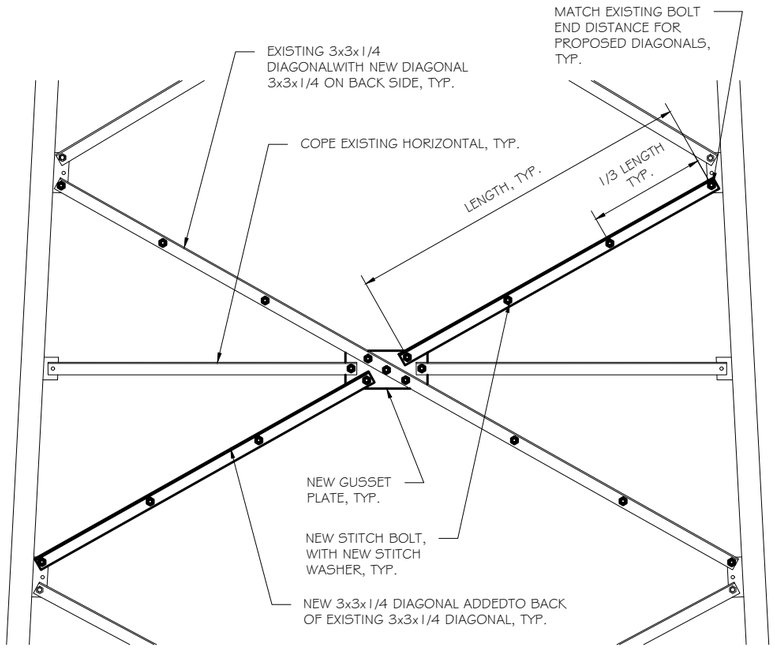
TRANSFER STATION
CT33XC522-C

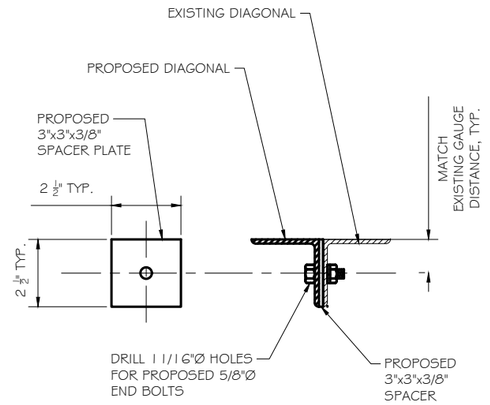
PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
STRUCTURAL DETAILS

