750 West Center Street, Floor 3 / Suite 301
West Bridgewater, MA 02379 *Corporate Headquarters*
781.713.4725
617.249.0819

Centerline Communications
Ryan Clark
750 West Center Street, Floor 3
West Bridgewater, MA 02379
203-300-7310
rclark@clinellc.com

July 17, 2019

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Notice of Exempt Modification
150 Willow Street Hamden, CT 06410
Latitude: 41.449392
Longitude:-72.904572
T-Mobile Site#: CTNH442A_L600

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 137-foot level of the existing 157-foot monopole tower at 150 Willow Street Hamden, CT 06410. The 157-foot tower is owned by Sprint Sites USA and property is owned by Hamden Fish & Game Protective. T-Mobile now intends to replace three (3) of its existing antennas with three (3) new 600/700 MHz antenna. The new antennas would be installed at the 137-foot level of the tower. A mount stabilizer kit is to be installed as recommended in the attached Mount Analysis.

Planned Modifications:

Remove and Replace:
(3) LNX-6515DS-A1M Antennas **(Remove)** - (3) APXVAARR24_43-U-NA20 600/700 MHz Antennas **(Replace)**
(3) RRUS11 B12 **(Remove) -** (3) RRU 4449 B12/B71 **(Replace)**

Install New:
(1) Fiber Hybrid Line

Existing to Remain:
(6) 1-5/8" Coax
(3) TMA
(2) Fiber Hybrid Line
(3) AIR21 _B2A_B4P 1900 MHz/2100 MHz Antennas
(3) AIR21 _B2P_B4A 2100 MHz Antennas

Ground:
(2) Proposed underground conduit runs

CENTERLINE COMMUNICATIONS

750 West Center Street, Floor 3 / Suite 301
West Bridgewater, MA 02379 *Corporate Headquarters*
781.713.4725
617.249.0819

This facility was approved by the CT Siting Council Docket No.324–on May 1, 2007- 150 Willow Street Hamden, CT with conditions. We used the information from the previous filing. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mayor Curt B. Leng, Elected Official and Daniel W. Kops, Jr. Town Planner for the Town of Hamden, as well as the property owner and the tower owner.

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

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal 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, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Ryan Clark
Mobile: 203-300-7310
Fax: 508-819-3017
Office: 117 Carol Street Danbury, CT 06810
Email: rclark@clinellc.com

CENTERLINE COMMUNICATIONS

750 West Center Street, Floor 3 / Suite 301
West Bridgewater, MA 02379 *Corporate Headquarters*
781.713.4725
617.249.0819

Attachments
cc: Mayor Curt B. Leng, Town of Hamden -chief elected official
Daniel W. Kops, Jr. -Town Planner for the Town of Hamden
Sprint Sites USA - tower owner
Hamden Fish & Game Protective- property owner

Exhibit A

Original Facility Approval

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

September 19, 2016

Eric Dahl
Vertical Development
20 Commercial Street
Branford, CT 06405

RE: **TS-T-MOBILE-062-160818** - T-Mobile Northeast LLC request for an order to approve tower sharing at an existing telecommunications facility located at 150 Willow Street, Hamden, Connecticut.

Dear Mr. Dahl:

At a public meeting held on September 15, 2016, the Connecticut Siting Council (Council) ruled that the shared use of this existing 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 with the following conditions:

1. Any deviation from the proposed installation as specified in the original tower share request and supporting materials with the Council shall render this decision invalid;
2. Any material changes to the proposed installation as specified in the original tower share request and supporting materials filed with the Council shall require an explicit request for modification to the Council pursuant to Connecticut General Statutes § 16-50aa, including 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;
3. Not less than 45 days after completion of the proposed installation, the Council shall be notified in writing that the installation has been completed;
4. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by T-Mobile Northeast LLC shall be removed within 60 days of the date the antenna ceased to function;
5. The validity of this action shall expire one year from the date of this letter; and
6. The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

This decision is under the exclusive jurisdiction of the Council and applies only to this request for tower sharing dated August 12, 2016. This facility has 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. Any deviation from the approved tower sharing request is enforceable under the provisions of Connecticut General Statutes § 16-50u.

The proposed shared use is to be implemented as specified in your letter dated August 12, 2016, including the placement of all necessary equipment and shelters within the tower compound.

Please be advised that the validity of this action shall expire one year from the date of this letter.

Thank you for your attention and cooperation.

Very truly yours,

Robert Stein

Robert Stein
Chairman

RS/FOC/lm

c: The Honorable Curt B. Leng, Mayor, Town of Hamden
Dan Kops, Acting Town Planner, Town of Hamden
Sprint Sites USA
Hamden Fish & Game Protective Association

8056 3/3234

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
Internet: ct.gov/csc

Daniel F. Caruso
Chairman

May 10, 2007

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

RE: **DOCKET NO. 324** – Sprint Nextel Corporation application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 150 Willow Street, Hamden, Connecticut.

Dear Attorney Regan:

By its Decision and Order dated May 1, 2007, the Connecticut Siting Council (Council) granted a Certificate of Environmental Compatibility and Public Need (Certificate) for the construction, maintenance and operation of a wireless telecommunications facility at 150 Willow Street, Hamden, Connecticut.

Enclosed are the Council's Certificate, Findings of Fact, Opinion, and Decision and Order.

Very truly yours,

S. Derek Phelps FOC

S. Derek Phelps
Executive Director

SDP/MP/laf

Enclosures (4)

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
Internet: ct.gov/csc

Daniel F. Caruso
Chairman

May 10, 2007

TO: Parties and Intervenors

FROM: S. Derek Phelps, Executive Director

RE: **DOCKET NO. 324** – Sprint Nextel Corporation application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 150 Willow Street, Hamden, Connecticut.

By its Decision and Order dated May 1, 2007, the Connecticut Siting Council granted a Certificate of Environmental Compatibility and Public Need (Certificate) for the construction, maintenance and operation of a wireless telecommunications facility at 150 Willow Street, Hamden, Connecticut.

Enclosed are the Council's Findings of Fact, Opinion, and Decision and Order.

SDP/MP/laf

Enclosures (3)

c: State Documents Librarian

STATE OF CONNECTICUT)

ss. New Britain, Connecticut :

COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the Findings of Fact, Opinion, and Decision and Order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

Fred O. Cunliffe
Supervising Siting Analyst
Connecticut Siting Council

I certify that a copy of the Findings of Fact, Opinion, and Decision and Order in Docket No. 324 has been forwarded by Certified First Class Return Receipt Requested mail on May 10, 2007, to all parties and intervenors of record as listed on the attached service list, dated November 3, 2006.

ATTEST:

Lisa A. Fontaine
Administrative Assistant
Connecticut Siting Council

Exhibit B

Property Card

150 WILLOW ST

Location	150 WILLOW ST	**Mblu**	3430/ 001/ / /
Acct#		**Owner**	HAMDEN FISH & GAME PROTECTIVE AS
Assessment	$419,570	**Appraisal**	$1,359,200
PID	18077	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$187,200	$1,172,000	$1,359,200

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$131,040	$288,530	$419,570

Owner of Record

Owner	HAMDEN FISH & GAME PROTECTIVE AS	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	P O BOX 5619 HAMDEN, CT 06518-0619	**Book & Page**	232/ 49
		Sale Date	10/10/1945
		Instrument	00

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
HAMDEN FISH & GAME PROTECTIVE AS	$0		232/ 49	00	10/10/1945

Building Information

Building 1 : Section 1

Year Built:	1900
Living Area:	3,081
Building Percent Good:	60

Building Attributes	
Field	**Description**
STYLE	Clubs/Lodges

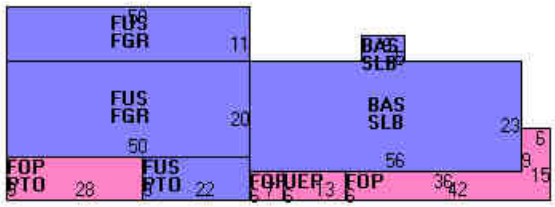
MODEL	Comm/Ind
Grade	C
Stories:	2
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asphalt
Interior Wall 1	K PINE/A WD
Interior Wall 2	
Interior Floor 1	Vinyl/Asphalt
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Forced Air-Duc
AC Type	06
Bldg Use	FISH&GAME
Total Rooms	
Total Bedrms	
Total Baths	
1st Floor Use:	
Heat/AC	NONE
Frame Type	WOOD FRAME
Baths/Plumbing	NONE
Ceiling/Wall	TYPICAL
Rooms/Prtns	LIGHT
Wall Height	8
% Comn Wall	

Building Photo

3430-001-00-0000 04/23/2015

(http://images.vgsi.com/photos/HamdenCTPhotos//\00\04\38/68

Building Layout



(http://images.vgsi.com/photos/HamdenCTPhotos//Sketches/180

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
FUS	Upper Story, Finished	1,748	1,748
BAS	First Floor	1,333	1,333
FGR	Garage	1,550	0
FOP	Porch, Open	600	0
PTO	Patio	450	0
SLB	Slab	0	0
UEP	Enclosed Porch, Unfinished	78	0
		5,759	3,081

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
FPL1	FIREPLACE AVG	1 UNITS	$2,200	1

A/C	AIR CONDITIONING	1288 S.F.	$1,500	1
FPL	FIREPLACE	1 UNITS	$1,600	1

Land

Land Use

Use Code	3850
Description	FISH&GAME
Zone	T1
Neighborhood	130
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	85.58
Frontage	0
Depth	0
Assessed Value	$288,530
Appraised Value	$1,172,000

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHD1	SHED FRAME			740 S.F.	$4,400	1
SHD6	SHED COM MAS			64 S.F.	$600	1
SHD6	SHED COM MAS			360 S.F.	$3,600	1
FGR4	W/LOFT-AVG			576 S.F	$8,400	1

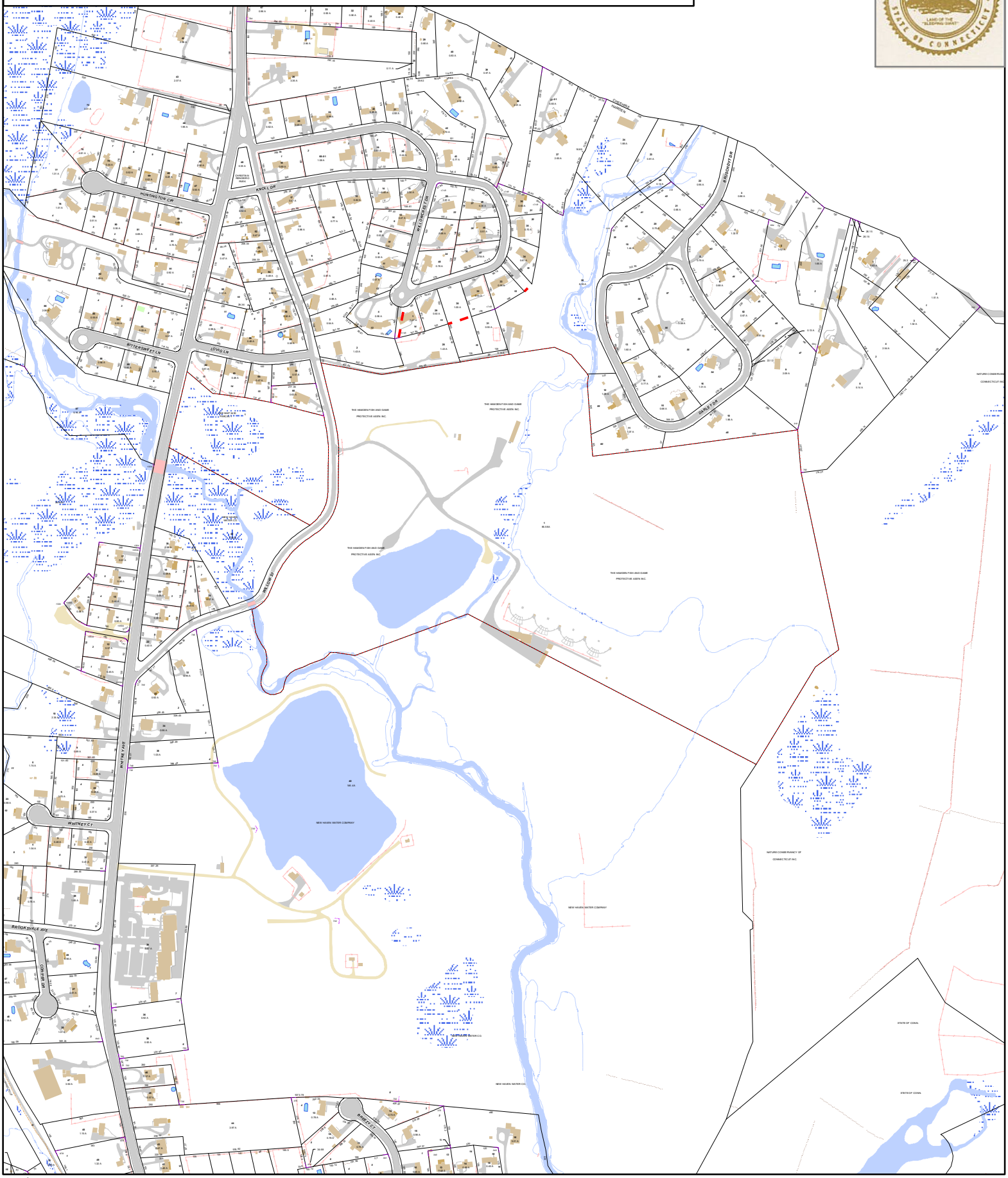
Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$187,200	$1,172,000	$1,359,200
2016	$187,200	$1,172,000	$1,359,200
2015	$187,200	$1,172,000	$1,359,200

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$131,040	$288,530	$419,570
2016	$131,040	$288,530	$419,570
2015	$131,040	$288,530	$419,570

Town of Hamden, Connecticut - Assessment Parcel Map

Parcel: 3430-001-00-0000 Address: 150 WILLOW ST



N

Approximate Scale: 1 inch = 600 feet

0 300 600 900 1,200 Feet

Map Produced: April 2019

Disclaimer: This map is for informational purposes only. All information is subject to verification by any user. The Town of Hamden and its mapping contractors assume no legal responsibility for the information contained herein.

Exhibit C

Construction Drawings

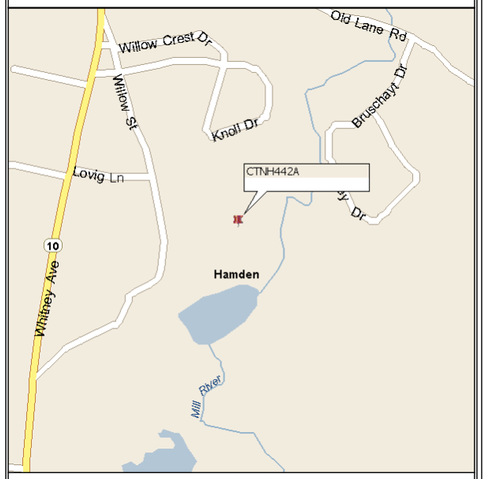
T-Mobile

SITE NAME:	**TMO CTNH442A**
SPRINT ID:	**CT54XC773**
SITE TYPE:	**EXISTING MONOPOLE**
PROJECT TYPE:	**L600**
JURISDICTION:	**NEW HAVEN COUNTY**
SITE ADDRESS:	**150 WILLOW STREET HAMDEN, CT 06518**

PROJECT SUMMARY

SITE NAME:	TMO CTNH442A
SPRINT NUMBER:	CT54XC773
SITE ADDRESS:	150 WILLOW STREET HAMDEN, CT 06518
COUNTY:	NEW HAVEN COUNTY
ZONING:	VCD
NAD83	
LATITUDE:	41.44939° N
LONGITUDE:	72.90457° W
GROUND ELEVATION:	128' AMSL
CUSTOMER/APPLICANT:	T-MOBILE 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 (913) 402-6500
OCCUPANCY TYPE:	UNMANNED
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION

AREA MAP



NO SCALE

LOCATION MAP

NO SCALE

DRAWING INDEX

SHEET #	SHEET DESCRIPTION	REV. #
T-1	TITLE SHEET	1
SP-1	SPECIFICATIONS	1
SP-2	SPECIFICATIONS	1
C-1	OVERALL SITE PLAN	1
C-2	EQUIPMENT PLANS	1
C-3	BUILDING ELEVATIONS	1
C-4	ANTENNA ORIENTATIONS	1
C-5	ANTENNA DETAILS	1
C-6	ANTENNA & RRU CONFIGURATION KEYS	1
E-1	PANEL SCHEDULE & ONE-LINE DIAGRAM	1
G-1	GROUNDING RISER DIAGRAM AND DETAILS	1

CONTACT INFORMATION

A&E FIRM:	B&T ENGINEERING, INC. 1717 S. BOULDER, STE. 300 TULSA, OK 74119	CONSTR. MANAGER:	T-MOBILE BRIAN PAUL Brian.Paul14@t-mobile.com (860) 550-5971
CONTACT:	MIKE OAKES	PROJECT MANAGER:	T-MOBILE MARK RICHARD mark.richard64@t-mobile.com (860) 648-1116
PHONE:	(918) 587-4630		

DRIVING DIRECTIONS

DEPART BRADLEY INTERNATIONAL AIRPORT ONTO BRADLEY FIELD CONNECTOR. ROAD NAME CHANGES TO CT-20 [BRADLEY FIELD CONNECTOR]. TAKE RAMP (RIGHT) ONTO I-91 [RICHARD P HORAN MEMORIAL HWY]. AT EXIT 18, TAKE RAMP (RIGHT) ONTO I-691. AT EXIT 3, TURN RIGHT ONTO RAMP. TURN LEFT ONTO CT-10 [HIGHLAND AVE]. TURN LEFT ONTO KNOLL DR [KNOLL RD]. TURN LEFT ONTO ONTO ACCESS ROAD AND ARRIVE AT TMO CTNH442A.

A/E DOCUMENT REVIEW STATUS

TITLE	SIGNATURE	DATE
T-MOBILE R.E. MGR.:		
T-MOBILE R.F. MGR.:		
T-MOBILE NetOps:		
T-MOBILE CONST. MGR.:		
INTERCONNECT:		
T-MOBILE SITE DEV. MGR.:		
PROPERTY OWNER:		
PLANNING:		

1		ACCEPTED: WITH OR NO COMMENTS, CONSTRUCTION MAY PROCEED
2		NOT ACCEPTED: RESOLVE COMMENTS AND RESUBMIT

ACCEPTANCE DOES NOT CONSTITUTE APPROVAL OF DESIGN, CALCULATIONS, ANALYSIS, TEST METHODS OF MATERIALS DEVELOPED OR SELECTED BY THE SUBCONTRACTOR AND DOES NOT RELIEVE SUBCONTRACTOR FROM FULL COMPLIANCE WITH CONTRACTUAL OBLIGATIONS.

CODE COMPLIANCE

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

CODE TYPE	CODE
BUILDING/DWELLING	2018 BUILDING CODE OF CONNECTICUT
STRUCTURAL	2018 BUILDING CODE OF CONNECTICUT
MECHANICAL	2018 MECHANICAL CODE OF CONNECTICUT
ELECTRICAL	2017 NATIONAL ELECTRIC CODE

PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES:

- REMOVE (3) EXISTING PANEL ANTENNAS.
- REMOVE (3) EXISTING RRUS11.
- REMOVE (1) EXISTING DUS41 & (1) XMU.
- INSTALL (3) NEW STABILIZER FRAME
- INSTALL (2) NEW BB 6630.
- INSTALL (3) NEW PANEL ANTENNAS.
- INSTALL (3) NEW REMOTE RADIO HEADS.
- INSTALL (1) NEW 6x12 HYBRID CABLE

DO NOT SCALE DRAWINGS

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

SEE SHEETS SP-1 & SP-2 FOR ADDITIONAL CONSTRUCTION NOTES

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

811

B+T GRP

T-Mobile

CENTERLINE COMMUNICATIONS

TMO CTNH442A
150 WILLOW STREET
HAMDEN, CT 06518
EXISTING 157'-0" MONOPOLE

PROJECT NO:	135662.003.01
CHECKED BY:	MDW

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
A	6/12/19	SMM	PRELIMINARY REVIEW
B	6/18/19	SMM	PRELIMINARY REVIEW
0	6/26/19	SMM	CONSTRUCTION
1	7/19/19	JJD	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

STATE OF CONNECTICUT
31627
LICENSED
PROFESSIONAL ENGINEER
7/19/19

SHEET NUMBER:	REVISION:
T-1	1

GENERAL REQUIREMENTS SECTION 01 10 00:

PART 1 GENERAL

1.1 INTENT:

A. THESE SPECIFICATIONS AND CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR CONSTRUCTION. PLANS ARE NOT TO BE SCALED.

B. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY, HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH.

C. THE INTENTION OF DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.

D. CONFLICTS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING MATERIAL OR DOING ANY WORK. NO COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND THOSE ON THE DOCUMENTS. ANY DISCREPANCY SHALL BE REPORTED TO THE OWNER OR HIS AGENT FOR CONSIDERATION.

1.2 LICENSING REQUIREMENTS:

THE CONTRACTOR IS RESPONSIBLE FOR PROCUREMENT AND MAINTAINING OF ALL APPLICABLE LICENSES AND BONDS.

1.3 STORAGE:

ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION THAT DOES NOT OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

1.4 CLEAN UP:

THE CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH AT ALL TIMES. TRASH MUST BE REMOVED DAILY.

1.5 QUALITY ASSURANCE:

ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.

PART 2 PRODUCTS – NOT APPLICABLE TO THIS SECTION

PART 3 EXECUTION – NOT APPLICABLE TO THIS SECTION

ELECTRICAL SECTION 16000:

PART 1 GENERAL

1.1 GENERAL CONDITIONS:

A. THE CONTRACTOR SHALL INSPECT THE SITE WHERE THIS WORK IS TO BE PERFORMED AND FULLY FAMILIARIZE HIMSELF WITH ALL CONDITIONS RELATED TO THIS PROJECT.

B. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND LICENSES AND SHALL MAKE ALL DEPOSITS AND PAY ALL FEES REQUIRED FOR THE PERFORMANCE OF WORK UNDER THIS SECTION.

C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS. DRAWINGS SHALL NOT BE SCALED TO DETERMINE DIMENSIONS.

1.2 LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES

A. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, AND ALL APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES.

1.3 REFERENCES:

A. THE PUBLICATIONS LISTED BELOW FORM PART OF THIS SPECIFICATION. EACH PUBLICATION SHALL BE THE LATEST REVISION AND ADDENDUM IN EFFECT ON THE DATE OF THIS SPECIFICATION IS ISSUED FOR CONSTRUCTION UNLESS OTHERWISE NOTED. EXCEPT AS MODIFIED BY THE REQUIREMENTS SPECIFIED HEREIN OR THE DETAILS OF THE DRAWINGS, WORK INCLUDED IN THIS SPECIFICATION SHALL CONFIRM TO THE APPLICABLE PROVISIONS OF THESE PUBLICATIONS.

1. ANSI/IEEE (AMERICAN NATIONAL STANDARDS INSTITUTE)
2. IEEE (INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS)
3. ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
4. ICEA (INSULATED CABLE ENGINEERS ASSOCIATION)
5. NEMA (NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION)
6. NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)
7. OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION)
8. UL (UNDERWRITERS LABORATORIES, INC.)

1.4 SCOPE OF WORK:

A. WORK UNDER THIS SECTION SHALL CONSIST OF FURNISHING ALL LABOR, MATERIAL AND ASSOCIATED SERVICES REQUIRED TO COMPLETELY CONSTRUCT AND LEAVE READY FOR OPERATION SYSTEMS AS SHOWN ON THE DRAWINGS AND HEREIN DESCRIBED.

B. ALL ELECTRICAL EQUIPMENT UNDER THIS CONTRACT SHALL BE PROPERLY TESTED, ADJUSTED AND ALIGNED BY THE CONTRACTOR.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATING, DRAINING, TRENCHES, BACKFILLING, AND REMOVAL AND EXCESS DIRT.

D. THE CONTRACTOR SHALL FURNISH TO THE OWNER, CERTIFICATES OF FINAL INSPECTION AND APPROVAL FROM THE INSPECTION AUTHORITIES HAVING JURISDICTION.

PART 2 PRODUCTS

2.1 GENERAL:

A. ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE NEW, FREE FROM DEFECTS AND OF THE BEST QUALITY NORMALLY USED FOR THE PURPOSE IN GOOD COMMERCIAL PRACTICE.

B. ALL MATERIALS AND EQUIPMENT SHALL BE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION AS SUITABLE FOR THE USE INTENDED.

C. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.

D. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING RATING EQUAL TO OR GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 10,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT.

2.2 MATERIALS AND EQUIPMENT:

A. CONDUIT:

1. RIGID GALVANIZED STEEL CONDUIT (RGS) SHALL BE HOT-DIP GALVANIZED INSIDE AND OUTSIDE INCLUDING ENDS AND THREADS AND ENAMELED OR LACQUERED INSIDE IN ADDITION TO GALVANIZING.
2. FLEXIBLE METAL CONDUIT SHALL BE GALVANIZED, ZINC-COATED STEEL, PVC COATED FOR OUTDOOR APPLICATIONS.
3. CONDUIT CLAMPS, STRAPS AND SUPPORTS SHALL BE STEEL OR MALLEABLE IRON. ALL FITTINGS SHALL BE COMPRESSION TYPE AND WATERTIGHT.
4. NON-METALLIC CONDUIT FITTINGS SHALL BE SCHEDULE 40 PVC, HEAVY-WALL RIGID WITH SOLVENT-CEMENT-TYPE JOINTS AS RECOMMENDED BY THE MANUFACTURER.

B. WIRE AND CABLE:

1. WIRE AND CABLE SHALL BE FLAME-RETARDANT, MOISTURE AND HEAT RESISTANT THERMOPLASTIC, SINGLE CONDUCTOR, COPPER, TYPE THHN/THWN, 600 VOLT, SIZES AS INDICATED, #12 AWG MINIMUM.
2. #10 AWG AND SMALLER CONDUCTORS SHALL BE SOLID AND #8 AWG AND LARGER CONDUCTORS SHALL BE STRANDED.
3. SOLDERLESS, PRESSURE-TYPE CONNECTORS CONSTRUCTED OF HIGH-STRENGTH, NON-CORRODIBLE, TIN-PLATED COPPER DESIGNED TO FURNISH HIGH-PULLOUT STRENGTH AND HIGH CONDUCTIVITY JOINTS SHALL BE USED.
4. SUPPORT GRIPS SHALL BE SINGLE WEAVE, CLOSED MESH, HIGH-GRADE, NON-MAGNETIC, TIN-COATED BRONZE, CAPABLE OF SUPPORTING TEN TIMES THE CABLE DEAD WEIGHT, HUBBELL KELLEMS OR APPROVED EQUAL.

C. DISCONNECT SWITCHES:

1. DISCONNECT SWITCHES SHALL BE HEAVY DUTY, DEAD-FRONT, QUICK-MAKE, QUICK-BREAK, EXTERNALLY OPERABLE, HANDLE LOCKABLE AND INTERLOCKED WITH COVER IN CLOSED POSITION, RATING AS INDICATED, UL LABELED FURNISHED IN NEMA 3R ENCLOSURE, SQUARE D CLASS 3110 OR APPROVED EQUAL.

D. SYSTEM GROUNDING:

1. GROUNDING CONDUCTOR SHALL BE BARE, SOLID TINNED COPPER, SIZE AS INDICATED, EXCEPT ABOVE GROUND GROUNDING CONDUCTORS SHALL BE INSULATED.
2. GROUND BUSSES SHALL BE BARE ANNEALED COPPER BARS OF RECTANGULAR CROSS SECTION.
3. CONNECTORS SHALL BE HIGH-CONDUCTIVITY, HEAVY DUTY, LISTED AND LABELED AS GROUNDING CONNECTORS FOR THE MATERIALS USED. USE TWO-HOLE COMPRESSION LUGS WITH HEAT SHRINK FOR MECHANICAL CONNECTIONS.
4. EXOTHERMIC WELDED CONNECTIONS SHALL BE PROVIDED IN KIT FORM AND SELECTED FOR THE SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS TO BE CONNECTED.
5. GROUND RODS SHALL BE COPPER-CLAD STEEL WITH HIGH-STRENGTH STEEL CORE AND ELECTROLYTIC-GRADE COPPER OUTER SHEATH, MOLTEN WELDED TO CORE, 3/4"x10'-0".

E. OTHER MATERIALS:

1. THE CONTRACTOR SHALL PROVIDE OTHER MATERIALS, THOUGH NOT SPECIFICALLY DESCRIBED, WHICH ARE REQUIRED FOR A COMPLETELY OPERATIONAL SYSTEM AND PROPER INSTALLATION OF THE WORK.

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CENTERLINE COMMUNICATIONS

TMO CTNH442A
150 WILLOW STREET
HAMDEN, CT 06518
EXISTING 157'-0" MONOPOLE

PROJECT NO:	135662.003.01
CHECKED BY:	MDW

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
A	6/12/19	SMM	PRELIMINARY REVIEW
B	6/18/19	SMM	PRELIMINARY REVIEW
0	6/26/19	SMM	CONSTRUCTION
1	7/19/19	JJD	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

STATE OF CONNECTICUT
31627
LICENSED
PROFESSIONAL ENGINEER
7/19/19

SHEET NUMBER:	REVISION:
SP-1	1

PART 3 EXECUTION

3.1 GENERAL:

A. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE W/ THE MANUFACTURER'S RECOMMENDATION

B. EQUIPMENT SHALL BE TIGHTLY COVER AND PROTECTED AGAINST DIRT OR WATER, AND AGAINST CHEMICAL OR MECHANICAL INJURY DURING INSTALLATION AND CONSTRUCTION PERIODS.

3.2 LABOR AND WORK:

A. ALL LABOR FOR THE INSTALLATION OF MATERIALS AND EQUIPMENT FURNISHED FOR THE ELECTRICAL SYSTEM SHALL BE DONE BY EXPERIENCED MECHANICS OF THE PROPER TRADES.

B. ALL ELECTRICAL EQUIPMENT FURNISHED SHALL BE ADJUSTED, ALIGNED AND TESTED BY THE CONTRACTOR AS REQUIRED TO PRODUCE THE INTENDED PERFORMANCE.

C. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED EQUIPMENT, REMOVE ALL LABELS AND ANY DEBRIS, CRATING OR CARTONS AND LEAVE THE INSTALLATION FINISHED AND READY FOR OPERATION.

3.3 COORDINATION:

A. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE OWNER–FURNISHED EQUIPMENT DELIVERY SCHEDULE TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.

3.4 INSTALLATION:

A. CONDUIT

1. ALL ELECTRICAL WIRING SHALL BE INSTALLED IN CONDUIT AS HEREIN SPECIFIED. NO CONDUIT OR TUBING OF LESS THAN 3/4 INCH NOMINAL SIZE SHALL BE USED.
2. PROVIDE RGS CONDUIT FOR ALL EXPOSED, EXTERIOR CONDUIT.
3. PROVIDE SCHEDULE 40 PVC OR RGS CONDUIT BELOW GRADE, 1" MINIMUM, UNLESS NOTED OTHERWISE. ALL 90 DEGREE BENDS TO ABOVE GRADE SHALL BE RGS, MINIMUM BURIAL DEPTH SHALL BE 30" CLEAR TO TOP OF CONDUIT, UNLESS NOTED OTHERWISE.
4. USE GALVANIZED FLEXIBLE STEEL CONDUIT WHERE DIRECT CONNECTION IS NOT DESIRABLE FOR REASONS EQUIPMENT MOVEMENT, VIBRATION OR FOR EASE OF MAINTENANCE. USE LIQUIDTIGHT, PVC COATED FLEXIBLE METAL CONDUIT FOR OUTDOOR APPLICATIONS.
5. INSTALL GALVANIZED FLEXIBLE STEEL CONDUIT AT ALL POINTS OF CONNECTION TO EQUIPMENT MOUNTED ON SUPPORTS TO ALLOW FOR EXPANSION AND CONTRACTION.
6. A RUN OF CONDUIT BETWEEN BOXES OR FITTINGS SHALL NOT CONTAIN MORE THE EQUIVALENT OF FOUR QURATER–BENDS INCLUDING THOSE BENDS LOCATED IMMEDIATELY AT THE BOX OR FITTING. THE RADIUS OF BENDS SHALL NEVER BE SHORTER THAN THAT OF THE CORRESPONDING TRADE ELBOW.
7. WHERE CONDUIT HAS TO BE CUT IN THE FIELD, IT SHALL BE CUT SQUARE WITH A PIPE CUTTER USING CUTTING KNIVES.
8. ALL CONDUITS SHALL BE SWABBED CLEAN BY PULLING AN APPROPRIATE SIZE MANDREL THROUGH THE CONDUIT BEFORE INSTALLATION OF WIRE OR CABLE. CLEAR ALL BLOCKAGES AND REMOVE BURRS, DIRT AND DEBRIS.
9. INSTALL MULE TAPE IN ALL EMPTY CONDUIT IDENTIFY PULL STRINGS AT EACH END WITH ITS DESTINATION.
10. PROVIDE INSULATED GROUNDING BUSHINGS OR ALL CONDUITS STUBBED INTO EQUIPMENT ENCLOSURES OR STUBBED OUT FOR FUTURE USE BY OTHERS.
11. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL CONDUITS DURING CONSTRUCTION. TEMPORARY OPENINGS IN THE CONDUIT SYSTEM SHALL BE PLUGGED OR CAPPED TO PREVENT ENTRANCE OF MOISTURE OR FOREIGN MATTER. CONTRACTOR SHALL REPLACE ANY CONDUIT CONTAINING FOREIGN MATERIALS THAT CANNOT BE REMOVED.
12. INSTALL 3" RED METALLIC LOCATOR TAPE 12" ABOVE ALL UNDERGROUND CONDUIT AND WIRE.
13. CONDUITS SHALL BE INSTALLED IN SUCH A MANNER AS TO INSURE AGAINST COLLECTION OF TRAPPED CONDENSATION.

B. WIRE AND CABLE:

1. ALL POWER WIRING SHALL BE COLOR CODED AS FOLLOWS

DESCRIPTION	120/270V	208Y/120V	480Y/277V
PHASE A	BLACK	BLACK	BROWN
PHASE B	RED	RED	ORANGE
PHASE C		BLUE	YELLOW
NEUTRAL	WHITE	WHITE	GRAY
GROUND	GREEN	GREEN	GREEN

2. SPLICES SHALL BE MADE ONLY AT OUTLETS, JUNCTION BOXES OR ACCESSIBLE RACEWAYS WITH PRESSURE–TYPE CONNECTORS.
3. PULLING LUBRICANT SHALL BE SOAPSTONE POWDER, POWDERED TALC OR A COMMERCIAL PULLING COMPOUND. NO SOAP SUDS, SOAP FLAKES, OIL OR GREASE SHALL BE USED, AS THESE MAY BE HARMFUL TO CABLE INSULATION. CONTRACTOR SHALL USE NYLON OR HEMP ROPE FOR PULLING CABLE TO AVOID SCORING THE CONDUIT.
4. CABLES SHALL BE NEATLY TRAINED, WITHOUT INTERLACING, AND BE OF SUFFICIENT LENGTH IN ALL BOXES, EQUIPMENT. ETC. TO PERMIT MAKING A NEAT ARRANGEMENT. CABLES SHALL BE SECURED IN A MANNER TO AVOID TENSION ON CONDUCTORS OR TERMINALS AND SHALL BE PROTECTED FROM MECHANICAL INJURY AND FROM MOISTURE. SHARP BENDS OVER CONDUIT BUSHINGS ARE PROHIBITED. DAMAGED CABLES SHALL BE REMOVED AND REPLACE AT THE CONTRACTOR'S EXPENSE.

