



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

October 12, 2018

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification for Sprint DO Macro: 876368
Sprint Site ID: CT33XC018
1 Public Works Dr. East Hampton, CT 06032
Latitude: 41° 33' 53.14"/ Longitude: -72° 32' 35.18"

Dear Ms. Bachman:

Sprint currently maintains six (6) antennas at the 180-foot level of the existing 180-foot monopole tower at 1 Public Works Dr. East Hampton, CT 06032. The tower is owned by Crown Castle. The Town of East Hampton owns the property. Sprint now intends to replace six (6) antennas with three (3) new antennas. These antennas would be installed at the 180-foot level of the tower. Sprint also intends to install mount modifications, twelve (12) RRHs, and replace six (6) Coax cables with four (4) new hybrid cables.

This facility was approved by the Connecticut Siting Council on November 21, 2002, This decision is documented in Docket No. 229.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Town manager Michael Maniscalco, Town of East Hampton, Glen LeConche, Building Official, Town of East Hampton, and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

The Foundation for a Wireless World.

CrownCastle.com

Melanie A. Bachman

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5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

- Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
- Tab 2: Exhibit-2: Structural Modification Report
- Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Michael Miniscalco, Town Manager
20 East High Street
East Hampton, CT 06424

Glen LeConche, Building Official
20 East High Street
East Hampton, CT 06424

1 PUBLIC WORKS DR #CELL

Location 1 PUBLIC WORKS DR #CELL

Mblu 06/ 5A/ 8B/ /

Acct# R07102

Owner EAST HAMPTON TOWN OF

Assessment \$210,000

Appraisal \$300,000

PID 5538

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$100,000	\$200,000	\$300,000
Assessment			
Valuation Year	Improvements	Land	Total
2015	\$70,000	\$140,000	\$210,000

Owner of Record

Owner	EAST HAMPTON TOWN OF	Sale Price	\$0
Co-Owner	%SPRINT SPECTRUM LP-PROPTY TAX	Certificate	
Address	PO BOX 8430 (CT33XC018); KANSAS CITY, MO 64114	Book & Page	000/0000
		Sale Date	01/01/1900
		Instrument	29

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
EAST HAMPTON TOWN OF	\$0		000/0000	29	01/01/1900

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: \$0
Building Percent
Good:
Replacement Cost
Less Depreciation: \$0

Building Photo

Building Attributes	
Field	Description
Style	Outbuildings
Model	

Grade:	
Story Height	
Foundation	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
# Extra Fixtures	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Fireplace	
Fin Basement	
Fin Bsmt Qual	
Bsmt. Garages	
Gas Fireplace	



(http://images.vgsi.com/photos/EastHamptonCTPhotos//default.j

Building Layout

 Building

(http://images.vgsi.com/photos/EastHamptonCTPhotos//Sketche:

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	



Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 200
Description Commercial Vacant
Zone C
Neighborhood COM
Alt Land Appr Category No

Land Line Valuation

Size (Acres) 1
Frontage
Depth
Assessed Value \$140,000
Appraised Value \$200,000

Outbuildings

Outbuildings	Legend
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Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
CEL	Cell Tower			1 UNITS	\$100,000	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$100,000	\$200,000	\$300,000
2014	\$100,000	\$200,000	\$300,000
2012	\$100,000	\$200,000	\$300,000

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$70,000	\$140,000	\$210,000
2014	\$70,000	\$140,000	\$210,000
2012	\$70,000	\$140,000	\$210,000

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Main St

Main St

Main St

Summit St

Summit St

Watrous St

Barton Hill Rd

Barton Hill Rd

Airline-Trail

The Learning Center at East Hampton

Congregational Church

Classic Lighting Devices

American Powder Coating

Harvey's Appliances

Sal's Small Engine Repair, 12 Summit...

Kenneth Barber & Associates

Town Garage

AirLine Cycles

Red Door Boutique

Main Street Pizza

Joseph N. Goff House Museum and...

ECO Coffee House

Designing Kids

Renu Hair Studio

Airline Trail Parking





SPRINT SITE NUMBER:
SPRINT SITE NAME:
SITE TYPE:
TOWER HEIGHT:

CT33XC018
YANKEE LAKE/EAST
MONOPOLE
180'-0"

CROWN CASTLE BU #: 876368
SITE ADDRESS:
COUNTY:
JURISDICTION:
MIDDLESEX
TOWN OF EAST HAMPTON

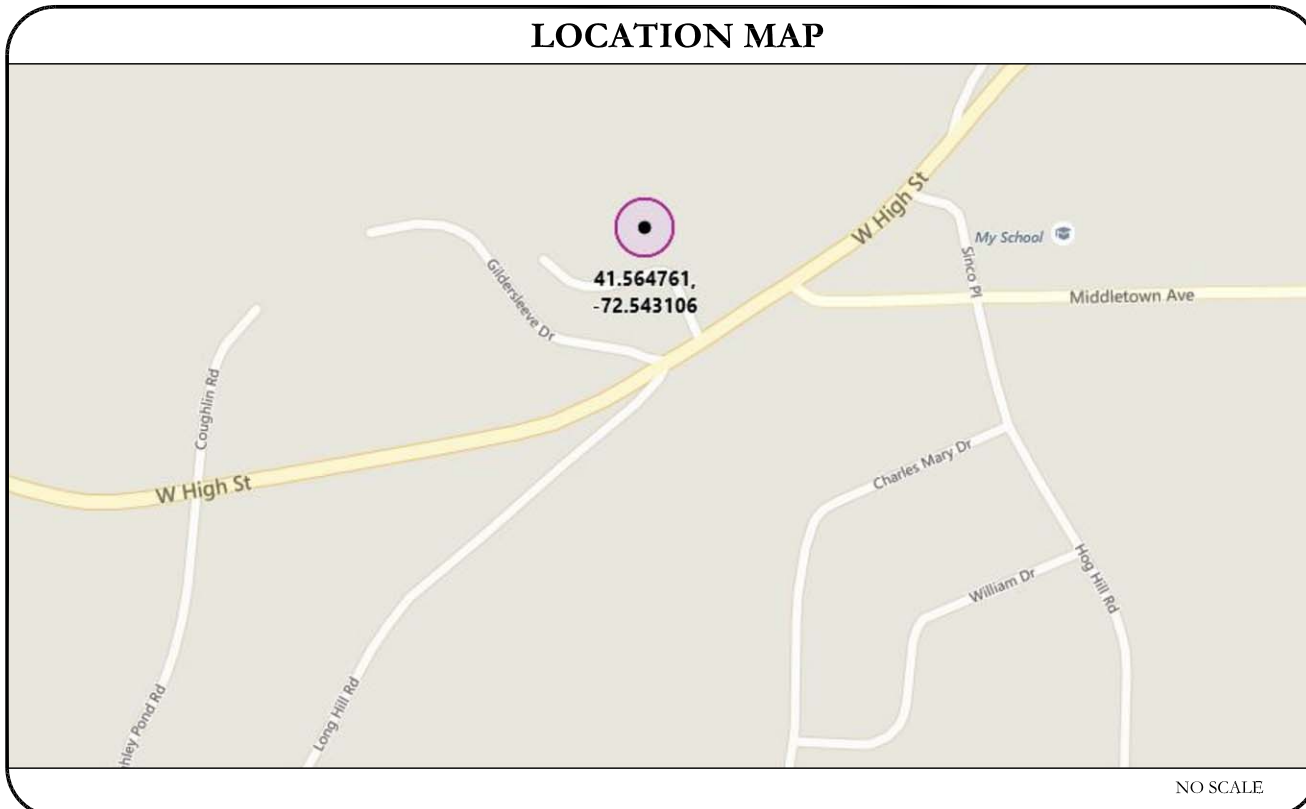
SPRINT DO MACRO UPGRADE



SITE INFORMATION	
CROWN CASTLE SITE NAME:	YANKEE LAKE/EAST HAMPTON/TOWN
SITE ADDRESS:	1 PUBLIC WORKS DR. EAST HAMPTON, CT 06032
COUNTY:	MIDDLESEX
MAP/PARCEL #:	EHAM-000071-000002R
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41° 33' 53.14"
LONGITUDE:	-72° 32' 35.18"
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	377 FT.
CURRENT ZONING:	NOT AVAILABLE
JURISDICTION:	TOWN OF EAST HAMPTON
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	VB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	TOWN OF EAST HAMPTON 20 EAST HIGH STREET EAST HAMPTON, CT 06424
TOWER OWNER:	GLOBAL SIGNAL ACQUISITIONS II LLC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	SPRINT 6391 SPRINT PARKWAY OVERLAND PARK, KS 66251-2650
CROWN CASTLE APPLICATION ID:	412832
ELECTRIC PROVIDER:	CONNECTICUT LIGHT & POWER CO (800) 286-2000
TELCO PROVIDER:	AT&T (866) 620-6900

DRAWING INDEX	
SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	OVERALL AND ENLARGED SITE PLAN
C-2	FINAL ELEVATION AND ANTENNA PLANS
C-3	ANTENNA AND CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECIFICATIONS
G-1	GROUNDING DETAILS
G-2	GROUNDING DETAILS
ATTACHMENT	MOUNT MODIFICATION SPECIFICATIONS

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.



PROJECT DESCRIPTION	
THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.	
TOWER SCOPE OF WORK	<ul style="list-style-type: none"> REMOVE (6) ANTENNAS REMOVE (6) 1-5/8" COAX CABLES INSTALL (3) ANTENNAS INSTALL (12) RRHs INSTALL (4) 1-1/4" HYBRID CABLES INSTALL MOUNT MODIFICATIONS PER MOUNT ANALYSIS BY HUDSON DESIGN GROUP LLC DATED JUNE 15, 2018
GROUND SCOPE OF WORK	<ul style="list-style-type: none"> NONE
<p>INSTALLER NOTE: NO ADDITIONAL LOADING TO BE ADDED UNTIL MOUNT MODIFICATIONS ARE INSTALLED PER MOUNT ANALYSIS BY HUDSON DESIGN GROUP DATED JUNE 15, 2018.</p>	
DESIGN PACKAGE BASED ON THE APPLICATION ID: 412832 REVISION: 3	

APPLICABLE CODES/REFERENCE DOCUMENTS									
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:									
<table border="0"> <tr> <th>CODE TYPE</th> <th>CODE</th> </tr> <tr> <td>BUILDING</td> <td>2016 CT STATE BUILDING CODE/2012 IBC W/ CT AMENDMENTS</td> </tr> <tr> <td>MECHANICAL</td> <td>2016 CT STATE BUILDING CODE/2012 IMC W/ CT AMENDMENTS</td> </tr> <tr> <td>ELECTRICAL</td> <td>2016 CT STATE BUILDING CODE/2014 NEC W/ CT AMENDMENTS</td> </tr> </table>	CODE TYPE	CODE	BUILDING	2016 CT STATE BUILDING CODE/2012 IBC W/ CT AMENDMENTS	MECHANICAL	2016 CT STATE BUILDING CODE/2012 IMC W/ CT AMENDMENTS	ELECTRICAL	2016 CT STATE BUILDING CODE/2014 NEC W/ CT AMENDMENTS	<p>REFERENCE DOCUMENTS:</p> <p>STRUCTURAL ANALYSIS: CROWN CASTLE USA INC. DATED JULY 12, 2018</p> <p>MOUNT ANALYSIS (CONDITIONAL PASSING): HUDSON DESIGN GROUP LLC DATED JUNE 15, 2018</p>
CODE TYPE	CODE								
BUILDING	2016 CT STATE BUILDING CODE/2012 IBC W/ CT AMENDMENTS								
MECHANICAL	2016 CT STATE BUILDING CODE/2012 IMC W/ CT AMENDMENTS								
ELECTRICAL	2016 CT STATE BUILDING CODE/2014 NEC W/ CT AMENDMENTS								
<p>CALL CONNECTICUT ONE CALL (800) 922-4455 CBYD.COM CALL 2 WORKING DAYS BEFORE YOU DIG!</p>									

PROJECT TEAM	
CROWN CASTLE A&E FIRM:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 CROWN.AE.APPROVAL@CROWNCASTLE.COM
CROWN CASTLE CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065
	TRICIA PELON - PROJECT MANAGER (518) 373-3507
	JASON D'AMICO - CONSTRUCTION MANAGER (860) 209-0104
	DASHANNA HANLON - A&E PROJECT MANAGER DASHANNA.HANLON@CROWNCASTLE.COM (781) 970-0067

SPRINT SITE NUMBER:
CT33XC018

BU #: **876368**
YANKEE LAKE/EAST HAMPTON/TOWN

1 PUBLIC WORKS DR.
 EAST HAMPTON, CT 06032

EXISTING 180'-0" MONOPOLE

ISSUED FOR:				
REV	DATE	DRWN	DESCRIPTION	DES./QA
A	07/24/18	JMM	PRELIMINARY	KK
0	09/10/18	ADE	CONSTRUCTION	AF

DocuSigned by:
 JOSEPH F. FANDOLZI
 No. 30515
 LICENSED PROFESSIONAL ENGINEER

9/11/2018 2:46:53 PM EDT

Crown Castle USA Inc. Certificate of Registration #PEC.0001101

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

SHEET NUMBER: **T-1** REVISION: **0**

CROWN CASTLE SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES, SUBCONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION.
3. ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE TOWER SITE" AND LATEST VERSION OF TIA 1019 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
4. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS.
5. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
6. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
7. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
11. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE PROJECT SPECIFICATIONS.
12. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
13. NOTICE TO PROCEED- NO WORK TO COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF A PURCHASE ORDER.
14. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA 1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA-1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

SPRINT CONSTRUCTION NOTES

SECTION 01 100 - SCOPE OF WORK

THE WORK:

MUST COMPLY WITH ALL APPLICABLE ADOPTED CODES AND STANDARDS, AND PORTIONS THEREOF. SPRINT METHOD OF PROCEDURE (MOP) AND SPRINT STANDARDS AT THE TIME OF CONSTRUCTION START.

PRECEDENCE:

SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. ALONG WITH SPRINT CONSTRUCTION MANAGER APPROVAL.

SITE FAMILIARITY:

CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

ON-SITE SUPERVISION:

THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE:

THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

A. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO PROVIDE A COMPLETE FUNCTIONING SYSTEM. MODIFICATIONS MAY BE REQUIRED TO SUITE JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

B. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

C. MARK THE FIELD SET OF DRAWINGS IN RED, DOCUMENTING ANY CHANGES FROM THE CONSTRUCTION DOCUMENTS.

METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION:

CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS. CONTRACTOR IS RESPONSIBLE FOR DISTRIBUTION OF LATEST MOPS.

- A. TOP HAT
- B. HOW TO INSTALL A NEW CABINET
- C. BASE BAND UNIT IN EXISTING UNIT
- D. INSTALLATION OF BATTERIES
- E. INSTALLATION OF FIBER CABLE
- F. INSTALLATION OF RRU'S
- G. CABLING
- H. TS-0200 REV 5 - ANTENNA LINE ACCEPTANCE STANDARDS
- I. SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1.
- J. COMMISSIONING MOPS

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

- A. COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DRAWINGS.
- B. CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT TO ENSURE IT IS PROTECTED AND HANDLED PROPERLY THROUGHOUT THE CONSTRUCTION DURATION.
- C. CONTRACTOR IS RESPONSIBLE FOR RECEIPT OF SPRINT FURNISHED EQUIPMENT AT CELL SITE OR CONTRACTORS LOCATION. CONTRACTOR TO COMPLETE SHIPPING AND RECEIPT DOCUMENTATION

IN ACCORDANCE WITH COMPANY PRACTICE. CONTRACTOR MAY BE REQUIRED TO PICK UP MATERIAL AT LOCATION PRESCRIBED BY SPRINT.

SECTION 01 300 - CELL SITE CONSTRUCTION

NOTICE TO PROCEED:

NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF WORK ORDER.

SITE CLEANLINESS:

CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

SECTION 01 400 - SUBMITTALS AND TESTS

ALTERNATIVES:

AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED.

TESTS AND INSPECTIONS:

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. COAX SWEEPS AND FIBER TESTS PER TS-200 REV 5 ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT: PROVIDE AN AUTOMATED REPORT UPLOADED TO SITERRA USING A COMMERCIAL MADE-FOR PURPOSE ELECTRONIC ANTENNA ALIGNMENT TOOL (AAT). INSTALLED AZIMUTH, CENTERLINE AND DOWNTILT MUST CONFORM WITH RF CONFIGURATION DATA.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
4. ALL TESTING REQUIRED BY APPLICABLE INSTALLATION MOPS.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

1. AZIMUTH, DOWNTILT, AGL FROM SUNSIGHT INSTRUMENTS - ANTENNA ALIGNMENT TOOL (AAT)
2. SWEEP AND FIBER TESTS.
3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT.
4. ALL AVAILABLE JURISDICTIONAL PERMIT AND OCCUPANCY INFORMATION.
5. PDF SCAN OF REDLINES PRODUCED IN FIELD.
6. A PDF SCAN OF REDLINE MARK-UPS SUITABLE FOR USE IN ELECTRONIC AS-BUILT DRAWING PRODUCTION.
7. LIEN WAIVERS.
8. FINAL PAYMENT APPLICATION.
9. REQUIRED FINAL CONSTRUCTION PHOTOS.
10. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS.
11. APPLICABLE POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINT'S DOCUMENT REPOSITORY OF RECORD).
12. CLOSEOUT PHOTOGRAPHS AND CLOSEOUT CHECKLIST: SPRINT WILL PROVIDE SEPARATE GUIDANCE.

a. PROVIDE PHOTOGRAPHS OF FINAL PROJECT PER THE FOLLOWING LIST. ADDITIONAL PHOTOS MAY BE REQUIRED TO SUPPORT ACCEPTANCE PROCESSES

- (i) BACK MAIN FIBER CABLE ROUTE (MINIMUM TWO PHOTOS)
 - (ii) OF EACH ANTENNA AND RRU
 - (iii) MANUFACTURERS NAME TAG FOR ALL SERIALIZED EQUIPMENT
 - (iv) PULL AND DISTRIBUTION BOXES INTERMEDIATE BETWEEN RRU'S AND RBS (DOOR OPEN)
 - (v) RBS CABINET WITH DOOR OPEN SHOWING MODIFICATIONS
 - (vi) POWER CABINET, DOORS OPEN, BATTERIES INSTALLED
 - (vii) BREAK OUT CYLINDERS
 - (viii) ASR SIGNAGE FOR SPRINT OWNED TOWERS
 - (ix) RADIATION EXPOSURE WARNING SIGNS
 - (x) PHOTOGRAPH FROM EACH SECTOR FROM APPROXIMATELY RAD CENTER OF ANY NEW ANTENNA AT HORIZON.
- b. LOAD PHOTOS TO SITERRA PROJECT LIBRARY 15. IN 15 CREATE NEW CATEGORY: 2.5 DEPLOYMENT, AND SECTION: PERMANENT CONSTRUCTION. LABEL PHOTOS WITH SITE CASCADE AND VIEW BEING DEPICTED. CAMERAS USED TO TAKE PHOTOS SHALL BE GPS ENABLED SUCH THAT THE GPS COORDINATES ARE INCLUDED IN THE PHOTO MEDIA-FILE INFORMATION.

COMMISSIONING:

PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

INTEGRATION:

PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPS

SECTION 09 900 - PAINTING

QUALITY ASSURANCE:

A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. COMPLY WITH ALL ENVIRONMENTAL REGULATIONS FOR VOLATILE ORGANIC COMPOUNDS.

MATERIALS:

A. MANUFACTURERS: BENJAMIN MOORE, ICI DEVOE COATINGS, PPG, SHERWIN WILLIAMS OR APPROVED PROVIDE PREMIUM GRADE, PROFESSIONAL-QUALITY PRODUCTS FOR COATING SYSTEMS.

PAINT SCHEDULE:

A. EXTERIOR ANTENNAE AND ANTENNA MOUNTING HARDWARE: ONE COAT OF PRIMER AND TWO FINISH COATS. PAINT FOR ANTENNAE SHALL BE NON-METALLIC BASED AND CONTAIN NO METALLIC PARTICLES. PROVIDE COLORS AND PATTERNS AS REQUIRED TO MASK APPEARANCE OF ANTENNAE ON ADJACENT BUILDING SURFACES AND AS ACCEPTABLE TO THE OWNER. REFER TO ANTENNA MANUFACTURER'S INSTRUCTION WHENEVER POSSIBLE.

B. WATER TANKS: TOUCH UP - PREPARE SURFACES TO BE REPAIRED. FOLLOW INDUSTRY STANDARDS AND REQUIREMENTS OF OWNER TO MATCH EXISTING COATING AND FINISH.

PAINTING APPLICATION:

1. INSPECT SURFACES, REPORT UNSATISFACTORY CONDITIONS IN WRITING; BEGINNING WORK MEANS ACCEPTANCE OF SUBSTRATE.
2. COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR PREPARATION, PRIMING AND COATING WORK. COORDINATE WITH WORK OF OTHER SECTIONS.
3. MATCH APPROVED MOCK-UPS FOR COLOR, TEXTURE, AND PATTERN. RE-COAT OR REMOVE AND REPLACE WORK WHICH DOES NOT MATCH OR SHOWS LOSS OF ADHESION.
4. CLEAN UP, TOUCH UP AND PROTECT WORK.

TOUCHUP PAINTING:

1. GALVANIZING DAMAGE AND ALL BOLTS AND NUTS SHALL BE TOUCHED UP AFTER TOWER ERECTION WITH "GALVANOX," "DRY GALV," OR "ZINC-IT".
2. FIELD TOUCHUP PAINT SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
3. ALL METAL COMPONENTS SHALL BE HANDLED WITH CARE TO PREVENT DAMAGE TO THE COMPONENTS, THEIR PRESERVATIVE TREATMENT, OR THEIR PROTECTIVE COATINGS.

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

SUMMARY:

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

ANTENNAS AND RRU'S:

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

NV FIBER CABLE:

EXISTING NV FIBER CABLE WILL BE USED AT EACH SITE. CABLE SHALL BE USED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTIONS:

FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2" FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE. MINIMUM LENGTH FOR JUMPER SHALL BE SO AS TO ALLOW FOR THE PROPER BEND RADIUS PER MANUFACTURER OR SPRINT SPECIFICATIONS.

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:

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

ANTENNA INSTALLATION:

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

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

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

FIBER CABLE INSTALLATION:

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

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

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

1. FASTENING MAIN FIBER CABLES:

a. LATTICE AND GUYED TOWERS:

ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS. HOISTING GRIPS SHOULD BE INSTALLED AT MID-POINT IF CABLE RUN EXCEEDS 200' AS WELL AS TOP SIDE.

a. MONOPOLE:

ALL CABLES SHALL BE PERMANENTLY SUPPORTED WITH HOISTING GRIPS AT INTERVALS OF NO MORE THAN 200' (ONE HOISTING GRIP PER COAX).

1. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA). WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES.

a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH AT 18" O.C. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.

b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.

2. FASTENING OR SECURING JUMPERS SHOULD CONSIST OF STAINLESS STEEL CLIPS, 18" FROM REAR OF CONNECTOR AND 24" THEREAFTER AND AT NO TIME SHALL THEY CONTACT TOWER OR STRUCTURAL STEEL.

3. CABLE INSTALLATION:

a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE. NOTIFY THE CONSTRUCTION MANAGER.

b. CABLE ROUTING CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOPE AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.

c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.

5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.

6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 REV 5.

7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY A ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1.



6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650



3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

SPRINT SITE NUMBER:
CT33XC018

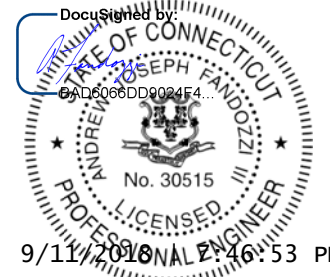
BU #: **876368**
YANKEE LAKE/EAST HAMPTON/TOWN

1 PUBLIC WORKS DR.
EAST HAMPTON, CT 06032

EXISTING 180'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	07/24/18	JMM	PRELIMINARY	KK
0	09/10/18	ADE	CONSTRUCTION	AF



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T-2

REVISION:

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WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

- A. ALL FIBER AND COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.
- B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF AMALGAMATING TAPE.
2. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
3. JMA-WPS SERIES ENCLOSURE.
4. BUTYL AND TAPE, 1 COMPLETE WRAP OF 3/4" PRE-TAPE, BUTYL WRAPPED IN HALF INCH LAP LAYERS, ENDED WITH SHINGLED DOWNWARD 3 WRAPS OF 2" TAPE, 3 WRAPS OF 3/4" TAPE SHINGLED DOWNWARD, FREE OF WRINKLES, BUCKLES AND FLAGGING.
5. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

- C. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE CONSTRUCTION DRAWINGS.