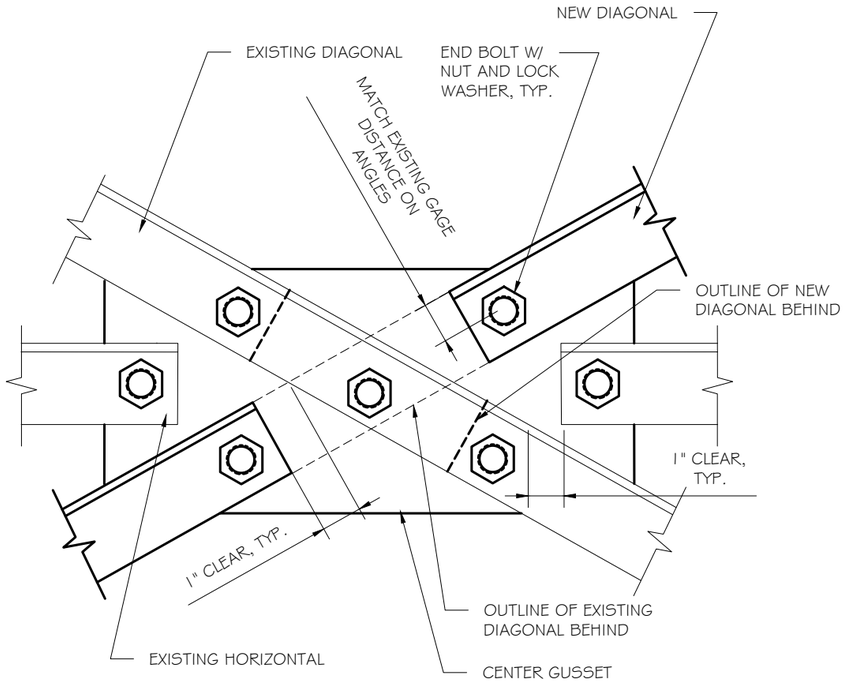
SCALE: NONE

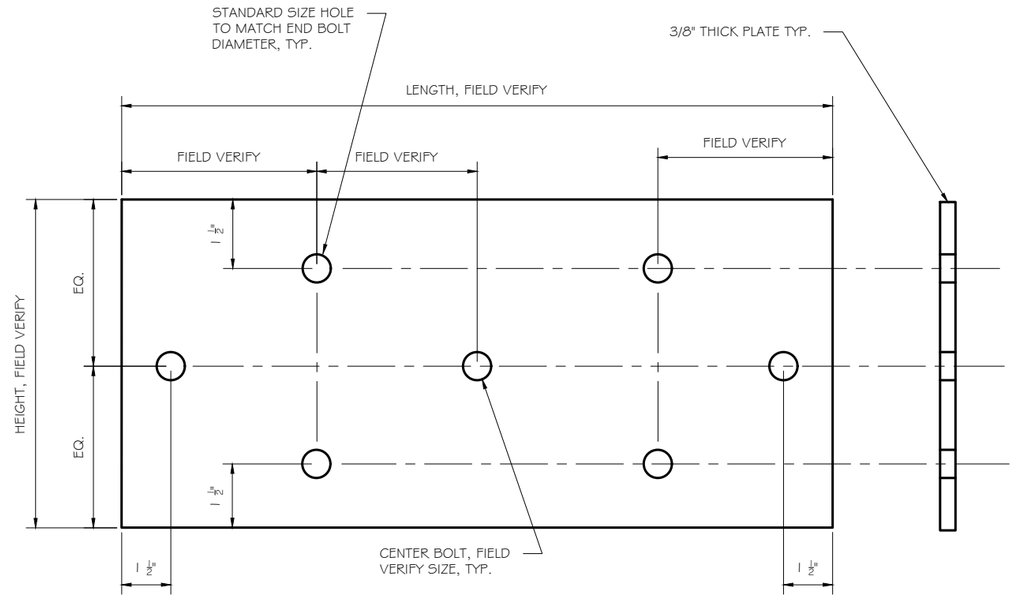
PROJECT NUMBER: 28737
SHEET NUMBER: S-3





DOUBLE ANGLE BOLT STITCHING DETAIL (1)
SCALE: NTS





DOUBLE ANGLE GUSSET W/ HORIZONTAL DETAIL (2)
SCALE: NTS

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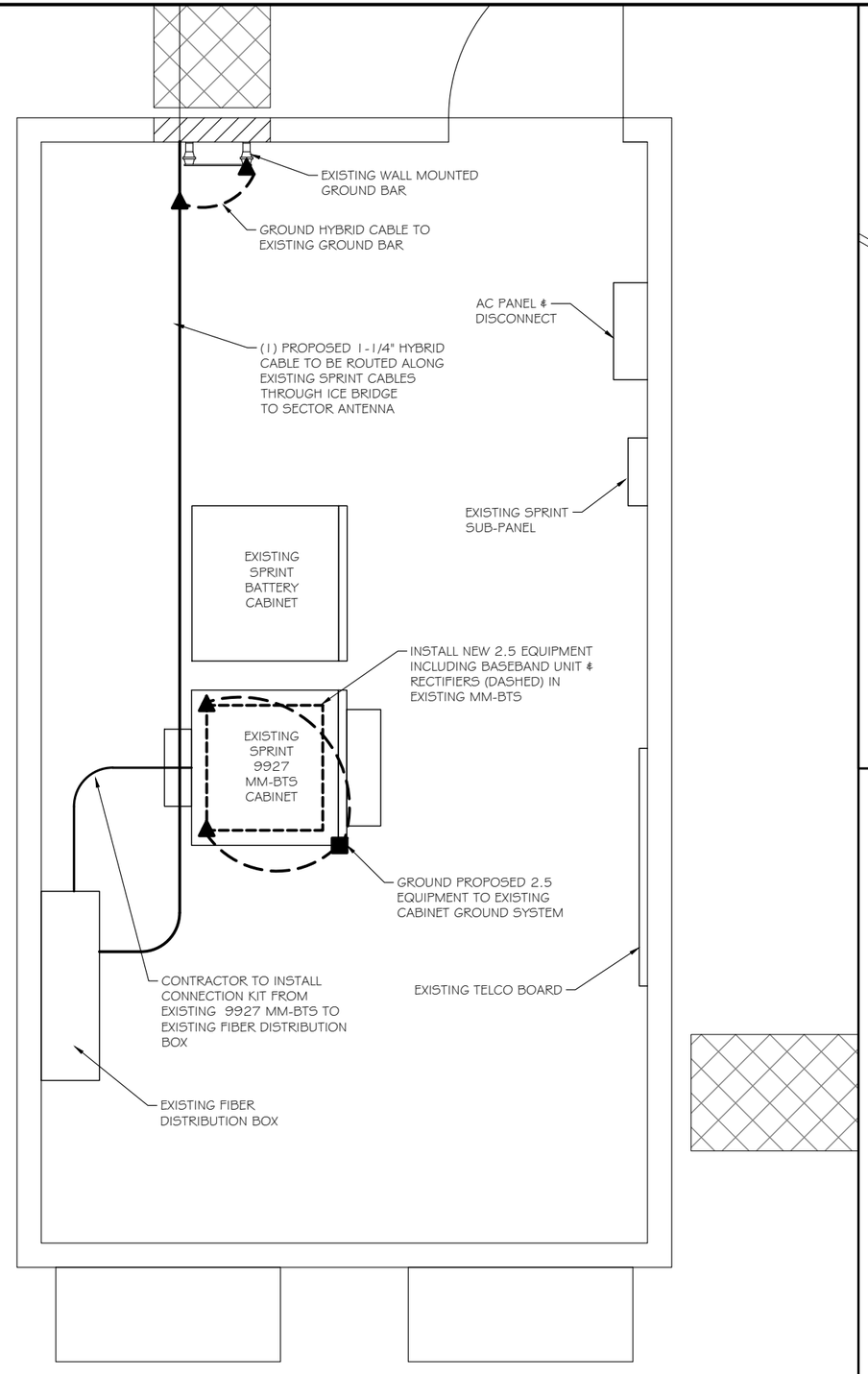
PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