C. DISCONNECT SWITCHES:

1. INSTALL DISCONNECT SWITCHED LEVEL AND PLUMB. CONNECT TO WIRING SYSTEM AND GROUND AS INDICATED.

D. GROUNDING:

1. ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT WHICH DO NOT CARRY CURRENT SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF ARTICLE 250 OF THE NATIONAL ELECTRIC CODE.
2. PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEMS INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING GROUNDING ELECTRODES, BONDING JUMPERS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
3. ROUTE GROUNDING CONNECTIONS AND CONDUCTORS TO GROUND IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES.
4. TIGHTEN GROUNDING AND BONDING CONNECTORS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURE'S TORQUING REQUIREMENTS ARE NOT AVAILABLE, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL 486A TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
5. ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS AND INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTION.
6. ALL GROUND CONNECTIONS SHALL BE INSPECTED FOR TIGHTNESS. EXOTHERMIC–WELDED CONNECTIONS SHALL BE APPROVED BY THE CONSTRUCTION INSPECTOR BEFORE BEING PERMANENTLY CONCEALED.
7. APPLY CORROSION–RESISTANT FINISH TO FIELD CONNECTION AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATING HAVE BEEN DESTROYED. USE COPPER–BASED "NO–OX" OR APPROVED EQUAL.
8. A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FEEDER AND BRACH CIRCUITS.
9. BOND ALL INSULATED GROUNDING BUSHINGS WITH A BARE #6 AWG GROUNDING CONDUCTOR TO A GROUND BUS OR GROUNDING LUG IN ENCLOSURE.
10. DIRECT BURIED GROUND CONDUCTORS SHALL BE INSTALLED AT A NOMINAL DEPTH OF 30" BELOW GRADE, UNLESS NOTED OTHERWISE.
11. ALL GROUNDING CONDUCTORS EMBEDDED IN OR PENETRATING CONCRETE SHALL BE INSULATED OR INSTALLED IN PVC CONDUIT.
12. INSTALL ELECTROLYTIC GROUNDING SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE SEALING TAPE FROM LEACHING AND BREATHER HOLES, INSTALL PROTECTIVE BOX FLUSH WITH GRADE.
13. DRIVE GROUND RODS UNTIL TOPS ARE 30" BELOW FINAL GRADE.
14. GROUNDING CONDUCTOR TO EQUIP[MENT GROUND LUGS:
    1) BOLTED TO EQUIPMENT HOUSING WITH STAINLESS STEEL BOLTS AND LOCK WASHERS.
    2) ALL EQUIPMENT TO BE GROUNDED SHALL BE FREE OF PAINT OR ANY OTHER MATERIAL COVERING BARE METAL AT THE POINT OF CONNECTION.

3.5 ACCEPTANCE TESTING:

1. PROVIDE PERSONNEL AND EQUIPMENT, MAKE REQUIRED TESTS AND SUBMIT TEST REPORTS UPON COMPLETE OF TESTS.
2. WHEN MATERIAL AND/OR WORKMANSHIP IS FOUND NOT TO COMPLY WITH THE SPECIFIED REQUIREMENTS, THE NON–COMPLYING ITEMS SHALL BE REMOVED FROM THE JOBSITE AND REPLACED WITH THE ITEMS COMPLYING WITH THE SPECIFIED REQUIREMENTS PROMPTLY AFTER RECEIPT OF NOTICE OF SUCH NON–COMPLIANCE.

A. TEST PROCEDURES:

1. ALL FEEDERS SHALL HAVE THEIR INSULATION TESTED AFTER INSTALLATION, BUT BEFORE CONNECTION TO DEVICES. THE CONDUCTORS SHALL TEST FREE FROM SHORT CIRCUITS AND GROUNDS. TESTING SHALL BE FOR ONE MINUTE, USING 1000V DC. INVESTIGATE ANY VALUES LESS THAN 50 MEGOHMS.
2. PRIOR TO ENERGIZING CIRCUITRY, TEST WIRING DEVICES FOR ELECTRICAL CONTINUITY AND PROPER POLARITY CONNECTIONS.
3. MEASURE AND RECORD VOLTAGES BETWEEN PHASES AN BETWEEN PHASE WIRE AND NEUTRALS. SUBMIT A REPORT OF MAXIMUM AND MINIMUM VOLTAGES.
4. PERFORM GROUND TEST TO MEASURE GROUND RESISTANCE OF GROUNDING SYSTEM USING THE IEEE STANDARD 3–POINT "FALL–OF–POTENTIAL" METHOD. PROVIDE PLOTTED TEST VALUES AND LOCATION SKETCH. NOTIFY THE ENGINEER IMMEDIATELY IF MEASURED VALUE IS OVER 5 OHMS.

END OF SECTION

END OF SPECIFICATION

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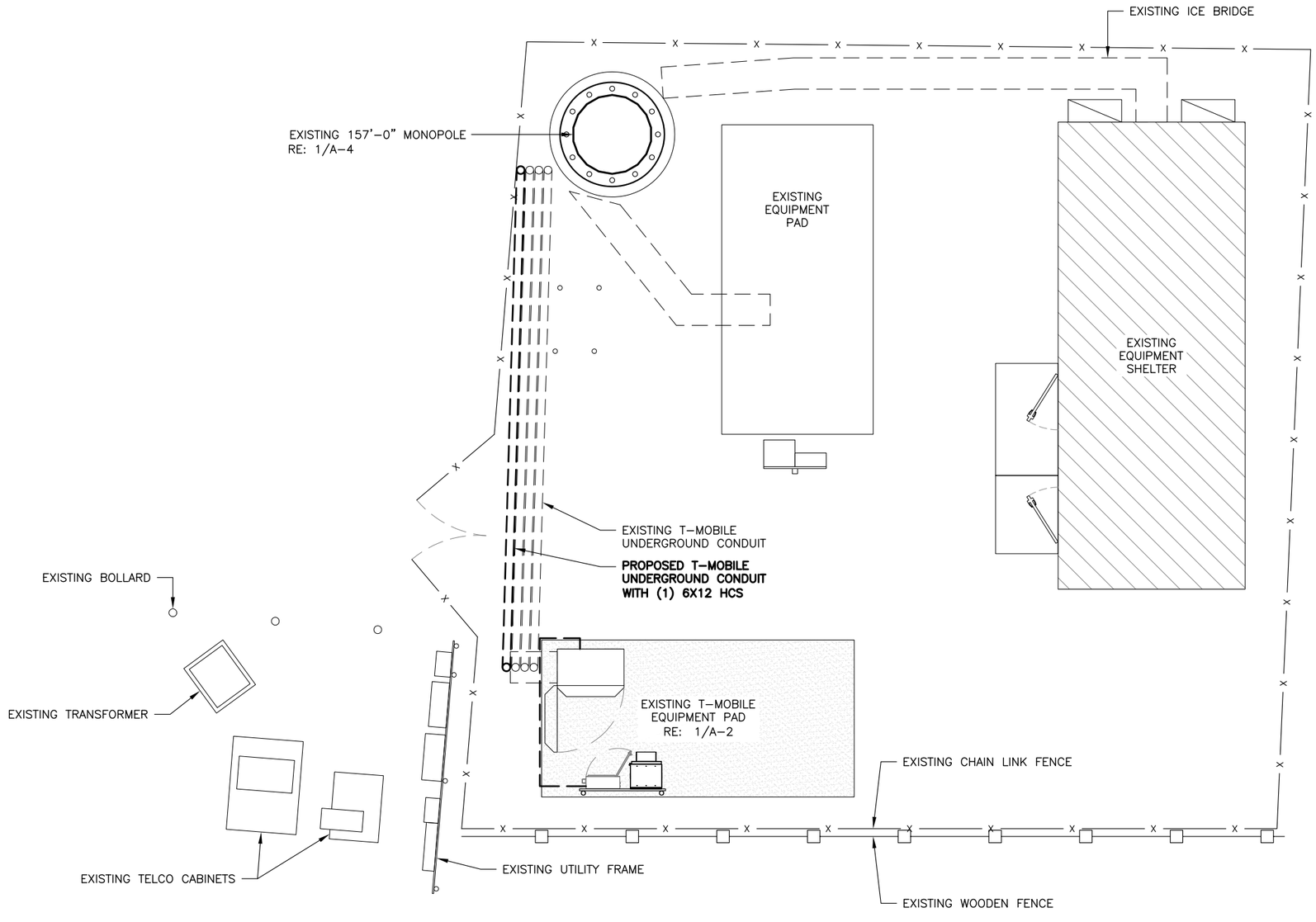
Expires 2/10/20

STATE OF CONNECTICUT 31627 LICENSED PROFESSIONAL ENGINEER

7/19/19

SHEET NUMBER: SP-2

REVISION: 1



1 OVERALL SITE PLAN

SCALE: 0' 1' 4' 8' 20'

N

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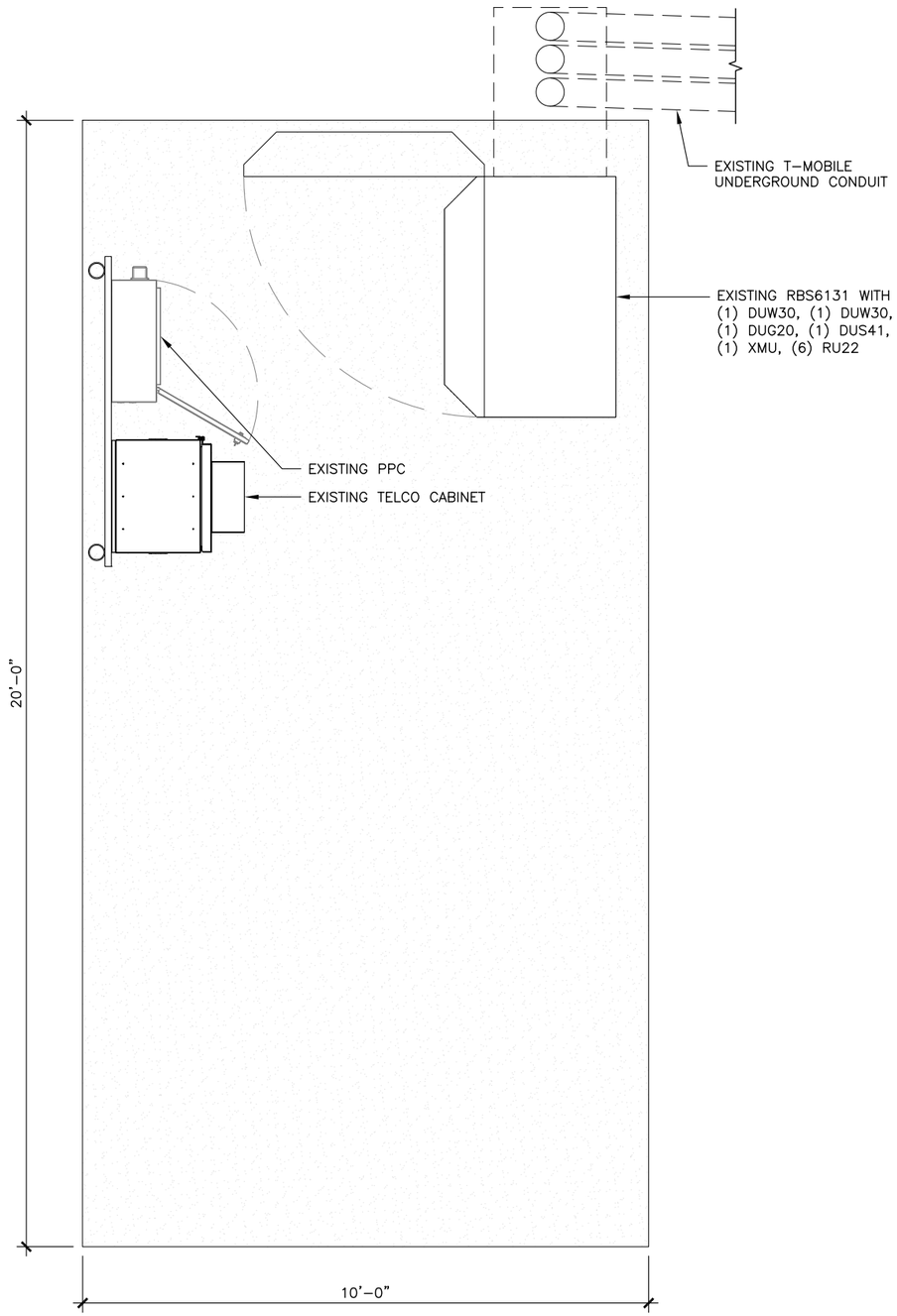
SHEET NUMBER:	REVISION:
C-1	1



1 EXISTING EQUIPMENT PLAN

SCALE: 0' 1' 2' 4' 8'

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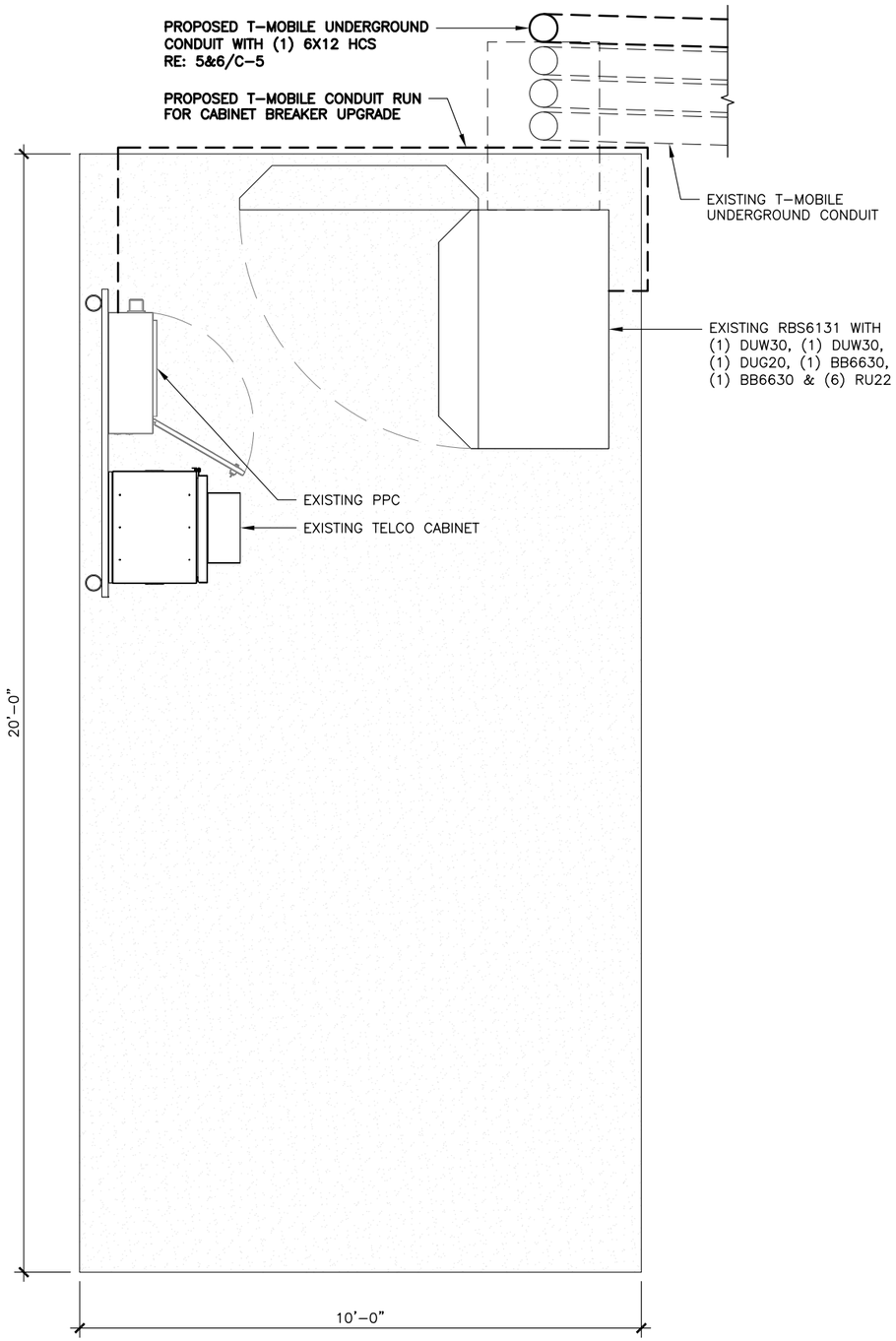

2 FINAL EQUIPMENT PLAN

SCALE: 0' 1' 2' 4' 8'

N

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TMO CTNH442A

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HAMDEN, CT 06518

EXISTING 157'-0" MONOPOLE

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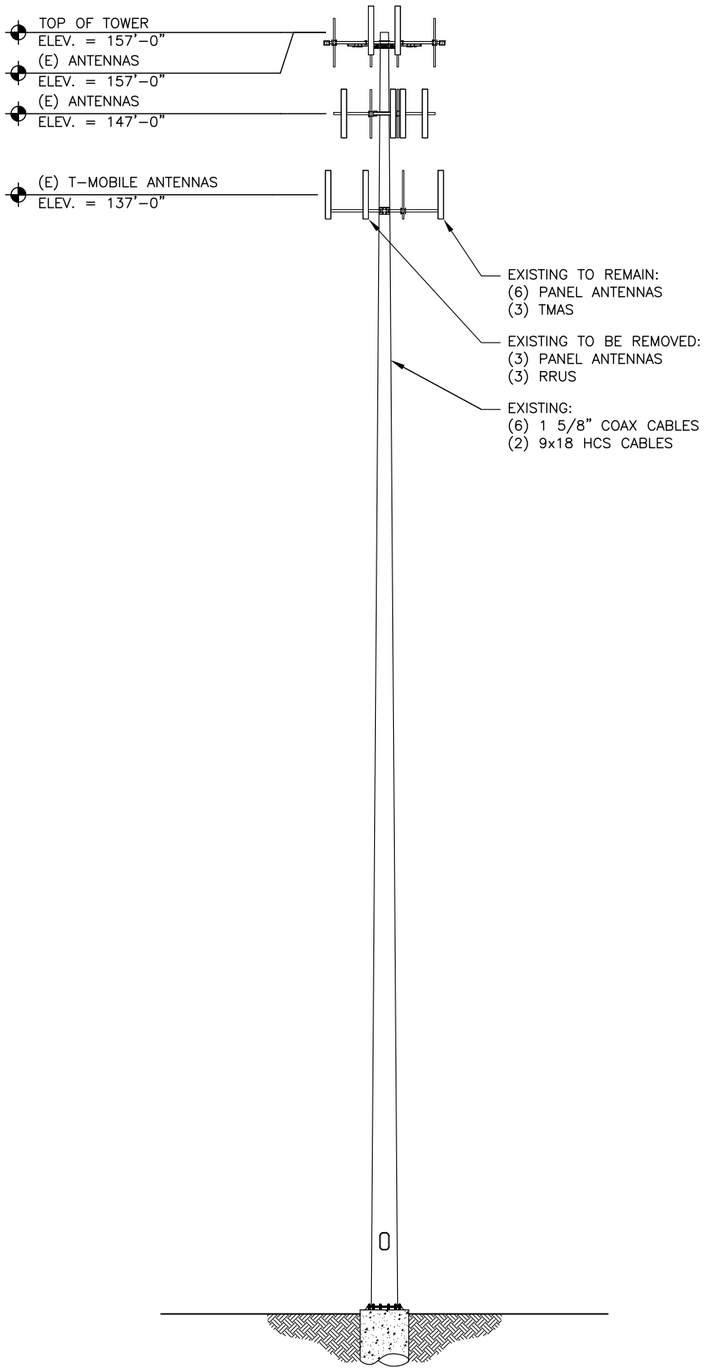
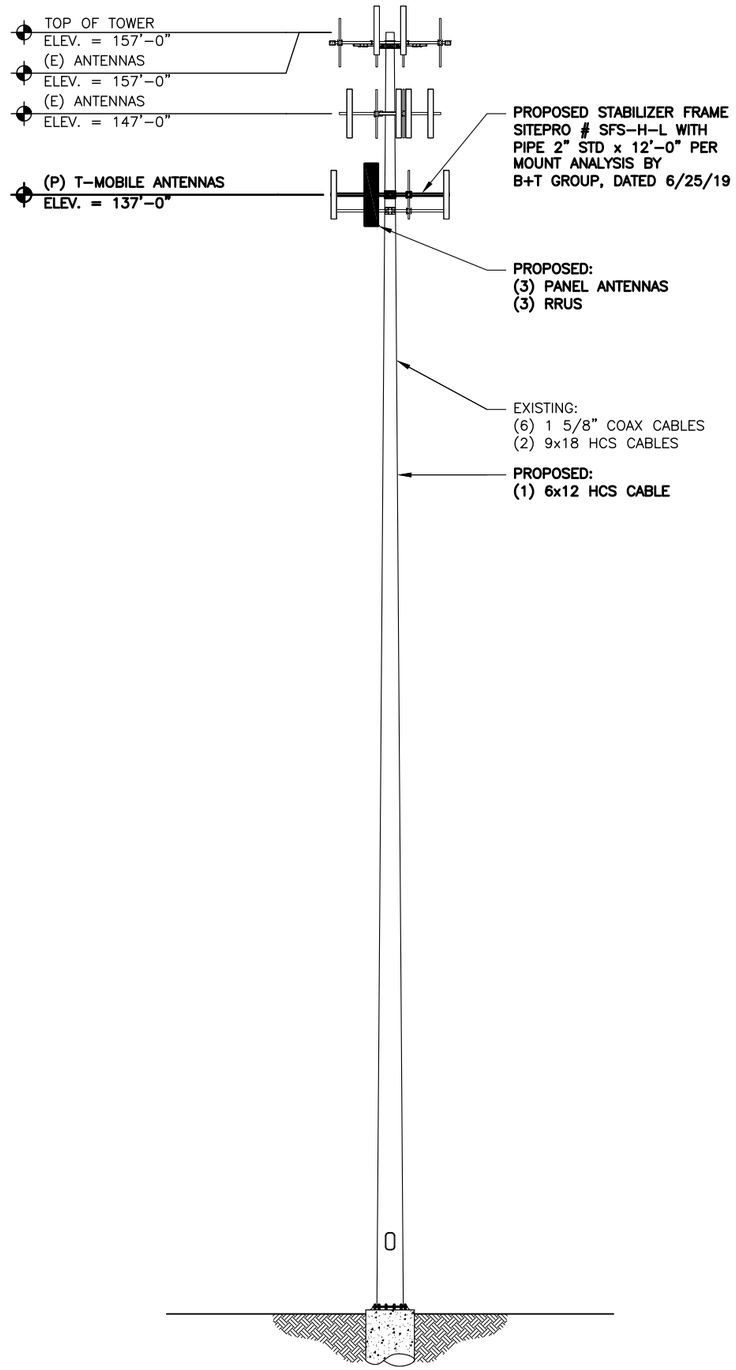
SHEET NUMBER: C-2

REVISION: 1



1 EXISTING TOWER ELEVATION
SCALE: N.T.S.



2 FINAL TOWER ELEVATION
SCALE: N.T.S.

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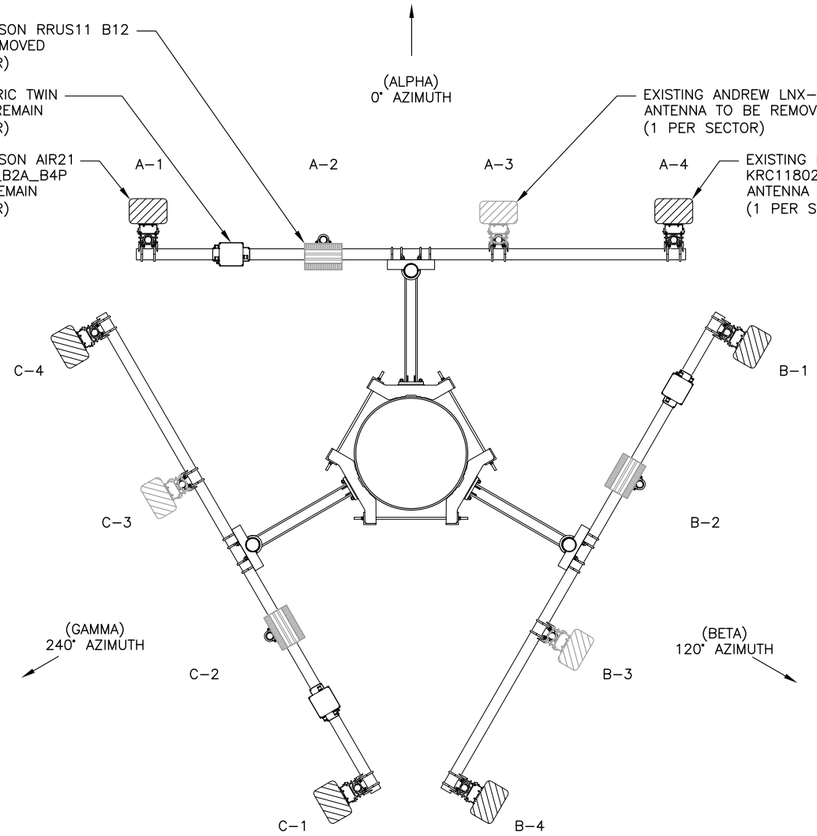
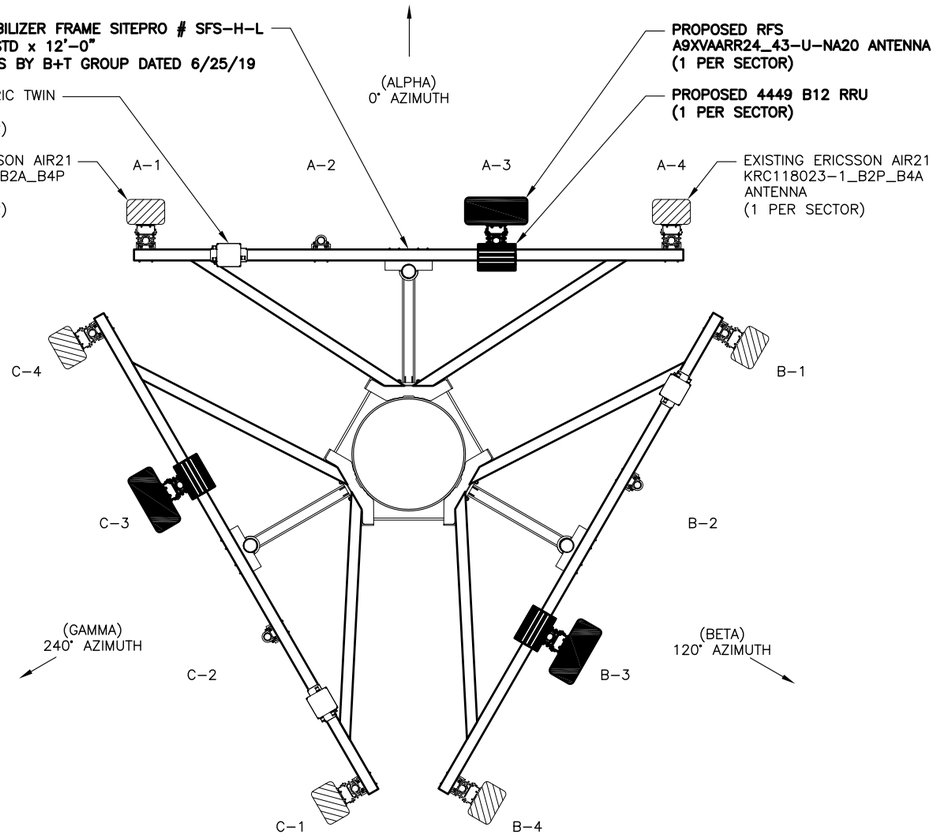
SHEET NUMBER: C-3
REVISION: 1



1 EXISTING ANTENNA ORIENTAION

SCALE: 0' 1' 2' 4' 10'

N



2 FINAL ANTENNA ORIENTAION

SCALE: 0' 1' 2' 4' 10'

N

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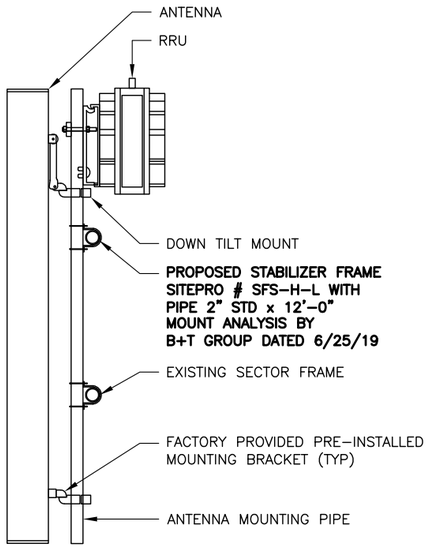
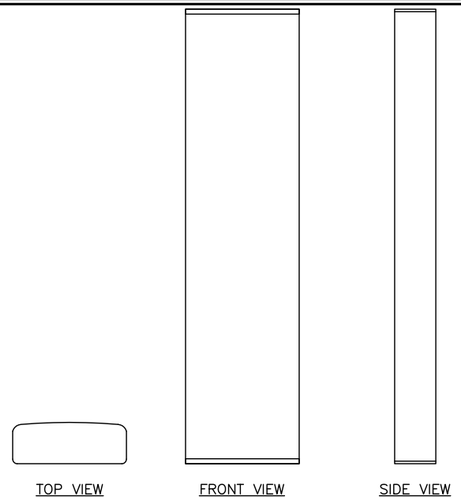
SHEET NUMBER: C-4

REVISION: 1

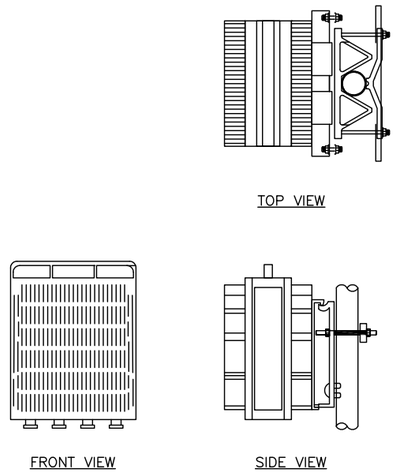


1 ANTENNA MOUNTING DETAIL
SCALE: N.T.S.



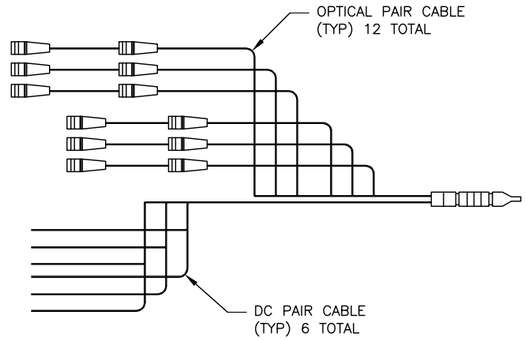
ANTENNA SPECS	
MANUFACTURER	RFS
MODEL #	APXVAARR24_43-U-NA20
WIDTH	24"
DEPTH	8.7"
HEIGHT	95.9"
WEIGHT	128 LBS

2 ANTENNA SPECS
SCALE: N.T.S.



RRU SPECS	
MANUFACTURER	ERICSSON
MODEL #	RRUS 4449 B12
WIDTH	13.19"
DEPTH	9.25"
HEIGHT	14.95"
WEIGHT	70 LBS

3 RRU SPECS
SCALE: N.T.S.



HYBRID CABLE SPECS	
MANUFACTURER	ERICSSON
MODEL #	HCS 6x12 4AWG
TOTAL WEIGHT	1.7 LBS/FT
DIAMETER	1.38" (±0.1")
COAX EQUIVALENT	1 3/8"

4 HYBRID CABLE SPECS
SCALE: N.T.S.

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C-5	1

ANTENNA NOTES:

1. ANTENNA CONTRACTOR SHALL INSURE THAT ALL ANTENNA MOUNTING PIPES ARE PLUMB.
2. COAXIAL FEEDER & FIBER LENGTHS INDICATED ARE APPROXIMATE.
3. ANTENNA COAXIAL FEEDERS & ANTENNA JUMPERS SHALL BE COLOR CODED PER T–MOBILE REQUIREMENTS. IN ADDITION TO THE COLOR CODE IN THE ANTENNA KEY THE FOLLOWING CHECKER STRIPE SHALL BE ADDED TO EACH ANTENNA COAXIAL FEEDER & ANTENNA JUMPER.

   LTE L600 – WHITE–SOLID STRIPE
   LTE 700 – RED–BLACK CHECKER STRIPE
   LTE PCS – RED–GREEN CHECKER STRIPE
   LTE AWS – YELLOW–BLACK CHECKER STRIPE
   UMTS PCS – RED–WHITE CHECKER STRIPE
   UMTS AWS – GREEN–WHITE CHECKER STRIPE
   GSM PCS – BLACK–WHITE CHECKER STRIPE
4. UMTS AWS LINE 1 & 2 TO HAVE TMA, MOUNTED ON PIPE BEHIND ANTENNA POSITION #2.
5. MULTI–PORTS ANTENNAS: TERMINATE UNUSED ANTENNA PORTS WITH CONNECTOR CAP & WEATHERPROOF THOROUGHLY. JUMPERS FROM TMAS MUST TERMINATE TO OPPOSITE POLARIZATIONS IN EACH SECTOR,
6. CONTRACTOR MUST FOLLOW ALL MANUFACTURERS' RECOMMENDATIONS REGARDING THE INSTALLATION OF COAXIAL CABLES, CONNECTORS & ANTENNAS.
7. MINIMUM BEND RADIUS:

   LDF4–50A (1/2" HARD LINE) = 5"
   FSJ4–50B (1/2" SUPER FLEX) = 1 1/4"
   AVA5–50A (7/8" HARD LINE) = 10"
   AVA7–50A (1 5/8 HARD LINE) = 15"
   LDF7–50A (1 5/8" HARD LINE) = 20"
8. CONTRACTOR SHALL RECORD THE SERIAL, SECTOR & POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND FURNISH THE INFORMATION TO T–MOBILE.
9. WEATHERPROOF ALL ANTENNA CONNECTORS WITH SELF–AMALGAMATING TAPE.
10. ANTENNA CONTRACTOR SHALL PERFORM A "TAPE DROP" MEASUREMENT TO CONFIRM/VALIDATE ANTENNA CENTERLINE (ACL) HEIGHT. CONTRACTOR SHALL SUBMIT A COMPLETED HEIGHT VERIFICATION FORM TO THE CONSTRUCTION MANAGER.
11. ALL FIBER RUNS TO BE CONTAINED IN (1) NOKIA HYBRID DC–FIBER CABLE (P/N: ASU9325TYP01) FROM LOWER COVP TO UPPER COVP. HYBRID CABLE SHALL BE COLOR CODED PER T–MOBILE REQUIREMENTS.