FIBER CABLE INSTALLATION:

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

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

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

- 1. FASTENING MAIN FIBER CABLES:

a. LATTICE AND GUYED TOWERS:

ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS. HOISTING GRIPS SHOULD BE INSTALLED AT MID-POINT IF CABLE RUN EXCEEDS 200' AS WELL AS TOP SIDE.

b. MONOPOLE:

ALL CABLES SHALL BE PERMANENTLY SUPPORTED WITH HOISTING GRIPS AT INTERVALS OF NO MORE THAN 200' (ONE HOISTING GRIP PER COAX).

- 2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA). WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES.

a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH AT 18" O.C. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.

b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.

- 3. FASTENING OR SECURING JUMPERS SHOULD CONSIST OF STAINLESS STEEL CLIPS, 18" FROM REAR OF CONNECTOR AND 24" THEREAFTER AND AT NO TIME SHALL THEY CONTACT TOWER OR STRUCTURAL STEEL.

- 4. CABLE INSTALLATION:

- a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE. NOTIFY THE CONSTRUCTION MANAGER.

b. CABLE ROUTING CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOPE AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.

c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.

- 5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.

- 6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 REV 5.

- 7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1.

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

- A. ALL FIBER AND COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.
- B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF AMALGAMATING TAPE.
2. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
3. JMA-WPS SERIES ENCLOSURE.
4. BUTYL AND TAPE, 1 COMPLETE WRAP OF 3/4" PRE-TAPE, BUTYL WRAPPED IN HALF INCH LAP LAYERS, ENDED WITH SHINGLED DOWNWARD 3 WRAPS OF 2" TAPE, 3 WRAPS OF 3/4" TAPE SHINGLED DOWNWARD, FREE OF WRINKLES, BUCKLES AND FLAGGING.
5. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

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

SUMMARY:

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

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

BY THE APPLICABLE INSTALLATION MOPS.

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

DC CIRCUIT BREAKER LABELING:

- A. LABEL CIRCUIT BREAKERS ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1. SECTION 26 100 - BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS.

QUALITY ASSURANCE:

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

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

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

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS. PROVIDE PRODUCTS BY THE FOLLOWING:

1. ALLIED TUBE AND CONDUIT.
2. B-LINE SYSTEM.
3. UNISTRUT DIVERSIFIED PRODUCTS.
4. THOMAS & BETTS

B. FASTENERS: TYPES, MATERIALS AND CONSTRUCTION FEATURES AS FOLLOWS:

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

SUPPORTING DEVICES:

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

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

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

1. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.
2. USE VIBRATION AND SHOCK-RESISTANT FASTNERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

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

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

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

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

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

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

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

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

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

HUBS AND BOXES:

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

- B. CABLE TERMINATION FITTINGS FOR CONDUIT

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

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

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

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

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

SUPPLEMENTAL GROUNDING SYSTEM:

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

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

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

EXISTING STRUCTURE:

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

CONDUIT AND CONDUCTOR INSTALLATION:

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

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

ADDITIONAL REQUIRED NOTES:

- GC IS RESPONSIBLE FOR HIRING ALL 3RD PARTY SPECIAL INSPECTIONS AS REQUIRED PER MUNICIPALITY
- GC IS RESPONSIBLE FOR VERIFYING ALL FIELD MEASUREMENTS PRIOR TO STARTING CONSTRUCTION
- DO NOT OPEN RRU PACKAGES IN THE RAIN
- NO OPEN FLAME ON SITE
- GC TO ENSURE HYBRIDS ARE SUPPORTED EVERY 3'-0" ON HORIZONTAL AND 4'-0" ON VERTICAL RUNS



6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650



3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

SPRINT SITE NUMBER:
CT33XC018

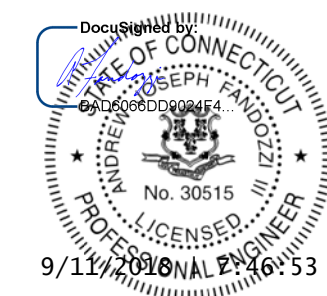
BU #: **876368**
YANKEE LAKE/EAST HAMPTON/TOWN

1 PUBLIC WORKS DR.
EAST HAMPTON, CT 06032

EXISTING 180'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	07/24/18	JMM	PRELIMINARY	KK
0	09/10/18	ADE	CONSTRUCTION	AF



9/11/2018 2:46:53 PM EDT

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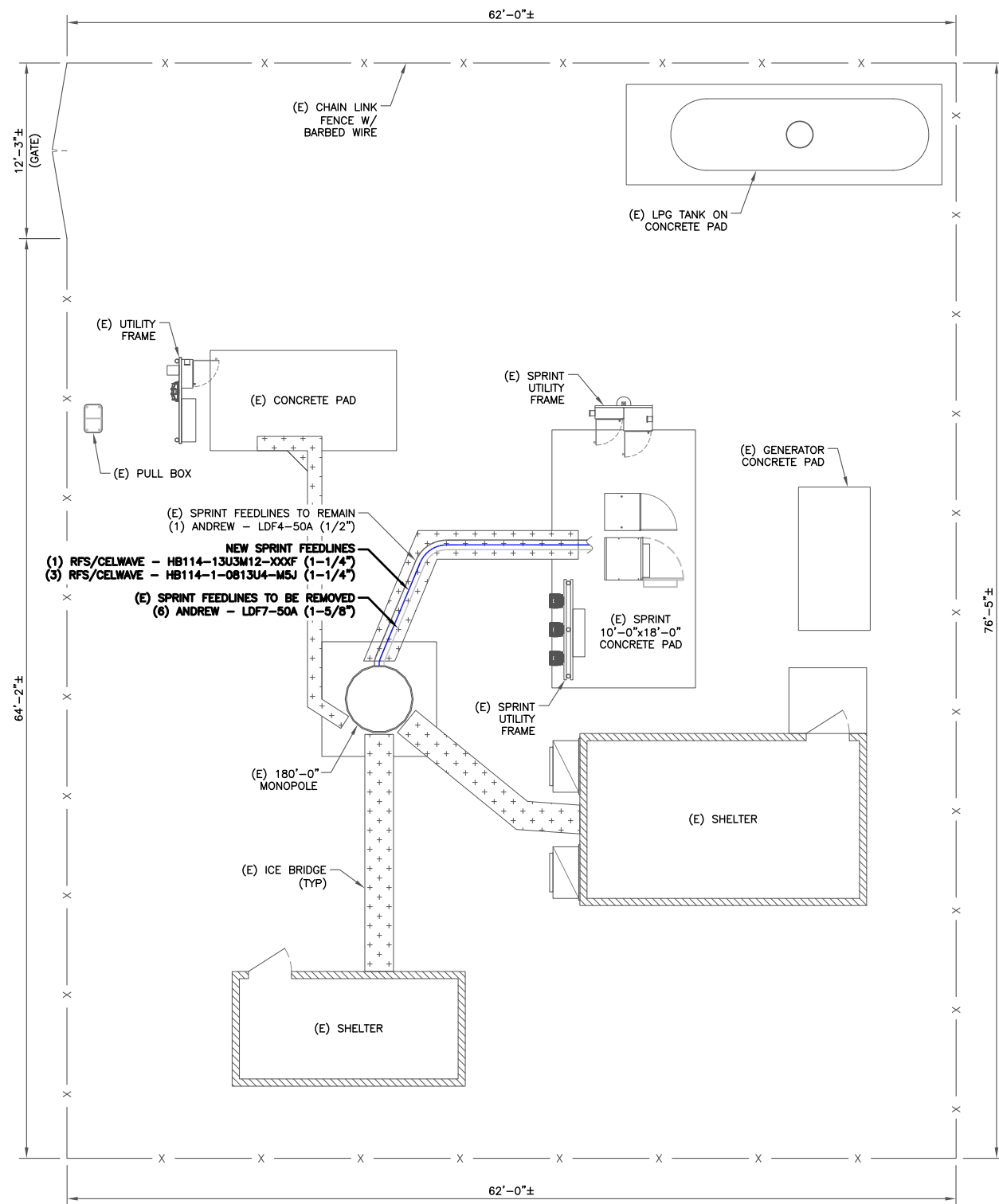
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OF A LICENSED PROFESSIONAL ENGINEER,
TO ALTER THIS DOCUMENT.

SHEET NUMBER:

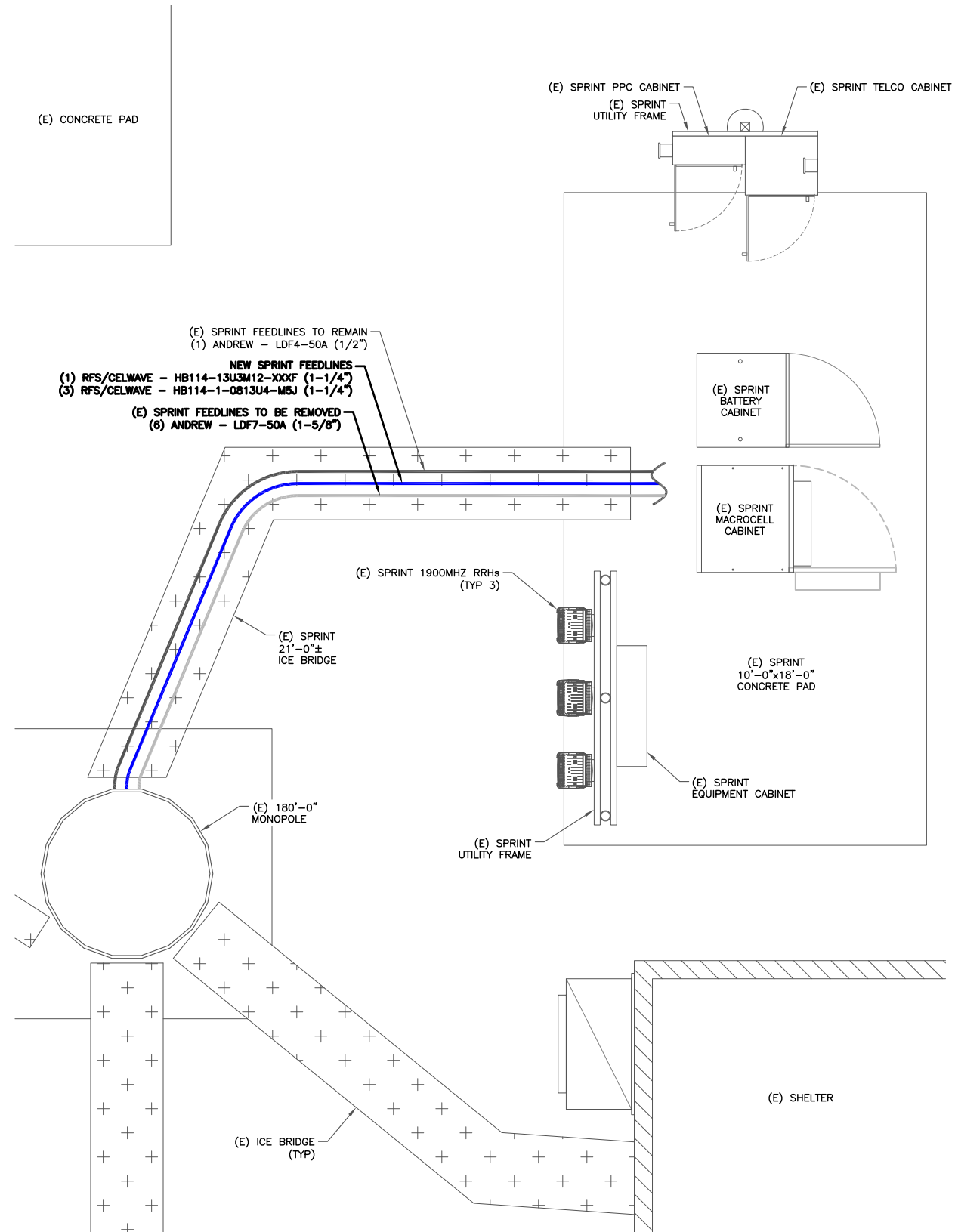
T-3

REVISION:

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1 OVERALL SITE PLAN
SCALE: 3/16"=1'-0" (FULL SIZE)
3/32"=1'-0" (11x17)



2 ENLARGED SITE PLAN
SCALE: 1/2"=1'-0" (FULL SIZE)
1/4"=1'-0" (11x17)



SPRINT SITE NUMBER:
CT33XC018

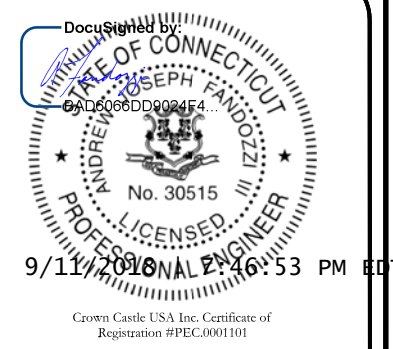
BU #: 876368
YANKEE LAKE/EAST HAMPTON/TOWN

1 PUBLIC WORKS DR.
EAST HAMPTON, CT 06032

EXISTING 180'-0" MONOPOLE

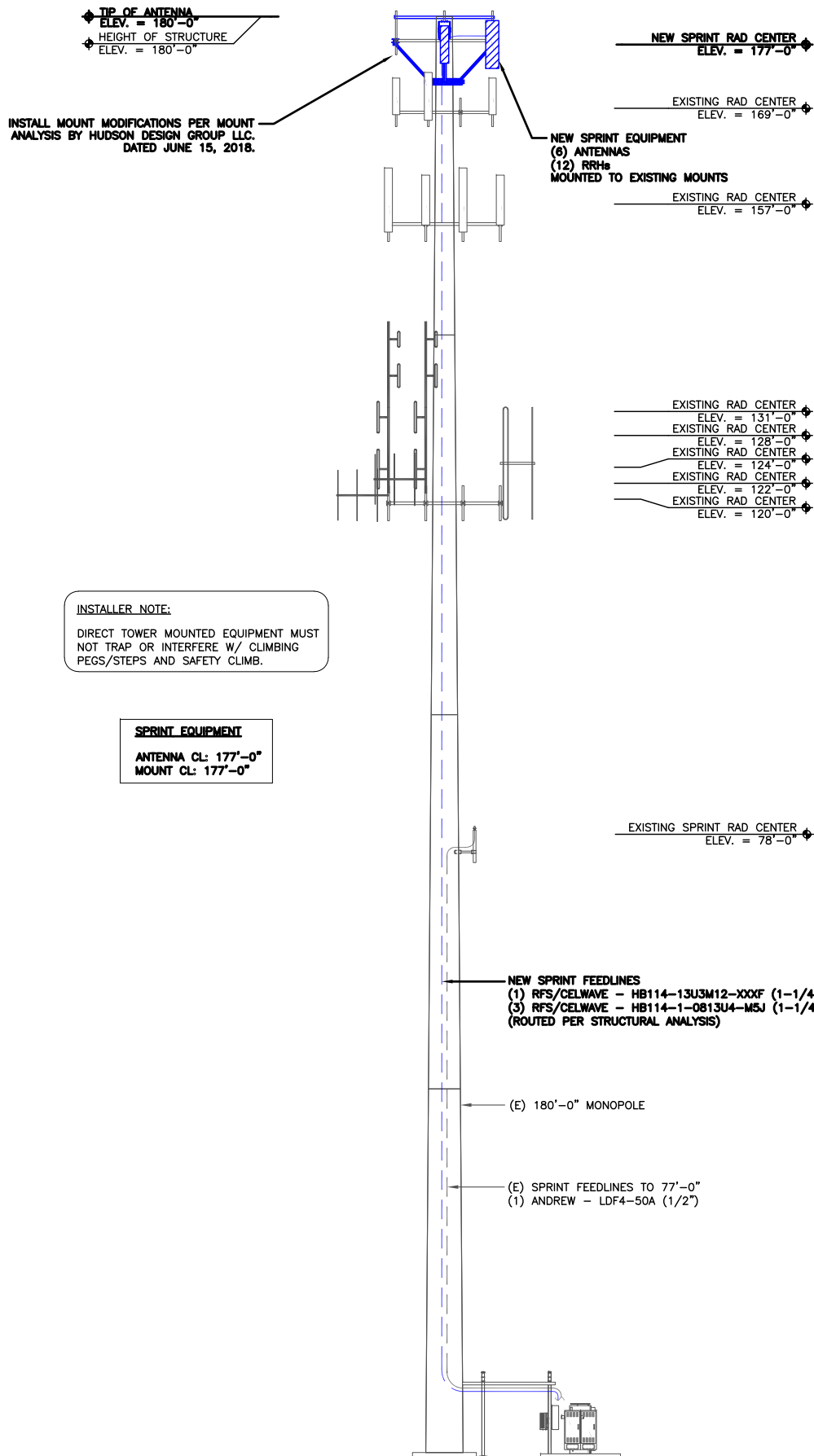
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REV	DATE	DRWN	DESCRIPTION	DES./QA
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0	09/10/18	ADE	CONSTRUCTION	AF



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SHEET NUMBER: **C-1** REVISION: **0**



INSTALLER NOTE:
DIRECT TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ CLIMBING PEGS/STEPS AND SAFETY CLIMB.

SPRINT EQUIPMENT
ANTENNA CL: 177'-0"
MOUNT CL: 177'-0"

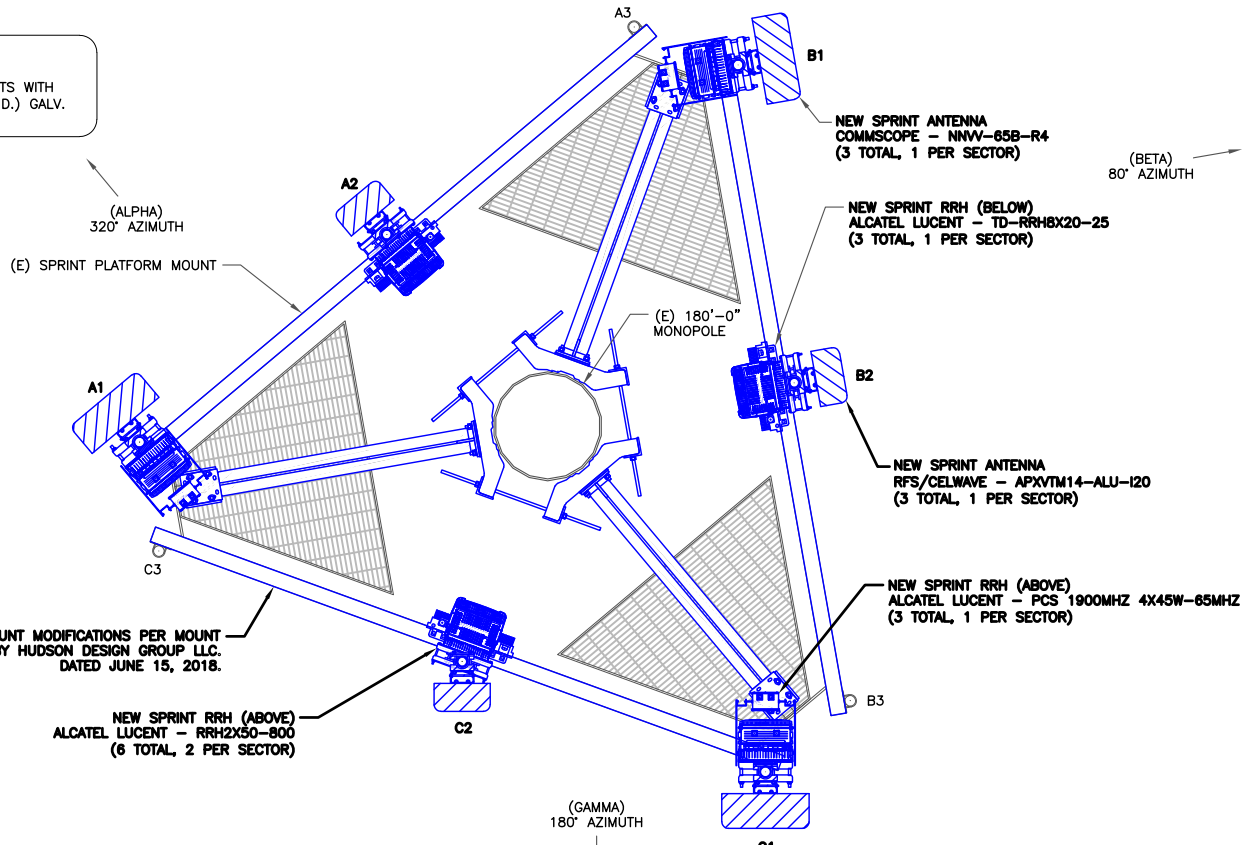
1 FINAL ELEVATION
SCALE: NOT TO SCALE

INSTALLER NOTE:
NO ADDITIONAL LOADING TO BE ADDED UNTIL MOUNT MODIFICATIONS ARE INSTALLED PER MOUNT ANALYSIS BY HUDSON DESIGN GROUP LLC DATED JUNE 15, 2018.

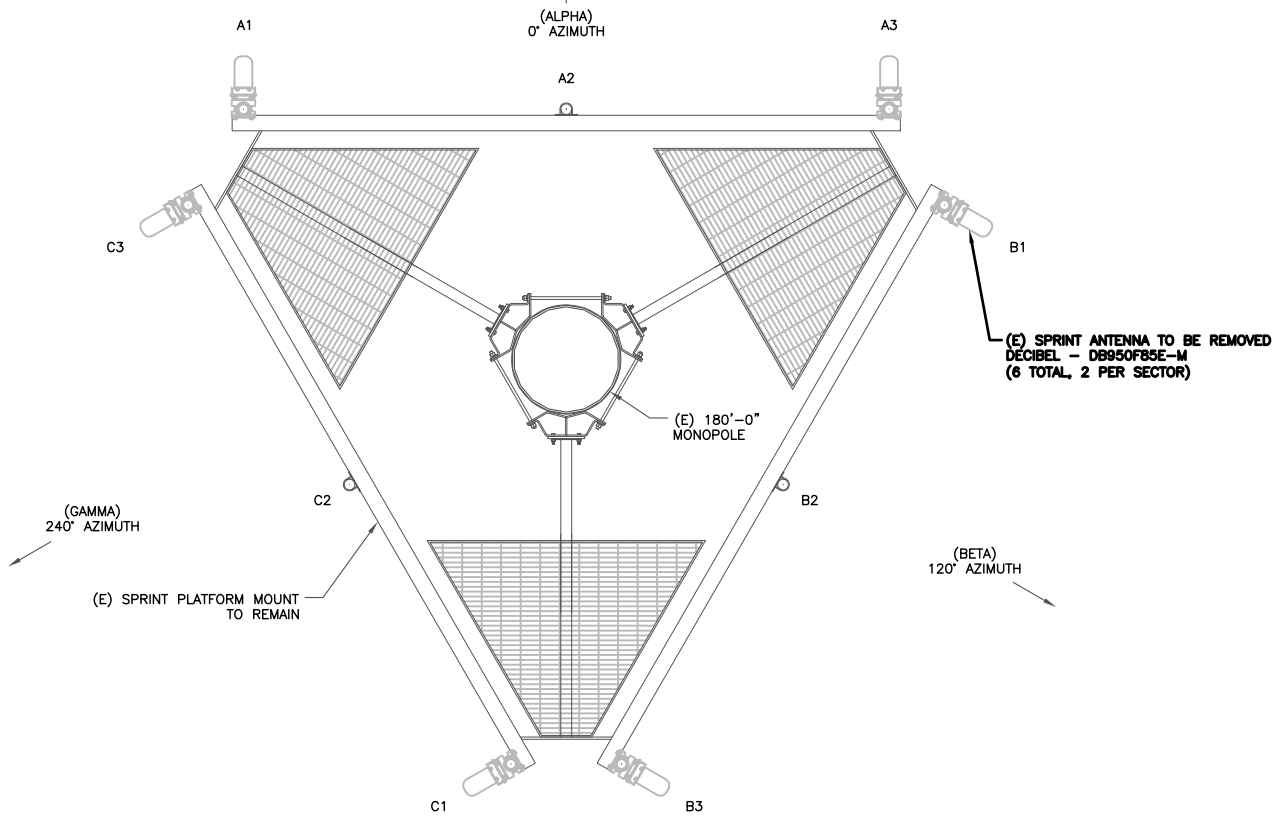
INSTALLER NOTE:
REPLACE EXISTING PIPE MOUNTS WITH NEW 2-1/2" STD (2-7/8" O.D.) GALV. SCH 40 PIPE AS REQ'D.