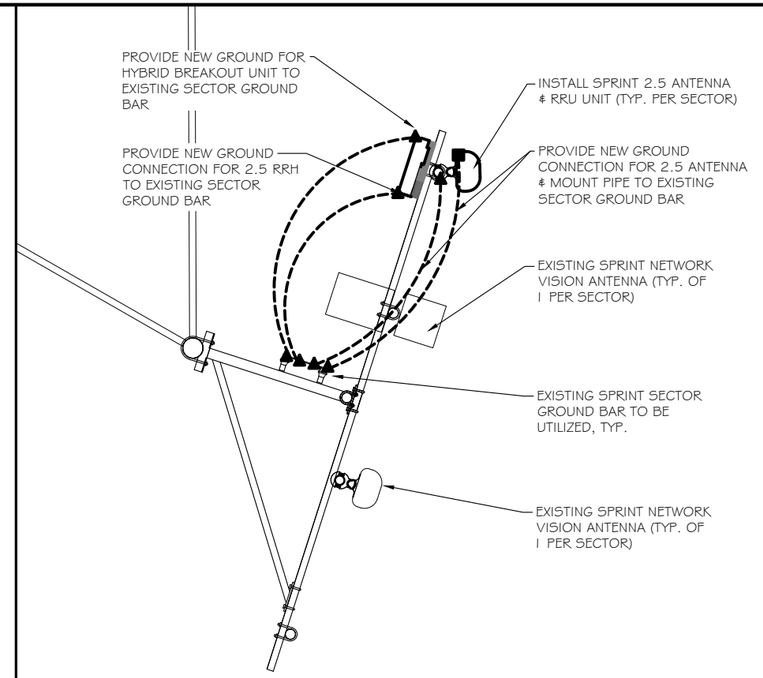
SHEET TITLE:
STRUCTURAL DETAILS

SCALE: NONE

PROJECT NUMBER: 28737
SHEET NUMBER: S-4



EQUIPMENT UTILITY & GROUNDING PLAN (1)
SCALE: NTS



ANTENNA GROUNDING DETAIL (2)
SCALE: NTS

GROUNDING NOTES:

1. CONTRACTOR TO ENSURE PROPER SEQUENCING OF GROUNDING AND UNDERGROUND CONDUIT INSTALLATION TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM AND/OR DAMAGE TO THE CONDUIT.
2. ALL EXTERIOR GROUND CONDUCTORS SHALL BE #2 AWG SOLID TINNED COPPER UNLESS NOTED OTHERWISE.
3. ALL GROUND CONNECTIONS BELOW GRADE SHALL BE EXOTHERMIC (CADWELD).
4. ALL GROUND CONNECTIONS ABOVE GRADE AND/OR INTERIOR SHALL BE COMPRESSION TYPE, TWO-HOLE LUGS OR DOUBLE-CRIMP "C" TAPS.
5. CONTACT AREAS WHERE CONNECTIONS ARE MADE SHALL BE PREPARED TO A BARE BRIGHT FINISH AND COATED WITH AN ANTI-OXIDATION MATERIAL BEFORE CONNECTIONS ARE MADE.
6. MAXIMUM RESISTANCE OF THE COMPLETED GROUND SYSTEM SHALL NOT EXCEED 5 OHMS.
7. WHERE GROUNDING CONNECTIONS ARE MADE TO PAINTED METAL SURFACES, PAINT SHALL BE REMOVED TO BEAR METAL TO ENSURE PROPER CONTACT AND RESTORED/PAINTED TO ORIGINAL FINISH.
8. GROUND DEPTH SHALL BE 30" MINIMUM BELOW FINISHED GRADE, OR 6" BELOW FROST LINE, WHICHEVER IS GREATER.

LEGEND:	
– – – – – – – – – – – –	EXISTING GROUND CABLE
▬▬▬▬▬▬▬▬▬▬▬▬	PROPOSED GROUND CABLE
▲	MECHANICAL CONNECTION
■	EXOTHERMIC CONNECTION
—E—E—E—E—	PROPOSED ELECTRIC

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PROJECT TITLE:
TRANSFER STATION
CT33XC522-C

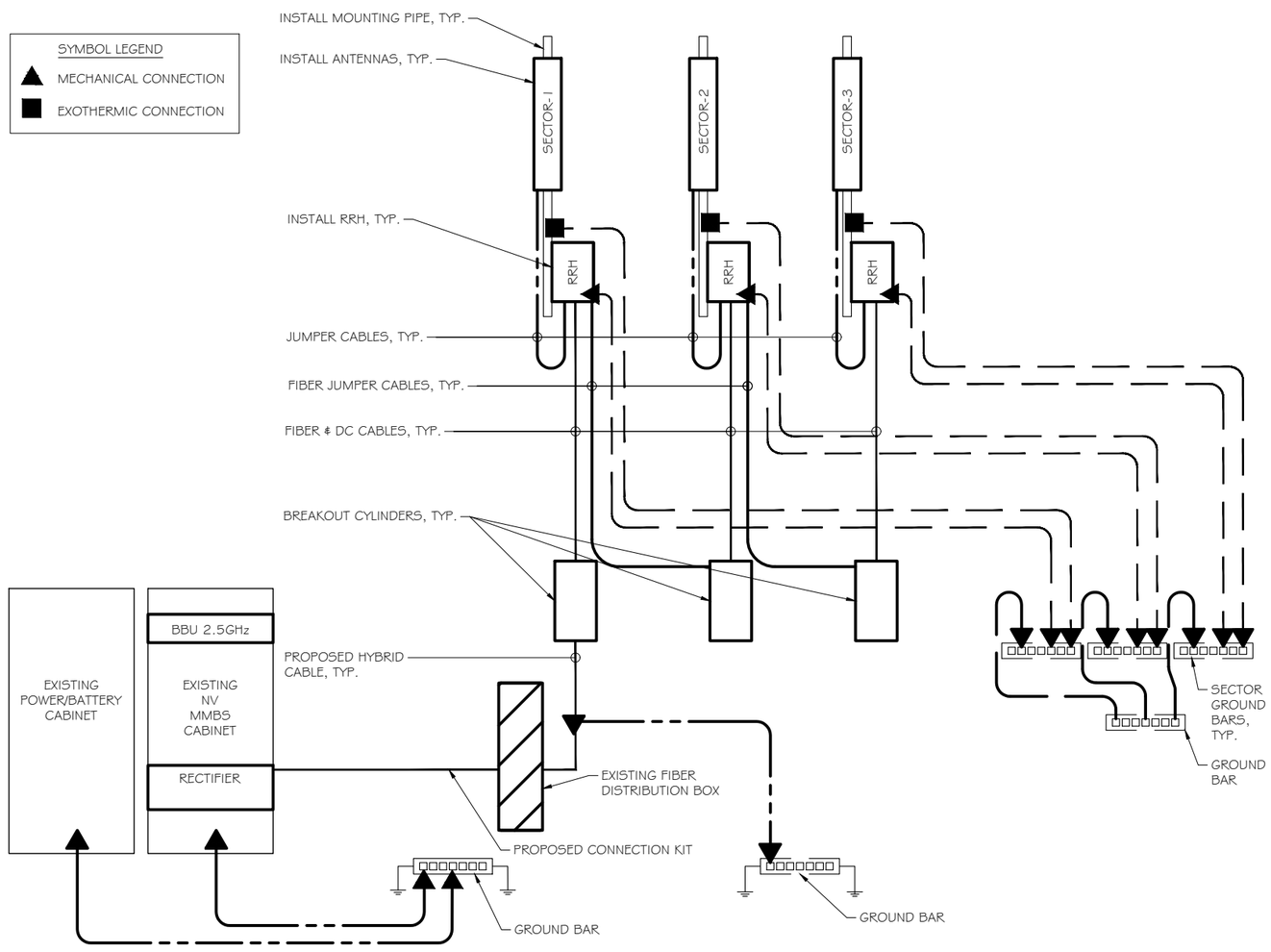
PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
EQUIPMENT UTILITY & GROUNDING PLAN