ANTENNA KEY

SECTOR	STATUS	ANTENNA NUMBER	TYPE	COLOR CODE	ANTENNA VENDOR	MODEL #	AZIMUTH	ELEC. TILT	MECH TILT	RAD CENTER	COAXIAL FEEDER SIZE	COAXIAL FEEDER LENGTH	HYBRID CABLE FEEDER SIZE	HYBRID CABLE FEEDER LENGTH
ALPHA	EXISTING	A–1	U1900 G1900	–	ERICSSON	AIR21 KRC118023–1–B2A–B4P	0°	2°	0°	137'–0"	–	–	EXISTING (1) ERICSSON 9x18 HCS	50M
			U2100	–				2°			(2) 1 5/8"	150'–0"		
	–	A–2	–	–	–	–	–	–	–	–	–	–		
	NEW	A–3	L700 L600	–	RFS	APXVAARR24_43–U–NA20	0°	2°	0°	137'–0"	–	–		
	EXISTING	A–4	L2100	–	ERICSSON	AIR21 KRC118023–1–B2P–B4A	0°	2°	0°	137'–0"	–	–		
BETA	EXISTING	B–1	U1900 G1900	–	ERICSSON	AIR21 KRC118023–1–B2A–B4P	120°	2°	0°	137'–0"	–	–	EXISTING (1) ERICSSON 9x18 HCS	50M
			U2100	–				2°			(2) 1 5/8"	150'–0"		
	–	B–2	–	–	–	–	–	–	–	–	–	–		
	NEW	B–3	L700 L600	–	RFS	APXVAARR24_43–U–NA20	120°	2°	0°	137'–0"	–	–		
	EXISTING	B–4	L2100	–	ERICSSON	AIR21 KRC118023–1–B2P–B4A	120°	2°	0°		–	–		
GAMMA	EXISTING	C–1	U1900 G1900	–	ERICSSON	AIR21 KRC118023–1–B2A–B4P	240°	2°	0°	137'–0"	–	–	PROPOSED (1) ERICSSON 6x12 HCS	50M
			U2100	–				2°			(2) 1 5/8"	150'–0"		
	–	C–2	–	–	–	–	–	–	–	–	–	–		
	NEW	C–3	L700 L600	–	RFS	APXVAARR24_43–U–NA20	240°	2°	0°	137'–0"	–	–		
	EXISTING	C–4	L2100	–	ERICSSON	AIR21 KRC118023–1–B2P–B4A	240°	2°	0°	137'–0"	–	–		

RRU KEY – ON TOWER

SECTOR	VENDOR	EQUIPMENT	MODEL #	ELEVATION	QUANTITY	STATUS
ALPHA	ERICSSON	RRU	4449 B12	137'–0"	1	NEW
BETA	ERICSSON	RRU	4449 B12	137'–0"	1	NEW
GAMMA	ERICSSON	RRU	4449 B12	137'–0"	1	NEW
ALPHA	UNKNOWN	TMA	GENERIC AWS	137'–0"	1	EXISTING
BETA	UNKNOWN	TMA	GENERIC AWS	137'–0"	1	EXISTING
GAMMA	UNKNOWN	TMA	GENERIC AWS	137'–0"	1	EXISTING

1 ANTENNA, RRU & TMA SCHEDULE
SCALE: N.T.S.

B+T GRP

T···Mobile

CENTERLINE COMMUNICATIONS

TMO CTNH442A
150 WILLOW STREET
HAMDEN, CT 06518
EXISTING 157'-0" MONOPOLE

PROJECT NO: 135662.003.01
CHECKED BY: MDW

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
A	6/12/19	SMM	PRELIMINARY REVIEW
B	6/18/19	SMM	PRELIMINARY REVIEW
0	6/26/19	SMM	CONSTRUCTION
1	7/19/19	JJD	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

STATE OF CONNECTICUT 31627 LICENSED PROFESSIONAL ENGINEER
7/19/19

SHEET NUMBER: C-6
REVISION: 1

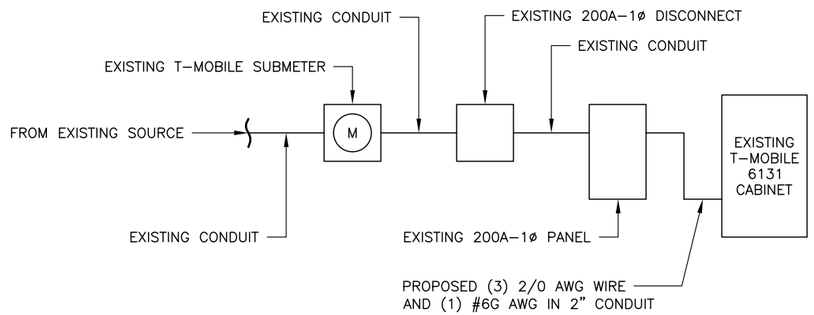
FINAL PANEL SCHEDULE							
LOAD	POLES	AMPS	BUS		AMPS	POLES	LOAD
			L1	L2			
TVSS	2	60	1	2	20	1	GFCI
			3	4	15	1	LIGHT
RBS 6131	2	100	5	6	–	–	–
			7	8	–	–	–
FIBER	1	20	9	10	–	–	–

RATED VOLTAGE: ■120/240 □_____. 1 PHASE, 3 WIRE		BRANCH POLES: □12 ■24 □30 □42	APPROVED MF'RS
RATED AMPS: □100 ■200 □400 □_____.		CABINET: ■SURFACE □FLUSH	NEMA □1 ■3R □4X
■MAIN LUGS ONLY	MAIN 200 AMPS ■BREAKER □FUSED SWITCH	■HINGED DOOR	■KEYED DOOR LATCH
□FUSED ■CIRCUIT BREAKER	BRANCH DEVICES	□_____ TO BE GFCI BREAKERS	FULL NEUTRAL BUS / GROUND BAR
ALL BREAKER MUST BE RATED TO INTERRUPT A SHORT CIRCUIT ISC OF 10,000 AMPS SYMMETRICAL.			

REPLACE EXISTING BREAKER IN POSITION 1 AND 3 WITH A NEW 2P 100A BREAKER
REPLACE EXISTING WIRES FOR EXISTING 6131 CABINET WITH (3) 2/0 AWG THWN (COPPER) AND (1) #6G AWG. MINIMUM CONDUIT SIZE TO BE 2".
IF 100A BREAKER WILL NOT PROPERLY FIT IN EXISTING PANEL, REPLACE (E) PANEL WITH SQUARE D PANEL QO12040M200RB (OR APPROVED EQUAL).
UPGRADE FEEDER WIRES TO MEET AMPACITY IF NEW PANEL IS REQUIRED.
FINAL PANEL DESIGN AND CALCULATIONS FOR WIRE SIZE WERE BASED OFF OF EXISTING DOCUMENTS AND PHOTOS

1 PANEL SCHEDULE

SCALE: N.T.S.



2 ONE-LINE DIAGRAM

SCALE: N.T.S.

B+T GRP

T···Mobile

CENTERLINE COMMUNICATIONS

TMO CTNH442A
150 WILLOW STREET
HAMDEN, CT 06518
EXISTING 157'-0" MONOPOLE

PROJECT NO:	135662.003.01
CHECKED BY:	MDW

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
A	6/12/19	SMM	PRELIMINARY REVIEW
B	6/18/19	SMM	PRELIMINARY REVIEW
0	6/26/19	SMM	CONSTRUCTION
1	7/19/19	JJD	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

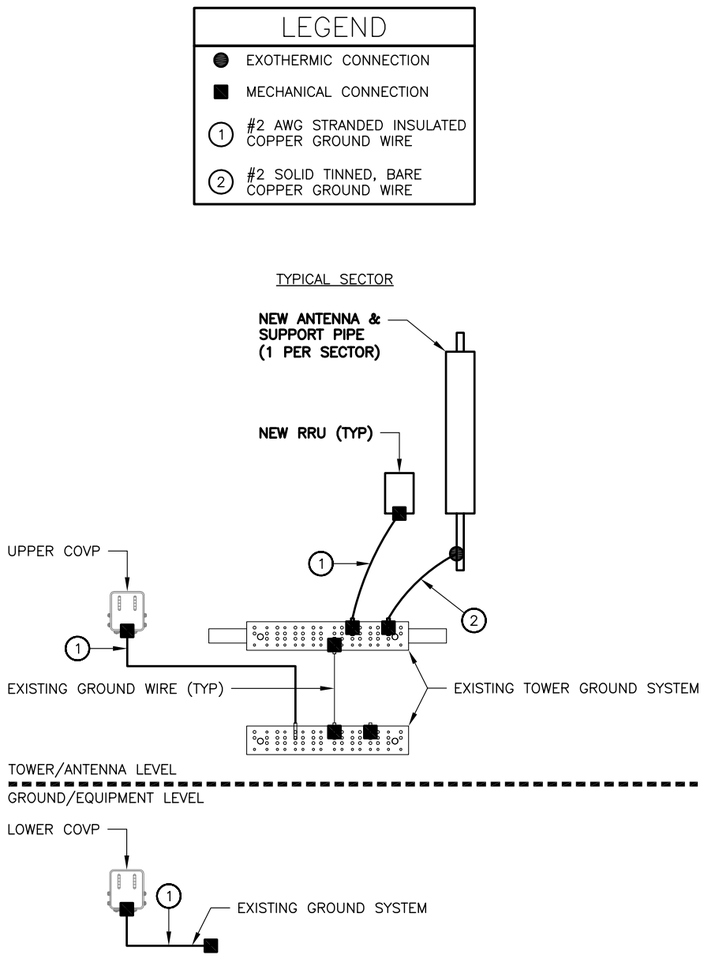
STATE OF CONNECTICUT SEAL 31627 LICENSED PROFESSIONAL ENGINEER

7/19/19

SHEET NUMBER: E-1

REVISION: 1

LEGEND	
●	EXOTHERMIC CONNECTION
■	MECHANICAL CONNECTION
(1)	#2 AWG STRANDED INSULATED COPPER GROUND WIRE
(2)	#2 SOLID TINNED, BARE COPPER GROUND WIRE

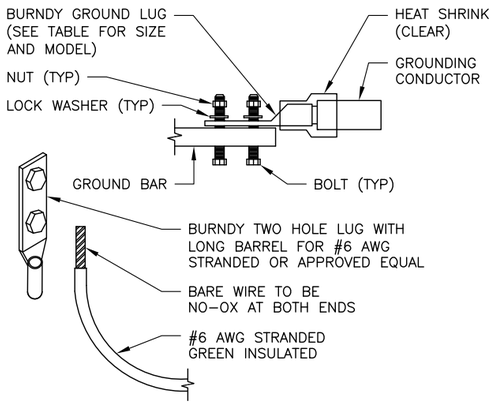


1 ANTENNA GROUND DIAGRAM
SCALE: N.T.S.

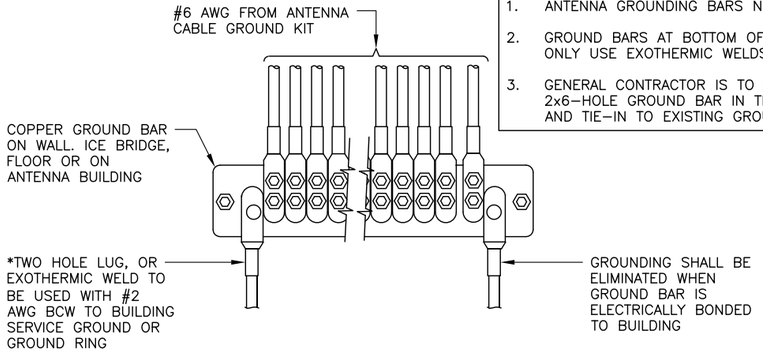
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT

NOTES:

1. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER, GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.
2. COPPER SHIELD, ANTIOX, CR NO-OX OR APPROVED EQUAL SHALL BE PLACE WHERE ALL DISSIMILAR METALS CONNECT.
3. ALL LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.



2 MECHANICAL LUG CONNECTION
SCALE: N.T.S.



NOTES:

1. ANTENNA GROUNDING BARS NOT TO USE INSULATORS.
2. GROUND BARS AT BOTTOM OF BUILDINGS SHALL ONLY USE EXOTHERMIC WELDS.
3. GENERAL CONTRACTOR IS TO FURNISH AND INSTALL A 2x6-HOLE GROUND BAR IN THE GBF OF THE RBS AND TIE-IN TO EXISTING GROUND RING.

3 GROUNDWIRE INSTALLATION
SCALE: N.T.S.

B+T GRP

T-Mobile

CENTERLINE COMMUNICATIONS

TMO CTNH442A
150 WILLOW STREET
HAMDEN, CT 06518
EXISTING 157'-0" MONOPOLE

PROJECT NO:	135662.003.01
CHECKED BY:	MDW

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
A	6/12/19	SMM	PRELIMINARY REVIEW
B	6/18/19	SMM	PRELIMINARY REVIEW
0	6/26/19	SMM	CONSTRUCTION
1	7/19/19	JJD	CONSTRUCTION

B&T ENGINEERING, INC.
PEC.0001564
Expires 2/10/20

SHEET NUMBER:	REVISION:
G-1	1

Exhibit D

Structural Analysis Report

Structural Analysis Report

Prepared for:

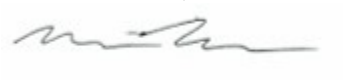
Sprint Sites USA – GA 2

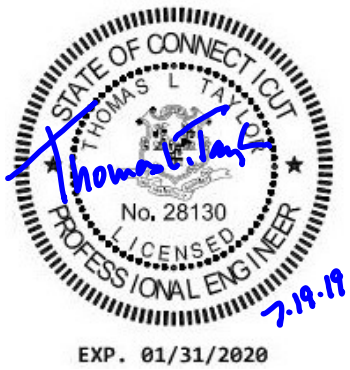
1765 Grassland parkway, Suite A
Alpharetta, GA 3004

ATTN: Debbie MacMaster

Structure	:	**157 ft Monopole**
Site ID	:	**CT54XC773**
Proposed Carrier	:	**T-Mobile**
Site Location	:	**150 Willow St** **Hamden, CT** **41.4494, -72.9046**
County	:	**New Haven**
Date	:	**July 19, 2019**
Max Usage	:	**58%**
Result	:	**Pass**

Prepared By:
Marcus Turner, EIT





EXP. 01/31/2020

Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 157 ft monopole to reflect the change in loading by T-Mobile.

Supporting Documents

Tower Drawings	EEI Project #14977, dated July 17, 2007
Foundation Drawing	EEI Project #14977, dated July 17, 2007
Geotechnical Report	JGI Project #J2075344, dated June 29, 2007

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	105 mph (3-Second Gust) Vasd / 123 mph (3-Second Gust) Vult
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	Ss = 0.19, S_1 = 0.06
Site Class:	D - Stiff Soil

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact Semaan Engineering Solutions at 402-289-1888.

Existing and Reserved Equipment

This loading **is** included in the analysis.

Centerline Elevation (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	Equip.					
157.5	158.0	3	800MHz RRH	Platform w/Handrails	(3) 1 1/4 Fiber (12) 1 5/8" Fiber (3) RET Cables (1) HB114-13U3M12-xxxF (2) 1/2" Coax	Sprint
		6	TD-RRH-8X20			
		3	APXVTM14-C-I20			
		3	96" x 14" x 7" Panel			
		12	16" x 9" x 6" Combiners			
		2	26" Microwave			
		1	GPS Antenna			
		9	RET Kit			
	157.5	2	ODU			
	158.0	6	1900MHz RRH			
		6	800 MHz Notch Filter			
		3	APXVSPP18-C-A20			
147.0	147.0	2	DB-T1-6Z-8AB-0Z	Low Profile Platform	(12) 1 5/8 Coax (2) 1 5/8" Fiber	Verizon
		6	JAHH-65B-R3B			
		3	RRH 4x40-850			
		3	B66 4x45 RRH			
		3	RRH 2x60 LTE			
		6	LPA-80080/4CF			
		6	FD9R6004-2C-3L			
137.0	137.0	3	AIR 21 B2A/B4P	(3) T-Arms	(6) 1 5/8" Coax	T-Mobile
		3	AIR 21 B4A/B2P			
		3	1B-twin AWS TMA			

Equipment to be Removed

This loading **is not** included in the analysis.

Centerline Elevation (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	Equip.					
137.0	137.0	3	Commscope LNX-6515DS-A1M	-	-	T-Mobile
		3	RRUS11 B12			

Proposed Equipment

This loading **is** included in the analysis.

Centerline Elevation (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	Equip.					
137.0	137.0	3	APXVAARR24_43-U-NA20	(3) Added Stabilizer Kits	(2) 9X18 HCS (1) 6X12 HCS	T-Mobile
		3	4449 B71/B12			

Install proposed coax inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	28%	Pass
Shaft	58%	Pass
Base Plate	28%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	3,992.0	44%
Axial (Kips)	59.12	32%
Shear (Kips)	33.75	28%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
157.5	26" Microwave	Sprint	1.238	1.000
137.0	APXVAARR24_43-U-NA20	T-Mobile	0.881	0.844
	4449 B71/B12			

***Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G**

Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

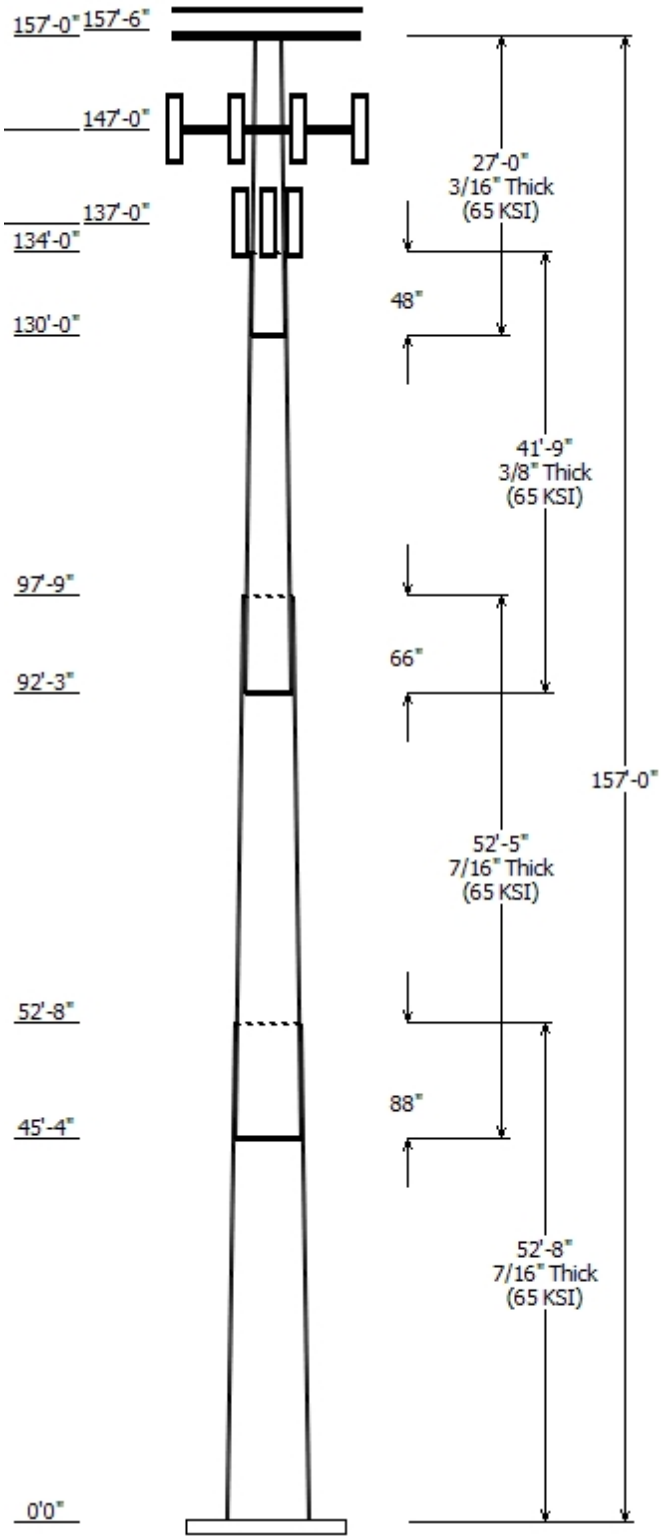
-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of Semaan Engineering Solutions, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to Semaan Engineering Solutions Holdings and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and Semaan Engineering Solutions, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Semaan Engineering Solutions Holdings is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.



Job Information

Pole :	CT54XC773	Code:	ANSI/TIA-222-G
Description :			
Client :	Sprint Sites USA - GA 2	Struct Class :	II
Location :	Hamden, CT		
Shape :	18 Sides	Exposure :	B
Height :	157.00 (ft)	Topo :	1
Base Elev (ft):	1.00		
Taper:	0.32802 (in/ft)		

Sections Properties

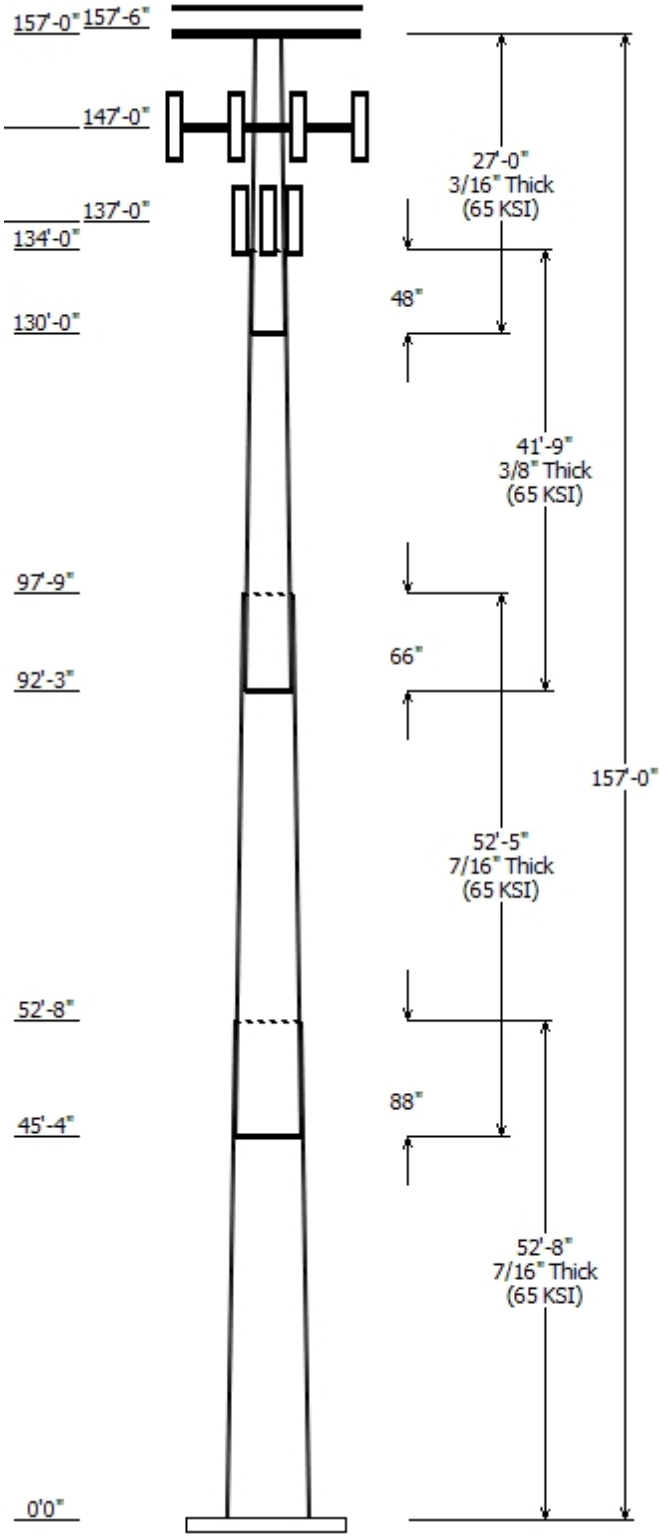
Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
1	52.667	50.72	68.00	0.438		0.000	0.328026	65
2	52.417	36.81	54.00	0.438	Slip Joint	88.000	0.328026	65
3	41.750	25.67	39.36	0.375	Slip Joint	66.000	0.328026	65
4	27.000	18.50	27.35	0.188	Slip Joint	48.000	0.328026	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
157.500	158.000	3	APXVSPP18-C-A20
157.500	158.000	6	800 MHz Notch Filter
157.500	158.000	6	1900MHz RRH
157.500	157.500	2	ODU
157.500	158.000	9	RET Kit
157.500	158.000	1	GPS Antenna
157.500	158.000	2	26" Microwave
157.500	158.000	12	16" x 9" x 6" Combiners
157.500	158.000	3	96" x 14" x 7" Panel
157.500	158.000	3	APXVTM14-C-I20
157.500	158.000	6	TD-RRH-8X20
157.500	158.000	3	800MHz RRH
157.000	157.500	1	Collar Mount
157.000	158.500	1	Platform w/ Rail
147.000	147.000	3	B66 4x45 RRH
147.000	147.000	3	RRH 4x40-850
147.000	147.000	6	JAHH-65B-R3B
147.000	147.000	2	DB-T1-6Z-8AB-0Z
147.000	147.000	3	RRH 2x60 LTE
147.000	147.000	6	LPA-80080/4CF
147.000	147.000	1	Low Profile Platform
147.000	147.000	6	FD9R6004-2C-3L
137.000	137.000	3	4449 B71/B12
137.000	137.000	3	APXVAARR24_43-U-NA20
137.000	137.000	3	T-Arms w/ Stabilizer Kit
137.000	137.000	3	1B-twin AWS TMA
137.000	137.000	3	AIR 21 B4A/B2P
137.000	137.000	3	AIR 21 B2A/B4P

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
0.000	137.0	1 1/4" Hybrid	No
0.000	137.0	1 5/8" Coax	No
0.000	147.0	1 5/8" Coax	No
0.000	147.0	1 5/8" Fiber	No
0.000	157.5	1 1/4" Fiber	No
0.000	157.5	1 5/8" Fiber	No
0.000	157.5	1/2" Coax	No
0.000	157.5	RET Cable	No



0.000	157.5	Trunk Line	No

Load Cases

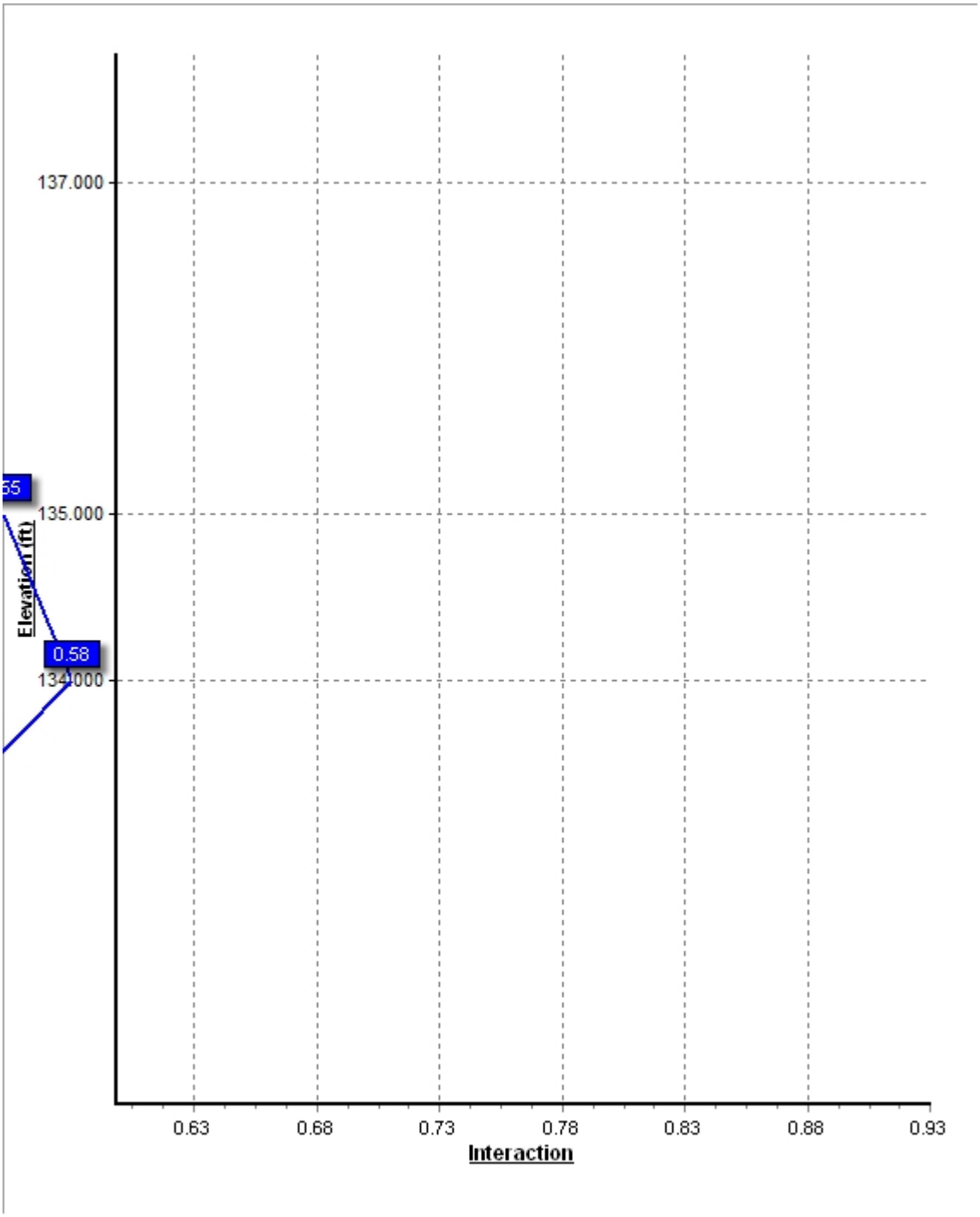
1.2D + 1.6W	105 mph with No Ice
0.9D + 1.6W	105 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	3992.00	33.75	59.12
0.9D + 1.6W	3960.25	33.73	44.33
1.2D + 1.0Di + 1.0Wi	886.85	7.79	86.95
(1.2 + 0.2Sds) * DL + E ELFM	271.59	2.16	58.84
(1.2 + 0.2Sds) * DL + E EMAM	450.95	3.53	58.84
(0.9 - 0.2Sds) * DL + E ELFM	269.04	2.16	40.84
(0.9 - 0.2Sds) * DL + E EMAM	446.32	3.53	40.84
1.0D + 1.0W	810.84	6.88	49.29

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	157.00	14.846	1.000


137.000
135.000
134.000
Elevation (ft)
0.58
0.63
0.68
0.73
0.78
0.83
0.88
0.93
Interaction

Site Number:	**CT54XC773**	**Code: ANSI/TIA-222-G**	
Site Name:	**Hamden, CT**	**Engineering Number: REV09B**	**7/19/2019 1:35:17 PM**
Customer:	**Sprint Sites USA - GA 2**		

Analysis Parameters

Location:	**New Haven County, CT**		
Code:	**ANSI/TIA-222-G**	**Height (ft):**	**157**
Shape:	**18 Sides**	**Base Diameter (in):**	**68.00**
Pole Type:	**Taper**	**Top Diameter (in):**	**18.50**
Pole Manfacturer:	**EEI**	**Taper (in/ft) :**	**0.328**

Ice & Wind Parameters

Structure Class:	**II**	**Design Wind Speed Without Ice:**	**105 mph**
Exposure Catagory:	**B**	**Design Wind Speed With Ice:**	**50 mph**
Topographic Catagory:	**1**	**Operational Wind Speed:**	**60 mph**
Crest Height:	**0.0 ft**	**Design Ice Thickness:**	**0.50 in**

Seismic Parameters

Analysis Method:	**Equivalent Modal Analysis & Equivalent Lateral Force Methods**				
Site Class:	**D - Stiff Soil**				
Period Based on Rayleigh Method (sec):	**2.00**				
T_L (sec):	**6**	**p:**	**1.3**	**C_s:**	**0.034**
S_s:	**0.186**	**S_1:**	**0.063**	**C_s Max:**	**0.034**
F_a:	**1.600**	**F_v:**	**2.400**	**C_s Min:**	**0.030**
S_{ds}:	**0.198**	**S_{d1}:**	**0.101**		

Load Cases

1.2D + 1.6W	**105 mph with No Ice**
0.9D + 1.6W	**105 mph with No Ice (Reduced DL)**
1.2D + 1.0Di + 1.0Wi	**50 mph with 0.75 in Radial Ice**
(1.2 + 0.2Sds) * DL + E ELFM	**Seismic Equivalent Lateral Forces Method**
(1.2 + 0.2Sds) * DL + E EMAM	**Seismic Equivalent Modal Analysis Method**
(0.9 - 0.2Sds) * DL + E ELFM	**Seismic (Reduced DL) Equivalent Lateral Forces Method**
(0.9 - 0.2Sds) * DL + E EMAM	**Seismic (Reduced DL) Equivalent Modal Analysis Method**
1.0D + 1.0W	**Serviceability 60 mph**

Site Number:	**CT54XC773**	**Code: ANSI/TIA-222-G**	
Site Name:	**Hamden, CT**	**Engineering Number: REV09B**	**7/19/2019 1:35:17 PM**
Customer:	**Sprint Sites USA - GA 2**		

Shaft Section Properties

							Bottom						Top						
Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Dia (in)	Elev (ft)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper (in/ft)
1-18	52.667	0.4375	65		0.00	14,663	68.00	0.00	93.82	54105.3	26.00	155.43	50.72	52.67	69.83	22308.8	19.03	115.94	0.328026
2-18	52.417	0.4375	65	Slip	88.00	11,138	54.00	45.33	74.38	26965.9	20.35	123.44	36.81	97.75	50.51	8442.3	13.43	84.14	0.328026
3-18	41.750	0.3750	65	Slip	66.00	5,435	39.36	92.25	46.41	8913.0	17.10	104.97	25.67	134.00	30.11	2433.6	10.66	68.45	0.328026
4-18	27.000	0.1875	65	Slip	48.00	1,243	27.35	130.00	16.17	1507.9	24.32	145.90	18.50	157.00	10.90	461.7	15.99	98.67	0.328026
				Shaft Weight		32,479													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor	Distance From Face (ft)	Vert Ecc (ft)
157.50	16" x 9" x 6" Combiners	12	10.00	1.200	0.50	36.40	2.531	0.50	0.000	0.500
157.50	1900MHz RRH	6	60.00	3.010	0.67	168.11	3.276	0.67	0.000	0.500
157.50	26" Microwave	2	90.00	3.960	1.00	223.24	5.152	1.00	0.000	0.500
157.50	800 MHz Notch Filter	6	8.82	0.750	0.50	33.31	1.013	0.50	0.000	0.500
157.50	800MHz RRH	3	64.00	2.480	0.67	154.95	3.636	0.67	0.000	0.500
157.50	96" x 14" x 7" Panel	3	70.00	13.000	0.79	358.36	14.651	0.79	0.000	0.500
157.50	APXVSPP18-C-A20	3	57.00	8.260	0.80	257.78	9.321	0.80	0.000	0.500
157.50	APXVTM14-C-I20	3	54.90	6.430	0.76	208.66	7.021	0.76	0.000	0.500
157.50	GPS Antenna	1	1.00	0.388	1.00	20.18	0.651	1.00	0.000	0.500
157.50	ODU	2	11.00	0.910	1.00	46.59	1.320	1.00	0.000	0.000
157.50	RET Kit	9	1.04	0.136	0.50	9.51	0.304	0.50	0.000	0.500
157.50	TD-RRH-8X20	6	70.00	4.800	0.67	184.18	4.951	0.67	0.000	0.500
157.00	Collar Mount	1	250.00	5.000	1.00	863.62	13.766	1.00	0.000	0.500
157.00	Platform w/ Rail	1	2500.00	35.850	1.00	6,006.39	52.014	1.00	0.000	1.500
147.00	B66 4x45 RRH	3	64.00	2.470	0.67	139.26	3.073	0.67	0.000	0.000
147.00	DB-T1-6Z-8AB-0Z	2	44.00	5.600	1.00	187.39	5.672	1.00	0.000	0.000
147.00	FD9R6004-2C-3L	6	3.10	0.367	0.50	11.11	0.816	0.50	0.000	0.000
147.00	JAHH-65B-R3B	6	63.30	9.110	0.83	260.20	11.541	0.83	0.000	0.000
147.00	Low Profile Platform	1	1600.00	25.550	1.00	3,341.69	31.716	1.00	0.000	0.000
147.00	LPA-80080/4CF	6	12.00	6.057	0.71	147.02	6.390	0.71	0.000	0.000
147.00	RRH 2x60 LTE	3	57.00	2.160	0.67	138.52	2.788	0.67	0.000	0.000
147.00	RRH 4x40-850	3	88.00	2.890	0.67	213.27	3.135	0.67	0.000	0.000
137.00	1B-twin AWS TMA	3	22.00	0.910	0.50	56.18	1.175	0.50	0.000	0.000
137.00	4449 B71/B12	3	74.00	1.640	0.85	127.39	2.464	0.85	0.000	0.000
137.00	AIR 21 B2A/B4P	3	92.00	6.530	0.88	267.24	7.138	0.88	0.000	0.000
137.00	AIR 21 B4A/B2P	3	90.39	6.580	0.83	256.57	7.138	0.83	0.000	0.000
137.00	APXVAARR24_43-U-NA20	3	128.00	20.240	0.72	554.05	22.117	0.72	0.000	0.000
137.00	T-Arms w/ Stabilizer Kit	3	242.00	13.000	1.00	446.08	29.142	1.00	0.000	0.000
	Totals	106	9383.55			26,027.28			Number of Loadings :	28

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Flat	Protected Width (in)	Exposed To Wind	Carrier
0.00	157.50	3	1 1/4" Fiber	1.25	0.95	N	0.00	N	Sprint
0.00	157.50	12	1 5/8" Fiber	1.98	1.78	N	0.00	N	Sprint
0.00	157.50	2	1/2" Coax	0.65	0.16	N	0.00	N	Sprint
0.00	157.50	3	RET Cable	0.44	0.08	N	0.00	N	Sprint
0.00	157.50	1	Trunk Line	1.25	0.95	N	0.00	N	Sprint
0.00	147.00	12	1 5/8" Coax	1.98	1.04	N	0.00	N	Verizon
0.00	147.00	2	1 5/8" Fiber	1.98	1.04	N	0.00	N	Verizon