INSTALL MOUNT MODIFICATIONS PER MOUNT ANALYSIS BY HUDSON DESIGN GROUP LLC. DATED JUNE 15, 2018.

NEW SPRINT RRH (ABOVE) ALCATEL LUCENT - RRH2X50-800 (6 TOTAL, 2 PER SECTOR)



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

SPRINT SITE NUMBER:
CT33XC018

BU #: 876368
YANKEE LAKE/EAST HAMPTON/TOWN

1 PUBLIC WORKS DR.
EAST HAMPTON, CT 06032

EXISTING 180'-0" MONOPOLE

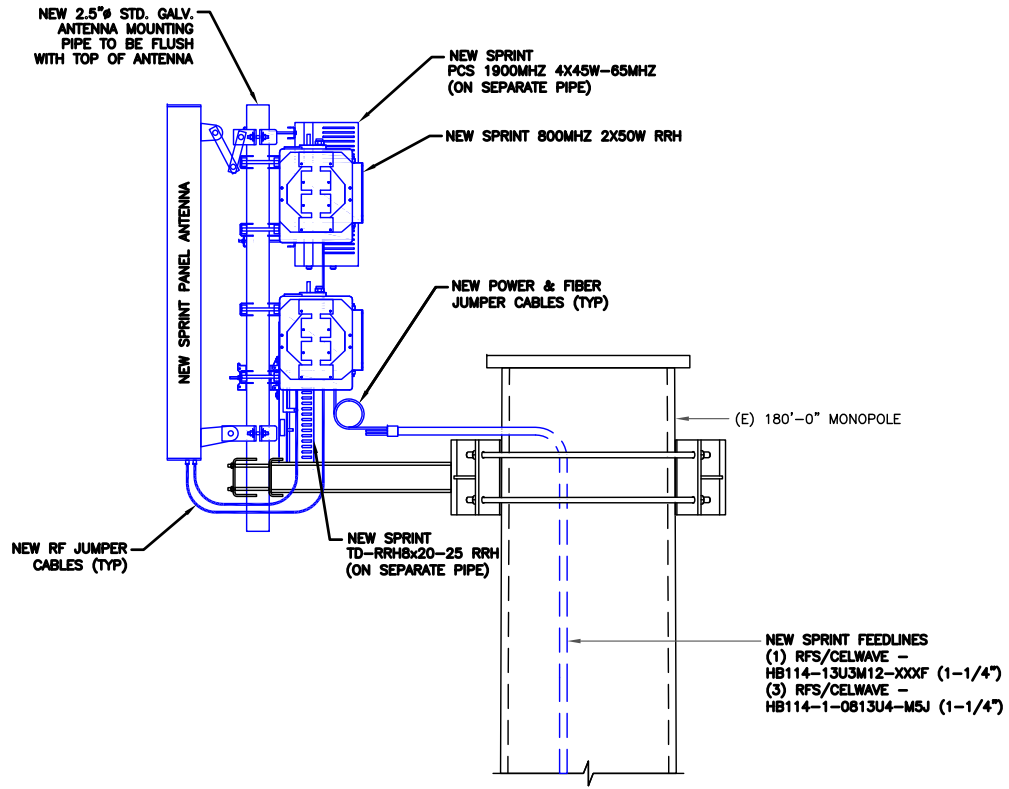
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	07/24/18	JMM	PRELIMINARY	KK
0	09/10/18	ADE	CONSTRUCTION	AF

DocuSigned by:
JOSEPH FANDOLZI
No. 30515
LICENSED PROFESSIONAL ENGINEER
9/11/2018 2:46:53 PM EDT
Crown Castle USA Inc. Certificate of Registration #PEC.0001101

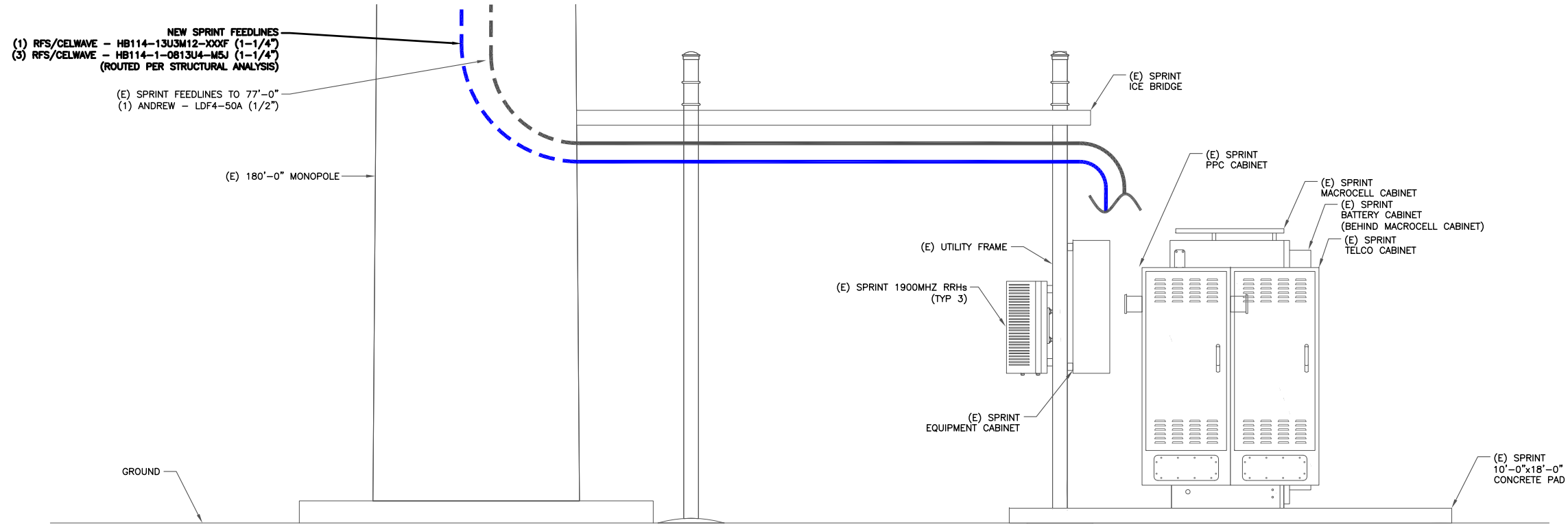
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER: C-2 **REVISION:** 0



1 ANTENNA MOUNTING ELEVATION
SCALE: NOT TO SCALE

2 NOT USED
SCALE: NOT TO SCALE



3 EQUIPMENT ELEVATION DETAIL
SCALE: NOT TO SCALE



SPRINT SITE NUMBER:
CT33XC018

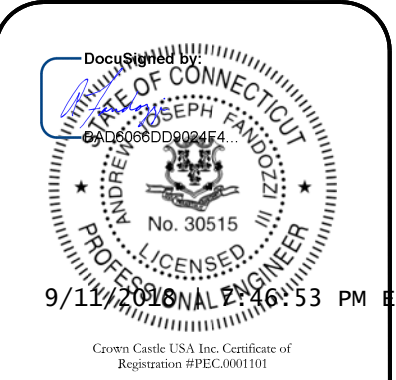
BU #: 876368
YANKEE LAKE/EAST HAMPTON/TOWN

1 PUBLIC WORKS DR.
EAST HAMPTON, CT 06032

EXISTING 180'-0" MONOPOLE

ISSUED FOR:

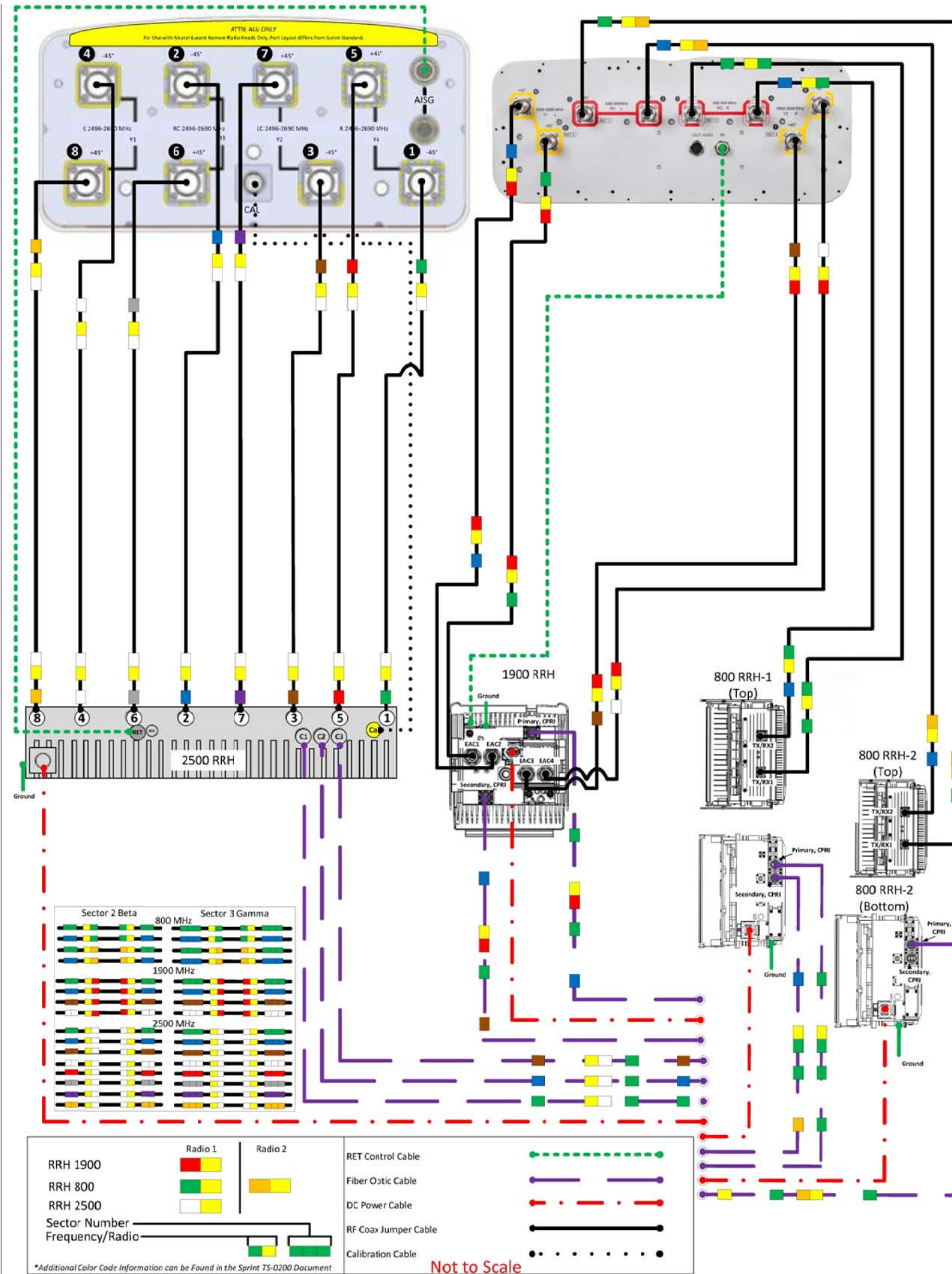
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SHEET NUMBER: **C-3** REVISION: **0**

ALU 211 APXVTM14-ALU-I20 & NNVV-65B-R4 wo Filters



SPRINT SITE NUMBER:
CT33XC018

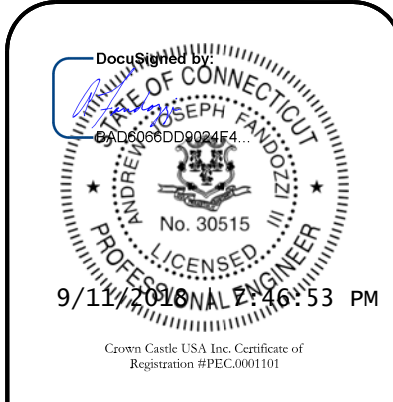
BU #: **876368**
YANKEE LAKE/EAST HAMPTON/TOWN

1 PUBLIC WORKS DR.
 EAST HAMPTON, CT 06032

EXISTING 180'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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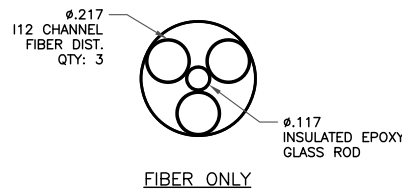
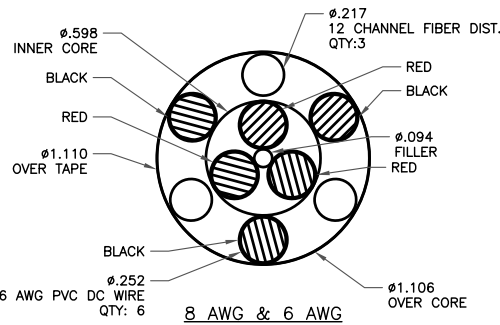
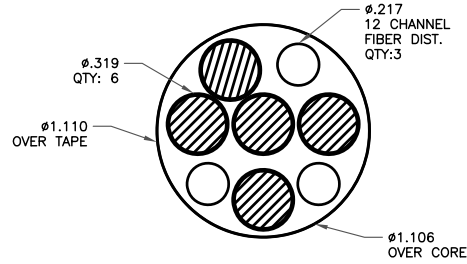
SHEET NUMBER: **C-4** REVISION: **0**

RFS HYBRIFLEX RISER CABLE SCHEDULE

FIBER ONLY (EXISTING DC POWER)	HYBRID CABLE MN: HB058-M12-050F 12X MULTI-MODE FIBER PAIRS, TOP: OUTDOOR PROTECTED CONNECTORS, BOTTOM: LC CONNECTORS, 5/8" CABLE, 50 FT	50 FT
	MN: HB058-M12-075F	75 FT
	MN: HB058-M12-100F	100 FT
	MN: HB058-M12-125F	125 FT
	MN: HB058-M12-150F	150 FT
	MN: HB058-M12-175F	175 FT
	MN: HB058-M12-200F	200 FT
8 AWG POWER	HYBRID CABLE MN: HB114-08U3M12-050F 3X8 AWG POWER PAIRS, 12X MULTI-MODE FIBER PAIRS, OUTDOOR RATED CONNECTORS & LC CONNECTORS, 1-1/4" CABLE, 50 FT	50 FT
	MN: HB114-08U3M12-075F	75 FT
	MN: HB114-08U3M12-100F	100 FT
	MN: HB114-08U3M12-125F	125 FT
	MN: HB114-08U3M12-150F	150 FT
	MN: HB114-08U3M12-175F	175 FT
	MN: HB114-08U3M12-200F	200 FT
6 AWG POWER	HYBRID CABLE MN: HB114-13U3M12-225F 3X6 AWG POWER PAIRS, 12X MULTI-MODE FIBER PAIRS, OUTDOOR RATED CONNECTORS & LC CONNECTORS, 1-1/4" CABLE, 225 FT	225 FT
	MN: HB114-13U3M12-250F	250 FT
	MN: HB114-13U3M12-275F	275 FT
	MN: HB114-13U3M12-300F	300 FT
4 AWG POWER	HYBRID CABLE MN: HB114-21U3M12-325F 3X6 AWG POWER PAIRS, 12X MULTI-MODE FIBER PAIRS, OUTDOOR RATED CONNECTORS & LC CONNECTORS, 1-1/4" CABLE, 325 FT	325 FT
	MN: HB114-21U3M12-350F	350 FT
	MN: HB114-21U3M12-375F	375 FT

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE
MANUF: RFS/CELWAVE

CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
FIBER ONLY	VARIES	USE NV HYBRIFLEX	5/8"
HYBRIFLEX	<200'	8 AWG	1-1/4"
HYBRIFLEX	225-300'	6 AWG	1-1/4"
HYBRIFLEX	325-375'	4 AWG	1-1/4"

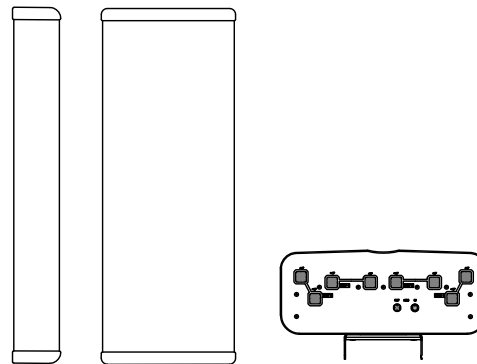


INSTALLER NOTE:
SPRINT CM TO CONFIRM HYBRID/FIBER
RISER CABLE & HYBRID/FIBER JUMPER
CABLE MODEL NUMBERS BEFORE
PREPARING BOM.

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

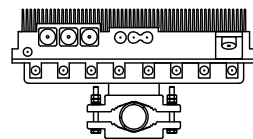
FIBER ONLY	HYBRID JUMPER CABLE MN: HBFO12-M3-5F1 5 FT, 3X MULTI-MODE FIBER PAIRS, OUTDOOR & LC CONNECTORS, 1/2" CABLE	5 FT
	MN: HBFO12-M3-10F1	10 FT
	MN: HBFO12-M3-15F1	15 FT
SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY		
8 AWG POWER	HYBRID JUMPER CABLE MN: HBFO58-08U1M3-5F1 5 FT, 1X8 AWG POWER PAIR, 3X MULTI-MODE FIBER PAIRS, OUTDOOR & LC CONNECTORS, 5/8" CABLE	5 FT
	MN: HBFO58-08U1M3-10F1	10 FT
	MN: HBFO58-08U1M3-15F1	15 FT
SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY		
6 AWG POWER	HYBRID JUMPER CABLE MN: HBFO58-13U1M3-5F1 5 FT, 1X6 AWG POWER PAIR, 3X MULTI-MODE FIBER PAIRS, OUTDOOR & LC CONNECTORS, 5/8" CABLE	5 FT
	MN: HBFO58-13U1M3-10F1	10 FT
	MN: HBFO58-13U1M3-15F1	15 FT
SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY		
4 AWG POWER	HYBRID JUMPER CABLE MN: HBFO78-21U1M3-5F1 5 FT, 1X4 AWG POWER PAIR, 3X MULTI-MODE FIBER PAIRS, OUTDOOR & LC CONNECTORS, 7/8" CABLE	5 FT
	MN: HBFO78-21U1M3-10F1	10 FT
	MN: HBFO78-21U1M3-15F1	15 FT
SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15' NOTIFY SPRINT CM OF ANY DISCREPANCY		

1 HYBRID CABLE CROSS SECTION & DATA
SCALE: NOT TO SCALE



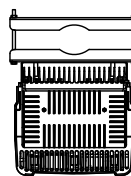
COMMSCOPE - NNW-65B-R4
WEIGHT (FULLY EQUIPPED): 67.2 LBS
SIZE (HxWxD): 72.0x19.6x7.8 IN.
CONNECTOR TYPE: 4.3-10 FEMALE (8 TOTAL PORTS)

1 COMMSCOPE - NNW-65B-R4
SCALE: NOT TO SCALE



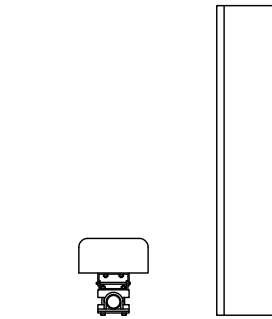
ALCATEL LUCENT - TD-RRH8x20-25
WEIGHT (WITHOUT MOUNTING HARDWARE): 66.0 LBS
SIZE (HxWxD): 25.4x17.5x5.7 IN.

4 ALCATEL LUCENT - TD-RRH8x20-25
SCALE: NOT TO SCALE



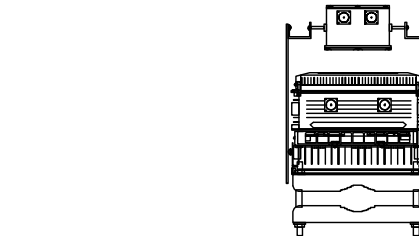
ALCATEL LUCENT - 1900MHZ 4X45W-65MHZ
WEIGHT: 60.0 LBS
SIZE: 25.0x11.10x10.7 IN.

6 ALCATEL LUCENT - 1900MHZ 4X45W-65MHZ
SCALE: NOT TO SCALE



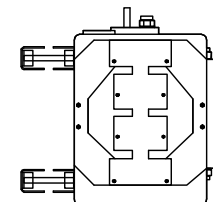
RFS/CELWAVE - APXVTM14-ALU-I20
WEIGHT (WITHOUT MOUNTING HARDWARE): 56.22 LBS
SIZE (HxWxD): 56.3x12.6x6.3 IN.

2 RFS/CELWAVE - APXVTM14-ALU-I20
SCALE: NOT TO SCALE



ALCATEL LUCENT - 800MHZ 2x50W RRH
WEIGHT (WITHOUT BRACKETS): 53.0 LBS
SIZE (WITHOUT BRACKET): 19.70x13.00x10.80 IN.

5 ALCATEL LUCENT - 800MHZ 2x50W RRH
SCALE: NOT TO SCALE



6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650



3 CORPORATE PARK DRIVE, SUITE 101
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SPRINT SITE NUMBER:
CT33XC018

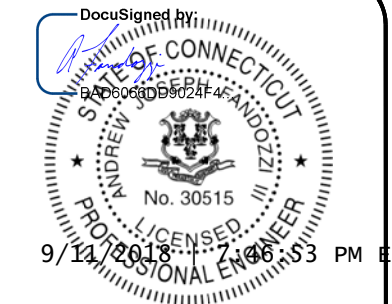
BU #: 876368
YANKEE LAKE/EAST
HAMPTON/TOWN

1 PUBLIC WORKS DR.
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EXISTING 180'-0" MONOPOLE

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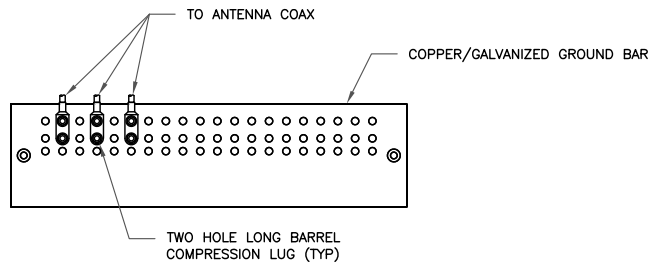
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SHEET NUMBER:

C-5

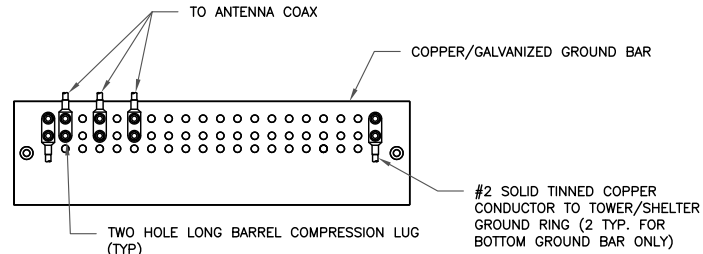
REVISION:

0



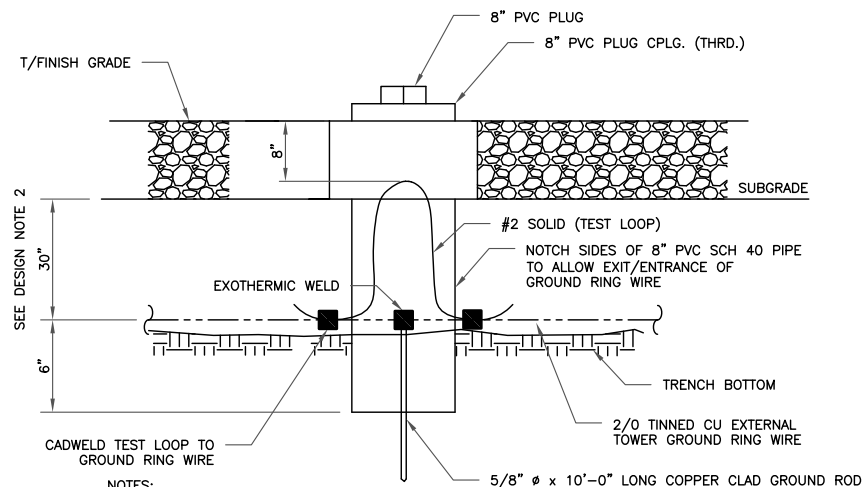
- NOTES:**
1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
 2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
 3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL.