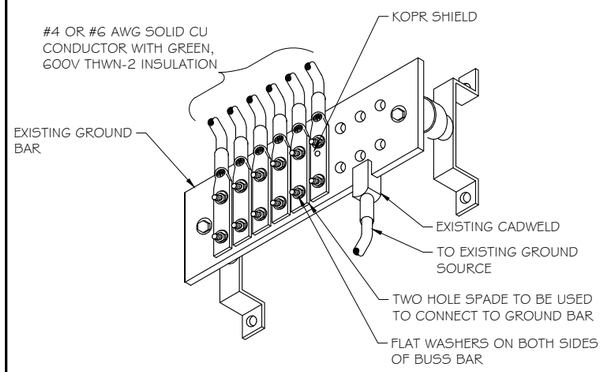
SCALE:
AS NOTED

PROJECT NUMBER: 28737
SHEET NUMBER: E-1

SYMBOL LEGEND
- MECHANICAL CONNECTION
- EXOTHERMIC CONNECTION



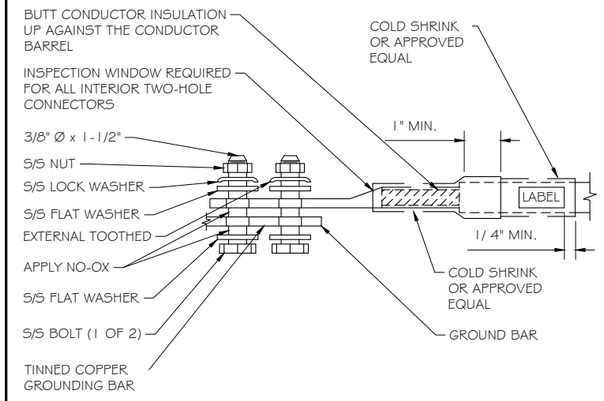
GROUNDING RISER DIAGRAM (1)
SCALE: NTS



NOTES:
1. APPLY NO-OX TO LUG AND GROUND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.

2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

GROUNDING CONDUCTOR INSTALLATION (2)
SCALE: NTS



TWO-HOLE LUG (3)
SCALE: NTS

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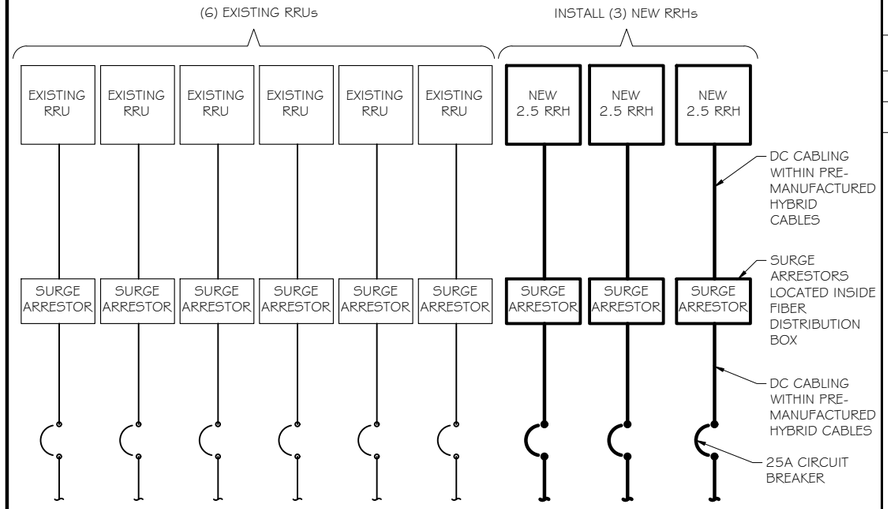
FAIRFIELD COUNTY