0.00	137.00	3	1 1/4" Hybrid Cable	1.25	0.95	N	0.00	N	T-Mobile
0.00	137.00	6	1 5/8" Coax	1.98	1.04	N	0.00	N	T-Mobile

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.4375	68.000	93.816	54,105.3	26.00	155.43	70.8	1567.	0.0	0.0
5.00		0.4375	66.360	91.538	50,259.8	25.33	151.68	71.6	1491.	0.0	1,576.8
10.00		0.4375	64.720	89.261	46,601.0	24.67	147.93	72.4	1418.	0.0	1,538.0
15.00		0.4375	63.080	86.983	43,124.3	24.01	144.18	73.2	1346.	0.0	1,499.3
20.00		0.4375	61.439	84.706	39,824.9	23.35	140.43	73.9	1276.	0.0	1,460.5
25.00		0.4375	59.799	82.428	36,698.2	22.69	136.68	74.7	1208.	0.0	1,421.8
30.00		0.4375	58.159	80.151	33,739.6	22.03	132.94	75.5	1142.	0.0	1,383.1
35.00		0.4375	56.519	77.874	30,944.5	21.37	129.19	76.3	1078.	0.0	1,344.3
40.00		0.4375	54.879	75.596	28,308.2	20.71	125.44	77.0	1016.	0.0	1,305.6
45.00		0.4375	53.239	73.319	25,826.0	20.05	121.69	77.8	955.5	0.0	1,266.8
45.33	Bot - Section 2	0.4375	53.130	73.167	25,665.9	20.00	121.44	77.9	951.5	0.0	83.1
50.00		0.4375	51.599	71.041	23,493.4	19.39	117.94	78.6	896.8	0.0	2,309.3
52.67	Top - Section 1	0.4375	51.599	71.042	23,493.7	19.39	117.94	78.6	896.8	0.0	1,289.3
55.00		0.4375	50.834	69.979	22,455.0	19.08	116.19	79.0	870.0	0.0	559.8
60.00		0.4375	49.193	67.701	20,333.2	18.42	112.44	79.7	814.1	0.0	1,171.2
65.00		0.4375	47.553	65.424	18,349.5	17.75	108.69	80.5	760.0	0.0	1,132.5
70.00		0.4375	45.913	63.146	16,499.1	17.09	104.94	81.3	707.8	0.0	1,093.7
75.00		0.4375	44.273	60.869	14,777.6	16.43	101.20	82.1	657.4	0.0	1,055.0
80.00		0.4375	42.633	58.592	13,180.1	15.77	97.45	82.6	608.9	0.0	1,016.2
85.00		0.4375	40.993	56.314	11,702.2	15.11	93.70	82.6	562.3	0.0	977.5
90.00		0.4375	39.353	54.037	10,339.0	14.45	89.95	82.6	517.5	0.0	938.7
92.25	Bot - Section 3	0.4375	38.615	53.012	9,761.9	14.15	88.26	82.6	497.9	0.0	409.8
95.00		0.4375	37.713	51.759	9,086.1	13.79	86.20	82.6	474.5	0.0	919.4
97.75	Top - Section 2	0.3750	37.561	44.258	7,732.1	16.25	100.16	82.3	405.5	0.0	897.7
100.0		0.3750	36.822	43.380	7,280.8	15.90	98.19	82.6	389.4	0.0	335.5
105.0		0.3750	35.182	41.428	6,341.4	15.13	93.82	82.6	355.0	0.0	721.5
110.0		0.3750	33.542	39.476	5,486.6	14.36	89.45	82.6	322.2	0.0	688.2
115.0		0.3750	31.902	37.524	4,712.2	13.59	85.07	82.6	290.9	0.0	655.0
120.0		0.3750	30.262	35.572	4,014.4	12.82	80.70	82.6	261.3	0.0	621.8
125.0		0.3750	28.622	33.620	3,389.1	12.05	76.32	82.6	233.2	0.0	588.6
130.0	Bot - Section 4	0.3750	26.982	31.667	2,832.4	11.28	71.95	82.6	206.8	0.0	555.4
134.0	Top - Section 3	0.1875	26.045	15.388	1,299.8	23.08	138.90	74.3	98.3	0.0	635.2
135.0		0.1875	25.717	15.192	1,251.0	22.77	137.15	74.6	95.8	0.0	52.0
137.0		0.1875	25.060	14.802	1,157.0	22.16	133.66	75.3	90.9	0.0	102.1
140.0		0.1875	24.076	14.216	1,025.0	21.23	128.41	76.4	83.9	0.0	148.1
145.0		0.1875	22.436	13.240	828.1	19.69	119.66	78.2	72.7	0.0	233.6
147.0		0.1875	21.780	12.850	757.0	19.07	116.16	79.0	68.5	0.0	88.8
150.0		0.1875	20.796	12.264	658.1	18.15	110.91	80.1	62.3	0.0	128.2
155.0		0.1875	19.156	11.288	513.2	16.60	102.17	81.9	52.8	0.0	200.4
157.0		0.1875	18.500	10.898	461.7	15.99	98.67	82.6	49.2	0.0	75.5
											32,479.3

Load Case: 1.2D + 1.6W — 105 mph with No Ice — 22 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 1.20
Wind Load Factor : 1.60
Wind Importance Factor : 1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		305.1	0.0					0.0	0.0	305.1	0.0	0.0	0.0
5.00		602.8	1,892.2					0.0	296.4	602.8	2,188.5	0.0	0.0
10.00		587.9	1,845.7					0.0	296.4	587.9	2,142.0	0.0	0.0
15.00		573.1	1,799.2					0.0	296.4	573.1	2,095.5	0.0	0.0
20.00		558.2	1,752.7					0.0	296.4	558.2	2,049.0	0.0	0.0
25.00		543.3	1,706.2					0.0	296.4	543.3	2,002.5	0.0	0.0
30.00		536.9	1,659.7					0.0	296.4	536.9	1,956.0	0.0	0.0
35.00		540.9	1,613.2					0.0	296.4	540.9	1,909.6	0.0	0.0
40.00		545.2	1,566.7					0.0	296.4	545.2	1,863.1	0.0	0.0
45.00		291.5	1,520.2					0.0	296.4	291.5	1,816.6	0.0	0.0
45.33	Bot - Section 2	277.6	99.7					0.0	19.8	277.6	119.5	0.0	0.0
50.00		407.3	2,771.1					0.0	276.6	407.3	3,047.7	0.0	0.0
52.67	Top - Section 1	277.0	1,547.1					0.0	158.1	277.0	1,705.2	0.0	0.0
55.00		404.3	671.8					0.0	138.3	404.3	810.1	0.0	0.0
60.00		547.6	1,405.5					0.0	296.4	547.6	1,701.9	0.0	0.0
65.00		541.4	1,359.0					0.0	296.4	541.4	1,655.4	0.0	0.0
70.00		533.8	1,312.5					0.0	296.4	533.8	1,608.9	0.0	0.0
75.00		524.8	1,266.0					0.0	296.4	524.8	1,562.4	0.0	0.0
80.00		514.7	1,219.5					0.0	296.4	514.7	1,515.9	0.0	0.0
85.00		503.4	1,173.0					0.0	296.4	503.4	1,469.4	0.0	0.0
90.00		358.7	1,126.5					0.0	296.4	358.7	1,422.9	0.0	0.0
92.25	Bot - Section 3	245.0	491.8					0.0	133.4	245.0	625.1	0.0	0.0
95.00		268.1	1,103.3					0.0	163.0	268.1	1,266.3	0.0	0.0
97.75	Top - Section 2	240.3	1,077.2					0.0	163.0	240.3	1,240.2	0.0	0.0
100.00		340.4	402.6					0.0	133.4	340.4	536.0	0.0	0.0
105.00		458.7	865.7					0.0	296.4	458.7	1,162.1	0.0	0.0
110.00		443.1	825.9					0.0	296.4	443.1	1,122.3	0.0	0.0
115.00		426.8	786.0					0.0	296.4	426.8	1,082.4	0.0	0.0
120.00		409.8	746.2					0.0	296.4	409.8	1,042.6	0.0	0.0
125.00		392.1	706.3					0.0	296.4	392.1	1,002.7	0.0	0.0
130.00	Bot - Section 4	340.1	666.5					0.0	296.4	340.1	962.9	0.0	0.0
134.00	Top - Section 3	184.8	762.2					0.0	237.1	184.8	999.3	0.0	0.0
135.00		107.5	62.4					0.0	59.3	107.5	121.7	0.0	0.0
137.00	Appertunance(s)	175.2	122.5	5,384.6	0.0	0.0	2,334.2	0.0	118.6	5,559.8	2,575.2	0.0	0.0
140.00		269.3	177.7					0.0	145.1	269.3	322.8	0.0	0.0
145.00		228.7	280.3					0.0	241.8	228.7	522.1	0.0	0.0
147.00	Appertunance(s)	155.2	106.5	5,446.8	0.0	0.0	3,342.5	0.0	96.7	5,602.0	3,545.7	0.0	0.0
150.00		236.7	153.8					0.0	92.6	236.7	246.5	0.0	0.0
155.00		199.7	240.4					0.0	154.4	199.7	394.8	0.0	0.0
157.00	Appertunance(s)	54.9	90.6	2,176.4	0.0	2,998.7	3,300.0	0.0	61.8	2,231.4	3,452.4	0.0	0.0
								Totals:		28,159.7	56,865.1	0.00	0.00

Site Number:	**CT54XC773**	**Code: ANSI/TIA-222-G**	
Site Name:	**Hamden, CT**	**Engineering Number: REV09B**	**7/19/2019 1:35:18 PM**
Customer:	**Sprint Sites USA - GA 2**		

Load Case: **1.2D + 1.6W** **105 mph with No Ice** **22 Iterations**

Gust Response Factor : 1.10
Dead Load Factor : 1.20
Wind Load Factor : 1.60

Wind Importance Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-59.12	-33.75	0.00	-3,992.00	0.00	3,992.00	5,980.07	2,990.03	16,624.4	8,324.57	0.00	0.00	0.490
5.00	-56.87	-33.25	0.00	-3,823.26	0.00	3,823.26	5,898.95	2,949.47	15,998.2	8,011.02	0.06	-0.10	0.487
10.00	-54.67	-32.76	0.00	-3,657.03	0.00	3,657.03	5,814.64	2,907.32	15,374.6	7,698.77	0.22	-0.21	0.485
15.00	-52.51	-32.28	0.00	-3,493.25	0.00	3,493.25	5,727.15	2,863.57	14,754.3	7,388.14	0.50	-0.32	0.482
20.00	-50.40	-31.80	0.00	-3,331.88	0.00	3,331.88	5,636.47	2,818.23	14,137.9	7,079.47	0.89	-0.43	0.480
25.00	-48.34	-31.34	0.00	-3,172.86	0.00	3,172.86	5,542.60	2,771.30	13,526.0	6,773.06	1.41	-0.55	0.477
30.00	-46.33	-30.88	0.00	-3,016.14	0.00	3,016.14	5,445.54	2,722.77	12,919.3	6,469.26	2.04	-0.67	0.475
35.00	-44.36	-30.42	0.00	-2,861.72	0.00	2,861.72	5,345.30	2,672.65	12,318.4	6,168.38	2.81	-0.79	0.472
40.00	-42.43	-29.94	0.00	-2,709.64	0.00	2,709.64	5,241.87	2,620.94	11,724.0	5,870.75	3.70	-0.92	0.470
45.00	-40.59	-29.67	0.00	-2,559.94	0.00	2,559.94	5,135.25	2,567.63	11,136.8	5,576.69	4.74	-1.05	0.467
45.33	-40.44	-29.44	0.00	-2,550.05	0.00	2,550.05	5,128.03	2,564.02	11,097.9	5,557.22	4.81	-1.06	0.467
50.00	-37.34	-29.04	0.00	-2,412.68	0.00	2,412.68	5,025.45	2,512.73	10,557.3	5,286.54	5.91	-1.19	0.464
52.67	-35.61	-28.77	0.00	-2,335.25	0.00	2,335.25	5,025.47	2,512.73	10,557.4	5,286.58	6.60	-1.27	0.449
55.00	-34.76	-28.41	0.00	-2,268.13	0.00	2,268.13	4,973.14	2,486.57	10,289.9	5,152.60	7.23	-1.33	0.447
60.00	-33.00	-27.90	0.00	-2,126.09	0.00	2,126.09	4,858.66	2,429.33	9,723.06	4,868.75	8.71	-1.47	0.444
65.00	-31.29	-27.40	0.00	-1,986.58	0.00	1,986.58	4,740.99	2,370.50	9,165.59	4,589.61	10.33	-1.62	0.440
70.00	-29.63	-26.89	0.00	-1,849.61	0.00	1,849.61	4,620.14	2,310.07	8,618.17	4,315.49	12.10	-1.77	0.435
75.00	-28.01	-26.39	0.00	-1,715.15	0.00	1,715.15	4,496.10	2,248.05	8,081.43	4,046.72	14.03	-1.92	0.430
80.00	-26.44	-25.90	0.00	-1,583.18	0.00	1,583.18	4,353.06	2,176.53	7,528.68	3,769.93	16.13	-2.08	0.426
85.00	-24.92	-25.42	0.00	-1,453.67	0.00	1,453.67	4,183.86	2,091.93	6,951.89	3,481.11	18.39	-2.24	0.424
90.00	-23.46	-25.05	0.00	-1,326.60	0.00	1,326.60	4,014.66	2,007.33	6,398.09	3,203.80	20.83	-2.41	0.420
92.25	-22.80	-24.81	0.00	-1,270.23	0.00	1,270.23	3,938.51	1,969.26	6,156.38	3,082.77	21.98	-2.49	0.418
95.00	-21.51	-24.53	0.00	-1,201.99	0.00	1,201.99	3,845.45	1,922.73	5,867.28	2,938.00	23.45	-2.59	0.415
97.75	-20.24	-24.26	0.00	-1,134.54	0.00	1,134.54	3,277.70	1,638.85	4,997.17	2,502.30	24.97	-2.69	0.460
100.00	-19.66	-23.95	0.00	-1,079.95	0.00	1,079.95	3,222.92	1,611.46	4,815.14	2,411.15	26.26	-2.77	0.454
105.00	-18.44	-23.50	0.00	-960.22	0.00	960.22	3,077.89	1,538.94	4,389.42	2,197.97	29.27	-2.97	0.443
110.00	-17.26	-23.05	0.00	-842.74	0.00	842.74	2,932.86	1,466.43	3,983.41	1,994.67	32.49	-3.18	0.429
115.00	-16.13	-22.62	0.00	-727.47	0.00	727.47	2,787.83	1,393.91	3,597.10	1,801.22	35.93	-3.38	0.410
120.00	-15.03	-22.20	0.00	-614.36	0.00	614.36	2,642.80	1,321.40	3,230.49	1,617.64	39.58	-3.58	0.386
125.00	-13.98	-21.80	0.00	-503.34	0.00	503.34	2,497.76	1,248.88	2,883.58	1,443.93	43.44	-3.78	0.354
130.00	-12.98	-21.43	0.00	-394.37	0.00	394.37	2,352.73	1,176.37	2,556.37	1,280.08	47.50	-3.97	0.314
134.00	-11.97	-21.19	0.00	-308.65	0.00	308.65	1,028.31	514.15	1,093.21	547.42	50.88	-4.11	0.577
135.00	-11.83	-21.09	0.00	-287.46	0.00	287.46	1,020.22	510.11	1,070.76	536.17	51.75	-4.14	0.549
137.00	-9.63	-15.38	0.00	-245.28	0.00	245.28	1,003.67	501.84	1,026.12	513.82	53.51	-4.27	0.488
140.00	-9.27	-15.12	0.00	-199.13	0.00	199.13	977.89	488.95	959.91	480.67	56.25	-4.43	0.425
145.00	-8.73	-14.87	0.00	-123.52	0.00	123.52	932.37	466.18	851.90	426.58	61.01	-4.65	0.300
147.00	-5.65	-9.01	0.00	-93.78	0.00	93.78	913.27	456.63	809.64	405.42	62.98	-4.73	0.238
150.00	-5.41	-8.76	0.00	-66.75	0.00	66.75	883.66	441.83	747.38	374.24	65.97	-4.82	0.185
155.00	-5.02	-8.53	0.00	-22.94	0.00	22.94	831.77	415.88	647.00	323.98	71.08	-4.92	0.077
157.00	0.00	-8.07	0.00	-5.87	0.00	5.87	809.65	404.83	607.80	304.35	73.14	-4.93	0.020

Site Number:	**CT54XC773**	**Code: ANSI/TIA-222-G**	
Site Name:	**Hamden, CT**	**Engineering Number: REV09B**	**7/19/2019 1:35:18 PM**
Customer:	**Sprint Sites USA - GA 2**		

Load Case: **0.9D + 1.6W** — **105 mph with No Ice (Reduced DL)** — **22 Iterations**

Gust Response Factor : 1.10
Dead Load Factor : 0.90
Wind Load Factor : 1.60

Wind Importance Factor : 1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		305.1	0.0					0.0	0.0	305.1	0.0	0.0	0.0
5.00		602.8	1,419.1					0.0	222.3	602.8	1,641.4	0.0	0.0
10.00		587.9	1,384.2					0.0	222.3	587.9	1,606.5	0.0	0.0
15.00		573.1	1,349.4					0.0	222.3	573.1	1,571.7	0.0	0.0
20.00		558.2	1,314.5					0.0	222.3	558.2	1,536.8	0.0	0.0
25.00		543.3	1,279.6					0.0	222.3	543.3	1,501.9	0.0	0.0
30.00		536.9	1,244.7					0.0	222.3	536.9	1,467.0	0.0	0.0
35.00		540.9	1,209.9					0.0	222.3	540.9	1,432.2	0.0	0.0
40.00		545.2	1,175.0					0.0	222.3	545.2	1,397.3	0.0	0.0
45.00		291.5	1,140.1					0.0	222.3	291.5	1,362.4	0.0	0.0
45.33	Bot - Section 2	277.6	74.8					0.0	14.8	277.6	89.6	0.0	0.0
50.00		407.3	2,078.3					0.0	207.5	407.3	2,285.8	0.0	0.0
52.67	Top - Section 1	277.0	1,160.3					0.0	118.6	277.0	1,278.9	0.0	0.0
55.00		404.3	503.9					0.0	103.7	404.3	607.6	0.0	0.0
60.00		547.6	1,054.1					0.0	222.3	547.6	1,276.4	0.0	0.0
65.00		541.4	1,019.2					0.0	222.3	541.4	1,241.5	0.0	0.0
70.00		533.8	984.4					0.0	222.3	533.8	1,206.7	0.0	0.0
75.00		524.8	949.5					0.0	222.3	524.8	1,171.8	0.0	0.0
80.00		514.7	914.6					0.0	222.3	514.7	1,136.9	0.0	0.0
85.00		503.4	879.7					0.0	222.3	503.4	1,102.0	0.0	0.0
90.00		358.7	844.9					0.0	222.3	358.7	1,067.2	0.0	0.0
92.25	Bot - Section 3	245.0	368.8					0.0	100.0	245.0	468.8	0.0	0.0
95.00		268.1	827.5					0.0	122.3	268.1	949.7	0.0	0.0
97.75	Top - Section 2	240.3	807.9					0.0	122.3	240.3	930.2	0.0	0.0
100.00		340.4	301.9					0.0	100.0	340.4	402.0	0.0	0.0
105.00		458.7	649.3					0.0	222.3	458.7	871.6	0.0	0.0
110.00		443.1	619.4					0.0	222.3	443.1	841.7	0.0	0.0
115.00		426.8	589.5					0.0	222.3	426.8	811.8	0.0	0.0
120.00		409.8	559.6					0.0	222.3	409.8	781.9	0.0	0.0
125.00		392.1	529.7					0.0	222.3	392.1	752.0	0.0	0.0
130.00	Bot - Section 4	340.1	499.9					0.0	222.3	340.1	722.1	0.0	0.0
134.00	Top - Section 3	184.8	571.6					0.0	177.8	184.8	749.5	0.0	0.0
135.00		107.5	46.8					0.0	44.5	107.5	91.3	0.0	0.0
137.00	Appertunance(s)	175.2	91.9	5,384.6	0.0	0.0	1,750.7	0.0	88.9	5,559.8	1,931.4	0.0	0.0
140.00		269.3	133.3					0.0	108.8	269.3	242.1	0.0	0.0
145.00		228.7	210.2					0.0	181.3	228.7	391.5	0.0	0.0
147.00	Appertunance(s)	155.2	79.9	5,446.8	0.0	0.0	2,506.9	0.0	72.5	5,602.0	2,659.3	0.0	0.0
150.00		236.7	115.4					0.0	69.5	236.7	184.9	0.0	0.0
155.00		199.7	180.3					0.0	115.8	199.7	296.1	0.0	0.0
157.00	Appertunance(s)	54.9	67.9	2,176.4	0.0	2,998.7	2,475.0	0.0	46.3	2,231.4	2,589.3	0.0	0.0
									Totals:	28,159.7	42,648.8	0.00	0.00

Site Number:	**CT54XC773**	**Code: ANSI/TIA-222-G**	
Site Name:	**Hamden, CT**	**Engineering Number: REV09B**	**7/19/2019 1:35:20 PM**
Customer:	**Sprint Sites USA - GA 2**		

Load Case: **0.9D + 1.6W** — **105 mph with No Ice (Reduced DL)** — **22 Iterations**

Gust Response Factor : 1.10
Dead Load Factor : 0.90
Wind Load Factor : 1.60
Wind Importance Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-44.33	-33.73	0.00	-3,960.25	0.00	3,960.25	5,980.07	2,990.03	16,624.4	8,324.57	0.00	0.00	0.483
5.00	-42.63	-33.21	0.00	-3,791.58	0.00	3,791.58	5,898.95	2,949.47	15,998.2	8,011.02	0.06	-0.10	0.481
10.00	-40.96	-32.69	0.00	-3,625.55	0.00	3,625.55	5,814.64	2,907.32	15,374.6	7,698.77	0.22	-0.21	0.478
15.00	-39.33	-32.19	0.00	-3,462.09	0.00	3,462.09	5,727.15	2,863.57	14,754.3	7,388.14	0.49	-0.32	0.476
20.00	-37.74	-31.69	0.00	-3,301.17	0.00	3,301.17	5,636.47	2,818.23	14,137.9	7,079.47	0.88	-0.43	0.473
25.00	-36.18	-31.21	0.00	-3,142.70	0.00	3,142.70	5,542.60	2,771.30	13,526.0	6,773.06	1.39	-0.54	0.471
30.00	-34.65	-30.73	0.00	-2,986.65	0.00	2,986.65	5,445.54	2,722.77	12,919.3	6,469.26	2.02	-0.66	0.468
35.00	-33.16	-30.25	0.00	-2,832.99	0.00	2,832.99	5,345.30	2,672.65	12,318.4	6,168.38	2.78	-0.78	0.466
40.00	-31.70	-29.75	0.00	-2,681.77	0.00	2,681.77	5,241.87	2,620.94	11,724.0	5,870.75	3.67	-0.91	0.463
45.00	-30.31	-29.47	0.00	-2,533.02	0.00	2,533.02	5,135.25	2,567.63	11,136.8	5,576.69	4.70	-1.04	0.460
45.33	-30.19	-29.23	0.00	-2,523.20	0.00	2,523.20	5,128.03	2,564.02	11,097.9	5,557.22	4.77	-1.05	0.460
50.00	-27.86	-28.83	0.00	-2,386.79	0.00	2,386.79	5,025.45	2,512.73	10,557.3	5,286.54	5.86	-1.18	0.457
52.67	-26.55	-28.56	0.00	-2,309.92	0.00	2,309.92	5,025.47	2,512.73	10,557.4	5,286.58	6.54	-1.25	0.442
55.00	-25.91	-28.19	0.00	-2,243.29	0.00	2,243.29	4,973.14	2,486.57	10,289.9	5,152.60	7.17	-1.32	0.441
60.00	-24.58	-27.67	0.00	-2,102.36	0.00	2,102.36	4,858.66	2,429.33	9,723.06	4,868.75	8.63	-1.46	0.437
65.00	-23.28	-27.15	0.00	-1,964.03	0.00	1,964.03	4,740.99	2,370.50	9,165.59	4,589.61	10.23	-1.60	0.433
70.00	-22.02	-26.64	0.00	-1,828.27	0.00	1,828.27	4,620.14	2,310.07	8,618.17	4,315.49	11.99	-1.75	0.429
75.00	-20.80	-26.13	0.00	-1,695.08	0.00	1,695.08	4,496.10	2,248.05	8,081.43	4,046.72	13.90	-1.90	0.424
80.00	-19.61	-25.64	0.00	-1,564.40	0.00	1,564.40	4,353.06	2,176.53	7,528.68	3,769.93	15.97	-2.06	0.420
85.00	-18.45	-25.14	0.00	-1,436.23	0.00	1,436.23	4,183.86	2,091.93	6,951.89	3,481.11	18.21	-2.22	0.417
90.00	-17.35	-24.78	0.00	-1,310.51	0.00	1,310.51	4,014.66	2,007.33	6,398.09	3,203.80	20.63	-2.39	0.414
92.25	-16.85	-24.54	0.00	-1,254.75	0.00	1,254.75	3,938.51	1,969.26	6,156.38	3,082.77	21.77	-2.46	0.411
95.00	-15.87	-24.26	0.00	-1,187.26	0.00	1,187.26	3,845.45	1,922.73	5,867.28	2,938.00	23.22	-2.56	0.408
97.75	-14.91	-24.00	0.00	-1,120.55	0.00	1,120.55	3,277.70	1,638.85	4,997.17	2,502.30	24.72	-2.66	0.453
100.00	-14.47	-23.68	0.00	-1,066.55	0.00	1,066.55	3,222.92	1,611.46	4,815.14	2,411.15	26.00	-2.74	0.447
105.00	-13.54	-23.22	0.00	-948.16	0.00	948.16	3,077.89	1,538.94	4,389.42	2,197.97	28.98	-2.94	0.436
110.00	-12.65	-22.78	0.00	-832.05	0.00	832.05	2,932.86	1,466.43	3,983.41	1,994.67	32.17	-3.14	0.422
115.00	-11.78	-22.35	0.00	-718.15	0.00	718.15	2,787.83	1,393.91	3,597.10	1,801.22	35.56	-3.34	0.403
120.00	-10.95	-21.93	0.00	-606.40	0.00	606.40	2,642.80	1,321.40	3,230.49	1,617.64	39.17	-3.54	0.379
125.00	-10.15	-21.53	0.00	-496.74	0.00	496.74	2,497.76	1,248.88	2,883.58	1,443.93	42.99	-3.74	0.348
130.00	-9.39	-21.17	0.00	-389.11	0.00	389.11	2,352.73	1,176.37	2,556.37	1,280.08	47.00	-3.92	0.308
134.00	-8.63	-20.94	0.00	-304.45	0.00	304.45	1,028.31	514.15	1,093.21	547.42	50.35	-4.06	0.566
135.00	-8.52	-20.84	0.00	-283.51	0.00	283.51	1,020.22	510.11	1,070.76	536.17	51.20	-4.10	0.539
137.00	-6.96	-15.17	0.00	-241.83	0.00	241.83	1,003.67	501.84	1,026.12	513.82	52.95	-4.22	0.478
140.00	-6.68	-14.91	0.00	-196.31	0.00	196.31	977.89	488.95	959.91	480.67	55.65	-4.38	0.416
145.00	-6.28	-14.67	0.00	-121.77	0.00	121.77	932.37	466.18	851.90	426.58	60.36	-4.60	0.293
147.00	-4.07	-8.87	0.00	-92.44	0.00	92.44	913.27	456.63	809.64	405.42	62.30	-4.67	0.233
150.00	-3.89	-8.63	0.00	-65.83	0.00	65.83	883.66	441.83	747.38	374.24	65.26	-4.76	0.181
155.00	-3.60	-8.41	0.00	-22.69	0.00	22.69	831.77	415.88	647.00	323.98	70.30	-4.86	0.075
157.00	0.00	-8.07	0.00	-5.87	0.00	5.87	809.65	404.83	607.80	304.35	72.34	-4.87	0.020

Load Case: 1.2D + 1.0Di + 1.0Wi — 50 mph with 0.75 in Radial Ice — 21 Iterations

Gust Response Factor : 1.10 | Ice Dead Load Factor : 1.00 | Wind Importance Factor : 1.00
Dead Load Factor : 1.20 | Ice Importance Factor : 1.00
Wind Load Factor : 1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		82.6	0.0					0.0	0.0	82.6	0.0	0.0	0.0
5.00		163.6	2,399.4					0.0	296.4	163.6	2,695.8	0.0	0.0
10.00		160.1	2,387.4					0.0	296.4	160.1	2,683.8	0.0	0.0
15.00		156.5	2,353.0					0.0	296.4	156.5	2,649.4	0.0	0.0
20.00		152.7	2,310.1					0.0	296.4	152.7	2,606.5	0.0	0.0
25.00		149.0	2,262.5					0.0	296.4	149.0	2,558.9	0.0	0.0
30.00		147.6	2,211.9					0.0	296.4	147.6	2,508.3	0.0	0.0
35.00		149.0	2,159.2					0.0	296.4	149.0	2,455.6	0.0	0.0
40.00		150.5	2,104.9					0.0	296.4	150.5	2,401.2	0.0	0.0
45.00		80.6	2,049.3					0.0	296.4	80.6	2,345.7	0.0	0.0
45.33	Bot - Section 2	76.8	135.1					0.0	19.8	76.8	154.9	0.0	0.0
50.00		112.8	3,263.7					0.0	276.6	112.8	3,540.4	0.0	0.0
52.67	Top - Section 1	76.8	1,826.1					0.0	158.1	76.8	1,984.2	0.0	0.0
55.00		112.3	913.6					0.0	138.3	112.3	1,051.9	0.0	0.0
60.00		152.4	1,910.7					0.0	296.4	152.4	2,207.1	0.0	0.0
65.00		151.1	1,852.1					0.0	296.4	151.1	2,148.4	0.0	0.0
70.00		149.4	1,792.8					0.0	296.4	149.4	2,089.2	0.0	0.0
75.00		147.3	1,733.2					0.0	296.4	147.3	2,029.5	0.0	0.0
80.00		144.9	1,673.0					0.0	296.4	144.9	1,969.4	0.0	0.0
85.00		142.2	1,612.5					0.0	296.4	142.2	1,908.9	0.0	0.0
90.00		101.5	1,551.7					0.0	296.4	101.5	1,848.1	0.0	0.0
92.25	Bot - Section 3	69.5	680.4					0.0	133.4	69.5	813.8	0.0	0.0
95.00		76.2	1,333.7					0.0	163.0	76.2	1,496.7	0.0	0.0
97.75	Top - Section 2	68.4	1,303.1					0.0	163.0	68.4	1,466.1	0.0	0.0
100.00		97.2	584.4					0.0	133.4	97.2	717.8	0.0	0.0
105.00		131.3	1,254.0					0.0	296.4	131.3	1,550.3	0.0	0.0
110.00		127.5	1,198.7					0.0	296.4	127.5	1,495.0	0.0	0.0
115.00		123.4	1,143.1					0.0	296.4	123.4	1,439.5	0.0	0.0
120.00		119.1	1,087.4					0.0	296.4	119.1	1,383.8	0.0	0.0
125.00		114.7	1,031.4					0.0	296.4	114.7	1,327.8	0.0	0.0
130.00	Bot - Section 4	100.0	975.3					0.0	296.4	100.0	1,271.6	0.0	0.0
134.00	Top - Section 3	54.5	1,002.0					0.0	237.1	54.5	1,239.1	0.0	0.0
135.00		31.9	121.8					0.0	59.3	31.9	181.1	0.0	0.0
137.00	Appertunance(s)	52.1	238.5	1,169.4	0.0	0.0	5,311.4	0.0	118.6	1,221.5	5,668.4	0.0	0.0
140.00		80.6	345.7					0.0	145.1	80.6	490.8	0.0	0.0
145.00		68.8	543.2					0.0	241.8	68.8	785.0	0.0	0.0
147.00	Appertunance(s)	47.1	209.1	923.9	0.0	0.0	7,573.3	0.0	96.7	970.9	7,879.1	0.0	0.0
150.00		72.3	301.5					0.0	92.6	72.3	394.2	0.0	0.0
155.00		61.4	469.3					0.0	154.4	61.4	623.7	0.0	0.0
157.00	Appertunance(s)	17.0	179.5	496.6	0.0	641.1	6,245.0	0.0	61.8	513.6	6,486.3	0.0	0.0
								Totals:		6,862.54	80,547.2	0.00	0.00

Load Case: 1.2D + 1.0Di + 1.0Wi — 50 mph with 0.75 in Radial Ice — 21 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 1.20
Wind Load Factor : 1.00
Ice Dead Load Factor : 1.00
Wind Importance Factor : 1.00
Ice Importance Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-86.95	-7.79	0.00	-886.85	0.00	886.85	5,980.07	2,990.03	16,624.4	8,324.57	0.00	0.00	0.121
5.00	-84.26	-7.66	0.00	-847.89	0.00	847.89	5,898.95	2,949.47	15,998.2	8,011.02	0.01	-0.02	0.120
10.00	-81.57	-7.54	0.00	-809.57	0.00	809.57	5,814.64	2,907.32	15,374.6	7,698.77	0.05	-0.05	0.119
15.00	-78.92	-7.41	0.00	-771.90	0.00	771.90	5,727.15	2,863.57	14,754.3	7,388.14	0.11	-0.07	0.118
20.00	-76.31	-7.29	0.00	-734.85	0.00	734.85	5,636.47	2,818.23	14,137.9	7,079.47	0.20	-0.10	0.117
25.00	-73.74	-7.17	0.00	-698.41	0.00	698.41	5,542.60	2,771.30	13,526.0	6,773.06	0.31	-0.12	0.116
30.00	-71.23	-7.05	0.00	-662.58	0.00	662.58	5,445.54	2,722.77	12,919.3	6,469.26	0.45	-0.15	0.116
35.00	-68.77	-6.92	0.00	-627.35	0.00	627.35	5,345.30	2,672.65	12,318.4	6,168.38	0.62	-0.17	0.115
40.00	-66.37	-6.80	0.00	-592.73	0.00	592.73	5,241.87	2,620.94	11,724.0	5,870.75	0.82	-0.20	0.114
45.00	-64.02	-6.73	0.00	-558.74	0.00	558.74	5,135.25	2,567.63	11,136.8	5,576.69	1.05	-0.23	0.113
45.33	-63.87	-6.67	0.00	-556.50	0.00	556.50	5,128.03	2,564.02	11,097.9	5,557.22	1.06	-0.23	0.113
50.00	-60.32	-6.56	0.00	-525.39	0.00	525.39	5,025.45	2,512.73	10,557.3	5,286.54	1.31	-0.26	0.111
52.67	-58.34	-6.49	0.00	-507.90	0.00	507.90	5,025.47	2,512.73	10,557.4	5,286.58	1.46	-0.28	0.108
55.00	-57.29	-6.40	0.00	-492.75	0.00	492.75	4,973.14	2,486.57	10,289.9	5,152.60	1.60	-0.29	0.107
60.00	-55.08	-6.26	0.00	-460.77	0.00	460.77	4,858.66	2,429.33	9,723.06	4,868.75	1.92	-0.32	0.106
65.00	-52.93	-6.13	0.00	-429.47	0.00	429.47	4,740.99	2,370.50	9,165.59	4,589.61	2.27	-0.35	0.105
70.00	-50.83	-5.99	0.00	-398.84	0.00	398.84	4,620.14	2,310.07	8,618.17	4,315.49	2.66	-0.39	0.103
75.00	-48.80	-5.86	0.00	-368.88	0.00	368.88	4,496.10	2,248.05	8,081.43	4,046.72	3.09	-0.42	0.102
80.00	-46.83	-5.73	0.00	-339.58	0.00	339.58	4,353.06	2,176.53	7,528.68	3,769.93	3.54	-0.45	0.101
85.00	-44.92	-5.60	0.00	-310.94	0.00	310.94	4,183.86	2,091.93	6,951.89	3,481.11	4.04	-0.49	0.100
90.00	-43.07	-5.50	0.00	-282.95	0.00	282.95	4,014.66	2,007.33	6,398.09	3,203.80	4.57	-0.52	0.099
92.25	-42.25	-5.44	0.00	-270.58	0.00	270.58	3,938.51	1,969.26	6,156.38	3,082.77	4.82	-0.54	0.099
95.00	-40.76	-5.36	0.00	-255.62	0.00	255.62	3,845.45	1,922.73	5,867.28	2,938.00	5.14	-0.56	0.098
97.75	-39.29	-5.29	0.00	-240.88	0.00	240.88	3,277.70	1,638.85	4,997.17	2,502.30	5.47	-0.58	0.108
100.00	-38.57	-5.21	0.00	-228.97	0.00	228.97	3,222.92	1,611.46	4,815.14	2,411.15	5.75	-0.60	0.107
105.00	-37.02	-5.09	0.00	-202.94	0.00	202.94	3,077.89	1,538.94	4,389.42	2,197.97	6.40	-0.64	0.104
110.00	-35.52	-4.97	0.00	-177.50	0.00	177.50	2,932.86	1,466.43	3,983.41	1,994.67	7.10	-0.69	0.101
115.00	-34.08	-4.85	0.00	-152.66	0.00	152.66	2,787.83	1,393.91	3,597.10	1,801.22	7.84	-0.73	0.097
120.00	-32.69	-4.74	0.00	-128.39	0.00	128.39	2,642.80	1,321.40	3,230.49	1,617.64	8.63	-0.77	0.092
125.00	-31.36	-4.63	0.00	-104.70	0.00	104.70	2,497.76	1,248.88	2,883.58	1,443.93	9.46	-0.81	0.085
130.00	-30.09	-4.53	0.00	-81.55	0.00	81.55	2,352.73	1,176.37	2,556.37	1,280.08	10.34	-0.85	0.077
134.00	-28.85	-4.46	0.00	-63.44	0.00	63.44	1,028.31	514.15	1,093.21	547.42	11.06	-0.88	0.144
135.00	-28.67	-4.44	0.00	-58.98	0.00	58.98	1,020.22	510.11	1,070.76	536.17	11.25	-0.89	0.138
137.00	-23.02	-3.14	0.00	-50.10	0.00	50.10	1,003.67	501.84	1,026.12	513.82	11.63	-0.91	0.120
140.00	-22.53	-3.07	0.00	-40.69	0.00	40.69	977.89	488.95	959.91	480.67	12.21	-0.95	0.108
145.00	-21.74	-2.99	0.00	-25.36	0.00	25.36	932.37	466.18	851.90	426.58	13.23	-0.99	0.083
147.00	-13.88	-1.89	0.00	-19.37	0.00	19.37	913.27	456.63	809.64	405.42	13.65	-1.01	0.063
150.00	-13.49	-1.82	0.00	-13.70	0.00	13.70	883.66	441.83	747.38	374.24	14.29	-1.03	0.052
155.00	-12.86	-1.75	0.00	-4.62	0.00	4.62	831.77	415.88	647.00	323.98	15.38	-1.05	0.030
157.00	0.00	-1.51	0.00	-1.13	0.00	1.13	809.65	404.83	607.80	304.35	15.82	-1.05	0.004