1 ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE



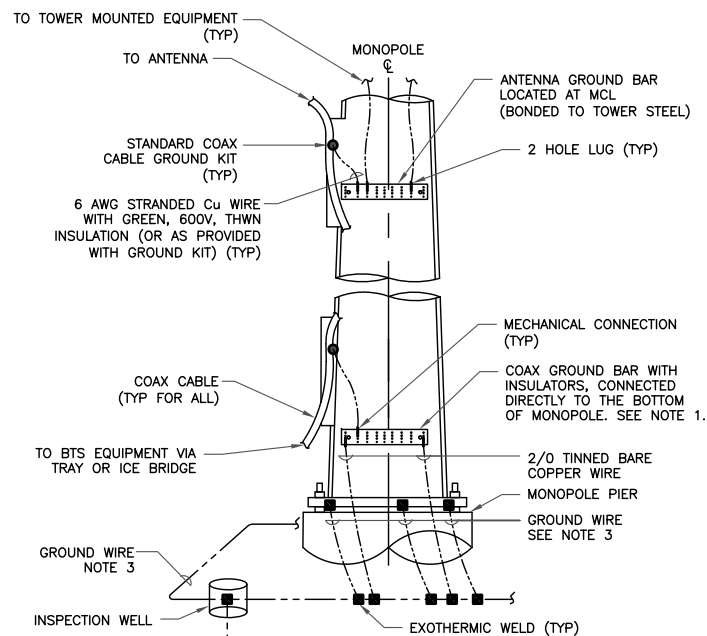
- NOTES:**
1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
 2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
 3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



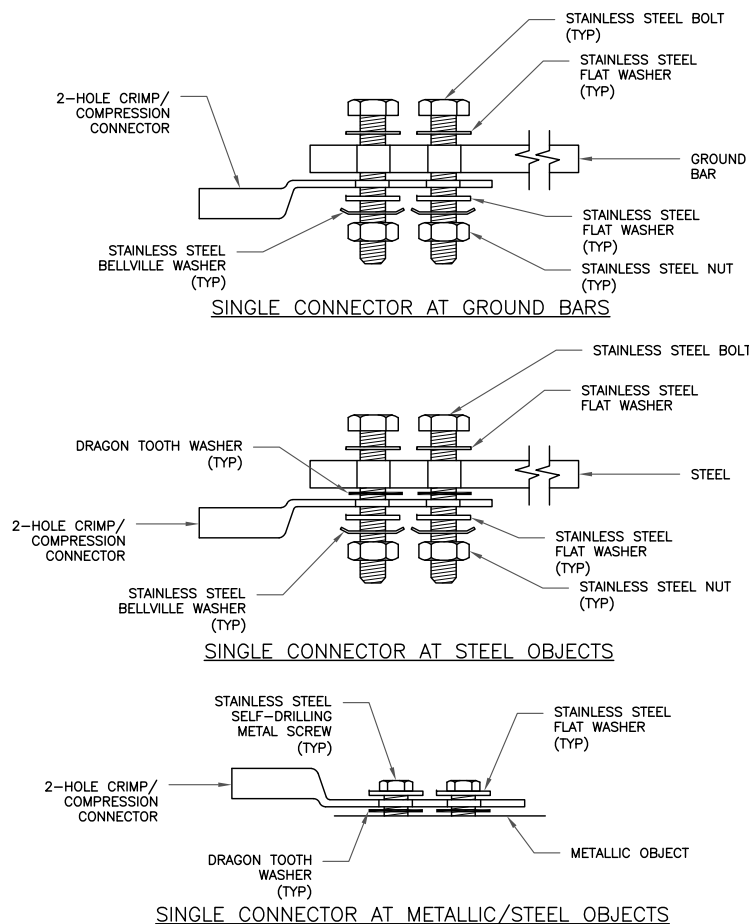
- NOTES:**
1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.
 2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D).

3 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE

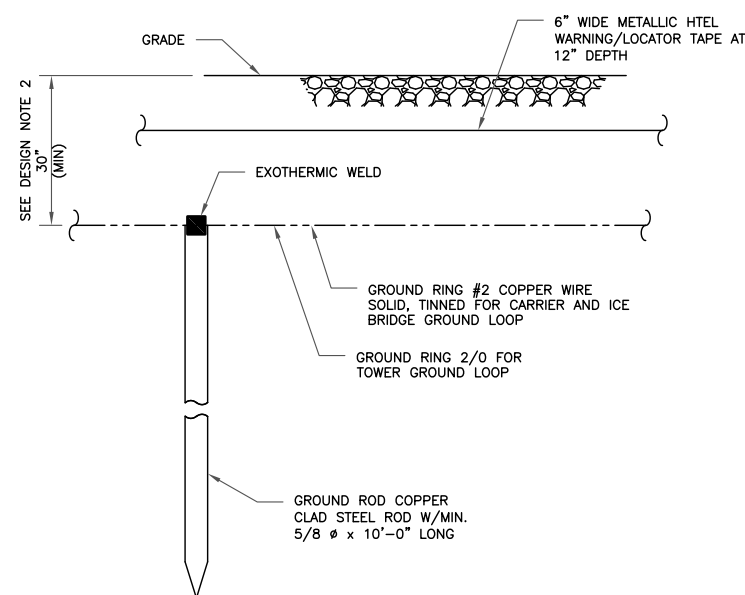


- NOTES:**
1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
 2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
 3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



- NOTES:**
1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL.
 2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D).

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE



SPRINT SITE NUMBER:
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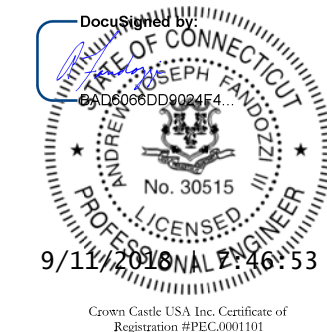
BU #: **876368**
YANKEE LAKE/EAST HAMPTON/TOWN

1 PUBLIC WORKS DR.
EAST HAMPTON, CT 06032

EXISTING 180'-0" MONOPOLE

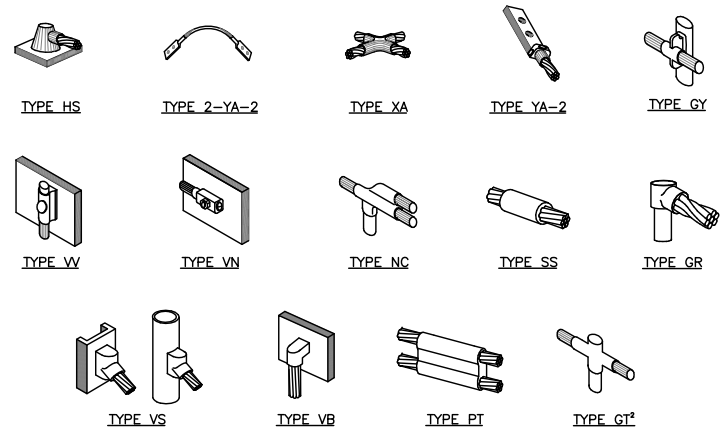
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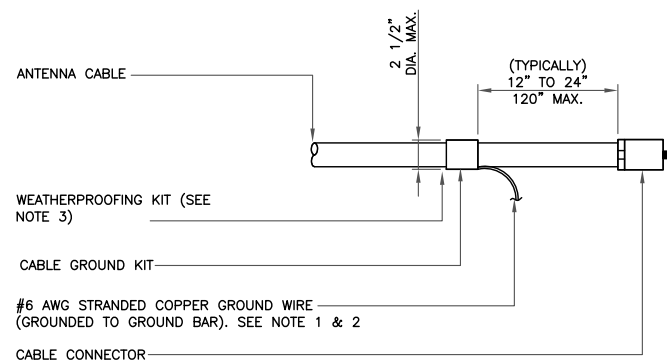
SHEET NUMBER: **G-1** REVISION: **0**



NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

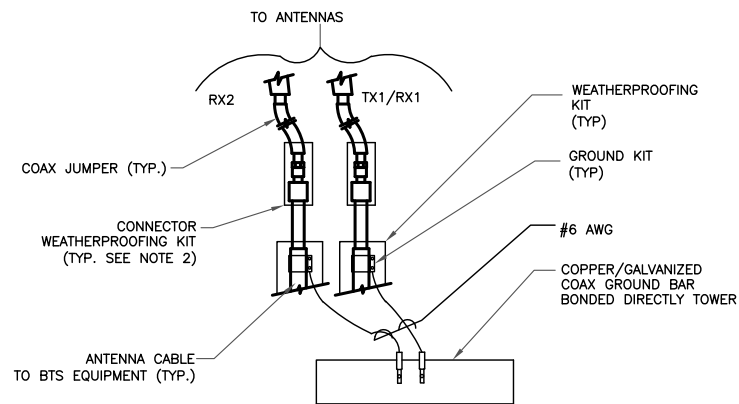
1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

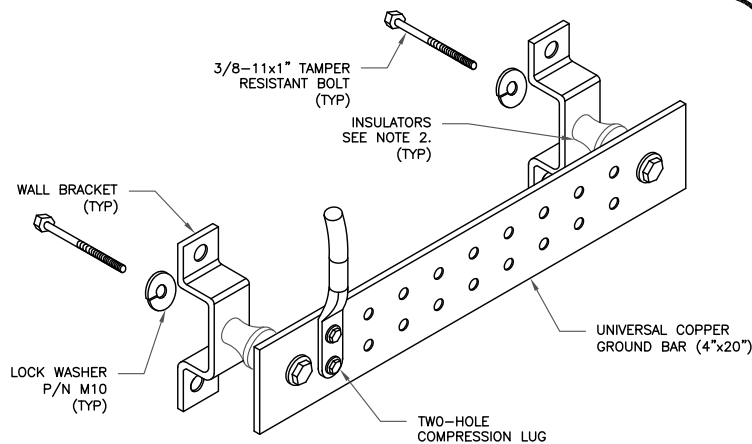
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

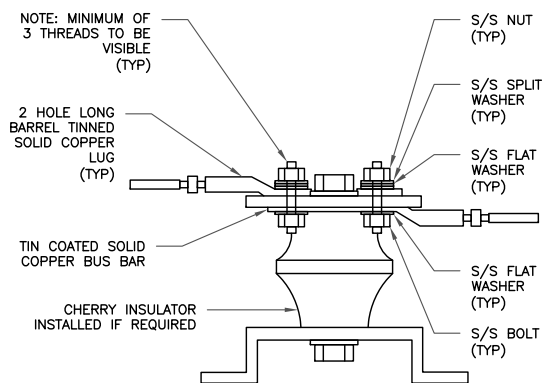
4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



NOTES:

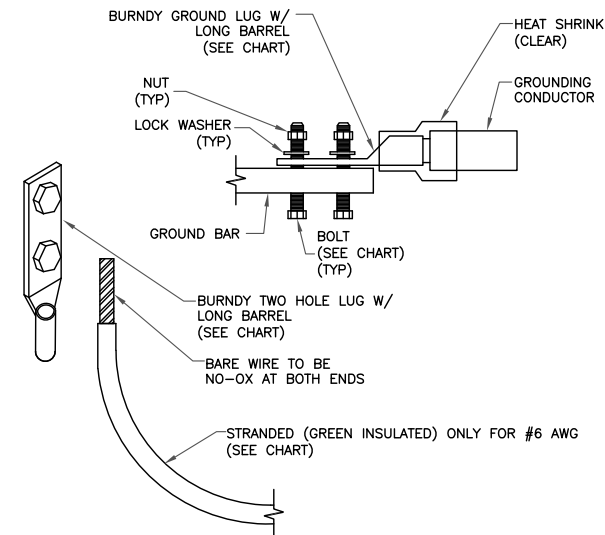
1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STG-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL. USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE

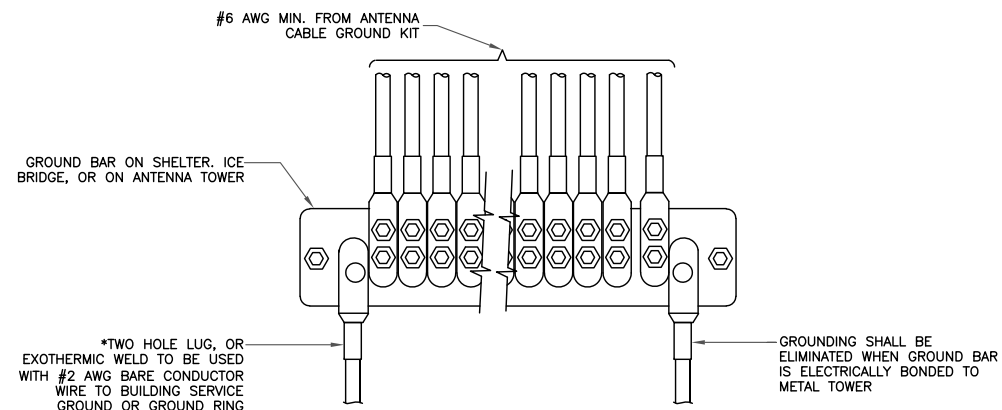
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



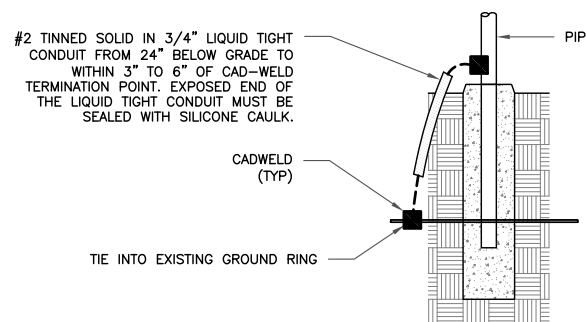
NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. 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 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE



6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251-2650



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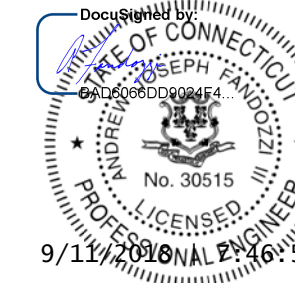
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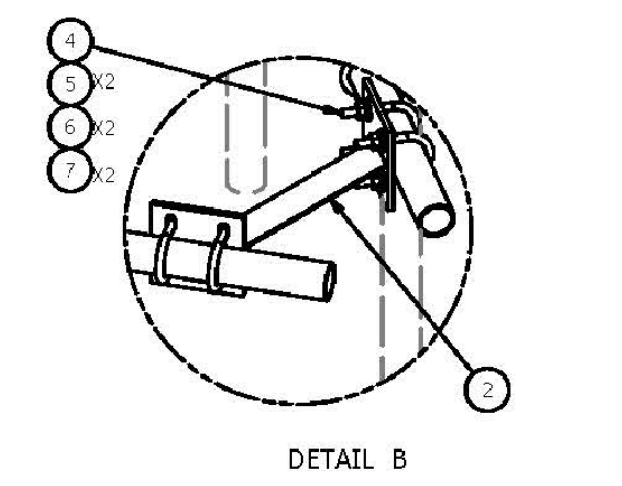
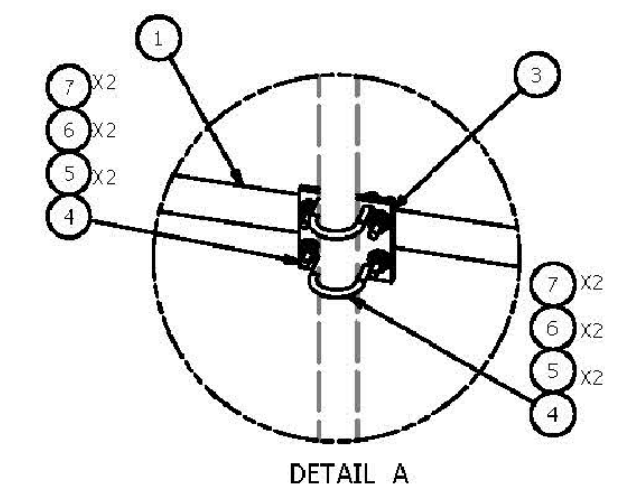
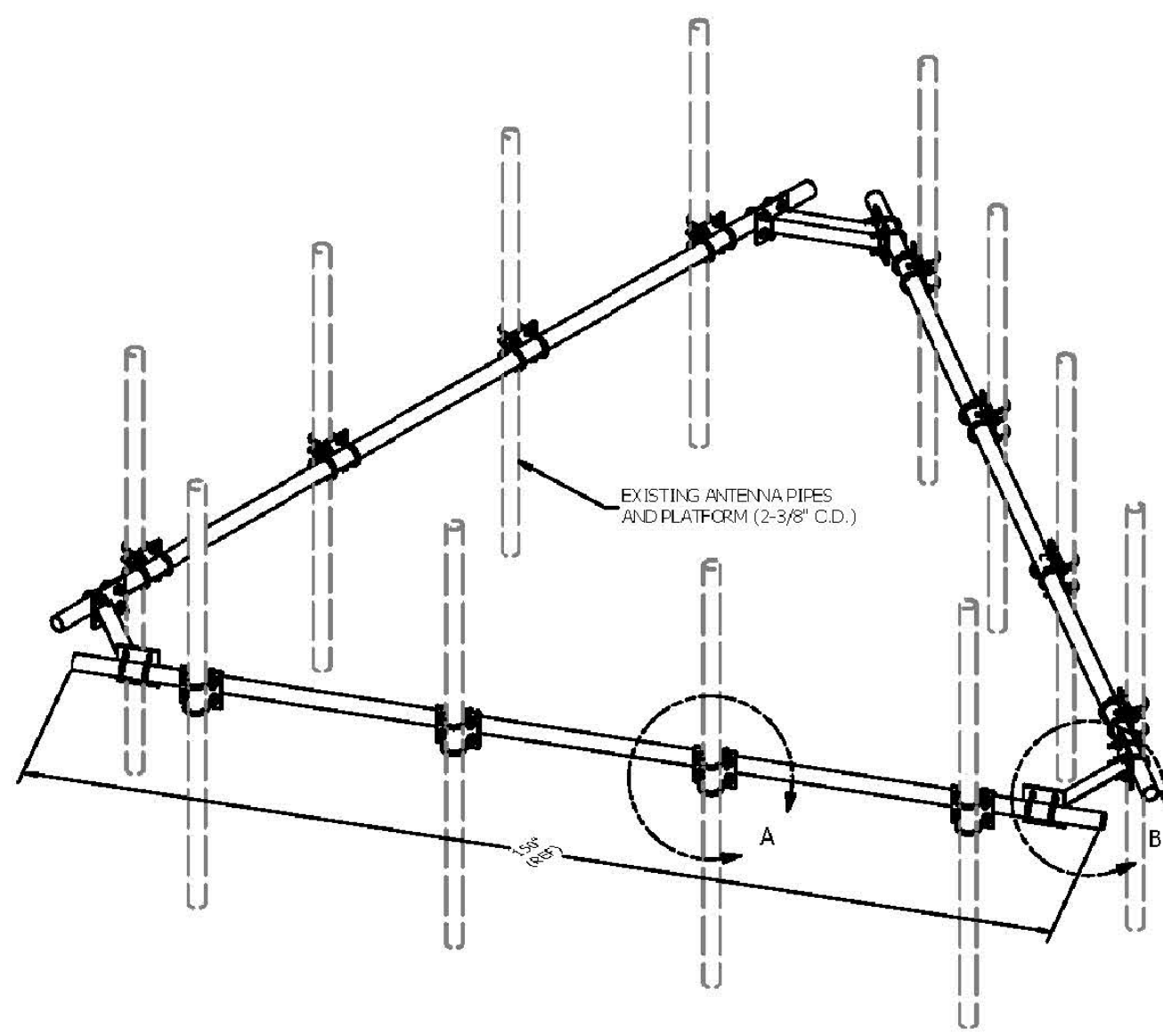



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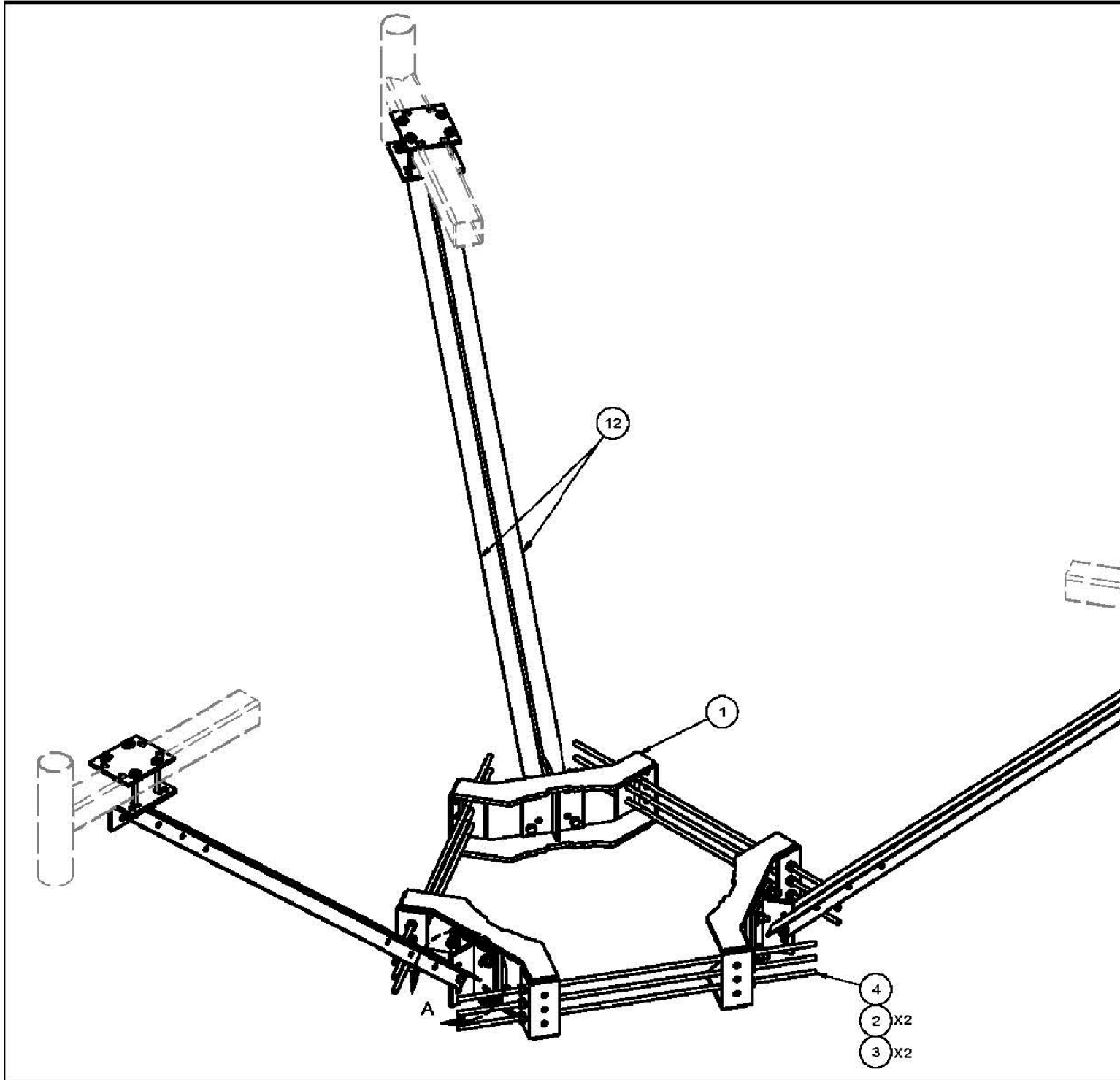
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SHEET NUMBER: **G-2** REVISION: **0**