SHEET TITLE:
GROUNDING DETAILS

SCALE:
AS NOTED

PROJECT NUMBER: 28737
SHEET NUMBER: E-2



DC ONE-LINE DIAGRAM (1)
SCALE: NTS

A/C PANEL SCHEDULE

VOLTAGE:	240V/120		PANEL STATUS:	EXISTING		N TO GROUND BOND:	YES
MAIN BREAKER:	200 AMP		MODEL NUMBER:	TBD		INTERNAL TVSS:	YES
MOUNT:	GROUND		PHASE:	1		WIRE:	3
ENCLOSURE TYPE:	NEMA 3R		BUSS RATING:	200 AMP		GROUND BAR:	YES
			NEUTRAL BAR:	YES			

CKT	DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	PHASE A VA	PHASE B VA	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	DESCRIPTION	CKT
1	SURGE ARRESTOR	20	2	ON			OFF	2	30	RECTIFIER #2	2
3											4
5	RECTIFIER #1	30	2	OFF			OFF	2	30	RECTIFIER #4	6
7											8
9	RECTIFIER #3	30	2	OFF			OFF	2	30	RECTIFIER #6	10
11											12
13	RECTIFIER #5	30	2	OFF			OFF	2	30	RECTIFIER #8	14
15											16
17	RECTIFIER #7	30	2	OFF			OFF	2	30	RECTIFIER #8	18
19											20
21	RECTIFIER #9 SPARE	30	2	OFF			ON	2	50	HVAC #2	22
23											24
25	HVAC #1	50	2	ON			ON	2	100	BTS	26
27											28
29	HVAC #3 SPARE	35	2	OFF			ON	1	20	LIGHTING	30
31							ON	1	20	SMOKE DETECTOR	32
33	RECEPTACLE	20	1	OFF			OFF	2	40	BTS	34
35	RECEPTACLE	20	1	OFF							36
37	RECEPTACLE	20	1	OFF			ON	1	20	EXT. RECEPTACLE	38
39	RECEPTACLE	20	1	OFF			ON	1	20	RECEPTACLE	40
41	BLANK (UNUSED)	-	-	-			-	-	-	BLANK (UNUSED)	42

AC PANEL SCHEDULE (2)
SCALE: NTS

FREQ BAND (1900,800) + RADIO NUMBER
HYBRID SHEATH COLOR CODE
RFS (OEM)COLOR CODE

HF11-FIBER PAIR 1-(F1)
HF11-FIBER PAIR 2-(F2)
HF11-FIBER PAIR 3-(F3)
HF11-FIBER PAIR 4-(F4)
HF11-FIBER PAIR 5-(F5)
HF12-FIBER PAIR 1-(F1) 2.5 ALPHA 1
HF21-FIBER PAIR 1-(F1)
HF21-FIBER PAIR 2-(F2)
HF21-FIBER PAIR 3-(F3)
HF21-FIBER PAIR 4-(F4)
HF21-FIBER PAIR 5-(F5)
HF12-FIBER PAIR 2-(F2) 2.5 BETA 1