Load Case: 1.0D + 1.0W Serviceability 60 mph 20 Iterations

Gust Response Factor : 1.10 Wind Importance Factor : 1.00
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		62.3	0.0					0.0	0.0	62.3	0.0	0.0	0.0
5.00		123.0	1,576.8					0.0	247.0	123.0	1,823.8	0.0	0.0
10.00		120.0	1,538.0					0.0	247.0	120.0	1,785.0	0.0	0.0
15.00		116.9	1,499.3					0.0	247.0	116.9	1,746.3	0.0	0.0
20.00		113.9	1,460.5					0.0	247.0	113.9	1,707.5	0.0	0.0
25.00		110.9	1,421.8					0.0	247.0	110.9	1,668.8	0.0	0.0
30.00		109.6	1,383.1					0.0	247.0	109.6	1,630.0	0.0	0.0
35.00		110.4	1,344.3					0.0	247.0	110.4	1,591.3	0.0	0.0
40.00		111.3	1,305.6					0.0	247.0	111.3	1,552.5	0.0	0.0
45.00		59.5	1,266.8					0.0	247.0	59.5	1,513.8	0.0	0.0
45.33	Bot - Section 2	56.7	83.1					0.0	16.5	56.7	99.5	0.0	0.0
50.00		83.1	2,309.3					0.0	230.5	83.1	2,539.8	0.0	0.0
52.67	Top - Section 1	56.5	1,289.3					0.0	131.7	56.5	1,421.0	0.0	0.0
55.00		82.5	559.8					0.0	115.3	82.5	675.1	0.0	0.0
60.00		111.8	1,171.2					0.0	247.0	111.8	1,418.2	0.0	0.0
65.00		110.5	1,132.5					0.0	247.0	110.5	1,379.5	0.0	0.0
70.00		108.9	1,093.7					0.0	247.0	108.9	1,340.7	0.0	0.0
75.00		107.1	1,055.0					0.0	247.0	107.1	1,302.0	0.0	0.0
80.00		105.0	1,016.2					0.0	247.0	105.0	1,263.2	0.0	0.0
85.00		102.7	977.5					0.0	247.0	102.7	1,224.5	0.0	0.0
90.00		73.2	938.7					0.0	247.0	73.2	1,185.7	0.0	0.0
92.25	Bot - Section 3	50.0	409.8					0.0	111.1	50.0	520.9	0.0	0.0
95.00		54.7	919.4					0.0	135.8	54.7	1,055.3	0.0	0.0
97.75	Top - Section 2	49.0	897.7					0.0	135.8	49.0	1,033.5	0.0	0.0
100.00		69.5	335.5					0.0	111.1	69.5	446.6	0.0	0.0
105.00		93.6	721.5					0.0	247.0	93.6	968.4	0.0	0.0
110.00		90.4	688.2					0.0	247.0	90.4	935.2	0.0	0.0
115.00		87.1	655.0					0.0	247.0	87.1	902.0	0.0	0.0
120.00		83.6	621.8					0.0	247.0	83.6	868.8	0.0	0.0
125.00		80.0	588.6					0.0	247.0	80.0	835.6	0.0	0.0
130.00	Bot - Section 4	69.4	555.4					0.0	247.0	69.4	802.4	0.0	0.0
134.00	Top - Section 3	37.7	635.2					0.0	197.6	37.7	832.7	0.0	0.0
135.00		21.9	52.0					0.0	49.4	21.9	101.4	0.0	0.0
137.00	Appertunance(s)	35.8	102.1	1,098.9	0.0	0.0	1,945.2	0.0	98.8	1,134.7	2,146.0	0.0	0.0
140.00		55.0	148.1					0.0	120.9	55.0	269.0	0.0	0.0
145.00		46.7	233.6					0.0	201.5	46.7	435.1	0.0	0.0
147.00	Appertunance(s)	31.7	88.8	1,111.6	0.0	0.0	2,785.4	0.0	80.6	1,143.3	2,954.8	0.0	0.0
150.00		48.3	128.2					0.0	77.2	48.3	205.4	0.0	0.0
155.00		40.8	200.4					0.0	128.7	40.8	329.0	0.0	0.0
157.00	Appertunance(s)	11.2	75.5	444.2	0.0	612.0	2,750.0	0.0	51.5	455.4	2,877.0	0.0	0.0
								Totals:		5,746.89	47,387.6	0.00	0.00

Load Case: 1.0D + 1.0W Serviceability 60 mph 20 Iterations

Gust Response Factor : 1.10 Wind Importance Factor : 1.00
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-49.29	-6.88	0.00	-810.84	0.00	810.84	5,980.07	2,990.03	16,624.4	8,324.57	0.00	0.00	0.106
5.00	-47.46	-6.78	0.00	-776.42	0.00	776.42	5,898.95	2,949.47	15,998.2	8,011.02	0.01	-0.02	0.105
10.00	-45.68	-6.67	0.00	-742.53	0.00	742.53	5,814.64	2,907.32	15,374.6	7,698.77	0.04	-0.04	0.104
15.00	-43.93	-6.57	0.00	-709.16	0.00	709.16	5,727.15	2,863.57	14,754.3	7,388.14	0.10	-0.06	0.104
20.00	-42.22	-6.47	0.00	-676.29	0.00	676.29	5,636.47	2,818.23	14,137.9	7,079.47	0.18	-0.09	0.103
25.00	-40.55	-6.38	0.00	-643.92	0.00	643.92	5,542.60	2,771.30	13,526.0	6,773.06	0.29	-0.11	0.102
30.00	-38.91	-6.28	0.00	-612.03	0.00	612.03	5,445.54	2,722.77	12,919.3	6,469.26	0.41	-0.14	0.102
35.00	-37.32	-6.18	0.00	-580.62	0.00	580.62	5,345.30	2,672.65	12,318.4	6,168.38	0.57	-0.16	0.101
40.00	-35.76	-6.08	0.00	-549.70	0.00	549.70	5,241.87	2,620.94	11,724.0	5,870.75	0.75	-0.19	0.100
45.00	-34.25	-6.03	0.00	-519.28	0.00	519.28	5,135.25	2,567.63	11,136.8	5,576.69	0.96	-0.21	0.100
45.33	-34.15	-5.98	0.00	-517.27	0.00	517.27	5,128.03	2,564.02	11,097.9	5,557.22	0.98	-0.22	0.100
50.00	-31.61	-5.90	0.00	-489.37	0.00	489.37	5,025.45	2,512.73	10,557.3	5,286.54	1.20	-0.24	0.099
52.67	-30.18	-5.84	0.00	-473.64	0.00	473.64	5,025.47	2,512.73	10,557.4	5,286.58	1.34	-0.26	0.096
55.00	-29.51	-5.77	0.00	-460.01	0.00	460.01	4,973.14	2,486.57	10,289.9	5,152.60	1.47	-0.27	0.095
60.00	-28.09	-5.66	0.00	-431.17	0.00	431.17	4,858.66	2,429.33	9,723.06	4,868.75	1.77	-0.30	0.094
65.00	-26.71	-5.56	0.00	-402.86	0.00	402.86	4,740.99	2,370.50	9,165.59	4,589.61	2.10	-0.33	0.093
70.00	-25.36	-5.46	0.00	-375.06	0.00	375.06	4,620.14	2,310.07	8,618.17	4,315.49	2.46	-0.36	0.092
75.00	-24.06	-5.35	0.00	-347.79	0.00	347.79	4,496.10	2,248.05	8,081.43	4,046.72	2.85	-0.39	0.091
80.00	-22.79	-5.25	0.00	-321.02	0.00	321.02	4,353.06	2,176.53	7,528.68	3,769.93	3.27	-0.42	0.090
85.00	-21.57	-5.15	0.00	-294.76	0.00	294.76	4,183.86	2,091.93	6,951.89	3,481.11	3.73	-0.45	0.090
90.00	-20.38	-5.08	0.00	-269.00	0.00	269.00	4,014.66	2,007.33	6,398.09	3,203.80	4.23	-0.49	0.089
92.25	-19.86	-5.03	0.00	-257.57	0.00	257.57	3,938.51	1,969.26	6,156.38	3,082.77	4.46	-0.51	0.089
95.00	-18.80	-4.97	0.00	-243.73	0.00	243.73	3,845.45	1,922.73	5,867.28	2,938.00	4.76	-0.53	0.088
97.75	-17.77	-4.92	0.00	-230.06	0.00	230.06	3,277.70	1,638.85	4,997.17	2,502.30	5.07	-0.55	0.097
100.00	-17.32	-4.86	0.00	-218.99	0.00	218.99	3,222.92	1,611.46	4,815.14	2,411.15	5.33	-0.56	0.096
105.00	-16.35	-4.76	0.00	-194.71	0.00	194.71	3,077.89	1,538.94	4,389.42	2,197.97	5.94	-0.60	0.094
110.00	-15.41	-4.67	0.00	-170.89	0.00	170.89	2,932.86	1,466.43	3,983.41	1,994.67	6.59	-0.64	0.091
115.00	-14.50	-4.59	0.00	-147.52	0.00	147.52	2,787.83	1,393.91	3,597.10	1,801.22	7.29	-0.69	0.087
120.00	-13.63	-4.50	0.00	-124.59	0.00	124.59	2,642.80	1,321.40	3,230.49	1,617.64	8.03	-0.73	0.082
125.00	-12.80	-4.42	0.00	-102.08	0.00	102.08	2,497.76	1,248.88	2,883.58	1,443.93	8.82	-0.77	0.076
130.00	-11.99	-4.35	0.00	-79.98	0.00	79.98	2,352.73	1,176.37	2,556.37	1,280.08	9.64	-0.81	0.068
134.00	-11.16	-4.30	0.00	-62.59	0.00	62.59	1,028.31	514.15	1,093.21	547.42	10.33	-0.83	0.125
135.00	-11.06	-4.28	0.00	-58.29	0.00	58.29	1,020.22	510.11	1,070.76	536.17	10.50	-0.84	0.120
137.00	-8.93	-3.12	0.00	-49.73	0.00	49.73	1,003.67	501.84	1,026.12	513.82	10.86	-0.87	0.106
140.00	-8.66	-3.07	0.00	-40.37	0.00	40.37	977.89	488.95	959.91	480.67	11.42	-0.90	0.093
145.00	-8.22	-3.02	0.00	-25.05	0.00	25.05	932.37	466.18	851.90	426.58	12.38	-0.94	0.068
147.00	-5.28	-1.83	0.00	-19.01	0.00	19.01	913.27	456.63	809.64	405.42	12.78	-0.96	0.053
150.00	-5.08	-1.78	0.00	-13.54	0.00	13.54	883.66	441.83	747.38	374.24	13.39	-0.98	0.042
155.00	-4.75	-1.73	0.00	-4.66	0.00	4.66	831.77	415.88	647.00	323.98	14.43	-1.00	0.020
157.00	0.00	-1.65	0.00	-1.20	0.00	1.20	809.65	404.83	607.80	304.35	14.85	-1.00	0.004

Site Number:	**CT54XC773**	**Code: ANSI/TIA-222-G**	
Site Name:	**Hamden, CT**	**Engineering Number: REV09B**	**7/19/2019 1:35:23 PM**
Customer:	**Sprint Sites USA - GA 2**		

Equivalent Lateral Forces Method Analysis

(Based on ASCE7-10 Chapters 11, 12, 15)

Spectral Response Acceleration for Short Period (S_s):	**0.19**	
Spectral Response Acceleration at 1.0 Second Period (S_1):	**0.06**	
Long-Period Transition Period (T_L):	**6**	
Importance Factor (I_E):	**1.00**	
Site Coefficient F_a:	**1.60**	
Site Coeffiecient F_v:	**2.40**	
Response Modification Coefficient (R):	**1.50**	
Design Spectral Response Acceleration at Short Period (S_{ds}):	**0.20**	
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	**0.10**	
Seismic Response Coefficient (C_s):	**0.03**	
Upper Limit C_s	**0.03**	
Lower Limit C_s	**0.03**	
Period based on Rayleigh Method (sec):	**2.00**	
Redundancy Factor (p):	**1.30**	
Seismic Force Distribution Exponent (k):	**1.75**	
Total Unfactored Dead Load:	**49.29**	**k**
Seismic Base Shear (E):	**2.16**	**k**

Load Case (1.2 + 0.2Sds) * DL + E ELFM — **Seismic Equivalent Lateral Forces Method**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
39	156.00	127	870	0.007	14	157
38	152.50	329	2,166	0.017	36	408
37	148.50	205	1,291	0.010	21	255
36	146.00	169	1,033	0.008	17	210
35	142.50	435	2,544	0.020	42	539
34	138.50	269	1,496	0.011	25	333
33	136.00	201	1,082	0.008	18	249
32	134.50	101	536	0.004	9	126
31	132.00	833	4,259	0.033	71	1,032
30	127.50	802	3,862	0.030	64	995
29	122.50	836	3,750	0.029	62	1,036
28	117.50	869	3,625	0.028	60	1,077
27	112.50	902	3,488	0.027	58	1,118
26	107.50	935	3,340	0.026	55	1,159
25	102.50	968	3,182	0.024	53	1,201
24	98.88	447	1,378	0.011	23	554
23	96.38	1,034	3,049	0.023	50	1,281
22	93.63	1,055	2,960	0.023	49	1,308
21	91.13	521	1,394	0.011	23	646
20	87.50	1,186	2,954	0.023	49	1,470
19	82.50	1,224	2,753	0.021	46	1,518
18	77.50	1,263	2,546	0.020	42	1,566
17	72.50	1,302	2,335	0.018	39	1,614

16	67.50	1,341	2,122	0.016	35	1,662
15	62.50	1,379	1,908	0.015	32	1,710
14	57.50	1,418	1,696	0.013	28	1,758
13	53.83	675	719	0.006	12	837
12	51.33	1,421	1,393	0.011	23	1,762
11	47.67	2,540	2,187	0.017	36	3,149
10	45.17	100	78	0.001	1	123
9	42.50	1,514	1,067	0.008	18	1,877
8	37.50	1,553	879	0.007	15	1,925
7	32.50	1,591	701	0.005	12	1,973
6	27.50	1,630	536	0.004	9	2,021
5	22.50	1,669	387	0.003	6	2,069
4	17.50	1,708	255	0.002	4	2,117
3	12.50	1,746	145	0.001	2	2,165
2	7.50	1,785	61	0.000	1	2,213
1	2.50	1,824	9	0.000	0	2,261
800MHz RRH	157.50	192	1,337	0.010	22	238
TD-RRH-8X20	157.50	420	2,925	0.022	48	521
APXVTM14-C-I20	157.50	165	1,147	0.009	19	204
96" x 14" x 7" Panel	157.50	210	1,463	0.011	24	260
16" x 9" x 6" Combin	157.50	120	836	0.006	14	149
26" Microwave	157.50	180	1,254	0.010	21	223
GPS Antenna	157.50	1	7	0.000	0	1
RET Kit	157.50	9	65	0.001	1	12
ODU	157.50	22	153	0.001	3	27
1900MHz RRH	157.50	360	2,508	0.019	42	446
800 MHz Notch Filter	157.50	53	369	0.003	6	66
APXVSPP18-C-A20	157.50	171	1,191	0.009	20	212
Platform w/ Rail	157.00	2,500	17,317	0.133	287	3,099
Collar Mount	157.00	250	1,732	0.013	29	310
DB-T1-6Z-8AB-0Z	147.00	88	543	0.004	9	109
JAHH-65B-R3B	147.00	380	2,345	0.018	39	471
RRH 4x40-850	147.00	264	1,630	0.013	27	327
B66 4x45 RRH	147.00	192	1,185	0.009	20	238
RRH 2x60 LTE	147.00	171	1,056	0.008	17	212
LPA-80080/4CF	147.00	72	445	0.003	7	89
FD9R6004-2C-3L	147.00	19	115	0.001	2	23
Low Profile Platform	147.00	1,600	9,878	0.076	164	1,983
T-Arms w/ Stabilizer	137.00	726	3,962	0.030	66	900
APXVAARR24_43-U-NA20	137.00	384	2,096	0.016	35	476
1B-twin AWS TMA	137.00	66	360	0.003	6	82
AIR 21 B2A/B4P	137.00	276	1,506	0.012	25	342
AIR 21 B4A/B2P	137.00	271	1,480	0.011	25	336
4449 B71/B12	137.00	222	1,212	0.009	20	275
		49,291	130,153	1.000	2,155	61,105

Load Case (0.9 - 0.2Sds) * DL + E ELFM — **Seismic (Reduced DL) Equivalent Lateral Forces Method**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
39	156.00	127	870	0.007	14	109
38	152.50	329	2,166	0.017	36	283
37	148.50	205	1,291	0.010	21	177
36	146.00	169	1,033	0.008	17	146
35	142.50	435	2,544	0.020	42	374
34	138.50	269	1,496	0.011	25	231
33	136.00	201	1,082	0.008	18	173
32	134.50	101	536	0.004	9	87
31	132.00	833	4,259	0.033	71	716
30	127.50	802	3,862	0.030	64	690

29	122.50	836	3,750	0.029	62	719
28	117.50	869	3,625	0.028	60	747
27	112.50	902	3,488	0.027	58	776
26	107.50	935	3,340	0.026	55	805
25	102.50	968	3,182	0.024	53	833
24	98.88	447	1,378	0.011	23	384
23	96.38	1,034	3,049	0.023	50	889
22	93.63	1,055	2,960	0.023	49	908
21	91.13	521	1,394	0.011	23	448
20	87.50	1,186	2,954	0.023	49	1,020
19	82.50	1,224	2,753	0.021	46	1,053
18	77.50	1,263	2,546	0.020	42	1,087
17	72.50	1,302	2,335	0.018	39	1,120
16	67.50	1,341	2,122	0.016	35	1,153
15	62.50	1,379	1,908	0.015	32	1,187
14	57.50	1,418	1,696	0.013	28	1,220
13	53.83	675	719	0.006	12	581
12	51.33	1,421	1,393	0.011	23	1,223
11	47.67	2,540	2,187	0.017	36	2,185
10	45.17	100	78	0.001	1	86
9	42.50	1,514	1,067	0.008	18	1,302
8	37.50	1,553	879	0.007	15	1,336
7	32.50	1,591	701	0.005	12	1,369
6	27.50	1,630	536	0.004	9	1,402
5	22.50	1,669	387	0.003	6	1,436
4	17.50	1,708	255	0.002	4	1,469
3	12.50	1,746	145	0.001	2	1,502
2	7.50	1,785	61	0.000	1	1,536
1	2.50	1,824	9	0.000	0	1,569
800MHz RRH	157.50	192	1,337	0.010	22	165
TD-RRH-8X20	157.50	420	2,925	0.022	48	361
APXVTM14-C-I20	157.50	165	1,147	0.009	19	142
96" x 14" x 7" Panel	157.50	210	1,463	0.011	24	181
16" x 9" x 6" Combin	157.50	120	836	0.006	14	103
26" Microwave	157.50	180	1,254	0.010	21	155
GPS Antenna	157.50	1	7	0.000	0	1
RET Kit	157.50	9	65	0.001	1	8
ODU	157.50	22	153	0.001	3	19
1900MHz RRH	157.50	360	2,508	0.019	42	310
800 MHz Notch Filter	157.50	53	369	0.003	6	46
APXVSPP18-C-A20	157.50	171	1,191	0.009	20	147
Platform w/ Rail	157.00	2,500	17,317	0.133	287	2,151
Collar Mount	157.00	250	1,732	0.013	29	215
DB-T1-6Z-8AB-0Z	147.00	88	543	0.004	9	76
JAHH-65B-R3B	147.00	380	2,345	0.018	39	327
RRH 4x40-850	147.00	264	1,630	0.013	27	227
B66 4x45 RRH	147.00	192	1,185	0.009	20	165
RRH 2x60 LTE	147.00	171	1,056	0.008	17	147
LPA-80080/4CF	147.00	72	445	0.003	7	62
FD9R6004-2C-3L	147.00	19	115	0.001	2	16
Low Profile Platform	147.00	1,600	9,878	0.076	164	1,377
T-Arms w/ Stabilizer	137.00	726	3,962	0.030	66	625
APXVAARR24_43-U-NA20	137.00	384	2,096	0.016	35	330
1B-twin AWS TMA	137.00	66	360	0.003	6	57
AIR 21 B2A/B4P	137.00	276	1,506	0.012	25	237
AIR 21 B4A/B2P	137.00	271	1,480	0.011	25	233
4449 B71/B12	137.00	222	1,212	0.009	20	191
		49,291	130,153	1.000	2,155	42,406

Load Case (1.2 + 0.2Sds) * DL + E ELFM **Seismic Equivalent Lateral Forces Method**

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-58.84	-2.16	0.00	-271.59	0.00	271.59	5,980.07	2,990.03	16,624.4	8,324.57	0.00	0.00	0.042
5.00	-56.63	-2.16	0.00	-260.80	0.00	260.80	5,898.95	2,949.47	15,998.2	8,011.02	0.00	-0.01	0.042
10.00	-54.47	-2.17	0.00	-249.98	0.00	249.98	5,814.64	2,907.32	15,374.6	7,698.77	0.02	-0.01	0.042
15.00	-52.35	-2.17	0.00	-239.14	0.00	239.14	5,727.15	2,863.57	14,754.3	7,388.14	0.03	-0.02	0.042
20.00	-50.28	-2.17	0.00	-228.29	0.00	228.29	5,636.47	2,818.23	14,137.9	7,079.47	0.06	-0.03	0.041
25.00	-48.26	-2.17	0.00	-217.44	0.00	217.44	5,542.60	2,771.30	13,526.0	6,773.06	0.10	-0.04	0.041
30.00	-46.29	-2.16	0.00	-206.60	0.00	206.60	5,445.54	2,722.77	12,919.3	6,469.26	0.14	-0.05	0.040
35.00	-44.36	-2.15	0.00	-195.80	0.00	195.80	5,345.30	2,672.65	12,318.4	6,168.38	0.19	-0.05	0.040
40.00	-42.48	-2.14	0.00	-185.05	0.00	185.05	5,241.87	2,620.94	11,724.0	5,870.75	0.25	-0.06	0.040
45.00	-42.36	-2.14	0.00	-174.36	0.00	174.36	5,135.25	2,567.63	11,136.8	5,576.69	0.32	-0.07	0.040
45.33	-39.21	-2.10	0.00	-173.64	0.00	173.64	5,128.03	2,564.02	11,097.9	5,557.22	0.33	-0.07	0.039
50.00	-37.45	-2.08	0.00	-163.83	0.00	163.83	5,025.45	2,512.73	10,557.3	5,286.54	0.40	-0.08	0.038
52.67	-36.61	-2.07	0.00	-158.28	0.00	158.28	5,025.47	2,512.73	10,557.4	5,286.58	0.45	-0.09	0.037
55.00	-34.85	-2.05	0.00	-153.44	0.00	153.44	4,973.14	2,486.57	10,289.9	5,152.60	0.49	-0.09	0.037
60.00	-33.14	-2.02	0.00	-143.21	0.00	143.21	4,858.66	2,429.33	9,723.06	4,868.75	0.59	-0.10	0.036
65.00	-31.48	-1.98	0.00	-133.13	0.00	133.13	4,740.99	2,370.50	9,165.59	4,589.61	0.71	-0.11	0.036
70.00	-29.87	-1.95	0.00	-123.21	0.00	123.21	4,620.14	2,310.07	8,618.17	4,315.49	0.83	-0.12	0.035
75.00	-28.30	-1.91	0.00	-113.47	0.00	113.47	4,496.10	2,248.05	8,081.43	4,046.72	0.96	-0.13	0.034
80.00	-26.78	-1.86	0.00	-103.94	0.00	103.94	4,353.06	2,176.53	7,528.68	3,769.93	1.10	-0.14	0.034
85.00	-25.31	-1.81	0.00	-94.62	0.00	94.62	4,183.86	2,091.93	6,951.89	3,481.11	1.25	-0.15	0.033
90.00	-24.67	-1.79	0.00	-85.55	0.00	85.55	4,014.66	2,007.33	6,398.09	3,203.80	1.42	-0.16	0.033
92.25	-23.36	-1.74	0.00	-81.52	0.00	81.52	3,938.51	1,969.26	6,156.38	3,082.77	1.49	-0.17	0.032
95.00	-22.08	-1.69	0.00	-76.72	0.00	76.72	3,845.45	1,922.73	5,867.28	2,938.00	1.59	-0.17	0.032
97.75	-21.52	-1.67	0.00	-72.07	0.00	72.07	3,277.70	1,638.85	4,997.17	2,502.30	1.70	-0.18	0.035
100.00	-20.32	-1.62	0.00	-68.32	0.00	68.32	3,222.92	1,611.46	4,815.14	2,411.15	1.78	-0.19	0.035
105.00	-19.16	-1.56	0.00	-60.24	0.00	60.24	3,077.89	1,538.94	4,389.42	2,197.97	1.98	-0.20	0.034
110.00	-18.04	-1.50	0.00	-52.44	0.00	52.44	2,932.86	1,466.43	3,983.41	1,994.67	2.20	-0.21	0.032
115.00	-16.97	-1.44	0.00	-44.92	0.00	44.92	2,787.83	1,393.91	3,597.10	1,801.22	2.43	-0.22	0.031
120.00	-15.93	-1.38	0.00	-37.71	0.00	37.71	2,642.80	1,321.40	3,230.49	1,617.64	2.67	-0.24	0.029
125.00	-14.94	-1.31	0.00	-30.82	0.00	30.82	2,497.76	1,248.88	2,883.58	1,443.93	2.92	-0.25	0.027
130.00	-13.90	-1.24	0.00	-24.24	0.00	24.24	2,352.73	1,176.37	2,556.37	1,280.08	3.19	-0.26	0.025
134.00	-13.78	-1.23	0.00	-19.28	0.00	19.28	1,028.31	514.15	1,093.21	547.42	3.41	-0.27	0.049
135.00	-13.53	-1.22	0.00	-18.04	0.00	18.04	1,020.22	510.11	1,070.76	536.17	3.46	-0.27	0.047
137.00	-10.79	-1.00	0.00	-15.61	0.00	15.61	1,003.67	501.84	1,026.12	513.82	3.58	-0.28	0.041
140.00	-10.25	-0.96	0.00	-12.60	0.00	12.60	977.89	488.95	959.91	480.67	3.76	-0.29	0.037
145.00	-10.04	-0.94	0.00	-7.79	0.00	7.79	932.37	466.18	851.90	426.58	4.07	-0.30	0.029
147.00	-6.33	-0.62	0.00	-5.90	0.00	5.90	913.27	456.63	809.64	405.42	4.20	-0.31	0.021
150.00	-5.92	-0.58	0.00	-4.04	0.00	4.04	883.66	441.83	747.38	374.24	4.39	-0.31	0.018
155.00	-5.77	-0.57	0.00	-1.13	0.00	1.13	831.77	415.88	647.00	323.98	4.72	-0.32	0.010
157.00	0.00	-0.53	0.00	0.00	0.00	0.00	809.65	404.83	607.80	304.35	4.86	-0.32	0.000

Load Case (0.9 - 0.2Sds) * DL + E ELFM **Seismic (Reduced DL) Equivalent Lateral Forces Method**

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-40.84	-2.16	0.00	-269.04	0.00	269.04	5,980.07	2,990.03	16,624.4	8,324.57	0.00	0.00	0.039
5.00	-39.30	-2.16	0.00	-258.25	0.00	258.25	5,898.95	2,949.47	15,998.2	8,011.02	0.00	-0.01	0.039
10.00	-37.80	-2.16	0.00	-247.45	0.00	247.45	5,814.64	2,907.32	15,374.6	7,698.77	0.01	-0.01	0.039
15.00	-36.33	-2.16	0.00	-236.63	0.00	236.63	5,727.15	2,863.57	14,754.3	7,388.14	0.03	-0.02	0.038
20.00	-34.89	-2.16	0.00	-225.82	0.00	225.82	5,636.47	2,818.23	14,137.9	7,079.47	0.06	-0.03	0.038
25.00	-33.49	-2.16	0.00	-215.02	0.00	215.02	5,542.60	2,771.30	13,526.0	6,773.06	0.09	-0.04	0.038
30.00	-32.12	-2.15	0.00	-204.24	0.00	204.24	5,445.54	2,722.77	12,919.3	6,469.26	0.14	-0.05	0.037
35.00	-30.78	-2.14	0.00	-193.50	0.00	193.50	5,345.30	2,672.65	12,318.4	6,168.38	0.19	-0.05	0.037
40.00	-29.48	-2.12	0.00	-182.81	0.00	182.81	5,241.87	2,620.94	11,724.0	5,870.75	0.25	-0.06	0.037
45.00	-29.40	-2.12	0.00	-172.20	0.00	172.20	5,135.25	2,567.63	11,136.8	5,576.69	0.32	-0.07	0.037
45.33	-27.21	-2.09	0.00	-171.49	0.00	171.49	5,128.03	2,564.02	11,097.9	5,557.22	0.33	-0.07	0.036
50.00	-25.99	-2.07	0.00	-161.76	0.00	161.76	5,025.45	2,512.73	10,557.3	5,286.54	0.40	-0.08	0.036
52.67	-25.41	-2.05	0.00	-156.25	0.00	156.25	5,025.47	2,512.73	10,557.4	5,286.58	0.45	-0.09	0.035
55.00	-24.19	-2.03	0.00	-151.46	0.00	151.46	4,973.14	2,486.57	10,289.9	5,152.60	0.49	-0.09	0.034
60.00	-23.00	-2.00	0.00	-141.32	0.00	141.32	4,858.66	2,429.33	9,723.06	4,868.75	0.59	-0.10	0.034
65.00	-21.85	-1.96	0.00	-131.33	0.00	131.33	4,740.99	2,370.50	9,165.59	4,589.61	0.70	-0.11	0.033
70.00	-20.73	-1.93	0.00	-121.51	0.00	121.51	4,620.14	2,310.07	8,618.17	4,315.49	0.82	-0.12	0.033
75.00	-19.64	-1.89	0.00	-111.88	0.00	111.88	4,496.10	2,248.05	8,081.43	4,046.72	0.95	-0.13	0.032
80.00	-18.59	-1.84	0.00	-102.45	0.00	102.45	4,353.06	2,176.53	7,528.68	3,769.93	1.09	-0.14	0.031
85.00	-17.56	-1.79	0.00	-93.24	0.00	93.24	4,183.86	2,091.93	6,951.89	3,481.11	1.24	-0.15	0.031
90.00	-17.12	-1.77	0.00	-84.28	0.00	84.28	4,014.66	2,007.33	6,398.09	3,203.80	1.40	-0.16	0.031
92.25	-16.21	-1.72	0.00	-80.29	0.00	80.29	3,938.51	1,969.26	6,156.38	3,082.77	1.48	-0.17	0.030
95.00	-15.32	-1.67	0.00	-75.56	0.00	75.56	3,845.45	1,922.73	5,867.28	2,938.00	1.57	-0.17	0.030
97.75	-14.94	-1.65	0.00	-70.97	0.00	70.97	3,277.70	1,638.85	4,997.17	2,502.30	1.68	-0.18	0.033
100.00	-14.10	-1.59	0.00	-67.26	0.00	67.26	3,222.92	1,611.46	4,815.14	2,411.15	1.76	-0.18	0.032
105.00	-13.30	-1.54	0.00	-59.29	0.00	59.29	3,077.89	1,538.94	4,389.42	2,197.97	1.96	-0.20	0.031
110.00	-12.52	-1.48	0.00	-51.60	0.00	51.60	2,932.86	1,466.43	3,983.41	1,994.67	2.17	-0.21	0.030
115.00	-11.77	-1.42	0.00	-44.19	0.00	44.19	2,787.83	1,393.91	3,597.10	1,801.22	2.40	-0.22	0.029
120.00	-11.05	-1.36	0.00	-37.09	0.00	37.09	2,642.80	1,321.40	3,230.49	1,617.64	2.63	-0.23	0.027
125.00	-10.36	-1.29	0.00	-30.30	0.00	30.30	2,497.76	1,248.88	2,883.58	1,443.93	2.88	-0.24	0.025
130.00	-9.65	-1.22	0.00	-23.83	0.00	23.83	2,352.73	1,176.37	2,556.37	1,280.08	3.15	-0.26	0.023
134.00	-9.56	-1.21	0.00	-18.94	0.00	18.94	1,028.31	514.15	1,093.21	547.42	3.36	-0.26	0.044
135.00	-9.39	-1.20	0.00	-17.73	0.00	17.73	1,020.22	510.11	1,070.76	536.17	3.42	-0.27	0.042
137.00	-7.48	-0.99	0.00	-15.34	0.00	15.34	1,003.67	501.84	1,026.12	513.82	3.53	-0.27	0.037
140.00	-7.11	-0.94	0.00	-12.38	0.00	12.38	977.89	488.95	959.91	480.67	3.71	-0.28	0.033
145.00	-6.96	-0.93	0.00	-7.65	0.00	7.65	932.37	466.18	851.90	426.58	4.02	-0.30	0.025
147.00	-4.39	-0.61	0.00	-5.80	0.00	5.80	913.27	456.63	809.64	405.42	4.14	-0.30	0.019
150.00	-4.11	-0.57	0.00	-3.97	0.00	3.97	883.66	441.83	747.38	374.24	4.33	-0.31	0.015
155.00	-4.00	-0.56	0.00	-1.11	0.00	1.11	831.77	415.88	647.00	323.98	4.66	-0.31	0.008
157.00	0.00	-0.53	0.00	0.00	0.00	0.00	809.65	404.83	607.80	304.35	4.79	-0.31	0.000