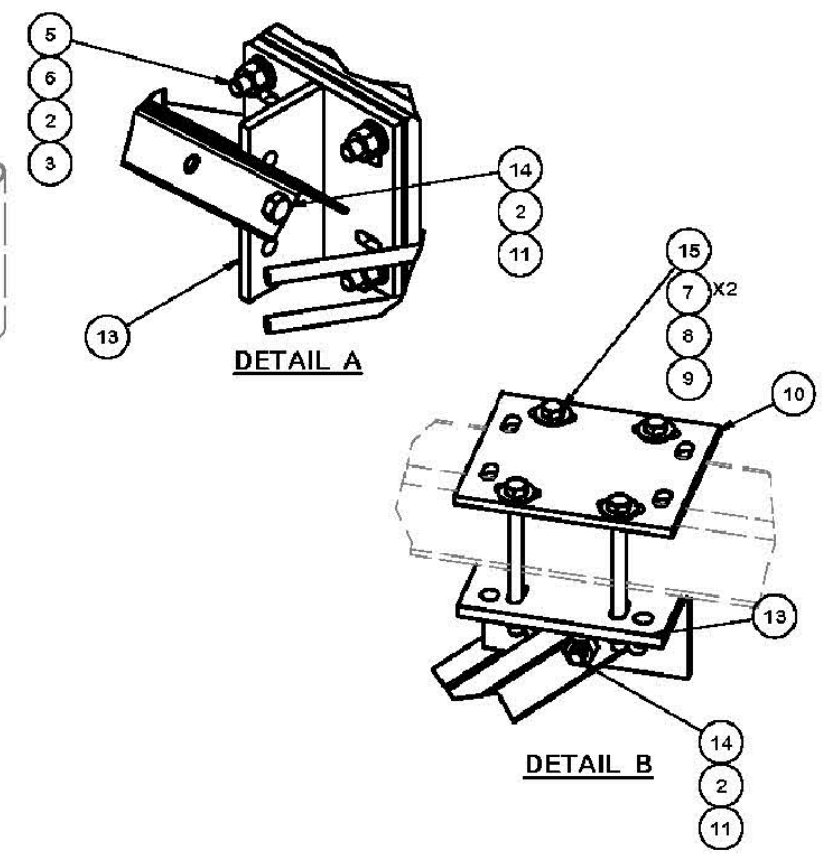
PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2150	2-3/8" CD X 150" SCH 40 GALVANIZED PIPE	150 in	48.06	144.17
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	12	SCX1	CROSSOVER PLATE 2-3/8" X 2-3/8"		3.71	44.50
4	120	G12FW	1/2" HDG USS FLATWASHER		0.03	4.08
5	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	43.90
6	120	G12LW	1/2" HDG LOCKWASHER		0.01	1.67
7	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.58
TOTAL WT. #						261.72



TOLERANCE NOTES TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE: SAWED, SHEARED AND GAS CUT EDGES (± 0.030) DRILLED AND GAS CUT HOLES (± 0.030) - NO CONING OF HOLES LASER CUT EDGES AND HOLES (± 0.010) - NO CONING OF HOLES BENDS ARE $\pm 1/2$ DEGREE ALL OTHER MACHINING (± 0.030) ALL OTHER ASSEMBLY (± 0.060)			DESCRIPTION HANDRAIL KIT FOR 12'-6" FACE		 Locations: New York, NY Atlanta, GA Los Angeles, CA Plymouth, IN Salem, OR Dallas, TX	
			CPD NO. DRAWN BY KC8 5/30/2012	ENG. APPROVAL	PART NO. HRK12	
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REVISION HISTORY A REPLACED HCP WITH X-AHCP CEK 7/10/2014						



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	36	G58LW	5/8" HDG LOCKWASHER		0.03	0.94
3	30	A58NUT	5/8" HDG A325 HEX NUT		0.13	3.90
4	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.55	4.94
4	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.55	4.94
5	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	4.27
6	12	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.41
7	24	G12FW	1/2" HDG USS FLATWASHER		0.03	0.82
8	12	G12LW	1/2" HDG LOCKWASHER		0.01	0.17
9	12	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	0.86
10	3	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	18.06
11	6	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	0.78
12	6	X-254923	PLATFORM REINFORCEMENT KIT ANGLE	84 in	22.83	137.00
13	6	X-253992	T-BRACKET FOR REINFORCEMENT KIT		13.55	81.27
14	6	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.62
15	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
					TOTAL WT. #	515.92

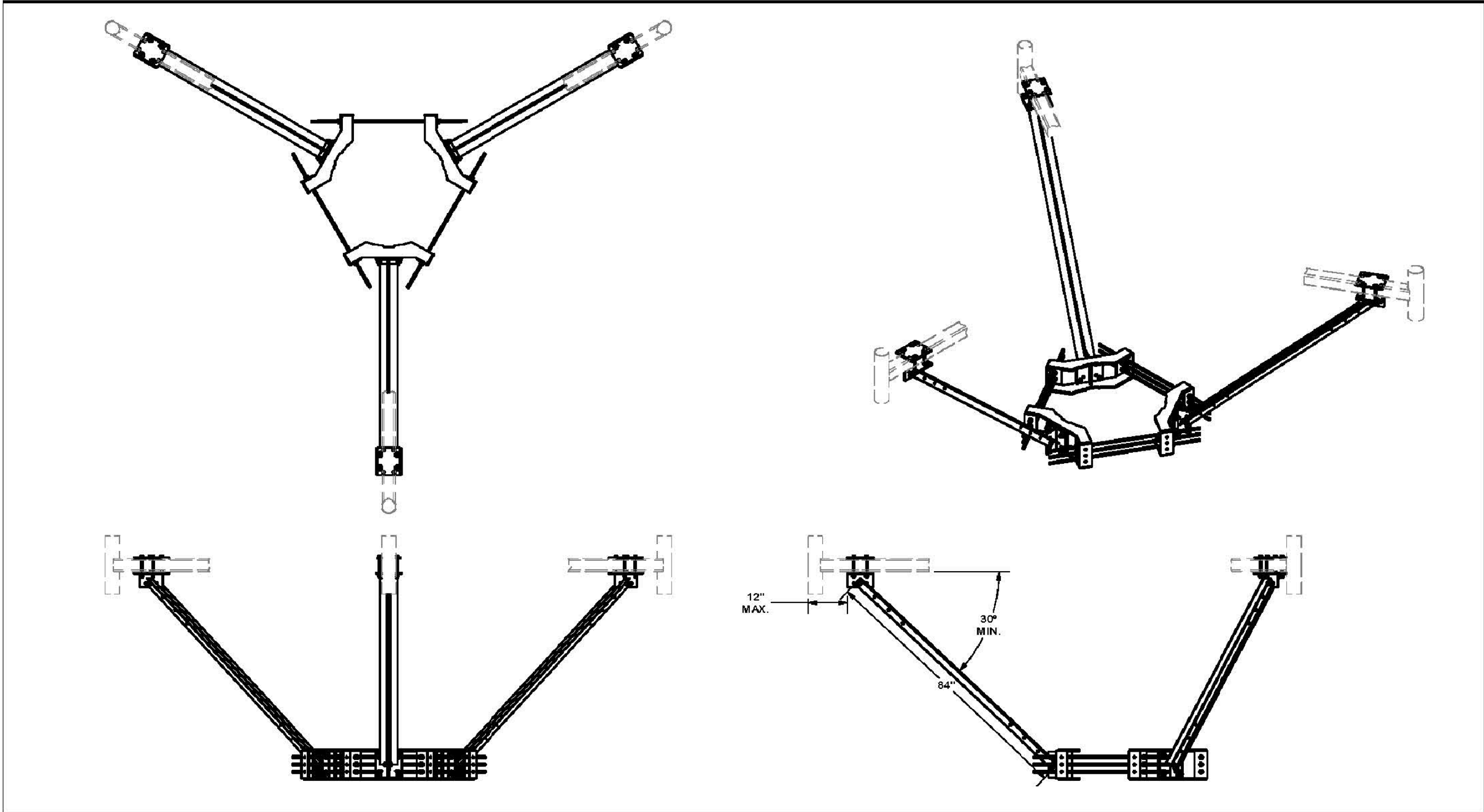


TOLERANCE NOTES
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 DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
 LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
 BENDS ARE $\pm 1/2$ DEGREE
 ALL OTHER MACHINING ($\pm 0.030"$)
 ALL OTHER ASSEMBLY ($\pm 0.060"$)

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DESCRIPTION PLATFORM REINFORCEMENT ON A 12" TO 45" POLE 7" ANGLE			
CPD NO. 4488	DRAWN BY CEK 7/15/2014	ENG. APPROVAL	
CLASS 81	SUB 01	DRAWING USAGE CUSTOMER	CHECKED BY BMC 7/22/2014

 A valmont COMPANY	Locations: New York, NY Atlanta, GA Los Angeles, CA Plymouth, IN Salem, OR Dallas, TX
	Engineering Support Team: 1-888-753-7446
PART NO. PRK-1245L	PAGE 1 OF 2
DWG. NO. PRK-1245L	



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
 SAWED, SHEARED AND GAS CUT EDGES (± 0.030 ")
 DRILLED AND GAS CUT HOLES (± 0.030 ") - NO CONING OF HOLES
 LASER CUT EDGES AND HOLES (± 0.010 ") - NO CONING OF HOLES
 BENDS ARE $\pm 1/2$ DEGREE
 ALL OTHER MACHINING (± 0.030 ")
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DESCRIPTION
 PLATFORM REINFORCEMENT
 ON A 12" TO 45" POLE
 7" ANGLE



Locations:
 New York, NY
 Atlanta, GA
 Los Angeles, CA
 Plymouth, IN
 Salem, OR
 Dallas, TX
 Engineering Support Team:
 1-888-753-7446

CPD NO. 4488	DRAWN BY CEK 7/15/2014	ENG. APPROVAL
CLASS 81	SUB 01	DRAWING USAGE CUSTOMER
CHECKED BY BMC 7/22/2014		

PART NO. PRK-1245L	PAGE 2 OF 2
DWG. NO. PRK-1245L	

Certificate Of Completion

Envelope Id: 7168DF5CA94F4A289E6B97F5745F763A	Status: Completed
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Source Envelope:	
Document Pages: 13	Signatures: 10
Certificate Pages: 3	Initials: 0
AutoNav: Enabled	Envelope Originator:
Envelopeld Stamping: Enabled	Phillip Lander
Time Zone: (UTC-05:00) Eastern Time (US & Canada)	2000 Corporate Drive
	Canonsburg, PA 15317
	Phillip.Lander.Contractor@crowncastle.com
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Notary Events	Signature	Timestamp
Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	9/11/2018 12:44:54 PM
Certified Delivered	Security Checked	9/11/2018 7:44:20 PM
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To contact us by email, send messages to: esignature@CrownCastle.com

To contact us by paper mail, send correspondence to

Crown Castle

2000 Corporate Drive

Canonsburg, PA 15317

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Screen Resolution:	800 x 600 minimum
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Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@po.state.ct.us

Web Site: www.state.ct.us/csc/index.htm

November 22, 2002

Thomas J. Regan, Esquire
Brown Rudnick Berlack Israels LLP
CityPlace I, 38th Floor
185 Asylum Street
Hartford, CT 06103-3402

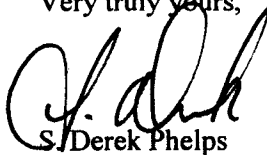
RE: **DOCKET NO. 229** - Sprint Spectrum, L. P. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a cellular telecommunications facility at Public Works Drive, East Hampton, Connecticut.

Dear Attorney Regan:

By its Decision and Order dated November 21, 2002, the Connecticut Siting Council (Council) granted a Certificate of Environmental Compatibility and Public Need (Certificate) the construction, maintenance and operation of a cellular telecommunications facility at Public Works Drive, East Hampton, Connecticut.

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

Very truly yours,


S. Derek Phelps
Executive Director

SDP/laf

Enclosures (4)

Date: July 12, 2018

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



Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject: Structural Analysis Report

Carrier Designation: Sprint PCS Co-Locate
Carrier Site Number: CT33XC018
Carrier Site Name: YANKEE LAKE/EAST

Crown Castle Designation: Crown Castle BU Number: 876368
Crown Castle Site Name: YANKEE LAKE/EAST HAMPTON/TOWN
Crown Castle JDE Job Number: 467775
Crown Castle Work Order Number: 1598906
Crown Castle Order Number: 412832 Rev. 3

Engineering Firm Designation: Crown Castle Project Number: 1598906

Site Data: 1 Public Works Dr., EAST HAMPTON, Middlesex County, CT
Latitude 41° 33' 53.14", Longitude -72° 32' 35.18"
180 Foot - Monopole Tower

Dear Charles McGuirt,

Crown Castle is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1598906, in accordance with order 412832, revision 3.

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

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

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

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

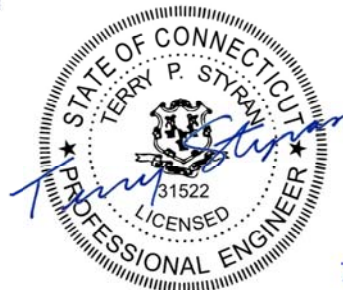
We at Crown Castle appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Mohamed Kader / DH

Respectfully submitted by:

Terry P. Styran P.E.
Senior Project Engineer

tnxTower Report - version 7.0.5.1



7/12/2018

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1) INTRODUCTION

This tower is a 180 ft Monopole tower designed by VALMONT in April of 2003. The tower was originally designed for a wind speed of 100 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 101 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
177.0	178.0	3	alcatel lucent	PCS 1900MHZ 4X45W-65MHZ	4	1-1/4	-
		6	alcatel lucent	RRH2X50-800			
		3	alcatel lucent	TD-RRH8X20-25			
		3	commscope	NNVV-65B-R4 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe			
	177.0	1	site pro 1	HRK12			
		1	site pro 1	PRK-1245L			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
177.0	178.0	6	decibel	DB950F85E-M w/ Mount Pipe	6	1-5/8	3
	177.0	1	tower mounts	Platform Mount [LP 601-1]	-	-	1
168.0	169.0	1	raycap	DC6-48-60-18-8F	-	-	1
		3	ericsson	RRUS 11	1 2	3/8 3/4	2
		3	ericsson	RRUS 32			
		3	ericsson	RRUS 32 B2			
		3	kaelus	DBC0061F1V51-2			
		6	powerwave technologies	7020.00			
		3	quintel technology	QS66512-2 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		6	powerwave technologies	7770.00 w/Mount Pipe			
		6	powerwave technologies	LGP21401			
		3	powerwave technologies	LGP21901			
	168.0	1	tower mounts	Platform Mount [LP 303-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
154.0	157.0	3	alcatel lucent	B66A RRH4X45	2	1-5/8	1
		3	alcatel lucent	RRH2X60-AWS			
		6	commscope	HBXX-6517DS-A2M w/ Mount Pipe			
		6	commscope	LNK-6515DS-A1M w/ Mount Pipe			
		2	rfs celwave	DB-T1-6Z-8AB-0Z			
154.0	1	tower mounts	Platform Mount [LP 304-1]				
119.0	131.0	5	decibel	DB264-A	9	1-1/4	1
	128.0	1	decibel	DB420			
	124.0	1	decibel	DB225-K			
	122.0	1	decibel	DB230-E			
	120.0	1	decibel	DB230-E			
	119.0	1	tower mounts	Platform Mount [LP 304-1]			
77.0	78.0	1	lucent	KS24019-L112A	1	1/2	1
	77.0	1	tower mounts	Side Arm Mount [SO 701-1]			

- Notes:
 1) Existing Equipment
 2) Reserved Equipment
 3) Equipment To Be Removed; Not Considered in This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
177	177	12	DAPA	48000	-	-
167	167	12	DAPA	48000	-	-
157	157	12	DAPA	48000	-	-
147	147	12	DAPA	48000	-	-
127	127	1	Generic	Whip	-	-
75	75	1	Generic	GPS	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Tower Manufacturer Drawings	Valmont Order# 19739-83	1531979	CCI Sites
Foundation Drawings	Valmont Order# 19739-83	2069183	CCI Sites
Geotech Report	Dr. Clarence Welti, P.E., P.C.	1441254	CCI Sites

3.1) Analysis Method

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

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	180 - 140.083	Pole	TP31.67x24.16x0.219	1	-11.361	1402.890	50.3	Pass
L2	140.083 - 92.5	Pole	TP40.17x30.307x0.344	2	-22.629	3026.680	65.7	Pass
L3	92.5 - 45.5833	Pole	TP48.31x38.355x0.438	3	-37.147	4716.500	66.6	Pass
L4	45.5833 - 0	Pole	TP56x46.134x0.5	4	-59.197	6342.060	67.4	Pass
							Summary	
						Pole (L4)	67.4	Pass
						Rating =	67.4	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	59.2	Pass
1	Base Plate	0	43.4	Pass
1	Base Foundation Structure	0	49.6	Pass
1	Base Foundation Soil Interaction	0	55.8	Pass

Structure Rating (max from all components) =	67.4%
---	--------------

Notes:

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

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.



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

SPRINT Existing Facility

Site ID: CT33XC018

Yankee Lake/East
1 Public Works Drive
East Hampton, CT 06032

October 2, 2018

EBI Project Number: 6218006414

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	7.25 %



October 2, 2018

SPRINT

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

Emissions Analysis for Site: **CT33XC018 – Yankee Lake/East**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **1 Public Works Drive, East Hampton, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

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

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



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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **1 Public Works Drive, East Hampton, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 50 Watts per Channel.
- 3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.
- 4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.



- 6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antennas used in this modeling are the **Commscope NNVV-65B-R4 and the RFS APXVTM14-ALU-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antenna mounting height centerlines of the proposed panel antennas are **178 feet** above ground level (AGL) for **Sector A**, **178 feet** above ground level (AGL) for **Sector B** and **178 feet** above ground level (AGL) for Sector C.
- 10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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



SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	178 feet	Height (AGL):	178 feet	Height (AGL):	178 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	7,378.61	ERP (W):	7,378.61	ERP (W):	7,378.61
Antenna A1 MPE%	1.10 %	Antenna B1 MPE%	1.10 %	Antenna C1 MPE%	1.10 %
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVTM14-ALU- I20	Make / Model:	RFS APXVTM14-ALU- I20	Make / Model:	RFS APXVTM14-ALU- I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	178 feet	Height (AGL):	178 feet	Height (AGL):	178 feet
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	0.76 %	Antenna B2 MPE%	0.76 %	Antenna C2 MPE%	0.76 %

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	1.86 %
Town (PD-455)	0.00 %
Town (Austin APC)	0.14 %
AT&T	1.42 %
Verizon Wireless	3.47 %
Nextel	0.36 %
Site Total MPE %:	7.25 %

SPRINT Sector A Total:	1.86 %
SPRINT Sector B Total:	1.86 %
SPRINT Sector C Total:	1.86 %
Site Total:	7.25 %

SPRINT _ Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	376.73	178	0.46	850 MHz	567	0.08%
Sprint 850 MHz LTE	2	941.82	178	2.29	850 MHz	567	0.40%
Sprint 1900 MHz (PCS) CDMA	5	511.82	178	3.11	1900 MHz (PCS)	1000	0.31%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	178	3.11	1900 MHz (PCS)	1000	0.31%
Sprint 2500 MHz (BRS) LTE	8	778.09	178	7.56	2500 MHz (BRS)	1000	0.76%
						Total:	1.86%



Summary

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

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

SPRINT Sector	Power Density Value (%)
Sector A:	1.86 %
Sector B:	1.86 %
Sector C:	1.86 %
SPRINT Maximum MPE % (per sector):	1.86 %
Site Total:	7.25 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **7.25 %** 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.

Date: May 16, 2018
June 15, 2018 (Rev.1)

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Subject: Mount Structural Analysis

Carrier Designation: Sprint Equipment Change-Out
Carrier Site Number: CT33XC018
Carrier Site Name: Yankee Lake/East Hampton/Town

Crown Castle Designation: **Crown Castle BU Number:** 876368
Crown Castle Site Name: Yankee Lake/East Hampton/Town
Crown Castle JDE Number: 467775
Crown Castle PO Number: 1201956
Crown Castle Application Number: 412832 Rev.3

Engineering Firm Designation: **Crown Castle Report Designation:** 3876267

Site Data: **1 Public Works Dr., East Hampton, CT, 06032**
Latitude: 41° 33' 53.14" Longitude: -72° 32' 35.18"

Structure Information: **Tower Height & Type:** 180 ft Monopole
Mount Elevation: 177 ft
Mount Width & Type: 12 ft Platform

Dear Marianne Dunst,

Hudson Design Group LLC (HDG) is pleased to submit this "Mount Structural Analysis Report" to determine the structural integrity of Sprint's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

Based upon our analysis, we have determined the adequacy of the antenna mounting system that will support the existing and proposed loading to be:

Platform

Conditional

This analysis has been performed in accordance with the 2012 International Building Code and the TIA-222-G based on a basic wind speed of 120 mph as required for use in the TIA-222-G Standard Annex B. Exposure Category B with a maximum topographic factor, K_{zt} , of 1.0 and Risk Category II were used in this analysis.

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

Mount structural analysis prepared by: HDG
 Respectfully Submitted by:



Michael Cabral
 Structural Dept. Head
 CCI Mount Analysis Report – Version 1.0.0



Daniel P. Hamm, P.E.
 Principal

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1) INTRODUCTION

This mount is a 12' platform. No original structural design documents or fabrication drawings were available for the existing mounts. A mount mapping was not performed at this site. HDG performed a visual assessment using field photographs and mount mapping data from similar mounts to perform this analysis. The mount is installed at an elevation of 177 ft on the 180 ft Monopole.

2) ANALYSIS CRITERIA

The mount structural analysis was conducted in accordance with the requirements of TIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a basic wind speed of 120 mph with no ice, 50 mph with a 1.78 inch escalated ice thickness, Exposure Category B and Topographic category 1 with a crest height of 0 ft. In addition, the mounts have been analyzed for various live loading conditions consisting of a 250 pound man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500 pound man live load applied individually at mount pipe locations using a 3-second gust wind speed of 30 mph.