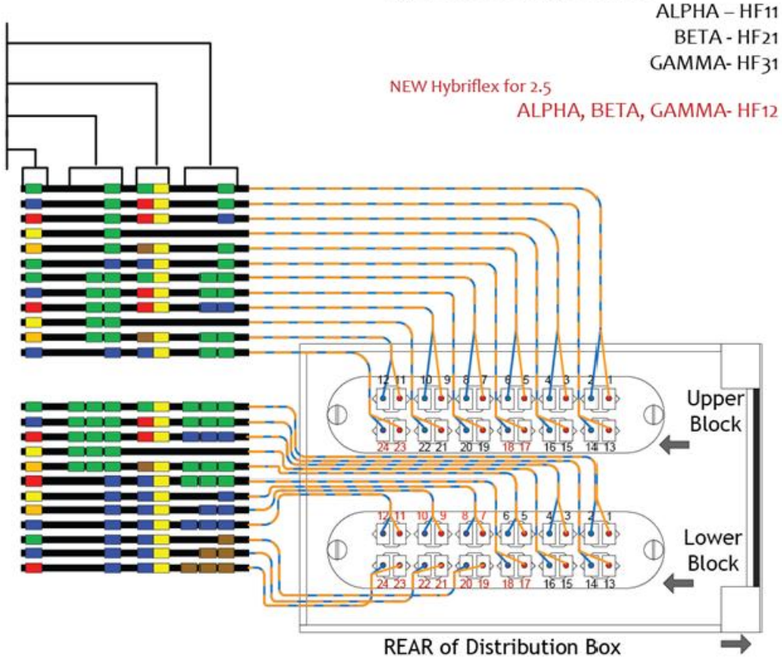
HF31-FIBER PAIR 1-(F1)
HF31-FIBER PAIR 2-(F2)
HF31-FIBER PAIR 3-(F3)
HF31-FIBER PAIR 4-(F4)
HF31-FIBER PAIR 5-(F5)
HF12-FIBER PAIR 3-(F3) 2.5 GAMMA 1
HF12-FIBER PAIR 4-(F4) 2.5 ALPHA 2
HF12-FIBER PAIR 5-(F5) 2.5 BETA 2
HF12-FIBER PAIR 6-(F6) 2.5 GAMMA 2
HF12-FIBER PAIR 7-(F7) 2.5 ALPHA 3
HF12-FIBER PAIR 8-(F8) 2.5 BETA 3
HF12-FIBER PAIR 9-(F9) 2.5 GAMMA 3

NOTES:

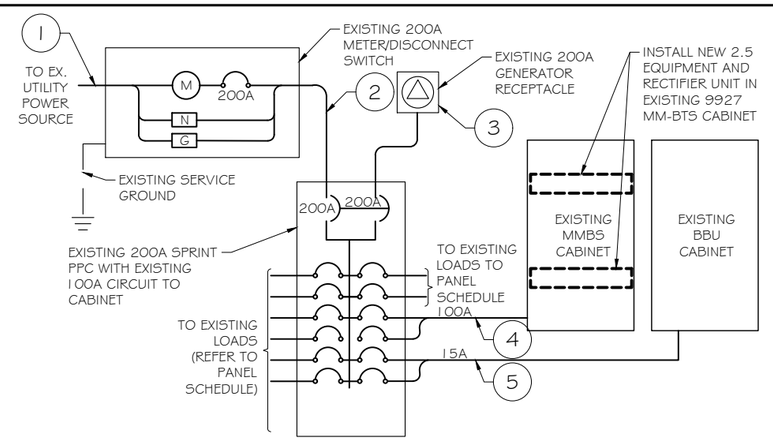
1). CIRCUIT BREAKER NUMBERS 4, 8, AND 12 ARE TO BE USED UNLESS THIRD DC RAIL IS REQUIRED FOR MICROWAVE.
2). USE DC POWER LOOP.
3). ALL UNUSED DC FEEDERS TO BE TERMINATED WITH WIRE NUTS AND TAPED.
4). REMOVE ALL DEBRIS FROM INTERIOR OF FIBER DISTRIBUTION BOX WHEN COMPLETE.

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



TYPICAL FIBER DISTRIBUTION (3)
SCALE: NTS



CIRCUIT SCHEDULE

NO.	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/ DISCONNECT	EXISTING
2	METER/ DISCONNECT	TRANSFER & LOAD CENTER	EXISTING
3	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	TRANSFER & LOAD CENTER	EX. MMBS CABINET	(3) #2 AWG, (1) #8 GND IN 1½" CONDUIT
5	TRANSFER & LOAD CENTER	EX. BBU CABINET	(2) #12 AWG, (1) #12 GND IN ¾" CONDUIT

ELECTRICAL ONE-LINE DIAGRAM (4)
SCALE: NTS

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TRANSFER STATION
CT33XC522-C

PROJECT INFORMATION:
237 GODFREY ROAD
WESTON, CT 06883
FAIRFIELD COUNTY

SHEET TITLE:
DC POWER DETAILS & PANEL SCHEDULES

SCALE:
AS NOTED

PROJECT NUMBER: 28737
SHEET NUMBER: E-3