Equivalent Modal Forces Analysis

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period (S_s):	0.19
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.20
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Period Based on Rayleigh Method (sec):	2.00
Redundancy Factor (p):	1.30

Load Case (1.2 + 0.2Sds) * DL + E EMAM **Seismic Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
39	156.00	127	1.866	1.856	1.095	0.364	40	157
38	152.50	329	1.783	1.463	0.949	0.311	89	408
37	148.50	205	1.691	1.088	0.801	0.255	45	255
36	146.00	169	1.634	0.889	0.718	0.223	33	210
35	142.50	435	1.557	0.651	0.613	0.181	68	539
34	138.50	269	1.471	0.432	0.509	0.138	32	333
33	136.00	201	1.418	0.319	0.451	0.114	20	249
32	134.50	101	1.387	0.260	0.419	0.100	9	126
31	132.00	833	1.336	0.174	0.369	0.078	57	1,032
30	127.50	802	1.246	0.053	0.291	0.044	31	995
29	122.50	836	1.151	-0.037	0.220	0.014	10	1,036
28	117.50	869	1.059	-0.090	0.162	-0.009	-7	1,077
27	112.50	902	0.970	-0.116	0.117	-0.025	-19	1,118
26	107.50	935	0.886	-0.122	0.082	-0.033	-27	1,159
25	102.50	968	0.806	-0.113	0.055	-0.035	-29	1,201
24	98.88	447	0.750	-0.101	0.041	-0.032	-12	554
23	96.38	1,034	0.712	-0.091	0.032	-0.028	-25	1,281
22	93.63	1,055	0.672	-0.078	0.025	-0.023	-21	1,308
21	91.13	521	0.637	-0.066	0.019	-0.017	-8	646
20	87.50	1,186	0.587	-0.048	0.013	-0.007	-7	1,470
19	82.50	1,224	0.522	-0.024	0.008	0.007	7	1,518
18	77.50	1,263	0.461	-0.002	0.006	0.021	23	1,566
17	72.50	1,302	0.403	0.017	0.006	0.032	36	1,614
16	67.50	1,341	0.349	0.033	0.009	0.041	47	1,662
15	62.50	1,379	0.300	0.045	0.012	0.046	55	1,710
14	57.50	1,418	0.254	0.055	0.017	0.049	61	1,758
13	53.83	675	0.222	0.060	0.020	0.050	30	837
12	51.33	1,421	0.202	0.063	0.023	0.051	62	1,762
11	47.67	2,540	0.174	0.066	0.027	0.051	111	3,149
10	45.17	100	0.156	0.067	0.029	0.050	4	123
9	42.50	1,514	0.138	0.069	0.032	0.050	65	1,877
8	37.50	1,553	0.108	0.071	0.036	0.048	65	1,925
7	32.50	1,591	0.081	0.072	0.039	0.047	65	1,973
6	27.50	1,630	0.058	0.072	0.041	0.046	65	2,021

5	22.50	1,669	0.039	0.070	0.041	0.044	64	2,069
4	17.50	1,708	0.023	0.066	0.039	0.041	61	2,117
3	12.50	1,746	0.012	0.057	0.033	0.037	56	2,165
2	7.50	1,785	0.004	0.042	0.024	0.028	44	2,213
1	2.50	1,824	0.000	0.017	0.009	0.013	20	2,261
800MHz RRH	157.50	192	1.902	2.044	1.163	0.388	65	238
TD-RRH-8X20	157.50	420	1.902	2.044	1.163	0.388	141	521
APXVTM14-C-I20	157.50	165	1.902	2.044	1.163	0.388	55	204
96" x 14" x 7" Panel	157.50	210	1.902	2.044	1.163	0.388	71	260
16" x 9" x 6" Combin	157.50	120	1.902	2.044	1.163	0.388	40	149
26" Microwave	157.50	180	1.902	2.044	1.163	0.388	61	223
GPS Antenna	157.50	1	1.902	2.044	1.163	0.388	0	1
RET Kit	157.50	9	1.902	2.044	1.163	0.388	3	12
ODU	157.50	22	1.902	2.044	1.163	0.388	7	27
1900MHz RRH	157.50	360	1.902	2.044	1.163	0.388	121	446
800 MHz Notch Filter	157.50	53	1.902	2.044	1.163	0.388	18	66
APXVSPP18-C-A20	157.50	171	1.902	2.044	1.163	0.388	58	212
Platform w/ Rail	157.00	2,500	1.890	1.980	1.140	0.380	823	3,099
Collar Mount	157.00	250	1.890	1.980	1.140	0.380	82	310
DB-T1-6Z-8AB-0Z	147.00	88	1.657	0.966	0.750	0.236	18	109
JAHH-65B-R3B	147.00	380	1.657	0.966	0.750	0.236	78	471
RRH 4x40-850	147.00	264	1.657	0.966	0.750	0.236	54	327
B66 4x45 RRH	147.00	192	1.657	0.966	0.750	0.236	39	238
RRH 2x60 LTE	147.00	171	1.657	0.966	0.750	0.236	35	212
LPA-80080/4CF	147.00	72	1.657	0.966	0.750	0.236	15	89
FD9R6004-2C-3L	147.00	19	1.657	0.966	0.750	0.236	4	23
Low Profile Platform	147.00	1,600	1.657	0.966	0.750	0.236	327	1,983
T-Arms w/ Stabilizer	137.00	726	1.439	0.362	0.473	0.123	77	900
APXVAARR24_43-U-	137.00	384	1.439	0.362	0.473	0.123	41	476
1B-twin AWS TMA	137.00	66	1.439	0.362	0.473	0.123	7	82
AIR 21 B2A/B4P	137.00	276	1.439	0.362	0.473	0.123	29	342
AIR 21 B4A/B2P	137.00	271	1.439	0.362	0.473	0.123	29	336
4449 B71/B12	137.00	222	1.439	0.362	0.473	0.123	24	275
		49,291	75.621	45.626	32.510	10.408	3,542	61,105

Load Case (0.9 - 0.2Sds) * DL + E EMAM **Seismic (Reduced DL) Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
39	156.00	127	1.866	1.856	1.095	0.364	40	109
38	152.50	329	1.783	1.463	0.949	0.311	89	283
37	148.50	205	1.691	1.088	0.801	0.255	45	177
36	146.00	169	1.634	0.889	0.718	0.223	33	146
35	142.50	435	1.557	0.651	0.613	0.181	68	374
34	138.50	269	1.471	0.432	0.509	0.138	32	231
33	136.00	201	1.418	0.319	0.451	0.114	20	173
32	134.50	101	1.387	0.260	0.419	0.100	9	87
31	132.00	833	1.336	0.174	0.369	0.078	57	716
30	127.50	802	1.246	0.053	0.291	0.044	31	690
29	122.50	836	1.151	-0.037	0.220	0.014	10	719
28	117.50	869	1.059	-0.090	0.162	-0.009	-7	747
27	112.50	902	0.970	-0.116	0.117	-0.025	-19	776
26	107.50	935	0.886	-0.122	0.082	-0.033	-27	805
25	102.50	968	0.806	-0.113	0.055	-0.035	-29	833
24	98.88	447	0.750	-0.101	0.041	-0.032	-12	384
23	96.38	1,034	0.712	-0.091	0.032	-0.028	-25	889
22	93.63	1,055	0.672	-0.078	0.025	-0.023	-21	908
21	91.13	521	0.637	-0.066	0.019	-0.017	-8	448
20	87.50	1,186	0.587	-0.048	0.013	-0.007	-7	1,020

19	82.50	1,224	0.522	-0.024	0.008	0.007	7	1,053
18	77.50	1,263	0.461	-0.002	0.006	0.021	23	1,087
17	72.50	1,302	0.403	0.017	0.006	0.032	36	1,120
16	67.50	1,341	0.349	0.033	0.009	0.041	47	1,153
15	62.50	1,379	0.300	0.045	0.012	0.046	55	1,187
14	57.50	1,418	0.254	0.055	0.017	0.049	61	1,220
13	53.83	675	0.222	0.060	0.020	0.050	30	581
12	51.33	1,421	0.202	0.063	0.023	0.051	62	1,223
11	47.67	2,540	0.174	0.066	0.027	0.051	111	2,185
10	45.17	100	0.156	0.067	0.029	0.050	4	86
9	42.50	1,514	0.138	0.069	0.032	0.050	65	1,302
8	37.50	1,553	0.108	0.071	0.036	0.048	65	1,336
7	32.50	1,591	0.081	0.072	0.039	0.047	65	1,369
6	27.50	1,630	0.058	0.072	0.041	0.046	65	1,402
5	22.50	1,669	0.039	0.070	0.041	0.044	64	1,436
4	17.50	1,708	0.023	0.066	0.039	0.041	61	1,469
3	12.50	1,746	0.012	0.057	0.033	0.037	56	1,502
2	7.50	1,785	0.004	0.042	0.024	0.028	44	1,536
1	2.50	1,824	0.000	0.017	0.009	0.013	20	1,569
800MHz RRH	157.50	192	1.902	2.044	1.163	0.388	65	165
TD-RRH-8X20	157.50	420	1.902	2.044	1.163	0.388	141	361
APXVTM14-C-I20	157.50	165	1.902	2.044	1.163	0.388	55	142
96" x 14" x 7" Panel	157.50	210	1.902	2.044	1.163	0.388	71	181
16" x 9" x 6" Combin	157.50	120	1.902	2.044	1.163	0.388	40	103
26" Microwave	157.50	180	1.902	2.044	1.163	0.388	61	155
GPS Antenna	157.50	1	1.902	2.044	1.163	0.388	0	1
RET Kit	157.50	9	1.902	2.044	1.163	0.388	3	8
ODU	157.50	22	1.902	2.044	1.163	0.388	7	19
1900MHz RRH	157.50	360	1.902	2.044	1.163	0.388	121	310
800 MHz Notch Filter	157.50	53	1.902	2.044	1.163	0.388	18	46
APXVSPP18-C-A20	157.50	171	1.902	2.044	1.163	0.388	58	147
Platform w/ Rail	157.00	2,500	1.890	1.980	1.140	0.380	823	2,151
Collar Mount	157.00	250	1.890	1.980	1.140	0.380	82	215
DB-T1-6Z-8AB-0Z	147.00	88	1.657	0.966	0.750	0.236	18	76
JAHH-65B-R3B	147.00	380	1.657	0.966	0.750	0.236	78	327
RRH 4x40-850	147.00	264	1.657	0.966	0.750	0.236	54	227
B66 4x45 RRH	147.00	192	1.657	0.966	0.750	0.236	39	165
RRH 2x60 LTE	147.00	171	1.657	0.966	0.750	0.236	35	147
LPA-80080/4CF	147.00	72	1.657	0.966	0.750	0.236	15	62
FD9R6004-2C-3L	147.00	19	1.657	0.966	0.750	0.236	4	16
Low Profile Platform	147.00	1,600	1.657	0.966	0.750	0.236	327	1,377
T-Arms w/ Stabilizer	137.00	726	1.439	0.362	0.473	0.123	77	625
APXVAARR24_43-U-	137.00	384	1.439	0.362	0.473	0.123	41	330
1B-twin AWS TMA	137.00	66	1.439	0.362	0.473	0.123	7	57
AIR 21 B2A/B4P	137.00	276	1.439	0.362	0.473	0.123	29	237
AIR 21 B4A/B2P	137.00	271	1.439	0.362	0.473	0.123	29	233
4449 B71/B12	137.00	222	1.439	0.362	0.473	0.123	24	191
		49,291	75.621	45.626	32.510	10.408	3,542	42,406

Load Case (1.2 + 0.2Sds) * DL + E EMAM **Seismic Equivalent Modal Analysis Method**

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-58.84	-3.53	0.00	-450.95	0.00	450.95	5,980.07	2,990.03	16,624.4	8,324.57	0.00	0.00	0.064
5.00	-56.63	-3.50	0.00	-433.31	0.00	433.31	5,898.95	2,949.47	15,998.2	8,011.02	0.01	-0.01	0.064
10.00	-54.46	-3.45	0.00	-415.84	0.00	415.84	5,814.64	2,907.32	15,374.6	7,698.77	0.02	-0.02	0.063
15.00	-52.35	-3.40	0.00	-398.59	0.00	398.59	5,727.15	2,863.57	14,754.3	7,388.14	0.06	-0.04	0.063
20.00	-50.28	-3.35	0.00	-381.59	0.00	381.59	5,636.47	2,818.23	14,137.9	7,079.47	0.10	-0.05	0.063
25.00	-48.26	-3.29	0.00	-364.86	0.00	364.86	5,542.60	2,771.30	13,526.0	6,773.06	0.16	-0.06	0.063
30.00	-46.28	-3.23	0.00	-348.41	0.00	348.41	5,445.54	2,722.77	12,919.3	6,469.26	0.23	-0.08	0.062
35.00	-44.36	-3.18	0.00	-332.24	0.00	332.24	5,345.30	2,672.65	12,318.4	6,168.38	0.32	-0.09	0.062
40.00	-42.48	-3.12	0.00	-316.36	0.00	316.36	5,241.87	2,620.94	11,724.0	5,870.75	0.42	-0.11	0.062
45.00	-42.36	-3.12	0.00	-300.76	0.00	300.76	5,135.25	2,567.63	11,136.8	5,576.69	0.54	-0.12	0.062
45.33	-39.21	-3.01	0.00	-299.72	0.00	299.72	5,128.03	2,564.02	11,097.9	5,557.22	0.55	-0.12	0.062
50.00	-37.45	-2.95	0.00	-285.67	0.00	285.67	5,025.45	2,512.73	10,557.3	5,286.54	0.68	-0.14	0.061
52.67	-36.61	-2.92	0.00	-277.80	0.00	277.80	5,025.47	2,512.73	10,557.4	5,286.58	0.76	-0.15	0.060
55.00	-34.85	-2.87	0.00	-270.98	0.00	270.98	4,973.14	2,486.57	10,289.9	5,152.60	0.83	-0.15	0.060
60.00	-33.14	-2.82	0.00	-256.64	0.00	256.64	4,858.66	2,429.33	9,723.06	4,868.75	1.00	-0.17	0.060
65.00	-31.48	-2.77	0.00	-242.56	0.00	242.56	4,740.99	2,370.50	9,165.59	4,589.61	1.19	-0.19	0.059
70.00	-29.86	-2.74	0.00	-228.69	0.00	228.69	4,620.14	2,310.07	8,618.17	4,315.49	1.40	-0.21	0.059
75.00	-28.29	-2.72	0.00	-214.98	0.00	214.98	4,496.10	2,248.05	8,081.43	4,046.72	1.62	-0.23	0.059
80.00	-26.78	-2.72	0.00	-201.36	0.00	201.36	4,353.06	2,176.53	7,528.68	3,769.93	1.87	-0.25	0.060
85.00	-25.30	-2.73	0.00	-187.77	0.00	187.77	4,183.86	2,091.93	6,951.89	3,481.11	2.14	-0.27	0.060
90.00	-24.66	-2.74	0.00	-174.12	0.00	174.12	4,014.66	2,007.33	6,398.09	3,203.80	2.43	-0.29	0.060
92.25	-23.35	-2.76	0.00	-167.96	0.00	167.96	3,938.51	1,969.26	6,156.38	3,082.77	2.57	-0.30	0.060
95.00	-22.07	-2.78	0.00	-160.36	0.00	160.36	3,845.45	1,922.73	5,867.28	2,938.00	2.75	-0.31	0.060
97.75	-21.51	-2.80	0.00	-152.71	0.00	152.71	3,277.70	1,638.85	4,997.17	2,502.30	2.93	-0.33	0.068
100.00	-20.31	-2.83	0.00	-146.41	0.00	146.41	3,222.92	1,611.46	4,815.14	2,411.15	3.09	-0.34	0.067
105.00	-19.15	-2.86	0.00	-132.28	0.00	132.28	3,077.89	1,538.94	4,389.42	2,197.97	3.45	-0.36	0.066
110.00	-18.03	-2.88	0.00	-118.00	0.00	118.00	2,932.86	1,466.43	3,983.41	1,994.67	3.85	-0.39	0.065
115.00	-16.95	-2.88	0.00	-103.62	0.00	103.62	2,787.83	1,393.91	3,597.10	1,801.22	4.28	-0.42	0.064
120.00	-15.91	-2.87	0.00	-89.19	0.00	89.19	2,642.80	1,321.40	3,230.49	1,617.64	4.74	-0.45	0.061
125.00	-14.92	-2.84	0.00	-74.82	0.00	74.82	2,497.76	1,248.88	2,883.58	1,443.93	5.22	-0.48	0.058
130.00	-13.89	-2.78	0.00	-60.60	0.00	60.60	2,352.73	1,176.37	2,556.37	1,280.08	5.74	-0.51	0.053
134.00	-13.76	-2.78	0.00	-49.46	0.00	49.46	1,028.31	514.15	1,093.21	547.42	6.18	-0.53	0.104
135.00	-13.51	-2.76	0.00	-46.69	0.00	46.69	1,020.22	510.11	1,070.76	536.17	6.29	-0.54	0.100
137.00	-10.77	-2.50	0.00	-41.17	0.00	41.17	1,003.67	501.84	1,026.12	513.82	6.52	-0.56	0.091
140.00	-10.23	-2.43	0.00	-33.68	0.00	33.68	977.89	488.95	959.91	480.67	6.88	-0.58	0.081
145.00	-10.02	-2.40	0.00	-21.53	0.00	21.53	932.37	466.18	851.90	426.58	7.51	-0.62	0.061
147.00	-6.31	-1.75	0.00	-16.73	0.00	16.73	913.27	456.63	809.64	405.42	7.77	-0.63	0.048
150.00	-5.91	-1.65	0.00	-11.49	0.00	11.49	883.66	441.83	747.38	374.24	8.18	-0.65	0.037
155.00	-5.75	-1.61	0.00	-3.23	0.00	3.23	831.77	415.88	647.00	323.98	8.87	-0.67	0.017
157.00	0.00	-1.55	0.00	0.00	0.00	0.00	809.65	404.83	607.80	304.35	9.15	-0.67	0.000

Load Case (0.9 - 0.2Sds) * DL + E EMAM **Seismic (Reduced DL) Equivalent Modal Analysis Method**

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-40.84	-3.53	0.00	-446.32	0.00	446.32	5,980.07	2,990.03	16,624.4	8,324.57	0.00	0.00	0.060
5.00	-39.30	-3.49	0.00	-428.69	0.00	428.69	5,898.95	2,949.47	15,998.2	8,011.02	0.01	-0.01	0.060
10.00	-37.80	-3.44	0.00	-411.25	0.00	411.25	5,814.64	2,907.32	15,374.6	7,698.77	0.02	-0.02	0.060
15.00	-36.33	-3.39	0.00	-394.04	0.00	394.04	5,727.15	2,863.57	14,754.3	7,388.14	0.06	-0.04	0.060
20.00	-34.89	-3.33	0.00	-377.10	0.00	377.10	5,636.47	2,818.23	14,137.9	7,079.47	0.10	-0.05	0.059
25.00	-33.49	-3.27	0.00	-360.45	0.00	360.45	5,542.60	2,771.30	13,526.0	6,773.06	0.16	-0.06	0.059
30.00	-32.12	-3.21	0.00	-344.10	0.00	344.10	5,445.54	2,722.77	12,919.3	6,469.26	0.23	-0.08	0.059
35.00	-30.78	-3.15	0.00	-328.03	0.00	328.03	5,345.30	2,672.65	12,318.4	6,168.38	0.32	-0.09	0.059
40.00	-29.48	-3.09	0.00	-312.26	0.00	312.26	5,241.87	2,620.94	11,724.0	5,870.75	0.42	-0.10	0.059
45.00	-29.39	-3.09	0.00	-296.79	0.00	296.79	5,135.25	2,567.63	11,136.8	5,576.69	0.53	-0.12	0.059
45.33	-27.21	-2.98	0.00	-295.76	0.00	295.76	5,128.03	2,564.02	11,097.9	5,557.22	0.54	-0.12	0.059
50.00	-25.98	-2.92	0.00	-281.85	0.00	281.85	5,025.45	2,512.73	10,557.3	5,286.54	0.67	-0.14	0.058
52.67	-25.40	-2.89	0.00	-274.06	0.00	274.06	5,025.47	2,512.73	10,557.4	5,286.58	0.75	-0.14	0.057
55.00	-24.18	-2.84	0.00	-267.30	0.00	267.30	4,973.14	2,486.57	10,289.9	5,152.60	0.82	-0.15	0.057
60.00	-23.00	-2.78	0.00	-253.12	0.00	253.12	4,858.66	2,429.33	9,723.06	4,868.75	0.99	-0.17	0.057
65.00	-21.84	-2.74	0.00	-239.20	0.00	239.20	4,740.99	2,370.50	9,165.59	4,589.61	1.17	-0.19	0.057
70.00	-20.72	-2.71	0.00	-225.50	0.00	225.50	4,620.14	2,310.07	8,618.17	4,315.49	1.38	-0.20	0.057
75.00	-19.63	-2.69	0.00	-211.97	0.00	211.97	4,496.10	2,248.05	8,081.43	4,046.72	1.60	-0.22	0.057
80.00	-18.58	-2.68	0.00	-198.54	0.00	198.54	4,353.06	2,176.53	7,528.68	3,769.93	1.85	-0.24	0.057
85.00	-17.56	-2.69	0.00	-185.13	0.00	185.13	4,183.86	2,091.93	6,951.89	3,481.11	2.11	-0.26	0.057
90.00	-17.11	-2.70	0.00	-171.68	0.00	171.68	4,014.66	2,007.33	6,398.09	3,203.80	2.40	-0.29	0.058
92.25	-16.20	-2.72	0.00	-165.60	0.00	165.60	3,938.51	1,969.26	6,156.38	3,082.77	2.54	-0.30	0.058
95.00	-15.31	-2.75	0.00	-158.12	0.00	158.12	3,845.45	1,922.73	5,867.28	2,938.00	2.71	-0.31	0.058
97.75	-14.92	-2.76	0.00	-150.57	0.00	150.57	3,277.70	1,638.85	4,997.17	2,502.30	2.89	-0.32	0.065
100.00	-14.09	-2.79	0.00	-144.37	0.00	144.37	3,222.92	1,611.46	4,815.14	2,411.15	3.05	-0.33	0.064
105.00	-13.28	-2.82	0.00	-130.43	0.00	130.43	3,077.89	1,538.94	4,389.42	2,197.97	3.41	-0.36	0.064
110.00	-12.51	-2.84	0.00	-116.35	0.00	116.35	2,932.86	1,466.43	3,983.41	1,994.67	3.80	-0.39	0.063
115.00	-11.76	-2.84	0.00	-102.16	0.00	102.16	2,787.83	1,393.91	3,597.10	1,801.22	4.22	-0.42	0.061
120.00	-11.04	-2.83	0.00	-87.94	0.00	87.94	2,642.80	1,321.40	3,230.49	1,617.64	4.68	-0.44	0.059
125.00	-10.35	-2.80	0.00	-73.77	0.00	73.77	2,497.76	1,248.88	2,883.58	1,443.93	5.16	-0.47	0.055
130.00	-9.63	-2.74	0.00	-59.76	0.00	59.76	2,352.73	1,176.37	2,556.37	1,280.08	5.67	-0.50	0.051
134.00	-9.54	-2.74	0.00	-48.78	0.00	48.78	1,028.31	514.15	1,093.21	547.42	6.10	-0.52	0.098
135.00	-9.37	-2.72	0.00	-46.05	0.00	46.05	1,020.22	510.11	1,070.76	536.17	6.21	-0.53	0.095
137.00	-7.46	-2.46	0.00	-40.61	0.00	40.61	1,003.67	501.84	1,026.12	513.82	6.43	-0.55	0.086
140.00	-7.09	-2.40	0.00	-33.22	0.00	33.22	977.89	488.95	959.91	480.67	6.79	-0.58	0.076
145.00	-6.94	-2.36	0.00	-21.24	0.00	21.24	932.37	466.18	851.90	426.58	7.41	-0.61	0.057
147.00	-4.38	-1.72	0.00	-16.51	0.00	16.51	913.27	456.63	809.64	405.42	7.67	-0.63	0.046
150.00	-4.09	-1.63	0.00	-11.34	0.00	11.34	883.66	441.83	747.38	374.24	8.07	-0.64	0.035
155.00	-3.98	-1.59	0.00	-3.18	0.00	3.18	831.77	415.88	647.00	323.98	8.75	-0.66	0.015
157.00	0.00	-1.55	0.00	0.00	0.00	0.00	809.65	404.83	607.80	304.35	9.03	-0.66	0.000

Analysis Summary

	Reactions						Max Usage	
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.6W	33.75	0.00	59.12	0.00	0.00	3992.00	134.00	0.58
0.9D + 1.6W	33.73	0.00	44.33	0.00	0.00	3960.25	134.00	0.57
1.2D + 1.0Di + 1.0Wi	7.79	0.00	86.95	0.00	0.00	886.85	134.00	0.14
(1.2 + 0.2Sds) * DL + E ELFM	2.16	0.00	58.84	0.00	0.00	271.59	134.00	0.05
(1.2 + 0.2Sds) * DL + E EMAM	3.53	0.00	58.84	0.00	0.00	450.95	134.00	0.10
(0.9 - 0.2Sds) * DL + E ELFM	2.16	0.00	40.84	0.00	0.00	269.04	134.00	0.04
(0.9 - 0.2Sds) * DL + E EMAM	3.53	0.00	40.84	0.00	0.00	446.32	134.00	0.10
1.0D + 1.0W	6.88	0.00	49.29	0.00	0.00	810.84	134.00	0.13

Base Summary

Reactions

Original Design			Analysis			
Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment Design %
7,151.38	68.80	61.40	3,992.00	86.95	33.75	55.82

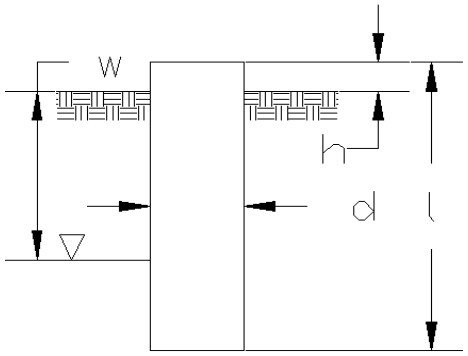
Base Plate

Yield (ksi)	Thick (in)	Width (in)	Style	Poly Sides	Clip Len (in)	Effective Len (in)	Mu (kip-in)	Phi Mn (kip-in)	Ratio
50.0	3.000	82.000	Round	0	0.00	43.884	1289.62	4443.28	0.29

Anchor Bolts

								Start	Compression			Tension		
Bolt Circle	Num Bolts	Bolt Type	Bolt Dia (in)	Yield (ksi)	Ultimate (ksi)	Arrange	Cluster Dist (in)	Angle (deg)	Force (kip)	Allow (kip)	Ratio	Force (kip)	Allow (kip)	Ratio
76.00	36	2.25" 18J	2.25	75.00	100.00	Radial	0.00	0.0	72.45	260.00	0.29	67.62	260.00	0.27

Site Name:	Hamden, CT	*Program Last Updated:*	*5/13/2014*
Site Number:	CT54XC773	*American Tower Corporation*	
Engineer:	MT		
Engineering Number:	REV09		
Date:	07/19/19		



Design Base Loads (Factored) - Analysis per TIA-222-G Standards

Analyze or Design a Foundation?	Analyze	
Foundation Mapped:	N	
Moment (M):	3992.0	k-ft
Shear/Leg (V):	33.8	k
Axial Load (P):	59.1	k
Uplift/Leg (U):	0.0	k
Tower Type (GT / SST / MP):	MP	
Diameter of Caisson (d):	8.0	ft
Caisson Embedment (L-h):	47.0	ft
Caisson Height Above Ground (h):	1.0	ft
Depth Below Ground Surface to Water Table (w):	15.0	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Water:	62.4	pcf
Tension Skin Friction/Compression Skin Friction:	1.00	
Pullout Angle:	30.0	degrees

Engineer Notes

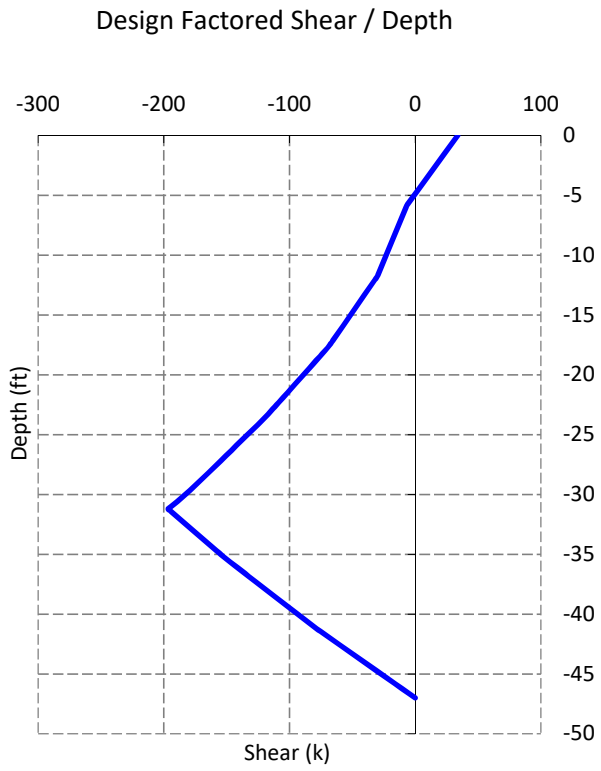
Soil Mechanical Properties

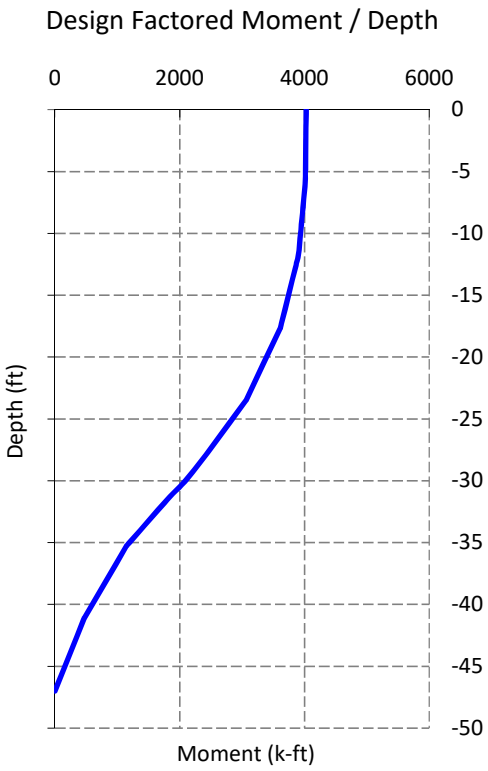
Depth (ft) Top	Depth (ft) Bottom	γ_{Soil} (pcf)	Cohesion (psf)	ϕ (degree)	Ultimate Skin Friction (psf)	Ultimate Bearing Pressure (psf)
0.0	2.5	120	0	25	0	0
2.5	48.0	120	0	28	0	12000

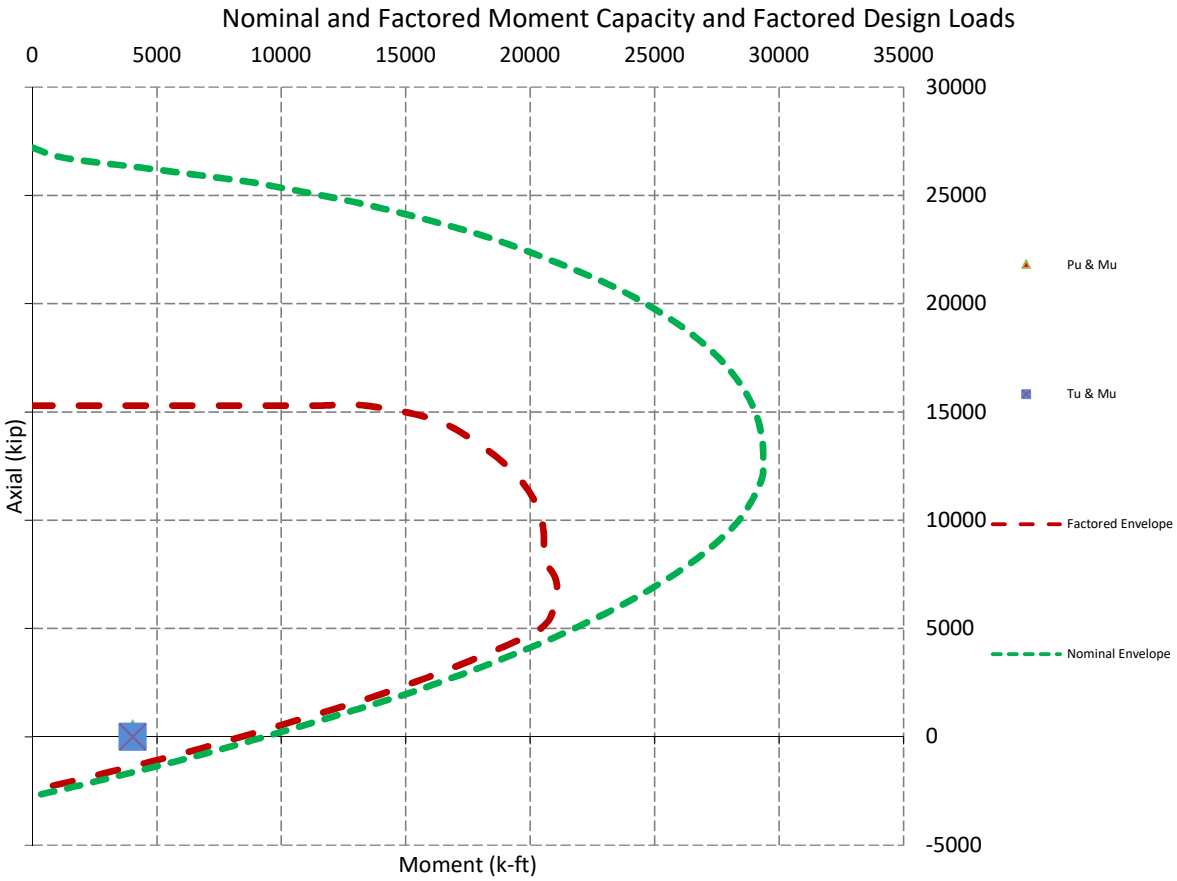
Required Embedment:	22.5	ft - OK, Caisson Embedment Satisfactory
Volume of Concrete:	2412.7	ft^3 = 89.4 yd^3
Weight of Concrete (Buoyancy Effect Considered):	261.5	k
Average Soil Unit Weight:	77.2	pcf
Skin Friction Resistance:	0.0	k
Compressive Bearing Resistance:	603.2	k
Pullout Weight (Minus Concrete Weight):	4032.5	k
Nominal Uplift Capacity per Leg ($\phi_s T_n$):	196.2	k
Nominal Compressive Capacity per Leg ($\phi_s P_n$):	452.4	k
P_u:	145.2	k
$T_u/\phi_s T_n$:	0.00	Result: OK
$P_u/\phi_s P_n$:	0.32	Result: OK
Total Lateral Resistance:	5978.1	k
Inflection Point (Below Ground Surface):	31.2	ft
Design Overturning Moment At Inflection Point (M_D):	5079.4	k-ft
Nominal Moment Capacity ($\phi_s M_n$):	43302.9	k-ft
$M_D/\phi_s M_n$:	0.12	Result: OK
ϕ_s:	0.75	