Table 1 - Proposed Equipment Loading Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Proposed Mount Type	Note
177	178	3	Commscope	NNVV-65B-R4	-	1,2
		3	RFS/Cellwave	APXVTM14-ALU-I20	-	1,2
		3	Alcatel Lucent	PCS 1900MHZ 4X45W-65MHZ	-	1,2
		6	Alcatel Lucent	RRH2X50-800	-	1,2
		3	Alcatel Lucent	TD-RRH8x20-25	-	1,2

Notes:

- 1) Proposed Equipment
- 2) Existing Mount to Remain

Table 2 - Existing and Reserved Equipment Loading Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Existing Mount Type	Note
177	-	-	-	-	12' Platform	1

Notes:

- 1) Existing Equipment

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
RFDS	Sprint	-	ON FILE

3.1) Analysis Method

RAM Elements (Version 14.0.1), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

3.2) Assumptions

- 1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and 2 and the referenced drawings.
- 3) 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.
- 4) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Square, Rectangular)	ASTM A500 (GR B)
Pipe	ASTM A53 (GR 53)
Connection Bolts	ASTM A325

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

4) ANALYSIS RESULTS

Table 4(a) - Mount Component Stresses vs. Capacity (Platform, Alpha Sector)

Notes	Component	Member No.	Centerline (ft)	% Capacity	Pass / Fail
1	Face Horizontal	22	177	69	Pass
1	Standoff Members	32	177	40	Pass
2	Mount-to-Tower Connection	-	177	57	Pass

Table 4(b) - Mount Component Stresses vs. Capacity (Platform, Beta Sector)

Notes	Component	Beam No.	Centerline (ft)	% Capacity	Pass / Fail
1	Face Horizontal	30	177	80	Pass
1	Standoff Members	31	177	30	Pass
2	Mount-to-Tower Connection	-	177	57	Pass

Table 4(c) - Mount Component Stresses vs. Capacity (Platform, Gamma Sector)

Notes	Component	Beam No.	Centerline (ft)	% Capacity	Pass / Fail
1	Face Horizontal	29	177	87	Pass
1	Standoff Members	33	177	40	Pass
2	Mount-to-Tower Connection	-	177	57	Pass

Structure Rating (max from all components) =	87%
---	------------

Notes:

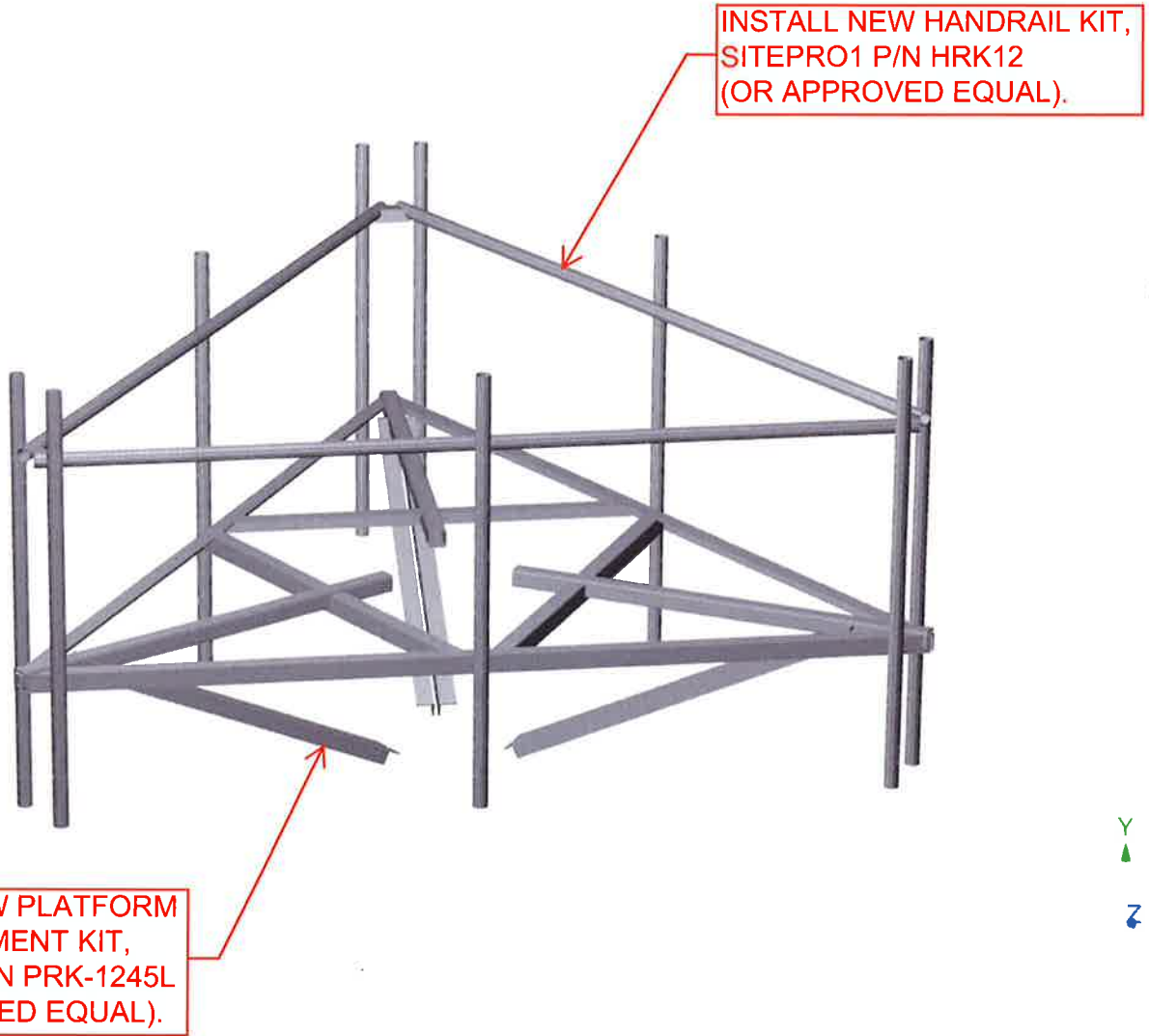
- 1) See additional documentation in "Appendix C – Analysis Output" for calculations supporting the % Capacity consumed.
- 2) See additional documentation in "Appendix D – Additional Calculations" for calculations supporting the % capacity consumed.

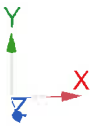
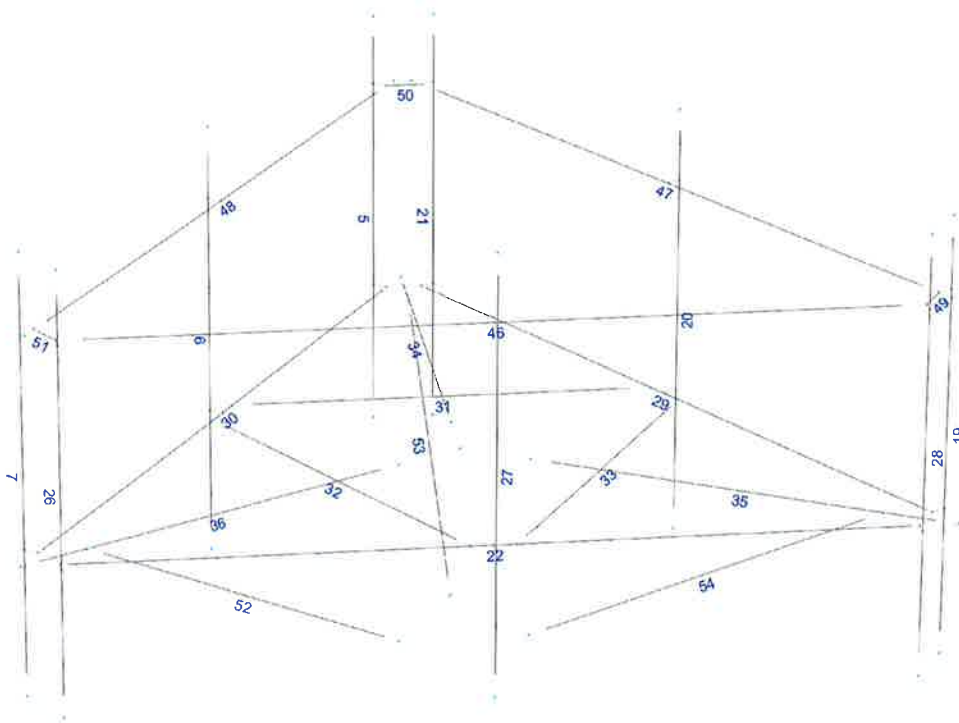
4.1) Recommendations

The mount has sufficient capacity to support the existing and proposed loading with the following modifications:

- Install new handrail kit, SitePro1 P/N HRK12 (or approved equal).
- Install new platform reinforcement kit, SitePro1 P/N PRK-1245L (or approved equal).

APPENDIX A
WIRE FRAMES AND RENDERED MODELS





APPENDIX B
RAM ELEMENTS INPUT CALCULATIONS

Date: 6/15/2018
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 Designed By: JN Checked By: MSC



2.6.5.2 Velocity Pressure Coeff:

$$K_z = 2.01 (z/z_g)^{2/\alpha}$$

$K_z =$ **1.165** $z =$ 178 (ft)
 $z_g =$ 1200 (ft)
 $\alpha =$ 7.0

$K_{zmin} \leq K_z \leq 2.01$

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_e
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.4 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$$K_{zt} = [1 + (K_e K_t / K_h)]^2$$

$$K_h = e^{(-z/H)}$$

$K_{zt} =$ **#DIV/0!**

$K_h =$ **#DIV/0!**

$K_e =$ 0 (from Table 2-4)

$K_t =$ 0 (from Table 2-5)

f = 0 (from Table 2-5)

z = 178

H = 0 (Ht. of the crest above surrounding terrain)

$K_{zt} =$ 1.00

$K_{iz} =$ 1.18 (from Sec. 2.6.8)

(If Category 1 then $K_{zt} = 1.0$)

Category = **1**

2.6.8 Design Ice Thickness

Max Ice Thickness =

$t_i =$ **0.75** in

$$t_{iz} = 2.0 * t_i * I * K_{iz} * (K_{zt})^{0.35}$$

$t_{iz} =$ **1.78** in

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 Project Name: Yankee Lake/East Hampton/Town
 Project Number: 876368
 Designed By: JN Checked By: MSC



2.6.7 Gust Effect Factor

2.6.7.1 Self Supporting Lattice Structures

Gh = 1.0 Latticed Structures > 600 ft

Gh = 0.85 Latticed Structures 450 ft or less

$Gh = 0.85 + 0.15 [h/150 - 3.0]$

h = ht. of structure

h = 180

Gh = 0.85

2.6.7.2 Guyed Masts

Gh = 0.85

2.6.7.3 Pole Structures

Gh = 1.1

2.6.9 Appurtenances

Gh = 1.0

2.6.7.4 Structures Supported on Other Structures

(Cantilevered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

Gh = 1.35

Gh = 1.00

2.6.9.2 Design Wind Force on Appurtenances

$F = q_z * Gh * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_d * V_{max}^2 * I$

$q_z = 40.81$

$q_z (ice) = 7.08$

$q_z (30) = 2.55$

$K_z = 1.165$

$K_{zt} = 1.0$

$K_d = 0.95$

$V_{max} = 120 \text{ mph}$

$V_{max(ice)} = 50 \text{ mph}$

$V_{30} = 30 \text{ mph}$

$I = 1.0$

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95

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Determine Ca:

Table 2-8

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Round	C < 32 (Subcritical)	0.7	0.8	1.2
	32 ≤ C ≤ 64 (Transitional)	$3.76/(C^{0.485})$	$3.37/(C^{0.415})$	$38.4/(C^{1.0})$
	C > 64 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
 (Aspect ratio is independent of the spacing between support points of a linear appurtenance.)

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness =

1.78 in

Angle = 0 (deg)

Equivalent Angle = 180 (deg)

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
NNVV-65B-R4 Antenna	72.0	19.6	7.8	9.80	3.67	1.25	501	108	31
APXVTM14-ALU-I20 Antenna	56.3	12.6	6.3	4.93	4.47	1.29	259	61	16
PCS 1900MHZ 4X45W-65MHZ RRH	25.0	11.1	11.4	1.93	2.25	1.20	94	25	6
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	25.0	0.0	11.4	0.00	0.00	1.20	0	0	0
RRH2X50-800 RRH	15.8	13.0	14.0	1.43	1.22	1.20	70	19	4
RRH2X50-800 RRH (Shielded)	15.8	0.4	14.0	0.04	39.50	2.48	4	9	0
TD-RRH8x20-25 RRH	26.1	18.6	6.7	3.37	1.40	1.20	165	39	10
TD-RRH8x20-25 RRH (Shielded)	26.1	0.0	6.7	0.00	0.00	1.20	0	0	0

Date: 6/15/2018

Project Name: Yankee Lake/East Hampton/Town

Project Number: 876368

Designed By: JN Checked By: MSC



WIND LOADS

Angle = 30 (deg)

Ice Thickness = 1.78 in.

Equivalent Angle = 210 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
NNVV-65B-R4 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	501	235	434
APXVTM14-ALU-I20 Antenna	56.3	12.6	6.3	4.93	2.46	4.47	8.94	1.29	1.46	259	147	231
PCS 1900MHZ 4X45W-65MHZ RRH	25.0	11.1	11.4	1.93	1.98	2.25	2.19	1.20	1.20	94	97	95
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	25.0	5.6	11.4	0.96	1.98	4.50	2.19	1.29	1.20	51	97	62
RRH2X50-800 RRH	15.8	13.0	14.0	1.43	1.54	1.22	1.13	1.20	1.20	70	75	71
RRH2X50-800 RRH (Shielded)	15.8	6.5	14.0	0.71	1.54	2.43	1.13	1.20	1.20	35	75	45
TD-RRH8x20-25 RRH	26.1	18.6	6.7	3.37	1.21	1.40	3.90	1.20	1.26	165	63	139
TD-RRH8x20-25 RRH (Shielded)	26.1	9.3	6.7	1.69	1.21	2.81	3.90	1.21	1.26	83	63	78

WIND LOADS WITH ICE:

NNVV-65B-R4 Antenna	75.6	23.2	11.4	12.15	5.96	3.26	6.66	1.23	1.38	106	58	94
APXVTM14-ALU-I20 Antenna	59.9	16.2	9.9	6.71	4.09	3.71	6.08	1.25	1.36	60	39	55
PCS 1900MHZ 4X45W-65MHZ RRH	28.6	14.7	15.0	2.90	2.96	1.95	1.91	1.20	1.20	25	25	25
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	28.6	7.3	15.0	1.45	2.96	3.90	1.91	1.26	1.20	13	25	16
RRH2X50-800 RRH	19.4	16.6	17.6	2.22	2.36	1.17	1.10	1.20	1.20	19	20	19
RRH2X50-800 RRH (Shielded)	19.4	8.3	17.6	1.11	2.36	2.34	1.10	1.20	1.20	9	20	12
TD-RRH8x20-25 RRH	29.7	22.2	10.3	4.56	2.11	1.34	2.89	1.20	1.22	39	18	34
TD-RRH8x20-25 RRH (Shielded)	29.7	11.1	10.3	2.28	2.11	2.68	2.89	1.21	1.22	20	18	19

WIND LOADS AT 30 MPH:

NNVV-65B-R4 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	31	15	27
APXVTM14-ALU-I20 Antenna	56.3	12.6	6.3	4.93	2.46	4.47	8.94	1.29	1.46	16	9	14
PCS 1900MHZ 4X45W-65MHZ RRH	25.0	11.1	11.4	1.93	1.98	2.25	2.19	1.20	1.20	6	6	6
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	25.0	5.6	11.4	0.96	1.98	4.50	2.19	1.29	1.20	3	6	4
RRH2X50-800 RRH	15.8	13.0	14.0	1.43	1.54	1.22	1.13	1.20	1.20	4	5	4
RRH2X50-800 RRH (Shielded)	15.8	6.5	14.0	0.71	1.54	2.43	1.13	1.20	1.20	2	5	3
TD-RRH8x20-25 RRH	26.1	18.6	6.7	3.37	1.21	1.40	3.90	1.20	1.26	10	4	9
TD-RRH8x20-25 RRH (Shielded)	26.1	9.3	6.7	1.69	1.21	2.81	3.90	1.21	1.26	5	4	5

Date: 6/15/2018
 Project Name: Yankee Lake/East Hamplon/Town
 Project Number: 876368
 Designed By: JN Checked By: MSC



WIND LOADS

Angle = 60 (deg)

Ice Thickness = 1.78 in.

Equivalent Angle = 240 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
NNVV-65B-R4 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	501	235	301
APXVTM14-ALU-I20 Antenna	56.3	12.6	6.3	4.93	2.46	4.47	8.94	1.29	1.46	259	147	175
PCS 1900MHZ 4X45W-65MHZ RRH	25.0	11.1	11.4	1.93	1.98	2.25	2.19	1.20	1.20	94	97	96
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	25.0	8.3	11.4	1.45	1.98	3.00	2.19	1.22	1.20	72	97	91
RRH2X50-800 RRH	15.8	13.0	14.0	1.43	1.54	1.22	1.13	1.20	1.20	70	75	74
RRH2X50-800 RRH (Shielded)	15.8	9.8	14.0	1.07	1.54	1.62	1.13	1.20	1.20	52	75	70
TD-RRH8x20-25 RRH	26.1	18.6	6.7	3.37	1.21	1.40	3.90	1.20	1.26	165	63	88
TD-RRH8x20-25 RRH (Shielded)	26.1	14.0	6.7	2.53	1.21	1.87	3.90	1.20	1.26	124	63	78

WIND LOADS WITH ICE:

NNVV-65B-R4 Antenna	75.6	23.2	11.4	12.15	5.96	3.26	6.66	1.23	1.38	106	58	70
APXVTM14-ALU-I20 Antenna	59.9	16.2	9.9	6.71	4.09	3.71	6.08	1.25	1.36	60	39	44
PCS 1900MHZ 4X45W-65MHZ RRH	28.6	14.7	15.0	2.90	2.96	1.95	1.91	1.20	1.20	25	25	25
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	28.6	11.0	15.0	2.18	2.96	2.60	1.91	1.20	1.20	19	25	24
RRH2X50-800 RRH	19.4	16.6	17.6	2.22	2.36	1.17	1.10	1.20	1.20	19	20	20
RRH2X50-800 RRH (Shielded)	19.4	12.4	17.6	1.67	2.36	1.56	1.10	1.20	1.20	14	20	19
TD-RRH8x20-25 RRH	29.7	22.2	10.3	4.56	2.11	1.34	2.89	1.20	1.22	39	18	23
TD-RRH8x20-25 RRH (Shielded)	29.7	16.6	10.3	3.42	2.11	1.78	2.89	1.20	1.22	29	18	21

WIND LOADS AT 30 MPH:

NNVV-65B-R4 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	31	15	19
APXVTM14-ALU-I20 Antenna	56.3	12.6	6.3	4.93	2.46	4.47	8.94	1.29	1.46	16	9	11
PCS 1900MHZ 4X45W-65MHZ RRH	25.0	11.1	11.4	1.93	1.98	2.25	2.19	1.20	1.20	6	6	6
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	25.0	8.3	11.4	1.45	1.98	3.00	2.19	1.22	1.20	5	6	6
RRH2X50-800 RRH	15.8	13.0	14.0	1.43	1.54	1.22	1.13	1.20	1.20	4	5	5
RRH2X50-800 RRH (Shielded)	15.8	9.8	14.0	1.07	1.54	1.62	1.13	1.20	1.20	3	5	4
TD-RRH8x20-25 RRH	26.1	18.6	6.7	3.37	1.21	1.40	3.90	1.20	1.26	10	4	6
TD-RRH8x20-25 RRH (Shielded)	26.1	14.0	6.7	2.53	1.21	1.87	3.90	1.20	1.26	8	4	5

Date: 6/15/2018
 Project Name: Yankee Lake/East Hampton/Town
 Project Number: 874368
 Designed By: JN Checked By: MSC



WIND LOADS

Angle = 90 (deg) Ice Thickness = 1.78 in. Equivalent Angle = 270 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
NNVV-65B-R4 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	501	235	235
APXVTM14-ALU-I20 Antenna	56.3	12.6	6.3	4.93	2.46	4.47	8.94	1.29	1.46	259	147	147
PCS 1900MHZ 4X45W-65MHZ RRH	25.0	11.1	11.4	1.93	1.98	2.25	2.19	1.20	1.20	94	97	97
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	25.0	0.0	11.4	0.00	1.98	0.00	2.19	1.20	1.20	0	97	97
RRH2X50-800 RRH	15.8	13.0	14.0	1.43	1.54	1.22	1.13	1.20	1.20	70	75	75
RRH2X50-800 RRH (Shielded)	15.8	0.4	14.0	0.04	1.54	39.50	1.13	2.48	1.20	4	75	75
TD-RRH8x20-25 RRH	26.1	18.6	6.7	3.37	1.21	1.40	3.90	1.20	1.26	165	63	63
TD-RRH8x20-25 RRH (Shielded)	26.1	0.0	6.7	0.00	1.21	0.00	3.90	1.20	1.26	0	63	63

WIND LOADS WITH ICE:

NNVV-65B-R4 Antenna	75.6	23.2	11.4	12.15	5.96	3.26	6.66	1.23	1.38	106	58	58
APXVTM14-ALU-I20 Antenna	59.9	16.2	9.9	6.71	4.09	3.71	6.08	1.25	1.36	60	39	39
PCS 1900MHZ 4X45W-65MHZ RRH	28.6	14.7	15.0	2.90	2.96	1.95	1.91	1.20	1.20	25	25	25
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	28.6	3.6	15.0	0.70	2.96	8.04	1.91	1.43	1.20	7	25	25
RRH2X50-800 RRH	19.4	16.6	17.6	2.22	2.36	1.17	1.10	1.20	1.20	19	20	20
RRH2X50-800 RRH (Shielded)	19.4	4.0	17.6	0.53	2.36	4.90	1.10	1.31	1.20	5	20	20
TD-RRH8x20-25 RRH	29.7	22.2	10.3	4.56	2.11	1.34	2.89	1.20	1.22	39	18	18
TD-RRH8x20-25 RRH (Shielded)	29.7	3.6	10.3	0.73	2.11	8.35	2.89	1.45	1.22	7	18	18

WIND LOADS AT 30 MPH:

NNVV-65B-R4 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	31	15	15
APXVTM14-ALU-I20 Antenna	56.3	12.6	6.3	4.93	2.46	4.47	8.94	1.29	1.46	16	9	9
PCS 1900MHZ 4X45W-65MHZ RRH	25.0	11.1	11.4	1.93	1.98	2.25	2.19	1.20	1.20	6	6	6
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	25.0	0.0	11.4	0.00	1.98	0.00	2.19	1.20	1.20	0	6	6
RRH2X50-800 RRH	15.8	13.0	14.0	1.43	1.54	1.22	1.13	1.20	1.20	4	5	5
RRH2X50-800 RRH (Shielded)	15.8	0.4	14.0	0.04	1.54	39.50	1.13	2.48	1.20	0	5	5
TD-RRH8x20-25 RRH	26.1	18.6	6.7	3.37	1.21	1.40	3.90	1.20	1.26	10	4	4
TD-RRH8x20-25 RRH (Shielded)	26.1	0.0	6.7	0.00	1.21	0.00	3.90	1.20	1.26	0	4	4

Date: 6/15/2018
 Project Name: Yankee Lake/East Hamplon/Town
 Project Number: 874368
 Designed By: JN Checked By: MSC



WIND LOADS

Angle = 120 (deg) Ice Thickness = 1.78 in. Equivalent Angle = 300 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
NNVV-65B-R4 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	501	235	301
APXVTM14-ALU-I20 Antenna	56.3	12.6	6.3	4.93	2.46	4.47	8.94	1.29	1.46	259	147	175
PCS 1900MHZ 4X45W-65MHZ RRH	25.0	11.1	11.4	1.93	1.98	2.25	2.19	1.20	1.20	94	97	96
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	25.0	8.3	11.4	1.45	1.98	3.00	2.19	1.22	1.20	72	97	91
RRH2X50-800 RRH	15.8	13.0	14.0	1.43	1.54	1.22	1.13	1.20	1.20	70	75	74
RRH2X50-800 RRH (Shielded)	15.8	9.8	14.0	1.07	1.54	1.62	1.13	1.20	1.20	52	75	70
TD-RRH8x20-25 RRH	26.1	18.6	6.7	3.37	1.21	1.40	3.90	1.20	1.26	165	63	88
TD-RRH8x20-25 RRH (Shielded)	26.1	14.0	6.7	2.53	1.21	1.87	3.90	1.20	1.26	124	63	78

WIND LOADS WITH ICE:

NNVV-65B-R4 Antenna	75.6	23.2	11.4	12.15	5.96	3.26	6.66	1.23	1.38	106	58	70
APXVTM14-ALU-I20 Antenna	59.9	16.2	9.9	6.71	4.09	3.71	6.08	1.25	1.36	60	39	44
PCS 1900MHZ 4X45W-65MHZ RRH	28.6	14.7	15.0	2.90	2.96	1.95	1.91	1.20	1.20	25	25	25
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	28.6	11.0	15.0	2.18	2.96	2.60	1.91	1.20	1.20	19	25	24
RRH2X50-800 RRH	19.4	16.6	17.6	2.22	2.36	1.17	1.10	1.20	1.20	19	20	20
RRH2X50-800 RRH (Shielded)	19.4	12.4	17.6	1.67	2.36	1.56	1.10	1.20	1.20	14	20	19
TD-RRH8x20-25 RRH	29.7	22.2	10.3	4.56	2.11	1.34	2.89	1.20	1.22	39	18	23
TD-RRH8x20-25 RRH (Shielded)	29.7	16.6	10.3	3.42	2.11	1.78	2.89	1.20	1.22	29	18	21

WIND LOADS AT 30 MPH:

NNVV-65B-R4 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	31	15	19
APXVTM14-ALU-I20 Antenna	56.3	12.6	6.3	4.93	2.46	4.47	8.94	1.29	1.46	16	9	11
PCS 1900MHZ 4X45W-65MHZ RRH	25.0	11.1	11.4	1.93	1.98	2.25	2.19	1.20	1.20	6	6	6
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	25.0	8.3	11.4	1.45	1.98	3.00	2.19	1.22	1.20	5	6	6
RRH2X50-800 RRH	15.8	13.0	14.0	1.43	1.54	1.22	1.13	1.20	1.20	4	5	5
RRH2X50-800 RRH (Shielded)	15.8	9.8	14.0	1.07	1.54	1.62	1.13	1.20	1.20	3	5	4
TD-RRH8x20-25 RRH	26.1	18.6	6.7	3.37	1.21	1.40	3.90	1.20	1.26	10	4	6
TD-RRH8x20-25 RRH (Shielded)	26.1	14.0	6.7	2.53	1.21	1.87	3.90	1.20	1.26	8	4	5

Date: 6/15/2018

Project Name: Yankee Lake/East Hampton/Town

Project Number: 876368

Designed By: JN Checked By: MSC



WIND LOADS

Angle = 150 (deg) Ice Thickness = 1.78 in. Equivalent Angle = 330 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
NNVV-65B-R4 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	501	235	434
APXVTM14-ALU-I20 Antenna	56.3	12.6	6.3	4.93	2.46	4.47	8.94	1.29	1.46	259	147	231
PCS 1900MHZ 4X45W-65MHZ RRH	25.0	11.1	11.4	1.93	1.98	2.25	2.19	1.20	1.20	94	97	95
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	25.0	5.6	11.4	0.96	1.98	4.50	2.19	1.29	1.20	51	97	62
RRH2X50-800 RRH	15.8	13.0	14.0	1.43	1.54	1.22	1.13	1.20	1.20	70	75	71
RRH2X50-800 RRH (Shielded)	15.8	6.5	14.0	0.71	1.54	2.43	1.13	1.20	1.20	35	75	45
TD-RRH8x20-25 RRH	26.1	18.6	6.7	3.37	1.21	1.40	3.90	1.20	1.26	165	63	139
TD-RRH8x20-25 RRH (Shielded)	26.1	9.3	6.7	1.69	1.21	2.81	3.90	1.21	1.26	83	63	78

WIND LOADS WITH ICE:

NNVV-65B-R4 Antenna	75.6	23.2	11.4	12.15	5.96	3.26	6.66	1.23	1.38	106	58	94
APXVTM14-ALU-I20 Antenna	59.9	16.2	9.9	6.71	4.09	3.71	6.08	1.25	1.36	60	39	55
PCS 1900MHZ 4X45W-65MHZ RRH	28.6	14.7	15.0	2.90	2.96	1.95	1.91	1.20	1.20	25	25	25
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	28.6	7.3	15.0	1.45	2.96	3.90	1.91	1.26	1.20	13	25	16
RRH2X50-800 RRH	19.4	16.6	17.6	2.22	2.36	1.17	1.10	1.20	1.20	19	20	19
RRH2X50-800 RRH (Shielded)	19.4	8.3	17.6	1.11	2.36	2.34	1.10	1.20	1.20	9	20	12
TD-RRH8x20-25 RRH	29.7	22.2	10.3	4.56	2.11	1.34	2.89	1.20	1.22	39	18	34
TD-RRH8x20-25 RRH (Shielded)	29.7	11.1	10.3	2.28	2.11	2.68	2.89	1.21	1.22	20	18	19

WIND LOADS AT 30 MPH:

NNVV-65B-R4 Antenna	72.0	19.6	7.8	9.80	3.90	3.67	9.23	1.25	1.47	31	15	27
APXVTM14-ALU-I20 Antenna	56.3	12.6	6.3	4.93	2.46	4.47	8.94	1.29	1.46	16	9	14
PCS 1900MHZ 4X45W-65MHZ RRH	25.0	11.1	11.4	1.93	1.98	2.25	2.19	1.20	1.20	6	6	6
PCS 1900MHZ 4X45W-65MHZ RRH (Shielded)	25.0	5.6	11.4	0.96	1.98	4.50	2.19	1.29	1.20	3	6	4
RRH2X50-800 RRH	15.8	13.0	14.0	1.43	1.54	1.22	1.13	1.20	1.20	4	5	4
RRH2X50-800 RRH (Shielded)	15.8	6.5	14.0	0.71	1.54	2.43	1.13	1.20	1.20	2	5	3
TD-RRH8x20-25 RRH	26.1	18.6	6.7	3.37	1.21	1.40	3.90	1.20	1.26	10	4	9
TD-RRH8x20-25 RRH (Shielded)	26.1	9.3	6.7	1.69	1.21	2.81	3.90	1.21	1.26	5	4	5

Date: 6/15/2018

Project Name: Yankee Lake/East Hampton/Town

Project Number: 876368

Designed By: JN Checked By: MSC



HUDSON
Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 0.75 in.
Density of ice: 56 pcf

NNVV-65B-R4 Antenna

Weight of ice based on total radial SF area:
Height (in): 72.0
Width (in): 19.6
Depth (in): 7.8
Total weight of ice on object: 111 lbs
Weight of object: 78 lbs
Combined weight of ice and object: 189 lbs

APXVTM14-ALU-I20 Antenna

Weight of ice based on total radial SF area:
Height (in): 56.3
Width (in): 12.6
Depth (in): 6.3
Total weight of ice on object: 61 lbs
Weight of object: 57 lbs
Combined weight of ice and object: 118 lbs

PCS 1900MHZ 4X45W-65MHZ RRH

Weight of ice based on total radial SF area:
Height (in): 25.0
Width (in): 11.1
Depth (in): 11.4
Total weight of ice on object: 37 lbs
Weight of object: 60 lbs
Combined weight of ice and object: 97 lbs

RRH2X50-800 RRH

Weight of ice based on total radial SF area:
Height (in): 15.8
Width (in): 13.0
Depth (in): 14.0
Total weight of ice on object: 33 lbs
Weight of object: 64 lbs
Combined weight of ice and object: 97 lbs

TD-RRH8x20-25 RRH

Weight of ice based on total radial SF area:
Height (in): 26.1
Width (in): 18.6
Depth (in): 6.7
Total weight of ice on object: 42 lbs
Weight of object: 70 lbs
Combined weight of ice and object: 112 lbs

HSS 3x3x1/4

Weight of ice based on total radial SF area:
Height (in): 3
Width (in): 3
Per foot weight of ice on object: 4 plf

L 2-1/2x2-1/2x1/4

Weight of ice based on total radial SF area:
Height (in): 2.5
Width (in): 2.5
Per foot weight of ice on object: 4 plf

L 3x3x1/4

Weight of ice based on total radial SF area:
Height (in): 3
Width (in): 3
Per foot weight of ice on object: 4 plf

2" pipe

Per foot weight of ice:
diameter (in): 2.38
Per foot weight of ice on object: 3 plf

Current Date: 6/15/2018 11:24 AM

Units system: English

File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\CROWN CASTLE\876368\876368 (Rev.1).etx\

Load data

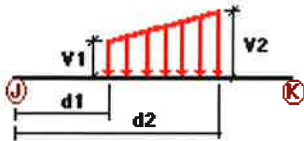
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
W0	Wind Load 0/60/120 deg	No	WIND
W30	Wind Load 30/90/150 deg	No	WIND
Di	Ice Load	No	LL
Wi0	Ice Wind Load 0/60/120 deg	No	WIND
Wi30	Ice Wind Load 30/90/150 deg	No	WIND
WL0	WL 30 mph 0/60/120 deg	No	WIND
WL30	WL 30 mph 30/90/150 deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load End of Mount	No	LL
LLa1	500 lb Live Load Antenna 1	No	LL
LLa2	500 lb Live Load Antenna 2	No	LL

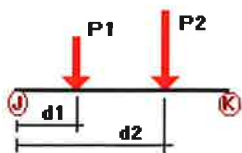
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	22	y	-0.01	0.00	0.00	No	0.00	No
	29	y	-0.01	0.00	0.00	No	0.00	No
	30	y	-0.01	0.00	0.00	No	0.00	No
	31	y	-0.01	0.00	0.00	No	0.00	No
	32	y	-0.01	0.00	0.00	No	0.00	No
	33	y	-0.01	0.00	0.00	No	0.00	No
	34	y	-0.01	0.00	0.00	No	0.00	No
	35	y	-0.01	0.00	0.00	No	0.00	No
	36	y	-0.01	0.00	0.00	No	0.00	No
	W0	5	z	-0.01	0.00	0.00	No	0.00
6		z	-0.01	0.00	0.00	No	0.00	No
7		z	-0.01	0.00	0.00	No	0.00	No
19		z	-0.01	0.00	0.00	No	0.00	No
20		z	-0.01	0.00	0.00	No	0.00	No
21		z	-0.01	0.00	0.00	No	0.00	No
22		z	-0.02	0.00	0.00	No	0.00	No
27	z	-0.01	0.00	0.00	No	0.00	No	

	29	z	-0.02	0.00	0.00	No	0.00	No
	30	z	-0.02	0.00	0.00	No	0.00	No
	46	z	-0.01	0.00	0.00	No	0.00	No
	47	z	-0.01	0.00	0.00	No	0.00	No
	48	z	-0.01	0.00	0.00	No	0.00	No
	52	z	-0.02	0.00	0.00	No	0.00	No
	53	z	-0.02	0.00	0.00	No	0.00	No
W30	54	z	-0.02	0.00	0.00	No	0.00	No
	5	x	-0.01	0.00	0.00	No	0.00	No
	6	x	-0.01	0.00	0.00	No	0.00	No
	7	x	-0.01	0.00	0.00	No	0.00	No
	19	x	-0.01	0.00	0.00	No	0.00	No
	20	x	-0.01	0.00	0.00	No	0.00	No
	21	x	-0.01	0.00	0.00	No	0.00	No
	26	x	-0.01	0.00	0.00	No	0.00	No
	27	x	-0.01	0.00	0.00	No	0.00	No
	28	x	-0.01	0.00	0.00	No	0.00	No
	29	x	-0.02	0.00	0.00	No	0.00	No
	30	x	-0.02	0.00	0.00	No	0.00	No
	46	x	-0.01	0.00	0.00	No	0.00	No
	47	x	-0.01	0.00	0.00	No	0.00	No
	48	x	-0.01	0.00	0.00	No	0.00	No
	52	x	-0.02	0.00	0.00	No	0.00	No
	53	x	-0.02	0.00	0.00	No	0.00	No
Di	54	x	-0.02	0.00	0.00	No	0.00	No
	5	y	-0.003	0.00	0.00	No	0.00	No
	6	y	-0.003	0.00	0.00	No	0.00	No
	7	y	-0.003	0.00	0.00	No	0.00	No
	19	y	-0.003	0.00	0.00	No	0.00	No
	20	y	-0.003	0.00	0.00	No	0.00	No
	21	y	-0.003	0.00	0.00	No	0.00	No
	22	y	-0.004	0.00	0.00	No	0.00	No
	26	y	-0.003	0.00	0.00	No	0.00	No
	27	y	-0.003	0.00	0.00	No	0.00	No
	28	y	-0.003	0.00	0.00	No	0.00	No
	29	y	-0.004	0.00	0.00	No	0.00	No
	30	y	-0.004	0.00	0.00	No	0.00	No
	31	y	-0.004	0.00	0.00	No	0.00	No
	32	y	-0.004	0.00	0.00	No	0.00	No
	33	y	-0.004	0.00	0.00	No	0.00	No
	34	y	-0.004	0.00	0.00	No	0.00	No
	35	y	-0.004	0.00	0.00	No	0.00	No
	36	y	-0.004	0.00	0.00	No	0.00	No
	46	y	-0.003	0.00	0.00	No	0.00	No
	47	y	-0.003	0.00	0.00	No	0.00	No
	48	y	-0.003	0.00	0.00	No	0.00	No
	49	y	-0.004	0.00	0.00	No	0.00	No
	50	y	-0.004	0.00	0.00	No	0.00	No
	51	y	-0.004	0.00	0.00	No	0.00	No
	52	y	-0.004	0.00	0.00	No	0.00	No
	53	y	-0.004	0.00	0.00	No	0.00	No
	54	y	-0.004	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	5	y	-0.029	1.00	No
		y	-0.029	5.00	No
		y	-0.06	3.00	No
		y	-0.064	1.50	No
	7	y	-0.039	0.50	No
		y	-0.039	5.50	No
		y	-0.07	3.00	No
		y	-0.064	1.50	No
	19	y	-0.029	1.00	No
		y	-0.029	5.00	No
		y	-0.06	3.00	No
		y	-0.064	1.50	No
	21	y	-0.039	0.50	No
		y	-0.039	5.50	No
		y	-0.07	3.00	No
		y	-0.064	1.50	No
	26	y	-0.029	1.00	No
		y	-0.029	5.00	No
		y	-0.06	3.00	No
		y	-0.064	1.50	No
	28	y	-0.039	0.50	No
		y	-0.039	5.50	No
		y	-0.07	3.00	No
		y	-0.064	1.50	No
W0	5	z	-0.088	1.00	No
		z	-0.088	5.00	No
		z	-0.091	3.00	No
		z	-0.07	1.50	No
	7	z	-0.151	0.50	No
		z	-0.151	5.50	No
		z	-0.078	3.00	No
		z	-0.07	1.50	No
	19	z	-0.088	1.00	No
		z	-0.088	5.00	No
		z	-0.091	3.00	No
		z	-0.07	1.50	No
21	z	-0.151	0.50	No	
	z	-0.151	5.50	No	
	z	-0.078	3.00	No	
	z	-0.07	1.50	No	
26	z	-0.13	1.00	No	
	z	-0.13	5.00	No	
	z	-0.251	0.50	No	
	z	-0.251	5.50	No	
W30	5	x	-0.116	1.00	No
		x	-0.116	5.00	No
		x	-0.062	3.00	No
		x	-0.045	1.50	No
	7	x	-0.218	0.50	No
		x	-0.218	5.50	No
		x	-0.078	3.00	No
		x	-0.045	1.50	No
	19	x	-0.116	1.00	No

		x	-0.116	5.00	No
		x	-0.062	3.00	No
		x	-0.045	1.50	No
	21	x	-0.218	0.50	No
		x	-0.218	5.50	No
		x	-0.078	3.00	No
		x	-0.045	1.50	No
	26	x	-0.074	1.00	No
		x	-0.074	5.00	No
		x	-0.097	3.00	No
		x	-0.075	1.50	No
	28	x	-0.118	0.50	No
		x	-0.118	5.50	No
		x	-0.063	3.00	No
		x	-0.075	1.50	No
Di	5	y	-0.031	1.00	No
		y	-0.031	5.00	No
		y	-0.037	3.00	No
		y	-0.033	1.50	No
	7	y	-0.056	0.50	No
		y	-0.056	5.50	No
		y	-0.042	3.00	No
		y	-0.033	1.50	No
	19	y	-0.031	1.00	No
		y	-0.031	5.00	No
		y	-0.037	3.00	No
		y	-0.033	1.50	No
	21	y	-0.056	0.50	No
		y	-0.056	5.50	No
		y	-0.042	3.00	No
		y	-0.033	1.50	No
	26	y	-0.031	1.00	No
		y	-0.031	5.00	No
		y	-0.037	3.00	No
		y	-0.033	1.50	No
	28	y	-0.056	0.50	No
		y	-0.056	5.50	No
		y	-0.042	3.00	No
		y	-0.033	1.50	No
Wi0	5	z	-0.023	1.00	No
		z	-0.023	5.00	No
		z	-0.025	3.00	No
		z	-0.02	1.50	No
	7	z	-0.036	0.50	No
		z	-0.036	5.50	No
		z	-0.023	3.00	No
		z	-0.02	1.50	No
	19	z	-0.023	1.00	No
		z	-0.023	5.00	No
		z	-0.025	3.00	No
		z	-0.02	1.50	No
	21	z	-0.036	0.50	No
		z	-0.036	5.50	No
		z	-0.023	3.00	No
		z	-0.02	1.50	No
	26	z	-0.031	1.00	No
		z	-0.031	5.00	No
		z	-0.025	3.00	No
		z	-0.019	1.50	No
	28	z	-0.054	0.50	No

		z	-0.054	5.50	No
		z	-0.039	3.00	No
		z	-0.019	1.50	No
Wi30	5	x	-0.028	1.00	No
		x	-0.028	5.00	No
		x	-0.025	3.00	No
		x	-0.019	1.50	No
	7	x	-0.048	0.50	No
		x	-0.048	5.50	No
		x	-0.034	3.00	No
		x	-0.019	1.50	No
	19	x	-0.028	1.00	No
		x	-0.028	5.00	No
		x	-0.025	3.00	No
		x	-0.019	1.50	No
	21	x	-0.048	0.50	No
		x	-0.048	5.50	No
		x	-0.034	3.00	No
		x	-0.019	1.50	No
	26	x	-0.02	1.00	No
		x	-0.02	5.00	No
		x	-0.025	3.00	No
		x	-0.02	1.50	No
	28	x	-0.03	0.50	No
		x	-0.03	5.50	No
		x	-0.018	3.00	No
		x	-0.02	1.50	No
WLO	5	z	-0.006	1.00	No
		z	-0.006	5.00	No
		z	-0.007	3.00	No
		z	-0.005	1.50	No
	7	z	-0.01	0.50	No
		z	-0.01	5.50	No
		z	-0.006	3.00	No
		z	-0.005	1.50	No
	19	z	-0.006	1.00	No
		z	-0.006	5.00	No
		z	-0.007	3.00	No
		z	-0.005	1.50	No
	21	z	-0.01	0.50	No
		z	-0.01	5.50	No
		z	-0.006	3.00	No
		z	-0.005	1.50	No
	26	z	-0.009	1.00	No
		z	-0.009	5.00	No
		z	-0.006	3.00	No
		z	-0.005	1.50	No
	28	z	-0.016	0.50	No
		z	-0.016	5.50	No
		z	-0.011	3.00	No
		z	-0.005	1.50	No
WL30	5	x	-0.008	1.00	No
		x	-0.008	5.00	No
		x	-0.006	3.00	No
		x	-0.005	1.50	No
	7	x	-0.014	0.50	No
		x	-0.014	5.50	No
		x	-0.009	3.00	No
		x	-0.005	1.50	No
	19	x	-0.008	1.00	No

		x	-0.008	5.00	No
		x	-0.006	3.00	No
		x	-0.005	1.50	No
21		x	-0.014	0.50	No
		x	-0.014	5.50	No
		x	-0.009	3.00	No
		x	-0.005	1.50	No
26		x	-0.005	1.00	No
		x	-0.005	5.00	No
		x	-0.007	3.00	No
		x	-0.005	1.50	No
28		x	-0.008	0.50	No
		x	-0.008	5.50	No
		x	-0.004	3.00	No
		x	-0.005	1.50	No
LL1	22	y	-0.25	50.00	Yes
LL2	22	y	-0.25	100.00	Yes
LLa1	28	y	-0.50	50.00	Yes
LLa2	26	y	-0.50	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
W0	Wind Load 0/60/120 deg	No	0.00	0.00	0.00
W30	Wind Load 30/90/150 deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi0	Ice Wind Load 0/60/120 deg	No	0.00	0.00	0.00
Wi30	Ice Wind Load 30/90/150 deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0/60/120 deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30/90/150 deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load End of Mount	No	0.00	0.00	0.00
LLa1	500 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	500 lb Live Load Antenna 2	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
W0	0.00	0.00	0.00
W30	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi0	0.00	0.00	0.00
Wi30	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00

LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00

Current Date: 6/15/2018 11:24 AM

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Geometry data

GLOSSARY

Cb22, Cb33 : Moment gradient coefficients
 Cm22, Cm33 : Coefficients applied to bending term in interaction formula
 d0 : Tapered member section depth at J end of member
 DJX : Rigid end offset distance measured from J node in axis X
 DJY : Rigid end offset distance measured from J node in axis Y
 DJZ : Rigid end offset distance measured from J node in axis Z
 DKX : Rigid end offset distance measured from K node in axis X
 DKY : Rigid end offset distance measured from K node in axis Y
 DKZ : Rigid end offset distance measured from K node in axis Z
 dL : Tapered member section depth at K end of member
 Ig factor : Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
 K22 : Effective length factor about axis 2
 K33 : Effective length factor about axis 3
 L22 : Member length for calculation of axial capacity
 L33 : Member length for calculation of axial capacity
 LB pos : Lateral unbraced length of the compression flange in the positive side of local axis 2
 LB neg : Lateral unbraced length of the compression flange in the negative side of local axis 2
 RX : Rotation about X
 RY : Rotation about Y
 RZ : Rotation about Z
 TO : 1 = Tension only member 0 = Normal member
 TX : Translation in X
 TY : Translation in Y
 TZ : Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
5	-3.1501	0.00	-1.4723	0
6	-2.8501	0.00	-1.9919	0
12	-0.4233	4.00	-6.5952	0
13	-3.1733	4.00	-1.8321	0
14	-5.9233	4.00	2.931	0
15	-0.4233	-2.00	-6.5952	0
16	-3.1733	-2.00	-1.8321	0
17	-5.9233	-2.00	2.931	0
35	7.65E-05	0.00	-6.9282	0
37	2.8501	0.00	-1.9919	0
38	3.1501	0.00	-1.4723	0
44	5.9233	4.00	2.931	0
45	3.1733	4.00	-1.8321	0
46	0.4233	4.00	-6.5952	0
47	5.9233	-2.00	2.931	0
48	3.1733	-2.00	-1.8321	0
49	0.4233	-2.00	-6.5952	0
51	6.00	0.00	3.4642	0
52	-6.00	0.00	3.4642	0
53	0.30	0.00	3.4642	0
54	-0.30	0.00	3.4642	0

60	-5.50	4.00	3.6642	0
61	0.00	4.00	3.6642	0
62	5.50	4.00	3.6642	0
63	-5.50	-2.00	3.6642	0
64	0.00	-2.00	3.6642	0
65	5.50	-2.00	3.6642	0
66	-0.866	0.00	0.50	0
67	0.866	0.00	0.50	0
68	0.00	0.00	-1.00	0
75	5.75	3.00	3.4642	0
76	5.875	3.00	3.2476	0
85	-0.125	3.00	-6.7117	0
86	0.1251	3.00	-6.7117	0
89	-5.875	3.00	3.2476	0
94	-5.75	3.00	3.4642	0
99	5.134	0.00	2.9642	0
100	-5.1341	0.00	2.9641	0
101	7.65E-05	0.00	-5.9282	0
102	0.00	-2.50	-1.00	0
104	-0.866	-2.50	0.50	0
103	0.866	-2.50	0.50	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
66	1	1	1	1	1	1
67	1	1	1	1	1	1
68	1	1	1	1	1	1
102	1	1	1	1	1	1
104	1	1	1	1	1	1
103	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
5	12	15		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
6	13	16		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
7	14	17		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
19	44	47		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
20	45	48		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
21	46	49		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
22	52	51		L 3X3X1_4	A36	0.00	0.00	0.00
26	60	63		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
27	61	64		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
28	62	65		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
29	51	35		L 3X3X1_4	A36	0.00	0.00	0.00
30	52	35		L 3X3X1_4	A36	0.00	0.00	0.00
31	6	37		L 3X3X1_4	A36	0.00	0.00	0.00
32	54	5		L 3X3X1_4	A36	0.00	0.00	0.00
33	53	38		L 3X3X1_4	A36	0.00	0.00	0.00





34	68	35	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
35	67	51	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
36	66	52	HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
46	94	75	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
47	76	86	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
48	85	89	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
49	97	77	L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
50	81	83	L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
51	90	92	L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
52	100	104	T2L 3X3X1_4X3_4	A36	0.00	0.00	0.00
53	102	101	T2L 3X3X1_4X3_4	A36	0.00	0.00	0.00
54	99	103	T2L 3X3X1_4X3_4	A36	0.00	0.00	0.00

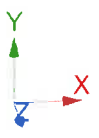
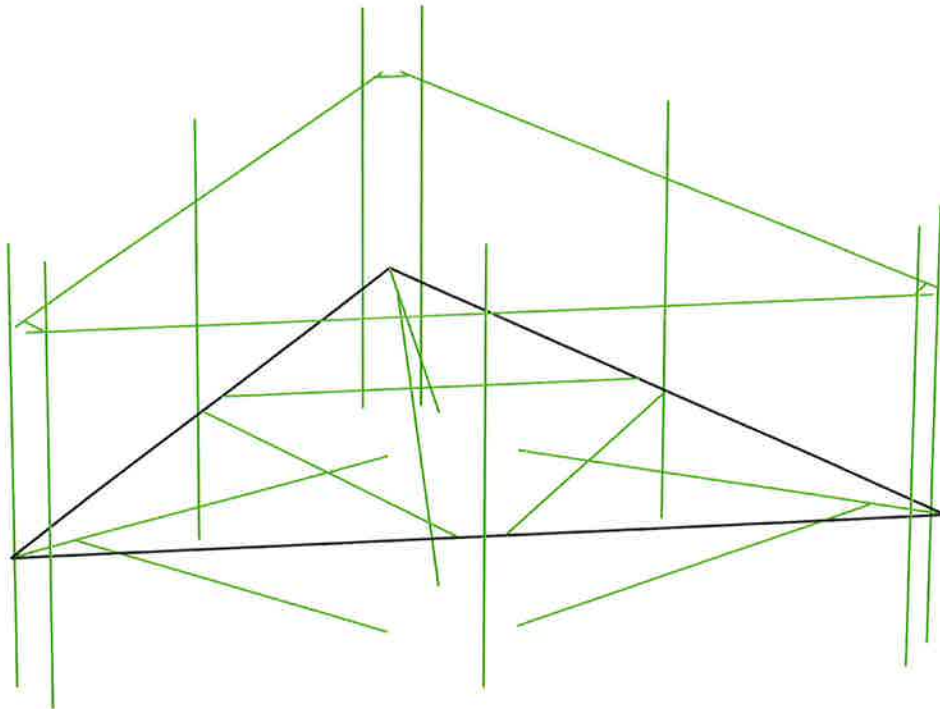
Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
5	0.00	2	-0.50	0.00	0.866
6	0.00	2	-0.50	0.00	0.866
7	0.00	2	-0.50	0.00	0.866
19	0.00	2	-0.50	0.00	-0.866
20	0.00	2	-0.50	0.00	-0.866
21	0.00	2	-0.50	0.00	-0.866
22	180.00	0	0.00	0.00	0.00
29	180.00	0	0.00	0.00	0.00
30	90.00	0	0.00	0.00	0.00
31	90.00	0	0.00	0.00	0.00
32	90.00	0	0.00	0.00	0.00
33	180.00	0	0.00	0.00	0.00
49	90.00	0	0.00	0.00	0.00
50	90.00	0	0.00	0.00	0.00
51	90.00	0	0.00	0.00	0.00