Caisson Strength Capacity

Concrete Compressive Strength (f'_c):	4000	psi
Vertical Steel Rebar Size #:	8	
Vertical Steel Rebar Area:	0.79	in^2
# of Vertical Steel Rebars:	58	
Vertical Steel Rebar Yield Strength (F_y):	60	ksi
Horizontal Tie / Stirrup Size #:	5	
Horizontal Tie / Stirrup Area:	0.31	in^2
Design Horizontal Tie / Stirrup Spacing:	12.0	in
Horizontal Tie / Stirrup Steel Yield Strength (F_y):	60	ksi
Rebar Cage Diameter:	88.0	in
Strength Bending/Tension Reduction Factor (ϕ_B):	0.90	ACI318-05 - 9.3.2.1
Strength Shear Reduction Factor (ϕ_V):	0.75	ACI318-05 - 9.3.2.3
Strength Compression Reduction Factor (ϕ_V):	0.65	ACI318-05 - 9.3.2.2
Steel Elastic Modulus:	29000	ksi
Design Moment (M_u):	4025.8	k-ft
Nominal Moment Capacity ($\phi_B M_n$):	8871.0	k-ft - ACI318-005 - 10.2
$M_u/\phi_B M_n$:	0.45	Result: OK
Design Shear (V_u):	196.6	k
Nominal Shear Capacity ($\phi_V V_n$):	689.5	k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u/\phi_V V_n$:	0.29	Result: OK
Design Tension (T_u):	0.0	k
Nominal Tension Capacity ($\phi_T T_n$):	2474.3	k - ACI318-05 - 10.2
$T_u/\phi_T T_n$:	0.00	Result: OK
Design Compression (P_u):	145.2	k
Nominal Compression Capacity ($\phi_P P_n$):	12716.2	k - ACI318-05 - 10.3.6.2
$P_u/\phi_P P_n$:	0.01	Result: OK
Bending Reinforcement Ratio:	0.006	ACI318-05 - 10.8.4 & 10.9.1
$M_u/\phi_B M_n + T_u/\phi_T T_n$:	0.45	Result: OK


Design Factored Shear / Depth
-300
-200
-100
0
100
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
Depth (ft)
Shear (k)


Design Factored Moment / Depth
0
2000
4000
6000
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
Depth (ft)
Moment (k-ft)


Nominal and Factored Moment Capacity and Factored Design Loads
0
5000
10000
15000
20000
25000
30000
35000
30000
25000
20000
15000
10000
5000
0
-5000
Axial (kip)
Moment (k-ft)
Pu & Mu
Tu & Mu
Factored Envelope
Nominal Envelope

Site Number:	**CT54XC773**
Site Name:	**Hamden, CT**
Job Number:	**REV09**
Engineer:	**MT**
Date:	**7/19/2019**

Base Plate and Bolt Analysis

Moment:	3992.0	k-ft
Shear/Leg:	33.8	k
Compression/Leg:	59.1	k

TIA-222 Code Revision (F/G):	G	
Anchor Bolt Arrangement:	Round	
Monopole Shaft Diameter (Across Flats):	68.0	in
Lower Monopole Thickness:	0.438	in
# of Sides of Pole:	18	
Monopole Shaft Yield Strength:	65	ksi
Baseplate Diameter / Length:	82.00	
Base Plate Thickness:	3.00	in
Base Plate Yield Strength:	50	ksi
Baseplate Detail Type:	D	
Include Plate Thickness Beyond Bolt Circle:	Y	
Stress Increase:	1.00	
Fillet Weld Size:	0.375	in
Weld Type (CJP or F/F):	CJP	
Weld Strength:	70	ksi

Anchor Bolts

Anchor Bolt Yield Strength:	75	ksi
Anchor Bolt Ultimate Strength:	100	ksi
Anchor Bolt Diameter:	2.25	in
Anchor Bolt Circle:	76.00	in
# of Anchor Bolts:	36	
Minimum Anchor Bolt Separation:	6.00	in
Additional Anchor Bolts Installed:	N	

	Baseplate Flexural Capacity					Baseplate Shear Capacity			
Failure Mode:	Effective Width (in)	Moment (k-in)	S/Z (in^3)	Capacity (k-in)	Usage	Shear (k)	Area (in^2)	Capacity (k)	Usage
AA	39.94	1000.2	89.9	4044.0	0.25	347.7	119.8	3235.2	0.11
AB	47.03	1309.3	105.8	4761.9	0.27	347.7	141.1	3809.5	0.09
BA	37.75	817.8	84.9	3822.5	0.21	347.7	113.3	3058.0	0.11
BB	43.46	1275.3	97.8	4399.9	0.29	347.7	130.4	3519.9	0.10

Anchor Bolt Capacity

Area of Bolt:	3.25	in^2
Inertia of Bolt:	0.84	in^4
Total Bolt Inertia:	84444.0	in^4
Maximum Bolt Tension:	68.4	k
Maximum Bolt Compression:	71.7	k
Bolt Shear:	0.9	k
Tensile Bolt Capacity:	259.8	k
Compressive Bolt Capacity:	259.8	k
Shear Bolt Capacity:	140.3	k
Interaction Equation:	0.28	Result:
		OK

Base Weld Capacity

Force / Weld:	10.5	k/in
Weld Capacity:	28.9	k/in
Interaction Equation:	0.36	Result:
		OK

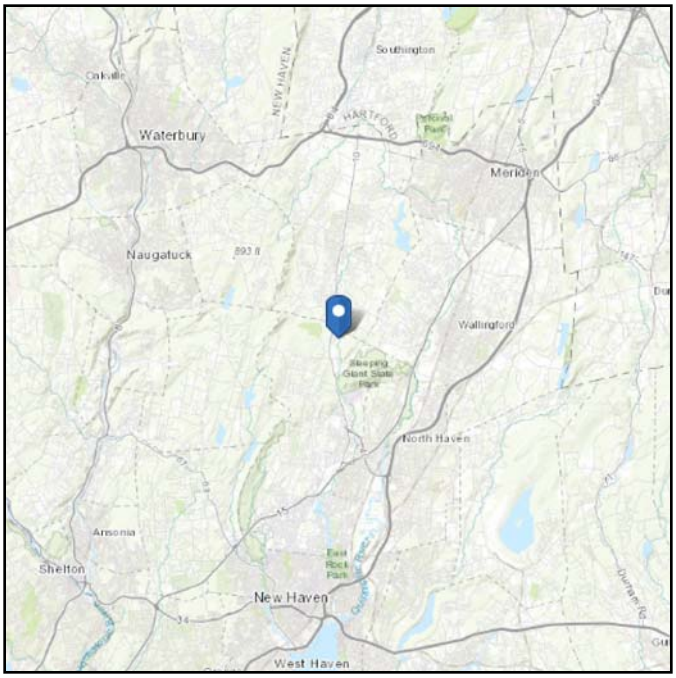
SES Base Plate Design Moment:	286.6	k-in
Design Stress:	21.5	ksi
SES Base Plate Allowable Stress / Moment Capacity:	600.8	ksi / k-in
Usage:	0.48	
Moment Factor:	4.45	
Length Factor:	7.32	

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 128.93 ft (NAVD 88)
Latitude: 41.4494
Longitude: -72.9046



Wind

Results:

Wind Speed:	123 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	93 Vmph
100-year MRI	100 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Wed Jun 26 2019

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

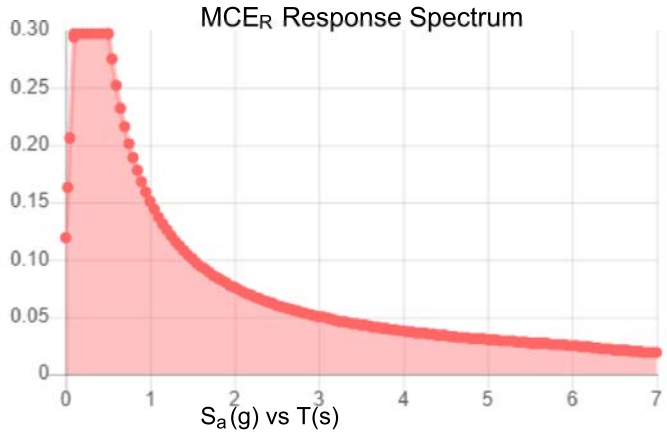
Seismic

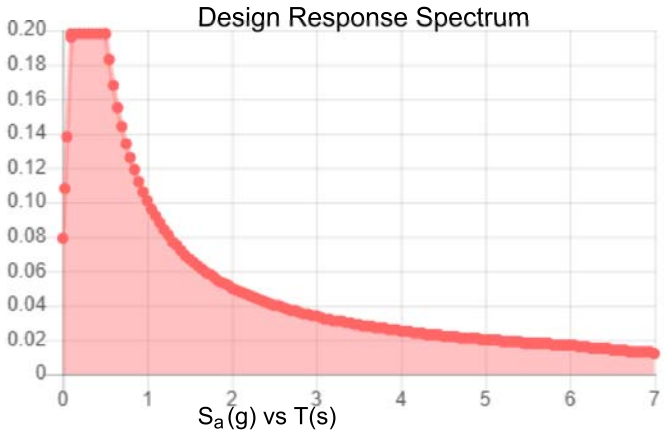
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.186	S_{DS} :	0.198
S_1 :	0.063	S_{D1} :	0.101
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.096
S_{MS} :	0.297	PGA_M :	0.154
S_{M1} :	0.151	F_{PGA} :	1.6
		I_e :	1

Seismic Design Category B





Data Accessed: Wed Jun 26 2019

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Jun 26 2019

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Exhibit E

Mount Analysis

June 25, 2019

Peter Fales
Centerline Communications, LLC.
95 Ryan Drive, Suite 1
Raynham, MA 02767
(401) 835-2033

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
btwo@btgrp.com

Subject:	**Appurtenance Mount Analysis Report**	
Carrier Designation:	**Site Number:**	CTNH442A
	Site Name:	Hamden
Engineering Firm Designation:	**B+T Group Project Number:**	135662.002.01 REV A
Site Data:	**150 Willow St, Hamden, CT, 06518, New Haven County** **Latitude *41.44939*°, Longitude *-72.90457*°** **Monopole** **(3) 12.5' T-Arm Mount**	

Dear Mr. Fales,

B+T Group is pleased to submit this **"Appurtenance Mount Analysis Report"** to determine the structural integrity of the antenna mount on the above-mentioned structure.

The purpose of the analysis is to determine acceptability of the mount's stress level. Based on our analysis we have determined the stress level for the mount under the following load case to be:

Existing + Proposed Equipment Note: See Table 1 for the final loading configuration	**Sufficient Capacity** **(Passing at 73.8% with Recommendations in Section 5)**

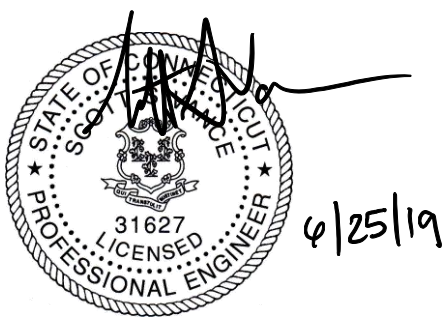
The analysis has been performed in accordance with the ANSI/TIA-222-G Standard. This analysis utilizes an ultimate 3-second gust wind speed of 123 mph converted to an equivalent 96 mph nominal 3-second gust wind speed per Section 1609.3.1 for use with ANSI/TIA-222-G as required by the 2018 Connecticut State Building Code. Exposure Category B and Risk Category II were used in this analysis.

All the equipment proposed in this report shall be installed in accordance with the drawings for the determined available structural capacity to be effective.

We at *B+T Group* appreciate the opportunity of providing our continuing professional services to you and *Centerline Communications, LLC.* If you have any questions or need further assistance on this or any other projects, please give us a call.

Mount structural analysis prepared by: Siva Tellakula, E.I.T.

Respectfully submitted by: B&T Engineering, Inc.
COA: PEC.0001564 Expires: 02/10/2020



Scott S. Vance, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

The appurtenance mount consists of SitePro1 T-Arm mounts, Part #RMV12-4-96 at 137 ft., attached to monopole at 150 Willow St, Hamden, CT, 06518, New Haven County. The proposed antenna loading information was obtained from Centerline Communications, LLC. All information provided to B+T Group was assumed accurate and complete.

2) ANALYSIS CRITERIA

The structural analysis was performed for this mount in accordance with the ANSI/TIA-222-G-2-2005 Structural Standard for Antenna Supporting Structures and Antennas – Addendum 2 using a 3-second gust wind speed of 96 mph with no ice and 50 mph with 0.75-inch escalated ice thickness. Exposure Category B with Topographic factor 1 and Risk Category II were used in this analysis. In addition, the T-Arm mount has been analyzed for various live loading conditions consisting of a 250-lb man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 0-pound man live load applied individually at mount pipe locations using a 3-second gust of 30mph. The mount was analyzed under 30º increments in the wind direction. The analyzed loading is detailed in Table 1.

Table 1 – Proposed and Existing Equipment Information

Loading	RAD Ctr. Elev. (ft.)	Position	Qty.	Manufacturer	Model / Type	Note
Proposed	137	3	3	RFS	APXVAARR24_43-U-NA20	1
			3	Ericsson	Radio 4449 B71+B12	2
Existing	137	1	3	Ericsson	AIR21 KRC118023-1_B2A_B4P	3
		4	3	Ericsson	AIR21 KRC118023-1_B2P_B4A	
		1	3	Ericsson	Generic Twin Style 1B - AWS	

Note:
(1) Proposed Antenna to be installed on the existing Mount Pipe.
(2) Proposed Equipment to be installed directly behind the Antenna.
(3) Existing Equipment to be installed on the Mount.

Table 2 - Documents Provided

Documents	Remarks	Reference	Source
RFDS	Existing Loading Proposed Loading	Date: 04/15/2019	Centerline Communications, LLC.
Structural Analysis	SEMAAN Engineering Solutions	Date: 07/15/2016	Centerline Communications, LLC.

3) ANALYSIS PROCEDURE

3.1) Analysis Method

RISA-3D (Version 17.0.2), a commercially available analysis software package, was used to create a three-dimensional model of the mount and calculate member stresses and deflections for various loading cases. Selected output from the analysis is included in Appendix A.

Manufacturers drawing were used to create the model.

3.2) Assumptions

1. The mount was built in accordance with the manufacturer's specifications.
2. The mount has been maintained in accordance with the manufacturer's specifications and is free of damage.
3. The configuration of antennas and other appurtenances are as specified in Table 1.

4. All mount components have been assumed to be in sufficient condition to carry their full design capacity for the analysis.
5. Mount areas and weights are determined from field measurements, standard material properties, and/or manufacturer product data.
6. Serviceability with respect to antenna twist, tilt, roll or lateral translation is not checked and is left to the carrier or tower owner to ensure conformance.
7. All prior structural modifications, if any are assumed to be correctly installed and fully effective.
8. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
9. The following material grades were assumed (Unless Noted Otherwise):
   a) Connection Bolts : ASTM A325
   b) Steel Pipe : ASTM A53 (GR. 35)
   c) HSS (Round) : ASTM 500 (GR. B-42)
   d) HSS (Rectangular) : ASTM 500 (GR. B-46)
   e) Channel : ASTM A36 (GR. 36)
   f) Steel Solid Rod : ASTM A36 (GR. 36)
   g) Steel Plate : ASTM A36 (GR. 36)
   h) Steel Angle : ASTM A36 (GR. 36)
   i) UNISTRUT : ASTM A570 (GR. 33)

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 – Mount Component Stresses vs. Capacity

Notes	Component	Elevation (ft.)	% Capacity	Pass / Fail
-	Face Horizontal	137	52.3	Pass
-	Support Tube	137	73.8	Pass
-	Mount Pipes	137	63.4	Pass
Modified	New Horizontal	137	28.7	Pass
Modified	Stabilizer Kit	137	18.2	Pass

Note: *Member Capacity based on Recommended Modification on Section 5

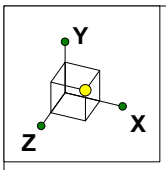
5) RECOMMENDATIONS

The mount will have sufficient capacity to carry the existing and proposed loads and be in compliance with the TIA-222-G Standard for the proposed and existing loading, with the modifications described below. (Refer to the RISA output for the specific members).

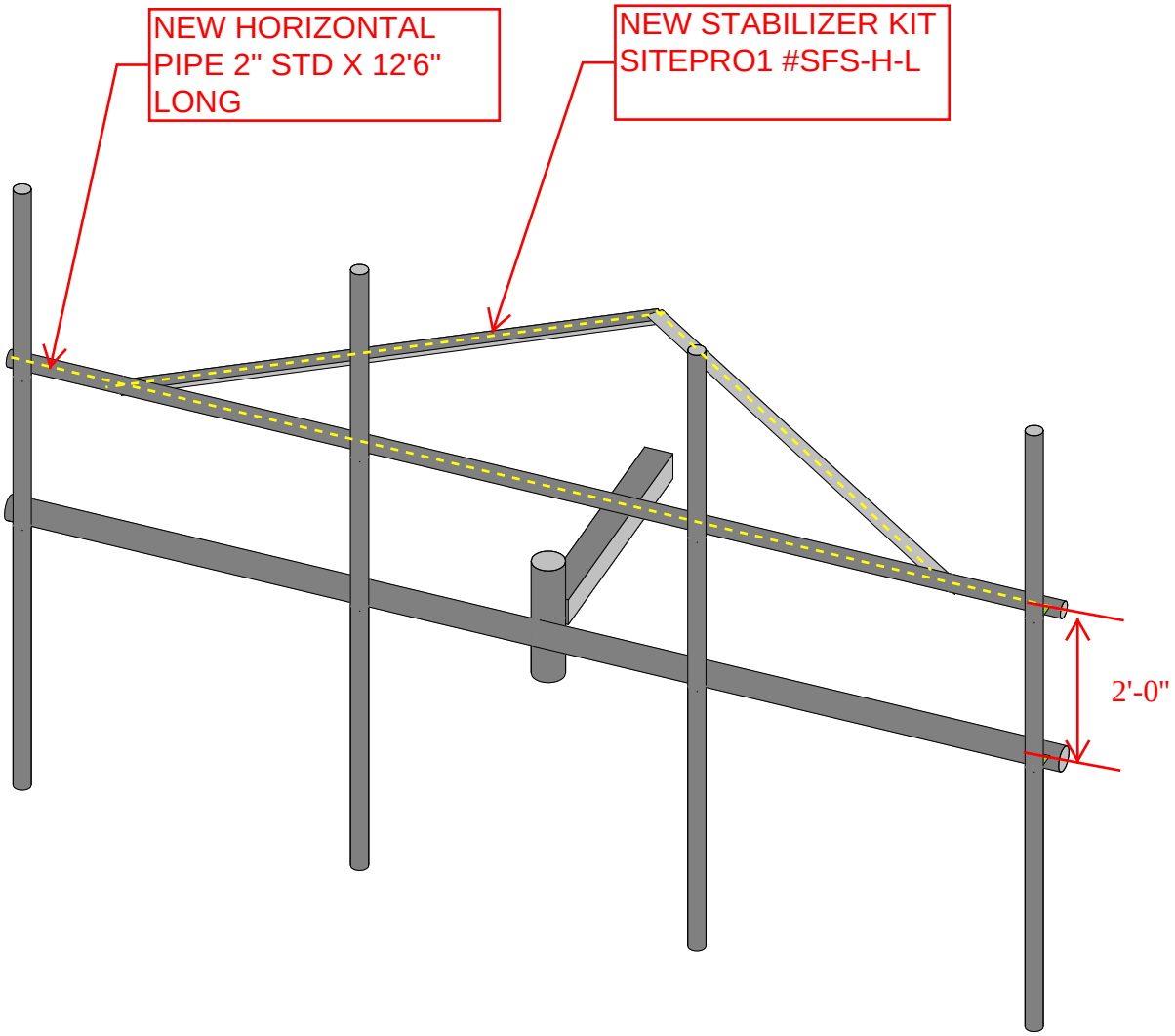
Install Sitepro1 Stabilizer kit #SFS-H-L connected to the mount using a new 2'' Std Horizontal pipe of 12.5ft as shown in SK-1 of Appendix-A.

APPENDIX A

(RISA-3D Output)



CONNECT THE STABILIZER TO TOWER USING RINGMOUNT SITEPRO #LWRM



Envelope Only Solution

B+T Group	CTNH442A - Hamden	SK - 1
SP		June 25, 2019 at 10:35 AM
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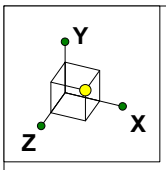

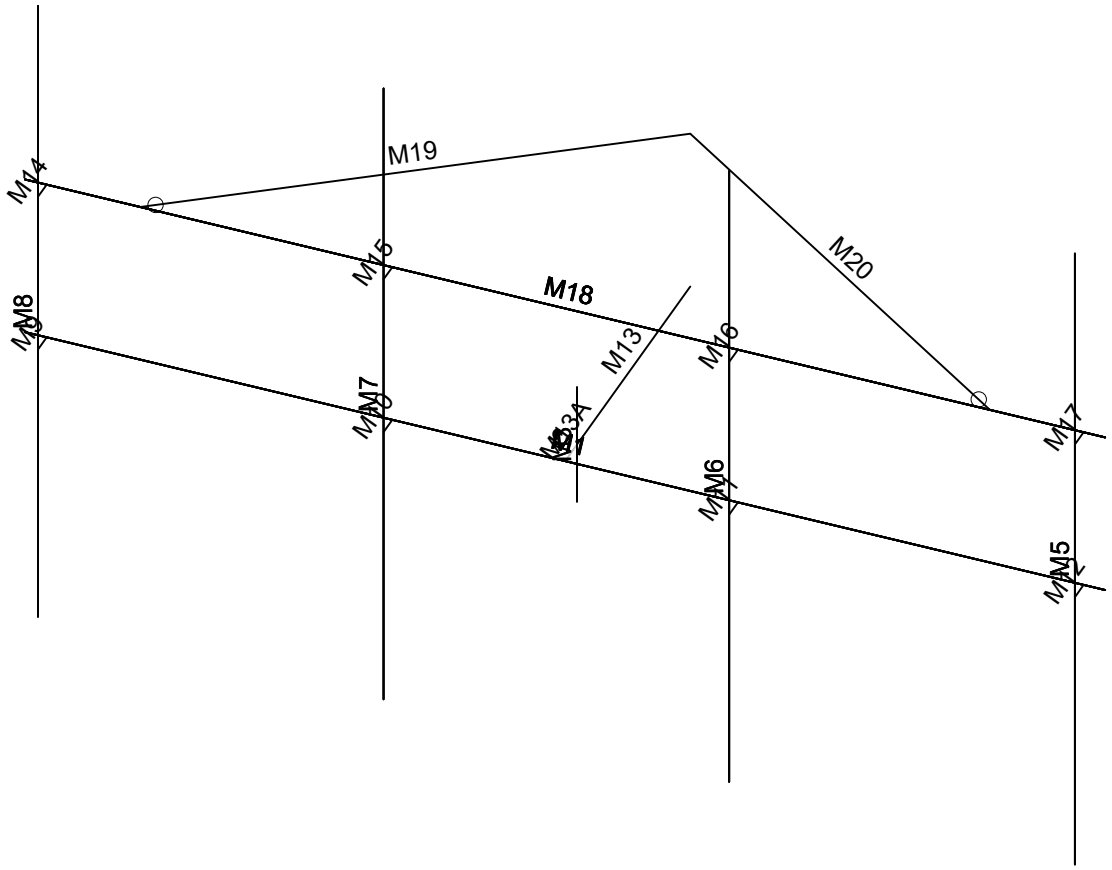

Envelope Only Solution

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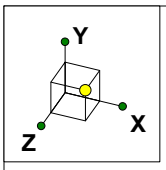

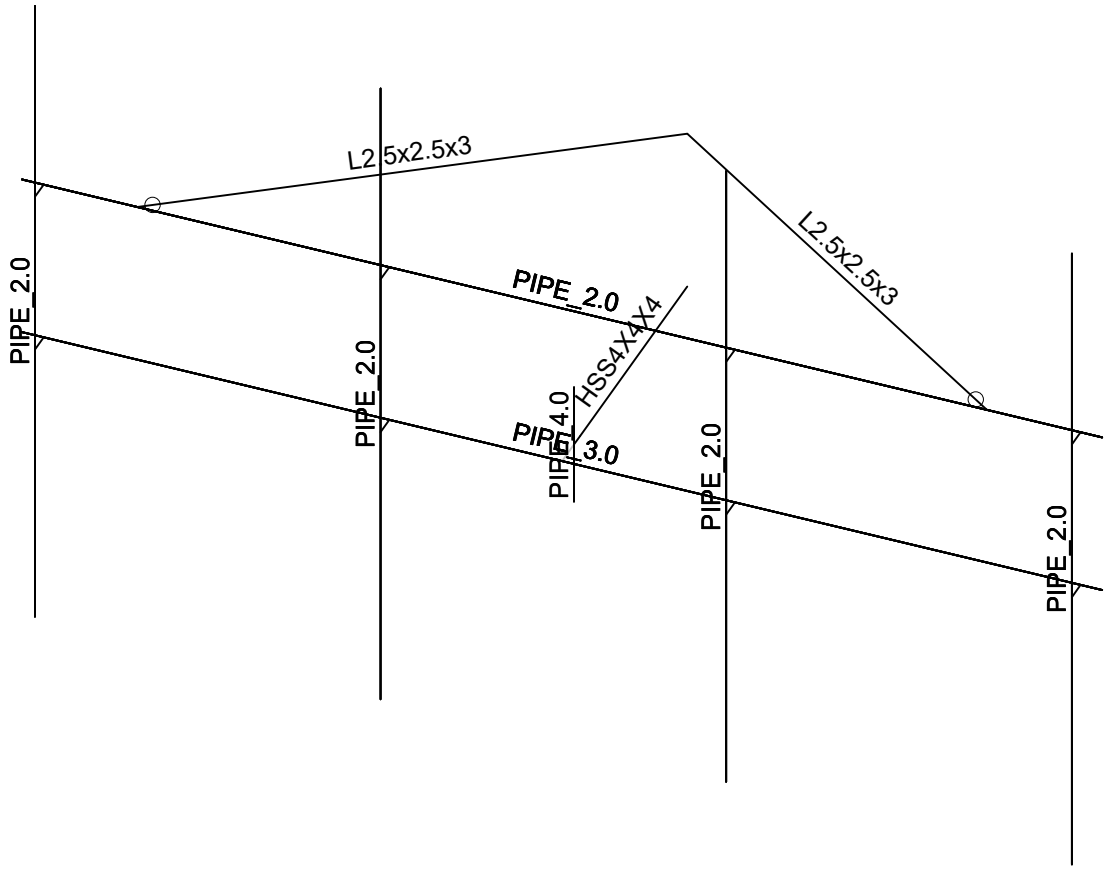

Envelope Only Solution

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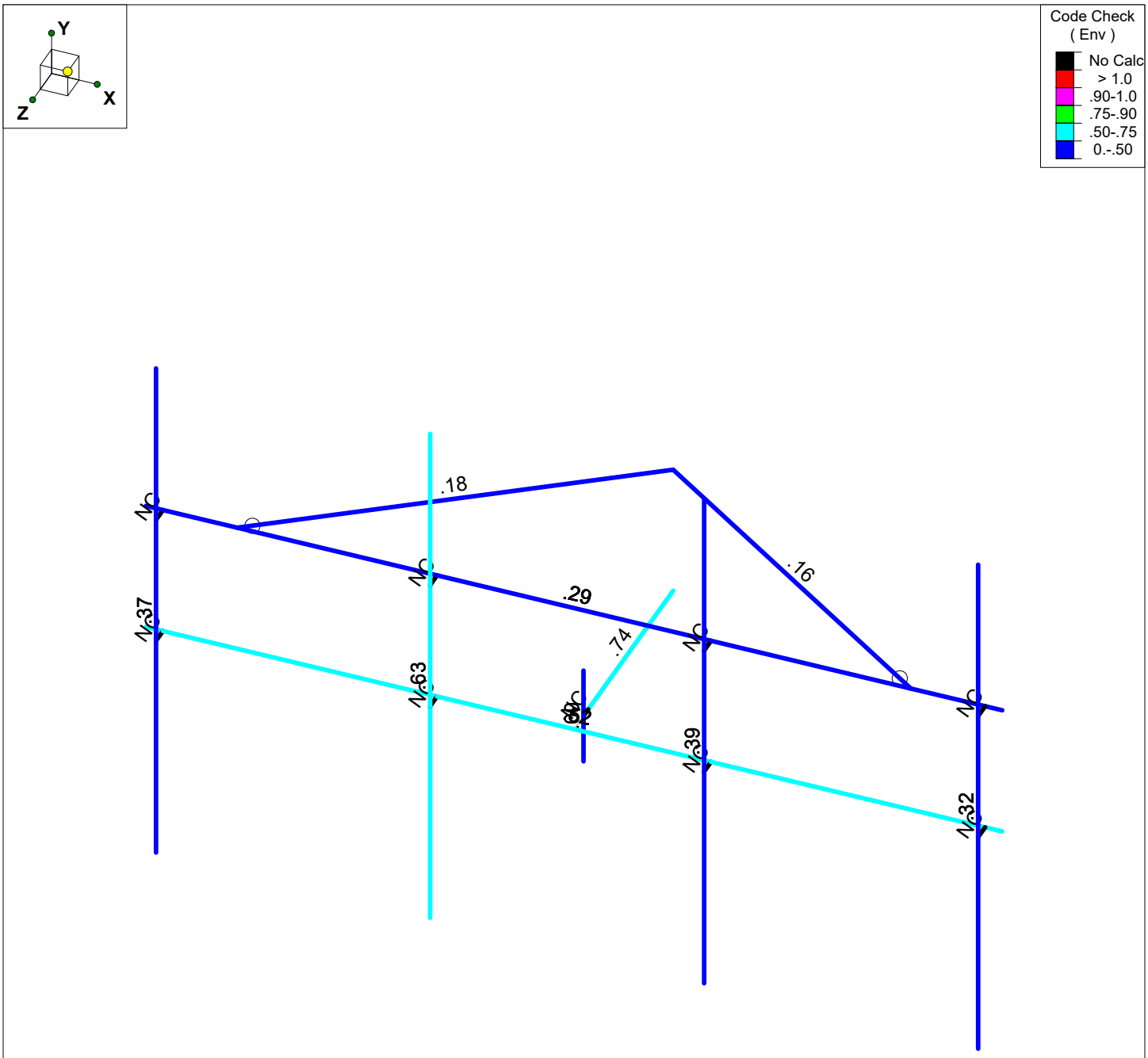

Member Code Checks Displayed (Enveloped)
Envelope Only Solution

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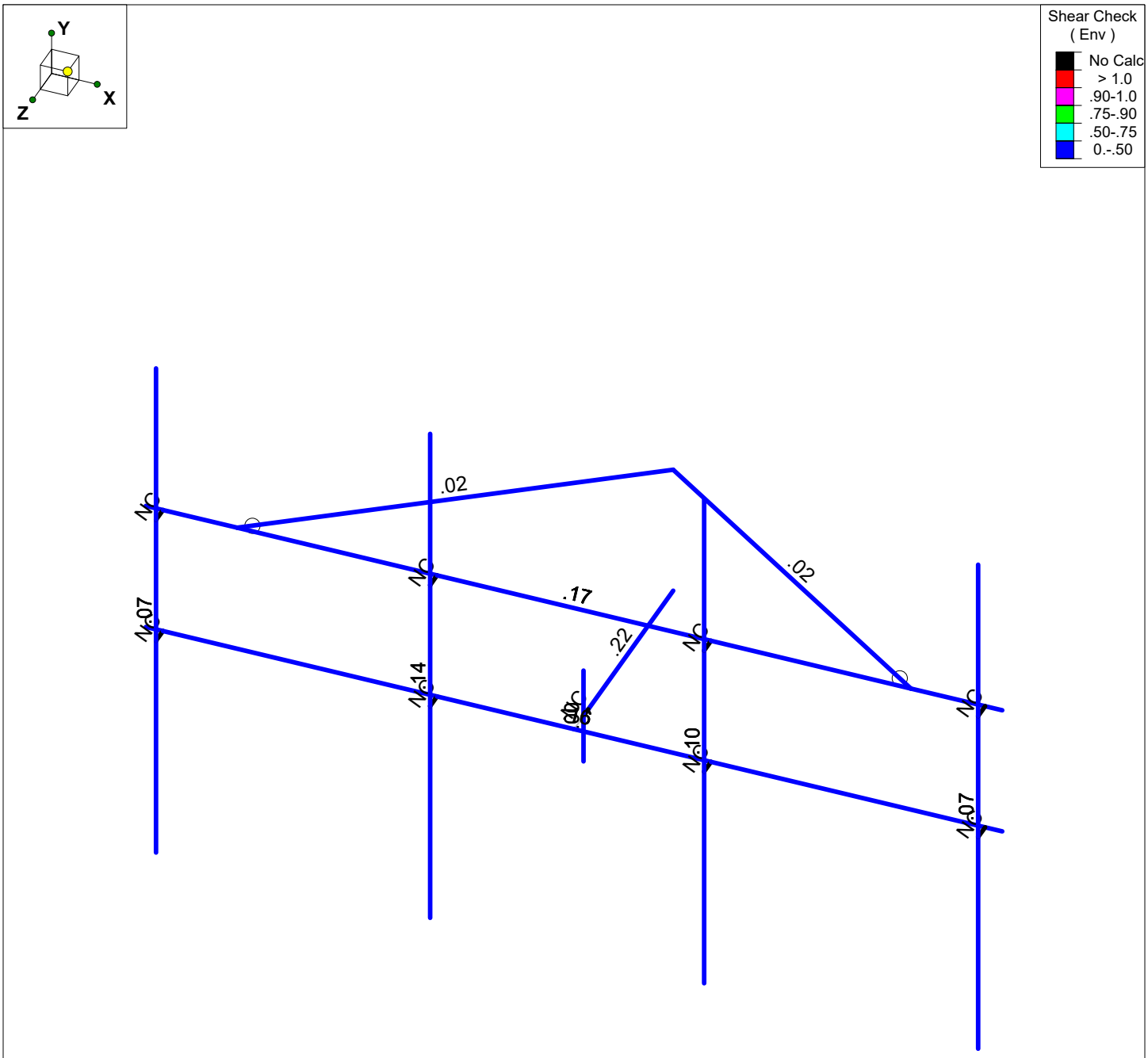

Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

B+T Group	CTNH442A - Hamden	SK - 5
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Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	MF-H1	PIPE_3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
2	MF-P1	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	F1-ST1	HSS4X4X4	Beam	Tube	A53 Gr.B	Typical	3.37	7.8	7.8	12.8
4	F1-CP	PIPE_4.0	Column	Pipe	A53 Gr.B	Typical	2.96	6.82	6.82	13.6
5	NEW HZ...	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
6	SFS	L2.5x2.5x3	HBrace	Single Angle	A36 Gr.36	Typical	.901	.535	.535	.011

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			MF-H1	Beam	Pipe	A53 Gr.B	Typical
2	M2	N3	N6			RIGID	None	None	RIGID	Typical
3	M3	N4	N5			F1-CP	Column	Pipe	A53 Gr.B	Typical
4	M5	N8	N9			MF-P1	Column	Pipe	A53 Gr.B	Typical
5	M6	N10	N11			MF-P1	Column	Pipe	A53 Gr.B	Typical
6	M7	N12	N13			MF-P1	Column	Pipe	A53 Gr.B	Typical
7	M8	N14	N15			MF-P1	Column	Pipe	A53 Gr.B	Typical
8	M9	N16	N17			RIGID	None	None	RIGID	Typical
9	M10	N18	N19			RIGID	None	None	RIGID	Typical
10	M11	N20	N21			RIGID	None	None	RIGID	Typical
11	M12	N22	N23			RIGID	None	None	RIGID	Typical
12	M13	N24	N7			F1-ST1	Beam	Tube	A53 Gr.B	Typical
13	M13A	N6	N24			RIGID	None	None	RIGID	Typical
14	M14	N28	N29			RIGID	None	None	RIGID	Typical
15	M15	N30	N31			RIGID	None	None	RIGID	Typical
16	M16	N32	N33			RIGID	None	None	RIGID	Typical
17	M17	N34	N35			RIGID	None	None	RIGID	Typical
18	M18	N25	N26			NEW HZNTL	Beam	Pipe	A53 Gr.B	Typical
19	M19	N27	N36		180	SFS	HBrace	Single Angle	A36 Gr.36	Typical
20	M20	N27	N37		90	SFS	HBrace	Single Angle	A36 Gr.36	Typical

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	Dead	DL		-1			20			
2	0 Wind - No Ice	WLZ					20	10		
3	90 Wind - No Ice	WLX					20	10		
4	0 Wind - Ice	WLZ					20	10		
5	90 Wind - Ice	WLX					20	10		
6	0 Wind - Service	WLZ					20	10		
7	90 Wind - Service	WLX					20	10		
8	Ice	OL1					20	10		
9	Live Load a	LL								
10	Live Load b	LL								
11	Live Load c	LL								
12	Live Load d	LL								
13	Maint LL 1	LL					1			
14	Maint LL 2	LL					1			
15	Maint LL 3	LL					1			
16	Maint LL 4	LL								

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
17	Maint LL 5	LL								
18	Maint LL 6	LL								

Load Combinations

	Description	Sol...	P-Delta	SR...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4 Dead	Yes	Y		1	1.4																				
2	0.9 D + 1.6 - 0 W	Yes	Y		1	.9	2	1.6																		
3	0.9 D + 1.6 - 30 W	Yes	Y		1	.9	2	1....	3	.8																
4	0.9 D + 1.6 - 60 W	Yes	Y		1	.9	3	1....	2	.8																
5	0.9 D + 1.6 - 90 W	Yes	Y		1	.9	3	1.6																		
6	0.9 D + 1.6 - 120 W	Yes	Y		1	.9	3	1....	2	-.8																
7	0.9 D + 1.6 - 150 W	Yes	Y		1	.9	2	-1....	3	.8																
8	0.9 D + 1.6 - 180 W	Yes	Y		1	.9	2	-1.6																		
9	0.9 D + 1.6 - 210 W	Yes	Y		1	.9	2	-1....	3	-.8																
10	0.9 D + 1.6 - 240 W	Yes	Y		1	.9	3	-1....	2	-.8																
11	0.9 D + 1.6 - 270 W	Yes	Y		1	.9	3	-1.6																		
12	0.9 D + 1.6 - 300 W	Yes	Y		1	.9	3	-1....	2	.8																
13	0.9 D + 1.6 - 330 W	Yes	Y		1	.9	2	1....	3	-.8																
14	1.2 D + 1.6 - 0 W	Yes	Y		1	1.2	2	1.6																		
15	1.2 D + 1.6 - 30 W	Yes	Y		1	1.2	2	1....	3	.8																
16	1.2 D + 1.6 - 60 W	Yes	Y		1	1.2	3	1....	2	.8																
17	1.2 D + 1.6 - 90 W	Yes	Y		1	1.2	3	1.6																		
18	1.2 D + 1.6 - 120 W	Yes	Y		1	1.2	3	1....	2	-.8																
19	1.2 D + 1.6 - 150 W	Yes	Y		1	1.2	2	-1....	3	.8																
20	1.2 D + 1.6 - 180 W	Yes	Y		1	1.2	2	-1.6																		
21	1.2 D + 1.6 - 210 W	Yes	Y		1	1.2	2	-1....	3	-.8																
22	1.2 D + 1.6 - 240 W	Yes	Y		1	1.2	3	-1....	2	-.8																
23	1.2 D + 1.6 - 270 W	Yes	Y		1	1.2	3	-1.6																		
24	1.2 D + 1.6 - 300 W	Yes	Y		1	1.2	3	-1....	2	.8																
25	1.2 D + 1.6 - 330 W	Yes	Y		1	1.2	2	1....	3	-.8																
26	0.9 D + 1.6 - 0 W/Ice	Yes	Y		1	.9	4	1.6			8	1														
27	0.9 D + 1.6 - 30 W/Ice	Yes	Y		1	.9	4	1....	5	.8	8	1														
28	0.9 D + 1.6 - 60 W/Ice	Yes	Y		1	.9	5	1....	4	.8	8	1														
29	0.9 D + 1.6 - 90 W/Ice	Yes	Y		1	.9	5	1.6			8	1														
30	0.9 D + 1.6 - 120 W/Ice	Yes	Y		1	.9	5	1....	4	-.8	8	1														
31	0.9 D + 1.6 - 150 W/Ice	Yes	Y		1	.9	4	-1....	5	.8	8	1														
32	0.9 D + 1.6 - 180 W/Ice	Yes	Y		1	.9	4	-1.6			8	1														
33	0.9 D + 1.6 - 210 W/Ice	Yes	Y		1	.9	4	-1....	5	-.8	8	1														
34	0.9 D + 1.6 - 240 W/Ice	Yes	Y		1	.9	5	-1....	4	-.8	8	1														
35	0.9 D + 1.6 - 270 W/Ice	Yes	Y		1	.9	5	-1.6			8	1														
36	0.9 D + 1.6 - 300 W/Ice	Yes	Y		1	.9	5	-1....	4	.8	8	1														
37	0.9 D + 1.6 - 330 W/Ice	Yes	Y		1	.9	4	1....	5	-.8	8	1														
38	1.2 D + 1.0 - 0 W/Ice	Yes	Y		1	1.2	4	1			8	1														
39	1.2 D + 1.0 - 30 W/Ice	Yes	Y		1	1.2	4	.866	5	.5	8	1														
40	1.2 D + 1.0 - 60 W/Ice	Yes	Y		1	1.2	5	.866	4	.5	8	1														
41	1.2 D + 1.0 - 90 W/Ice	Yes	Y		1	1.2	5	1			8	1														
42	1.2 D + 1.0 - 120 W/Ice	Yes	Y		1	1.2	5	.866	4	-.5	8	1														
43	1.2 D + 1.0 - 150 W/Ice	Yes	Y		1	1.2	4	-.8...	5	.5	8	1														
44	1.2 D + 1.0 - 180 W/Ice	Yes	Y		1	1.2	4	-1			8	1														
45	1.2 D + 1.0 - 210 W/Ice	Yes	Y		1	1.2	4	-.8...	5	-.5	8	1														

Load Combinations (Continued)

	Description	Sol..	PDelta	SR...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
46	1.2 D + 1.0 - 240 W/Ice	Yes	Y		1	1.2	5	-.8...	4	-.5	8	1														
47	1.2 D + 1.0 - 270 W/Ice	Yes	Y		1	1.2	5	-1			8	1														
48	1.2 D + 1.0 - 300 W/Ice	Yes	Y		1	1.2	5	-.8...	4	.5	8	1														
49	1.2 D + 1.0 - 330 W/Ice	Yes	Y		1	1.2	4	.866	5	-.5	8	1														
50	1.2 D + 1.5 LL a + Service - 0 W	Yes	Y		1	1.2	6	1			9	1.5														
51	1.2 D + 1.5 LL a + Service - 30 W	Yes	Y		1	1.2	6	.866	7	.5	9	1.5														
52	1.2 D + 1.5 LL a + Service - 60 W	Yes	Y		1	1.2	7	.866	6	.5	9	1.5														
53	1.2 D + 1.5 LL a + Service - 90 W	Yes	Y		1	1.2	7	1			9	1.5														
54	1.2 D + 1.5 LL a + Service - 120 W	Yes	Y		1	1.2	7	.866	6	-.5	9	1.5														
55	1.2 D + 1.5 LL a + Service - 150 W	Yes	Y		1	1.2	6	-.8...	7	.5	9	1.5														
56	1.2 D + 1.5 LL a + Service - 180 W	Yes	Y		1	1.2	6	-1			9	1.5														
57	1.2 D + 1.5 LL a + Service - 210 W	Yes	Y		1	1.2	6	-.8...	7	-.5	9	1.5														
58	1.2 D + 1.5 LL a + Service - 240 W	Yes	Y		1	1.2	7	-.8...	6	-.5	9	1.5														
59	1.2 D + 1.5 LL a + Service - 270 W	Yes	Y		1	1.2	7	-1			9	1.5														
60	1.2 D + 1.5 LL a + Service - 300 W	Yes	Y		1	1.2	7	-.8...	6	.5	9	1.5														
61	1.2 D + 1.5 LL a + Service - 330 W	Yes	Y		1	1.2	6	.866	7	-.5	9	1.5														
62	1.2 D + 1.5 LL b + Service - 0 W	Yes	Y		1	1.2	6	1			10	1.5														
63	1.2 D + 1.5 LL b + Service - 30 W	Yes	Y		1	1.2	6	.866	7	.5	10	1.5														
64	1.2 D + 1.5 LL b + Service - 60 W	Yes	Y		1	1.2	7	.866	6	.5	10	1.5														
65	1.2 D + 1.5 LL b + Service - 90 W	Yes	Y		1	1.2	7	1			10	1.5														
66	1.2 D + 1.5 LL b + Service - 120 W	Yes	Y		1	1.2	7	.866	6	-.5	10	1.5														
67	1.2 D + 1.5 LL b + Service - 150 W	Yes	Y		1	1.2	6	-.8...	7	.5	10	1.5														
68	1.2 D + 1.5 LL b + Service - 180 W	Yes	Y		1	1.2	6	-1			10	1.5														
69	1.2 D + 1.5 LL b + Service - 210 W	Yes	Y		1	1.2	6	-.8...	7	-.5	10	1.5														
70	1.2 D + 1.5 LL b + Service - 240 W	Yes	Y		1	1.2	7	-.8...	6	-.5	10	1.5														
71	1.2 D + 1.5 LL b + Service - 270 W	Yes	Y		1	1.2	7	-1			10	1.5														
72	1.2 D + 1.5 LL b + Service - 300 W	Yes	Y		1	1.2	7	-.8...	6	.5	10	1.5														
73	1.2 D + 1.5 LL b + Service - 330 W	Yes	Y		1	1.2	6	.866	7	-.5	10	1.5														
74	1.2 D + 1.5 LL c + Service - 0 W	Yes	Y		1	1.2	6	1			11	1.5														
75	1.2 D + 1.5 LL c + Service - 30 W	Yes	Y		1	1.2	6	.866	7	.5	11	1.5														
76	1.2 D + 1.5 LL c + Service - 60 W	Yes	Y		1	1.2	7	.866	6	.5	11	1.5														
77	1.2 D + 1.5 LL c + Service - 90 W	Yes	Y		1	1.2	7	1			11	1.5														
78	1.2 D + 1.5 LL c + Service - 120 W	Yes	Y		1	1.2	7	.866	6	-.5	11	1.5														
79	1.2 D + 1.5 LL c + Service - 150 W	Yes	Y		1	1.2	6	-.8...	7	.5	11	1.5														
80	1.2 D + 1.5 LL c + Service - 180 W	Yes	Y		1	1.2	6	-1			11	1.5														
81	1.2 D + 1.5 LL c + Service - 210 W	Yes	Y		1	1.2	6	-.8...	7	-.5	11	1.5														
82	1.2 D + 1.5 LL c + Service - 240 W	Yes	Y		1	1.2	7	-.8...	6	-.5	11	1.5														
83	1.2 D + 1.5 LL c + Service - 270 W	Yes	Y		1	1.2	7	-1			11	1.5														
84	1.2 D + 1.5 LL c + Service - 300 W	Yes	Y		1	1.2	7	-.8...	6	.5	11	1.5														
85	1.2 D + 1.5 LL c + Service - 330 W	Yes	Y		1	1.2	6	.866	7	-.5	11	1.5														
86	1.2 D + 1.5 LL d + Service - 0 W	Yes	Y		1	1.2	6	1			12	1.5														
87	1.2 D + 1.5 LL d + Service - 30 W	Yes	Y		1	1.2	6	.866	7	.5	12	1.5														
88	1.2 D + 1.5 LL d + Service - 60 W	Yes	Y		1	1.2	7	.866	6	.5	12	1.5														
89	1.2 D + 1.5 LL d + Service - 90 W	Yes	Y		1	1.2	7	1			12	1.5														
90	1.2 D + 1.5 LL d + Service - 120 W	Yes	Y		1	1.2	7	.866	6	-.5	12	1.5														
91	1.2 D + 1.5 LL d + Service - 150 W	Yes	Y		1	1.2	6	-.8...	7	.5	12	1.5														
92	1.2 D + 1.5 LL d + Service - 180 W	Yes	Y		1	1.2	6	-1			12	1.5														
93	1.2 D + 1.5 LL d + Service - 210 W	Yes	Y		1	1.2	6	-.8...	7	-.5	12	1.5														
94	1.2 D + 1.5 LL d + Service - 240 W	Yes	Y		1	1.2	7	-.8...	6	-.5	12	1.5														
95	1.2 D + 1.5 LL d + Service - 270 W	Yes	Y		1	1.2	7	-1			12	1.5														
96	1.2 D + 1.5 LL d + Service - 300 W	Yes	Y		1	1.2	7	-.8...	6	.5	12	1.5														
97	1.2 D + 1.5 LL d + Service - 330 W	Yes	Y		1	1.2	6	.866	7	-.5	12	1.5														

Load Combinations (Continued)

	Description	Sol..	P..	Delta	SR...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
98	1.2 D + 1.5 LL Maint (1)	Yes	Y			1	1.2					13	1.5														
99	1.2 D + 1.5 LL Maint (2)	Yes	Y			1	1.2					14	1.5														
100	1.2 D + 1.5 LL Maint (3)	Yes	Y			1	1.2					15	1.5														
101	1.2 D + 1.5 LL Maint (4)	Yes	Y			1	1.2					16	1.5														
102	1.2 D + 1.5 LL Maint (5)	Yes	Y			1	1.2					17	1.5														
103	1.2 D + 1.5 LL Maint (6)	Yes	Y			1	1.2					18	1.5														

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	Y	-.042	%15
2	M5	Y	-.042	%65
3	M5	Y	0	0
4	M5	Y	0	0
5	M5	Y	0	0
6	M7	Y	-.064	%10
7	M7	Y	-.064	%90
8	M7	Y	-.075	%40
9	M7	Y	0	0
10	M7	Y	0	0
11	M8	Y	-.046	%15
12	M8	Y	-.046	%65
13	M8	Y	0	0
14	M8	Y	0	0
15	M8	Y	0	0
16	M1	Y	-.011	%80
17	M1	Y	0	0
18	M1	Y	0	0
19	M1	Y	0	0
20	M1	Y	0	0

Member Point Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	Z	-.072	%15
2	M5	Z	-.072	%65
3	M5	Z	0	0
4	M5	Z	0	0
5	M5	Z	0	0
6	M7	Z	-.245	%10
7	M7	Z	-.245	%90
8	M7	Z	-.04	%40
9	M7	Z	0	0
10	M7	Z	0	0
11	M8	Z	-.074	%15
12	M8	Z	-.074	%65
13	M8	Z	0	0
14	M8	Z	0	0
15	M8	Z	0	0
16	M1	Z	-.009	%80
17	M1	Z	0	0
18	M1	Z	0	0

Member Point Loads (BLC 2 : 0 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
19	M1	Z	0	0
20	M1	Z	0	0

Member Point Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	X	-.047	%15
2	M5	X	-.047	%65
3	M5	X	0	0
4	M5	X	0	0
5	M5	X	0	0
6	M7	X	-.089	%10
7	M7	X	-.089	%90
8	M7	X	-.028	%40
9	M7	X	0	0
10	M7	X	0	0
11	M8	X	-.048	%15
12	M8	X	-.048	%65
13	M8	X	0	0
14	M8	X	0	0
15	M8	X	0	0
16	M1	X	-.004	%80
17	M1	X	0	0
18	M1	X	0	0
19	M1	X	0	0
20	M1	X	0	0

Member Point Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	Z	-.026	%15
2	M5	Z	-.026	%65
3	M5	Z	0	0
4	M5	Z	0	0
5	M5	Z	0	0
6	M7	Z	-.078	%10
7	M7	Z	-.078	%90
8	M7	Z	-.017	%40
9	M7	Z	0	0
10	M7	Z	0	0
11	M8	Z	-.027	%15
12	M8	Z	-.027	%65
13	M8	Z	0	0
14	M8	Z	0	0
15	M8	Z	0	0
16	M1	Z	-.005	%80
17	M1	Z	0	0
18	M1	Z	0	0
19	M1	Z	0	0
20	M1	Z	0	0

Member Point Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]

Member Point Loads (BLC 5 : 90 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	X	-.019	%15
2	M5	X	-.019	%65
3	M5	X	0	0
4	M5	X	0	0
5	M5	X	0	0
6	M7	X	-.035	%10
7	M7	X	-.035	%90
8	M7	X	-.013	%40
9	M7	X	0	0
10	M7	X	0	0
11	M8	X	-.02	%15
12	M8	X	-.02	%65
13	M8	X	0	0
14	M8	X	0	0
15	M8	X	0	0
16	M1	X	-.004	%80
17	M1	X	0	0
18	M1	X	0	0
19	M1	X	0	0
20	M1	X	0	0

Member Point Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	Z	-.007	%15
2	M5	Z	-.007	%65
3	M5	Z	0	0
4	M5	Z	0	0
5	M5	Z	0	0
6	M7	Z	-.024	%10
7	M7	Z	-.024	%90
8	M7	Z	-.004	%40
9	M7	Z	0	0
10	M7	Z	0	0
11	M8	Z	-.007	%15
12	M8	Z	-.007	%65
13	M8	Z	0	0
14	M8	Z	0	0
15	M8	Z	0	0
16	M1	Z	-.0008	%80
17	M1	Z	0	0
18	M1	Z	0	0
19	M1	Z	0	0
20	M1	Z	0	0

Member Point Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	X	-.004	%15
2	M5	X	-.004	%65
3	M5	X	0	0
4	M5	X	0	0
5	M5	X	0	0

Member Point Loads (BLC 7 : 90 Wind - Service) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
6	M7	X	-.009	%10
7	M7	X	-.009	%90
8	M7	X	-.003	%40
9	M7	X	0	0
10	M7	X	0	0
11	M8	X	-.005	%15
12	M8	X	-.005	%65
13	M8	X	0	0
14	M8	X	0	0
15	M8	X	0	0
16	M1	X	-.0004	%80
17	M1	X	0	0
18	M1	X	0	0
19	M1	X	0	0
20	M1	X	0	0

Member Point Loads (BLC 8 : Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M5	Y	-.078	%15
2	M5	Y	-.078	%65
3	M5	Y	0	0
4	M5	Y	0	0
5	M5	Y	0	0
6	M7	Y	-.23	%10
7	M7	Y	-.23	%90
8	M7	Y	-.047	%40
9	M7	Y	0	0
10	M7	Y	0	0
11	M8	Y	-.08	%15
12	M8	Y	-.08	%65
13	M8	Y	0	0
14	M8	Y	0	0
15	M8	Y	0	0
16	M1	Y	-.01	%80
17	M1	Y	0	0
18	M1	Y	0	0
19	M1	Y	0	0
20	M1	Y	0	0

Member Point Loads (BLC 13 : Maint LL 1)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.25	%5

Member Point Loads (BLC 14 : Maint LL 2)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.25	%95

Member Point Loads (BLC 15 : Maint LL 3)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M13	Y	-.25	1.417

Member Distributed Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	-.009	-.009	0	0
2	M3	Z	-.006	-.006	0	0
3	M5	Z	-.006	-.006	0	0
4	M6	Z	-.006	-.006	0	0
5	M7	Z	-.006	-.006	0	0
6	M8	Z	-.006	-.006	0	0
7	M13	Z	-.012	-.012	0	0
8	M18	Z	-.006	-.006	0	0
9	M19	Z	-.01	-.01	0	0
10	M20	Z	-.01	-.01	0	0

Member Distributed Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.009	-.009	0	0
2	M3	X	-.006	-.006	0	0
3	M5	X	-.006	-.006	0	0
4	M6	X	-.006	-.006	0	0
5	M7	X	-.006	-.006	0	0
6	M8	X	-.006	-.006	0	0
7	M13	X	-.012	-.012	0	0
8	M18	X	-.006	-.006	0	0
9	M19	X	-.01	-.01	0	0
10	M20	X	-.01	-.01	0	0

Member Distributed Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	-.002	-.002	0	0
2	M3	Z	-.003	-.003	0	0
3	M5	Z	-.002	-.002	0	0
4	M6	Z	-.002	-.002	0	0
5	M7	Z	-.002	-.002	0	0
6	M8	Z	-.002	-.002	0	0
7	M13	Z	-.006	-.006	0	0
8	M18	Z	-.002	-.002	0	0
9	M19	Z	-.007	-.007	0	0
10	M20	Z	-.007	-.007	0	0

Member Distributed Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.002	-.002	0	0
2	M3	X	-.003	-.003	0	0
3	M5	X	-.002	-.002	0	0
4	M6	X	-.002	-.002	0	0
5	M7	X	-.002	-.002	0	0
6	M8	X	-.002	-.002	0	0
7	M13	X	-.006	-.006	0	0
8	M18	X	-.002	-.002	0	0
9	M19	X	-.007	-.007	0	0
10	M20	X	-.007	-.007	0	0

Member Distributed Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	-.0004	-.0004	0	0
2	M3	Z	-.0004	-.0004	0	0
3	M5	Z	-.0003	-.0003	0	0
4	M6	Z	-.0003	-.0003	0	0
5	M7	Z	-.0003	-.0003	0	0
6	M8	Z	-.0003	-.0003	0	0
7	M13	Z	-.001	-.001	0	0
8	M18	Z	-.0003	-.0003	0	0
9	M19	Z	-.001	-.001	0	0
10	M20	Z	-.001	-.001	0	0

Member Distributed Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.0004	-.0004	0	0
2	M3	X	-.0004	-.0004	0	0
3	M5	X	-.0003	-.0003	0	0
4	M6	X	-.0003	-.0003	0	0
5	M7	X	-.0003	-.0003	0	0
6	M8	X	-.0003	-.0003	0	0
7	M13	X	-.001	-.001	0	0
8	M18	X	-.0003	-.0003	0	0
9	M19	X	-.001	-.001	0	0
10	M20	X	-.001	-.001	0	0

Member Distributed Loads (BLC 8 : Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.011	-.011	0	0
2	M3	Y	-.013	-.013	0	0
3	M5	Y	-.009	-.009	0	0
4	M6	Y	-.009	-.009	0	0
5	M7	Y	-.009	-.009	0	0
6	M8	Y	-.009	-.009	0	0
7	M13	Y	-.016	-.016	0	0
8	M18	Y	-.009	-.009	0	0
9	M19	Y	-.011	-.011	0	0
10	M20	Y	-.011	-.011	0	0

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
No Data to Print ...			

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N7	max	1.264	5	2.34	38	1.08	14	-1.424	8	5.172	4	1.099	99
2		min	-1.383	23	.626	7	-.844	8	-7.806	38	-5.132	10	-1.825	98
3	N27	max	.391	98	.098	44	1.13	2	0	103	0	103	0	103
4		min	-.256	99	.012	2	-1.366	20	0	1	0	1	0	1
5	Totals:	max	1.489	5	2.432	46	2.176	2						

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
6		min	-1.489	23	.646	4	-2.176	20						

Envelope AISC 13th(360-05): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc.....		LC	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn.....	Eqn
1	M13	HSS4X4X4	.738	3	28	.217	3	y	98	103.156	106.155	12.311	12.311	1...H1-1b
2	M7	PIPE_2.0	.634	4.5	20	.140	4.5		20	14.916	32.13	1.872	1.872	2...H1-1b
3	M1	PIPE_3.0	.523	6.25	39	.159	6.25		20	28.251	65.205	5.749	5.749	1...H1-1b
4	M6	PIPE_2.0	.390	4.5	40	.102	4.5		14	14.916	32.13	1.872	1.872	2...H1-1b
5	M8	PIPE_2.0	.371	4.5	46	.071	4.5		46	14.916	32.13	1.872	1.872	2...H1-1b
6	M5	PIPE_2.0	.318	4.5	41	.073	4.5		38	14.916	32.13	1.872	1.872	2...H1-1b
7	M18	PIPE_2.0	.287	4.167	45	.169	1.302		20	6.295	32.13	1.872	1.872	2...H1-1b
8	M19	L2.5x2.5x3	.182	0	2	.018	0	y	40	9.015	29.192	.873	1.694	1...H2-1
9	M20	L2.5x2.5x3	.156	0	2	.016	0	z	47	9.015	29.192	.873	1.696	1...H2-1
10	M3	PIPE_4.0	.000	.75	18	.000	.75		18	92.571	93.24	10.631	10.631	1...H1-1b

Exhibit F

Power Density/RF Emissions Report

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CTNH442A

CTNH442A replacement for CTNH221A
150 Willow Street
Hamden, Connecticut 06410

May 15, 2019

EBI Project Number: 6219001641

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**6.99%**

May 15, 2019

T-Mobile
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CTNH442A - CTNH442A replacement for CTNH221A

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **150 Willow Street** in **Hamden, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile 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 ($\mu W/cm^2$). 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 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency 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 T-Mobile Wireless antenna facility located at 150 Willow Street in Hamden, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 GSM/UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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 Ericsson AIR21 B2A_B4P for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-UNA20 for the 600 MHz / 700 MHz channel(s), the Ericsson AIR21 B2P_B4A for the 2100 MHz channel(s) in Sector A, the Ericsson AIR21 B2A_B4P for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-UNA20 for the 600 MHz / 700 MHz channel(s), the Ericsson AIR21 B2P_B4A for the 2100 MHz channel(s) in Sector B, the Ericsson AIR21 B2A_B4P for the 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-UNA20 for the 600 MHz / 700 MHz channel(s), the Ericsson AIR21 B2P_B4A for the 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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 centerline of the proposed antennas is 137 feet above ground level (AGL).

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.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B2A_B4P	Make / Model:	Ericsson AIR21 B2A_B4P	Make / Model:	Ericsson AIR21 B2A_B4P
Frequency Bands:	1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.35 dBd	Gain:	15.35 dBd / 15.35 dBd	Gain:	15.35 dBd / 15.35 dBd
Height (AGL):	137 feet	Height (AGL):	137 feet	Height (AGL):	137 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,113.21	ERP (W):	4,113.21	ERP (W):	4,113.21
Antenna A1 MPE %:	**0.79%**	Antenna B1 MPE %:	**0.79%**	Antenna C1 MPE %:	**0.79%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAARR24_43-UNA20	Make / Model:	RFS APXVAARR24_43-UNA20	Make / Model:	RFS APXVAARR24_43-UNA20
Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz	Frequency Bands:	600 MHz / 700 MHz
Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 13.35 dBd
Height (AGL):	137 feet	Height (AGL):	137 feet	Height (AGL):	137 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	2,481.08	ERP (W):	2,481.08	ERP (W):	2,481.08
Antenna A2 MPE %:	**1.10%**	Antenna B2 MPE %:	**1.10%**	Antenna C2 MPE %:	**1.10%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR21 B2P_B4A	Make / Model:	Ericsson AIR21 B2P_B4A	Make / Model:	Ericsson AIR21 B2P_B4A
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.35 dBd	Gain:	15.35 dBd	Gain:	15.35 dBd
Height (AGL):	137 feet	Height (AGL):	137 feet	Height (AGL):	137 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,113.21	ERP (W):	4,113.21	ERP (W):	4,113.21
Antenna A3 MPE %:	**0.79%**	Antenna B3 MPE %:	**0.79%**	Antenna C3 MPE %:	**0.79%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	2.67%
Sprint	2.01%
Metro PCS	0.4%
Verizon	1.91%
Site Total MPE % :	6.99%

T-Mobile Sector A Total:	2.67%
T-Mobile Sector B Total:	2.67%
T-Mobile Sector C Total:	2.67%
Site Total:	6.99%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz GSM/UMTS	2	1028.30	137.0	3.94	1900 MHz GSM/UMTS	1000	0.39%
T-Mobile 2100 MHz UMTS	2	1028.30	137.0	3.94	2100 MHz UMTS	1000	0.39%
T-Mobile 600 MHz LTE	2	591.73	137.0	2.27	600 MHz LTE	400	0.57%
T-Mobile 700 MHz LTE	2	648.82	137.0	2.49	700 MHz LTE	467	0.53%
T-Mobile 2100 MHz LTE	2	2056.61	137.0	7.88	2100 MHz LTE	1000	0.79%
						Total:	**2.67%**

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 T-Mobile 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:

T-Mobile Sector	Power Density Value (%)
Sector A:	2.67%
Sector B:	2.67%
Sector C:	2.67%
T-Mobile Maximum MPE % (Sector A):	2.67%
Site Total:	6.99%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **6.99%** 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.

Exhibit G

Mailings Receipt/Proof of Notice

UPS CampusShip: View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   Customers with a Daily Pickup
   Your driver will pickup your shipment(s) as usual.

   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the Resources area of CampusShip and select UPS Locations.
   Schedule a same day or future day Pickup to have a UPS driver pickup all your CampusShip packages.
   Hand the package to any UPS driver in your area.

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DANBURY ,CT 06810

UPS Access Point™
THE UPS STORE
42 LAKE AVENUE EXT
DANBURY ,CT 06811

UPS Access Point™
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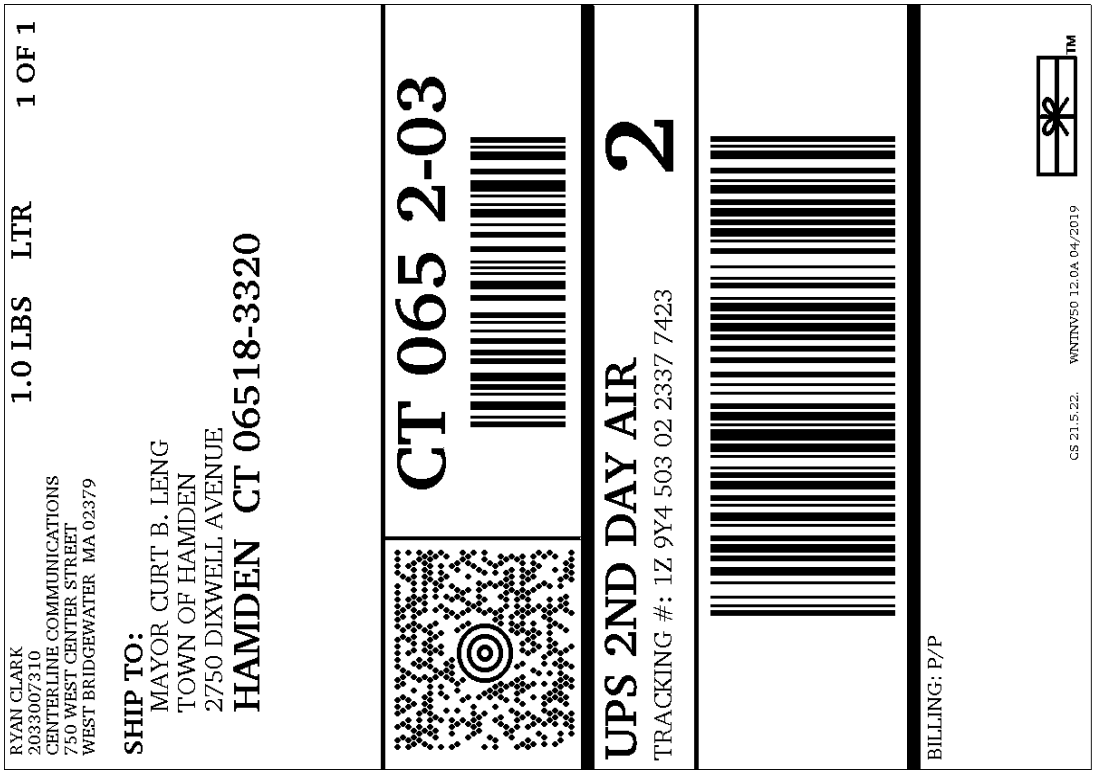
107 TRIANGLE ST
DANBURY ,CT 06810

FOLD HERE



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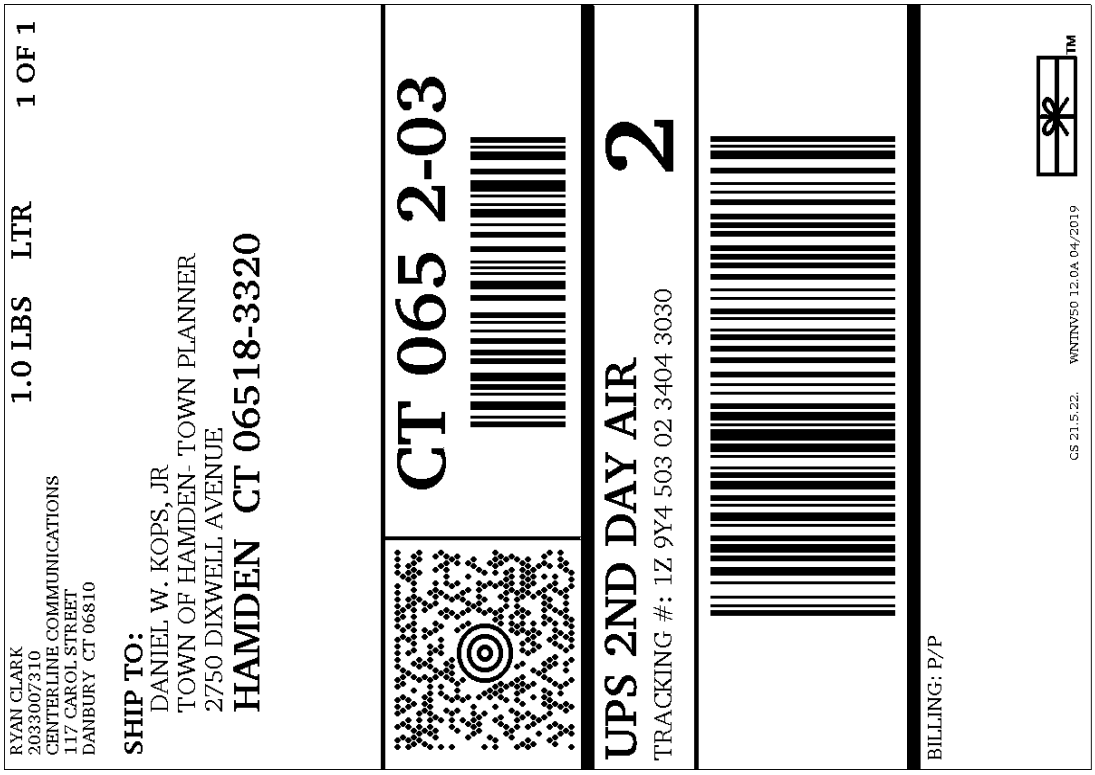

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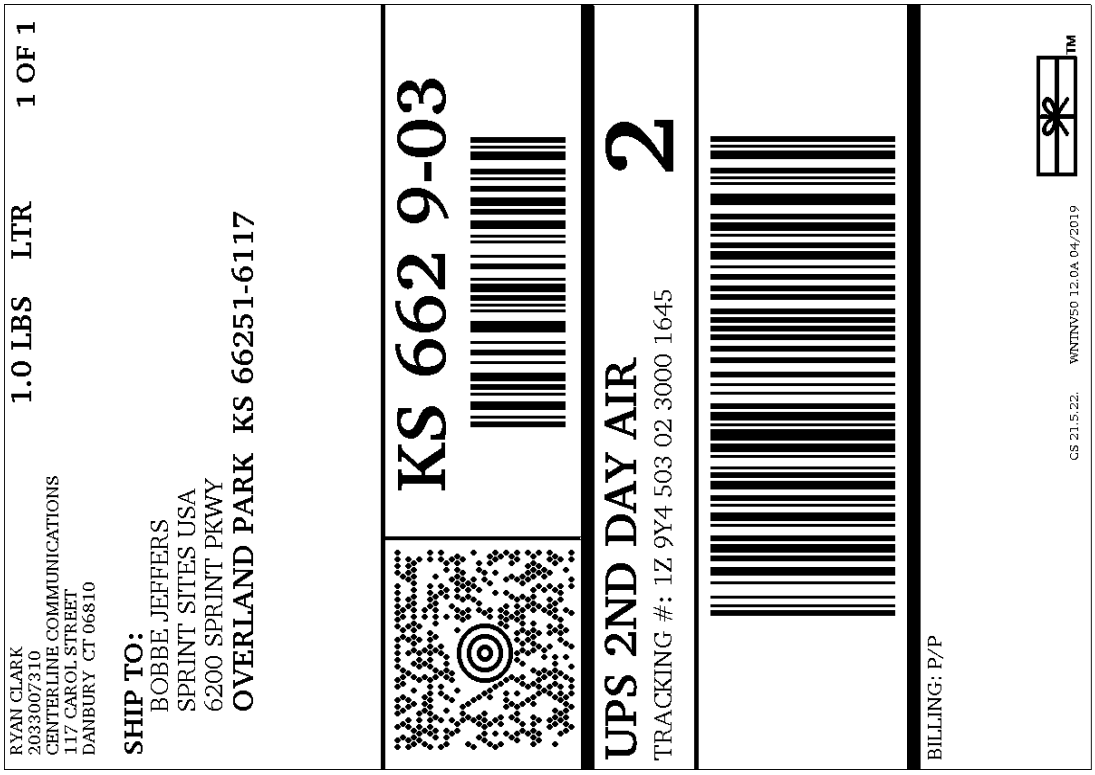

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