APPENDIX C
RAM ELEMENTS ANALYSIS OUTPUT

Design status

-  Not designed
-  Error on design
-  Design O.K.
-  With warnings



Current Date: 6/15/2018 11:23 AM

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Steel Code Check

Report: Summary - For all selected load conditions

Load conditions to be included in design :

- LC1=1.2DL+1.6W0
- LC2=1.2DL+1.6W30
- LC3=1.2DL-1.6W0
- LC4=1.2DL-1.6W30
- LC5=0.9DL+1.6W0
- LC6=0.9DL+1.6W30
- LC7=0.9DL-1.6W0
- LC8=0.9DL-1.6W30
- LC9=1.2DL+Di+Wi0
- LC10=1.2DL+Di+Wi30
- LC11=1.2DL+Di-Wi0
- LC12=1.2DL+Di-Wi30
- LC13=1.2DL
- LC14=0.9DL
- LC15=1.2DL+1.5LL1
- LC16=1.2DL+1.5LL2
- LC17=1.2DL+WL0+1.5LLa1
- LC18=1.2DL+WL30+1.5LLa1
- LC19=1.2DL-WL0+1.5LLa1
- LC20=1.2DL-WL30+1.5LLa1
- LC21=1.2DL+WL0+1.5LLa2
- LC22=1.2DL+WL30+1.5LLa2
- LC23=1.2DL-WL0+1.5LLa2
- LC24=1.2DL-WL30+1.5LLa2

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 3X3X1_4	34	LC1 at 83.33%	0.16	OK	Eq. H1-1b
			LC10 at 100.00%	0.12	OK	
			LC11 at 100.00%	0.12	OK	Eq. H1-1b
			LC12 at 100.00%	0.12	OK	
			LC13 at 100.00%	0.08	OK	
			LC14 at 100.00%	0.06	OK	
			LC15 at 100.00%	0.08	OK	
			LC16 at 100.00%	0.08	OK	
			LC17 at 100.00%	0.08	OK	
			LC18 at 100.00%	0.08	OK	
			LC19 at 100.00%	0.08	OK	
			LC2 at 0.00%	0.26	OK	Eq. H1-1b
			LC20 at 100.00%	0.08	OK	
			LC21 at 100.00%	0.08	OK	
			LC22 at 100.00%	0.08	OK	
			LC23 at 100.00%	0.08	OK	
			LC24 at 100.00%	0.08	OK	
			LC3 at 100.00%	0.11	OK	
			LC4 at 0.00%	0.26	OK	
			LC5 at 83.33%	0.15	OK	
			LC6 at 0.00%	0.25	OK	
			LC7 at 100.00%	0.09	OK	
			LC8 at 0.00%	0.25	OK	
			LC9 at 100.00%	0.11	OK	

35	LC1 at 0.00%	0.19	OK	Eq. H1-1b
	LC10 at 100.00%	0.12	OK	
	LC11 at 100.00%	0.12	OK	
	LC12 at 100.00%	0.12	OK	
	LC13 at 100.00%	0.08	OK	
	LC14 at 100.00%	0.06	OK	
	LC15 at 100.00%	0.10	OK	
	LC16 at 83.33%	0.11	OK	
	LC17 at 100.00%	0.15	OK	Eq. H1-1b
	LC18 at 100.00%	0.15	OK	
	LC19 at 100.00%	0.15	OK	
	LC2 at 100.00%	0.11	OK	
	LC20 at 100.00%	0.15	OK	
	LC21 at 100.00%	0.08	OK	
	LC22 at 100.00%	0.08	OK	
	LC23 at 100.00%	0.08	OK	
	LC24 at 100.00%	0.08	OK	
	LC3 at 0.00%	0.20	OK	Eq. H1-1b
	LC4 at 83.33%	0.16	OK	Eq. H1-1b
	LC5 at 0.00%	0.19	OK	
LC6 at 100.00%	0.09	OK		
LC7 at 0.00%	0.19	OK		
LC8 at 83.33%	0.15	OK		
LC9 at 100.00%	0.12	OK		

36	LC1 at 0.00%	0.13	OK	Eq. H1-1b
	LC10 at 100.00%	0.12	OK	
	LC11 at 100.00%	0.12	OK	
	LC12 at 100.00%	0.12	OK	
	LC13 at 100.00%	0.08	OK	
	LC14 at 100.00%	0.06	OK	
	LC15 at 100.00%	0.10	OK	
	LC16 at 100.00%	0.08	OK	
	LC17 at 100.00%	0.08	OK	
	LC18 at 100.00%	0.08	OK	
	LC19 at 100.00%	0.08	OK	
	LC2 at 83.33%	0.16	OK	Eq. H1-1b
	LC20 at 100.00%	0.08	OK	
	LC21 at 100.00%	0.15	OK	
	LC22 at 100.00%	0.15	OK	Eq. H1-1b
	LC23 at 100.00%	0.15	OK	
	LC24 at 100.00%	0.15	OK	Eq. H1-1b
	LC3 at 0.00%	0.14	OK	Eq. H1-1b
	LC4 at 100.00%	0.11	OK	
	LC5 at 0.00%	0.13	OK	
LC6 at 83.33%	0.15	OK		
LC7 at 0.00%	0.13	OK		
LC8 at 100.00%	0.09	OK		
LC9 at 100.00%	0.12	OK		

L 2-1_2X2-1_2X1_4

49	LC1 at 100.00%	0.57	OK	Eq. H3-8
	LC10 at 100.00%	0.04	OK	
	LC11 at 0.00%	0.05	OK	
	LC12 at 100.00%	0.04	OK	
	LC13 at 0.00%	0.01	OK	
	LC14 at 0.00%	0.01	OK	
	LC15 at 100.00%	0.02	OK	
	LC16 at 0.00%	0.01	OK	
	LC17 at 100.00%	0.13	OK	
	LC18 at 100.00%	0.10	OK	
	LC19 at 100.00%	0.09	OK	
	LC2 at 100.00%	0.34	OK	Eq. H2-1
	LC20 at 100.00%	0.12	OK	
	LC21 at 100.00%	0.02	OK	

LC22 at 100.00%	0.01	OK	
LC23 at 0.00%	0.02	OK	
LC24 at 100.00%	0.01	OK	
LC3 at 0.00%	0.56	OK	
LC4 at 100.00%	0.33	OK	
LC5 at 100.00%	0.57	OK	
LC6 at 100.00%	0.34	OK	
LC7 at 0.00%	0.57	OK	
LC8 at 100.00%	0.33	OK	Eq. H2-1
LC9 at 100.00%	0.08	OK	

50	LC1 at 0.00%	0.27	OK	
	LC10 at 100.00%	0.08	OK	
	LC11 at 0.00%	0.05	OK	
	LC12 at 0.00%	0.06	OK	
	LC13 at 0.00%	0.01	OK	
	LC14 at 0.00%	0.01	OK	
	LC15 at 0.00%	0.01	OK	
	LC16 at 18.75%	0.01	OK	
	LC17 at 100.00%	0.01	OK	
	LC18 at 0.00%	0.02	OK	
	LC19 at 100.00%	0.03	OK	
	LC2 at 100.00%	0.64	OK	Eq. H3-8
	LC20 at 100.00%	0.03	OK	
	LC21 at 0.00%	0.01	OK	
	LC22 at 0.00%	0.03	OK	
	LC23 at 0.00%	0.03	OK	
	LC24 at 100.00%	0.02	OK	
	LC3 at 0.00%	0.28	OK	
	LC4 at 0.00%	0.63	OK	
	LC5 at 0.00%	0.27	OK	
	LC6 at 100.00%	0.64	OK	
	LC7 at 0.00%	0.28	OK	
	LC8 at 0.00%	0.63	OK	
	LC9 at 100.00%	0.03	OK	

51	LC1 at 0.00%	0.47	OK	
	LC10 at 0.00%	0.03	OK	
	LC11 at 100.00%	0.07	OK	
	LC12 at 0.00%	0.06	OK	
	LC13 at 0.00%	0.01	OK	
	LC14 at 0.00%	0.01	OK	
	LC15 at 0.00%	0.02	OK	
	LC16 at 0.00%	0.01	OK	
	LC17 at 0.00%	0.01	OK	
	LC18 at 0.00%	0.01	OK	
	LC19 at 100.00%	0.02	OK	
	LC2 at 0.00%	0.43	OK	
	LC20 at 100.00%	0.02	OK	
	LC21 at 0.00%	0.11	OK	
	LC22 at 0.00%	0.11	OK	
	LC23 at 0.00%	0.08	OK	
	LC24 at 0.00%	0.09	OK	
	LC3 at 100.00%	0.48	OK	Eq. H3-8
	LC4 at 0.00%	0.44	OK	Eq. H2-1
	LC5 at 0.00%	0.47	OK	
	LC6 at 0.00%	0.43	OK	
	LC7 at 100.00%	0.48	OK	
	LC8 at 0.00%	0.44	OK	
	LC9 at 0.00%	0.04	OK	

L 3X3X1_4

22	LC1 at 48.96%	0.64	With warnings	Eq. H3-8
	LC10 at 100.00%	0.38	With warnings	
	LC11 at 100.00%	0.37	With warnings	

	LC12 at 0.00%	0.37	With warnings	
	LC13 at 100.00%	0.24	With warnings	
	LC14 at 100.00%	0.18	With warnings	
	LC15 at 100.00%	0.32	With warnings	
	LC16 at 100.00%	0.29	With warnings	
	LC17 at 100.00%	0.51	With warnings	
	LC18 at 100.00%	0.52	With warnings	Eq. H2-1
	LC19 at 100.00%	0.52	With warnings	
	LC2 at 4.17%	0.53	With warnings	Sec. F1
	LC20 at 100.00%	0.51	With warnings	
	LC21 at 0.00%	0.51	With warnings	
	LC22 at 0.00%	0.50	With warnings	
	LC23 at 0.00%	0.51	With warnings	
	LC24 at 0.00%	0.52	With warnings	Eq. H2-1
	LC3 at 100.00%	0.69	With warnings	Eq. H2-1
	LC4 at 0.00%	0.48	With warnings	
	LC5 at 48.96%	0.63	With warnings	
	LC6 at 4.17%	0.52	With warnings	
	LC7 at 100.00%	0.66	With warnings	
	LC8 at 0.00%	0.42	With warnings	
	LC9 at 100.00%	0.35	With warnings	
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29	LC1 at 51.04%	0.55	With warnings	
	LC10 at 0.00%	0.34	With warnings	
	LC11 at 100.00%	0.37	With warnings	
	LC12 at 100.00%	0.38	With warnings	
	LC13 at 100.00%	0.24	With warnings	
	LC14 at 100.00%	0.18	With warnings	
	LC15 at 0.00%	0.25	With warnings	
	LC16 at 0.00%	0.28	With warnings	
	LC17 at 0.00%	0.36	With warnings	
	LC18 at 0.00%	0.35	With warnings	
	LC19 at 0.00%	0.34	With warnings	
	LC2 at 50.00%	0.87	With warnings	Eq. H3-8
	LC20 at 0.00%	0.35	With warnings	
	LC21 at 0.00%	0.24	With warnings	
	LC22 at 0.00%	0.24	With warnings	
	LC23 at 100.00%	0.24	With warnings	
	LC24 at 100.00%	0.25	With warnings	
	LC3 at 51.04%	0.64	With warnings	Eq. H3-8
	LC4 at 50.00%	0.78	With warnings	
	LC5 at 51.04%	0.56	With warnings	
	LC6 at 50.00%	0.85	With warnings	
	LC7 at 51.04%	0.63	With warnings	
	LC8 at 50.00%	0.79	With warnings	
	LC9 at 0.00%	0.38	With warnings	
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30	LC1 at 100.00%	0.56	With warnings	
	LC10 at 0.00%	0.44	With warnings	
	LC11 at 0.00%	0.39	With warnings	
	LC12 at 0.00%	0.38	With warnings	
	LC13 at 0.00%	0.26	With warnings	
	LC14 at 0.00%	0.20	With warnings	
	LC15 at 0.00%	0.26	With warnings	
	LC16 at 0.00%	0.26	With warnings	
	LC17 at 0.00%	0.26	With warnings	
	LC18 at 0.00%	0.26	With warnings	
	LC19 at 100.00%	0.26	With warnings	
	LC2 at 0.00%	0.74	With warnings	Eq. H2-1
	LC20 at 100.00%	0.25	With warnings	
	LC21 at 0.00%	0.36	With warnings	
	LC22 at 0.00%	0.37	With warnings	
	LC23 at 0.00%	0.35	With warnings	
	LC24 at 0.00%	0.36	With warnings	

	LC3 at 47.92%	0.53	With warnings	
	LC4 at 52.08%	0.80	With warnings	Eq. H3-8
	LC5 at 100.00%	0.59	With warnings	
	LC6 at 0.00%	0.72	With warnings	
	LC7 at 47.92%	0.51	With warnings	
	LC8 at 52.08%	0.78	With warnings	
	LC9 at 0.00%	0.43	With warnings	
31	LC1 at 50.00%	0.30	OK	Sec. F1
	LC10 at 50.00%	0.23	OK	
	LC11 at 50.00%	0.21	OK	
	LC12 at 50.00%	0.22	OK	
	LC13 at 50.00%	0.18	OK	
	LC14 at 50.00%	0.13	OK	
	LC15 at 50.00%	0.14	OK	
	LC16 at 50.00%	0.18	OK	
	LC17 at 50.00%	0.17	OK	
	LC18 at 50.00%	0.17	OK	
	LC19 at 50.00%	0.17	OK	
	LC2 at 50.00%	0.23	OK	
	LC20 at 50.00%	0.17	OK	
	LC21 at 50.00%	0.17	OK	
	LC22 at 50.00%	0.17	OK	
	LC23 at 50.00%	0.16	OK	
	LC24 at 50.00%	0.16	OK	
	LC3 at 50.00%	0.08	OK	
	LC4 at 53.13%	0.21	OK	
	LC5 at 50.00%	0.25	OK	
	LC6 at 50.00%	0.21	OK	
	LC7 at 100.00%	0.06	OK	
	LC8 at 53.13%	0.19	OK	
	LC9 at 50.00%	0.24	OK	
32	LC1 at 50.00%	0.15	OK	
	LC10 at 50.00%	0.24	OK	
	LC11 at 50.00%	0.23	OK	
	LC12 at 50.00%	0.21	OK	
	LC13 at 50.00%	0.18	OK	
	LC14 at 50.00%	0.13	OK	
	LC15 at 46.88%	0.40	OK	Sec. F1
	LC16 at 50.00%	0.18	OK	
	LC17 at 50.00%	0.18	OK	
	LC18 at 50.00%	0.19	OK	
	LC19 at 46.88%	0.18	OK	
	LC2 at 50.00%	0.31	OK	Sec. F1
	LC20 at 46.88%	0.18	OK	
	LC21 at 50.00%	0.19	OK	
	LC22 at 50.00%	0.19	OK	
	LC23 at 50.00%	0.19	OK	
	LC24 at 50.00%	0.18	OK	
	LC3 at 46.88%	0.26	OK	
	LC4 at 100.00%	0.11	OK	Eq. H2-1
	LC5 at 50.00%	0.11	OK	
	LC6 at 50.00%	0.26	OK	
	LC7 at 46.88%	0.22	OK	
	LC8 at 50.00%	0.11	OK	
	LC9 at 50.00%	0.22	OK	
33	LC1 at 50.00%	0.17	OK	
	LC10 at 50.00%	0.21	OK	
	LC11 at 50.00%	0.23	OK	
	LC12 at 50.00%	0.24	OK	
	LC13 at 50.00%	0.18	OK	
	LC14 at 50.00%	0.13	OK	

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LC15 at 46.88%	0.40	OK	Sec. F1
LC16 at 50.00%	0.18	OK	
LC17 at 50.00%	0.19	OK	
LC18 at 50.00%	0.19	OK	
LC19 at 50.00%	0.19	OK	
LC2 at 100.00%	0.11	OK	Eq. H2-1
LC20 at 50.00%	0.19	OK	
LC21 at 50.00%	0.18	OK	
LC22 at 46.88%	0.18	OK	
LC23 at 46.88%	0.18	OK	
LC24 at 50.00%	0.19	OK	
LC3 at 46.88%	0.25	OK	
LC4 at 50.00%	0.31	OK	Sec. F1
LC5 at 50.00%	0.13	OK	
LC6 at 100.00%	0.10	OK	
LC7 at 46.88%	0.21	OK	
LC8 at 50.00%	0.26	OK	
LC9 at 50.00%	0.23	OK	

LC1 at 64.58%	0.50	OK	
LC10 at 64.58%	0.10	OK	
LC11 at 64.58%	0.13	OK	
LC12 at 64.58%	0.13	OK	
LC13 at 64.58%	0.06	OK	
LC14 at 64.58%	0.04	OK	
LC15 at 64.58%	0.05	OK	
LC16 at 64.58%	0.06	OK	
LC17 at 64.58%	0.07	OK	
LC18 at 64.58%	0.05	OK	
LC19 at 64.58%	0.06	OK	
LC2 at 16.67%	0.47	OK	
LC20 at 64.58%	0.06	OK	
LC21 at 64.58%	0.05	OK	
LC22 at 64.58%	0.07	OK	
LC23 at 64.58%	0.08	OK	
LC24 at 64.58%	0.05	OK	
LC3 at 64.58%	0.55	OK	Eq. H1-1b
LC4 at 16.67%	0.49	OK	Eq. H1-1b
LC5 at 64.58%	0.51	OK	
LC6 at 16.67%	0.48	OK	Eq. H1-1b
LC7 at 64.58%	0.54	OK	
LC8 at 16.67%	0.49	OK	
LC9 at 64.58%	0.14	OK	

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LC1 at 16.67%	0.52	OK	Eq. H1-1b
LC10 at 16.67%	0.05	OK	
LC11 at 64.58%	0.09	OK	
LC12 at 64.58%	0.08	OK	
LC13 at 64.58%	0.02	OK	
LC14 at 64.58%	0.01	OK	
LC15 at 64.58%	0.02	OK	
LC16 at 64.58%	0.02	OK	
LC17 at 64.58%	0.03	OK	
LC18 at 64.58%	0.03	OK	
LC19 at 64.58%	0.04	OK	
LC2 at 16.67%	0.43	OK	
LC20 at 64.58%	0.03	OK	
LC21 at 64.58%	0.03	OK	
LC22 at 64.58%	0.06	OK	
LC23 at 64.58%	0.07	OK	
LC24 at 64.58%	0.04	OK	
LC3 at 64.58%	0.54	OK	Eq. H1-1b
LC4 at 64.58%	0.47	OK	
LC5 at 16.67%	0.52	OK	

	LC6 at 64.58%	0.44	OK	
	LC7 at 64.58%	0.53	OK	
	LC8 at 64.58%	0.47	OK	
	LC9 at 16.67%	0.08	OK	
7	LC1 at 64.58%	0.56	OK	
	LC10 at 64.58%	0.11	OK	
	LC11 at 64.58%	0.18	OK	
	LC12 at 64.58%	0.16	OK	
	LC13 at 64.58%	0.06	OK	
	LC14 at 64.58%	0.05	OK	
	LC15 at 64.58%	0.06	OK	
	LC16 at 64.58%	0.06	OK	
	LC17 at 64.58%	0.05	OK	
	LC18 at 64.58%	0.07	OK	
	LC19 at 64.58%	0.09	OK	
	LC2 at 64.58%	0.69	OK	
	LC20 at 64.58%	0.06	OK	
	LC21 at 64.58%	0.08	OK	
	LC22 at 64.58%	0.09	OK	
	LC23 at 64.58%	0.11	OK	
	LC24 at 64.58%	0.09	OK	
	LC3 at 64.58%	0.65	OK	
	LC4 at 64.58%	0.73	OK	Eq. H1-1b
	LC5 at 64.58%	0.57	OK	
	LC6 at 64.58%	0.69	OK	
	LC7 at 64.58%	0.64	OK	
	LC8 at 64.58%	0.72	OK	
	LC9 at 64.58%	0.14	OK	
19	LC1 at 64.58%	0.54	OK	Eq. H1-1b
	LC10 at 64.58%	0.11	OK	
	LC11 at 64.58%	0.14	OK	
	LC12 at 64.58%	0.12	OK	
	LC13 at 64.58%	0.06	OK	
	LC14 at 64.58%	0.04	OK	
	LC15 at 64.58%	0.06	OK	
	LC16 at 64.58%	0.05	OK	
	LC17 at 64.58%	0.08	OK	
	LC18 at 64.58%	0.07	OK	
	LC19 at 64.58%	0.10	OK	
	LC2 at 64.58%	0.45	OK	
	LC20 at 64.58%	0.09	OK	
	LC21 at 64.58%	0.05	OK	
	LC22 at 64.58%	0.05	OK	
	LC23 at 64.58%	0.08	OK	
	LC24 at 64.58%	0.07	OK	
	LC3 at 16.67%	0.47	OK	Eq. H1-1b
	LC4 at 64.58%	0.41	OK	
	LC5 at 64.58%	0.53	OK	
	LC6 at 64.58%	0.44	OK	
	LC7 at 16.67%	0.47	OK	
	LC8 at 64.58%	0.42	OK	
	LC9 at 64.58%	0.13	OK	
20	LC1 at 16.67%	0.55	OK	Eq. H1-1b
	LC10 at 64.58%	0.07	OK	
	LC11 at 64.58%	0.10	OK	
	LC12 at 16.67%	0.06	OK	
	LC13 at 64.58%	0.02	OK	
	LC14 at 64.58%	0.01	OK	
	LC15 at 64.58%	0.03	OK	
	LC16 at 64.58%	0.02	OK	
	LC17 at 64.58%	0.03	OK	

LC18 at 64.58%	0.05	OK
LC19 at 64.58%	0.07	OK
LC2 at 64.58%	0.46	OK
LC20 at 64.58%	0.06	OK
LC21 at 64.58%	0.03	OK
LC22 at 64.58%	0.03	OK
LC23 at 64.58%	0.05	OK
LC24 at 64.58%	0.03	OK
LC3 at 64.58%	0.57	OK
LC4 at 64.58%	0.43	OK
LC5 at 16.67%	0.55	OK
LC6 at 64.58%	0.46	OK
LC7 at 64.58%	0.56	OK
LC8 at 64.58%	0.44	OK
LC9 at 16.67%	0.08	OK

Eq. H1-1b

21

LC1 at 64.58%	0.67	OK
LC10 at 64.58%	0.17	OK
LC11 at 64.58%	0.17	OK
LC12 at 64.58%	0.09	OK
LC13 at 64.58%	0.06	OK
LC14 at 64.58%	0.05	OK
LC15 at 64.58%	0.05	OK
LC16 at 64.58%	0.06	OK
LC17 at 64.58%	0.05	OK
LC18 at 64.58%	0.06	OK
LC19 at 64.58%	0.09	OK
LC2 at 64.58%	0.67	OK
LC20 at 64.58%	0.07	OK
LC21 at 64.58%	0.07	OK
LC22 at 64.58%	0.08	OK
LC23 at 64.58%	0.07	OK
LC24 at 64.58%	0.05	OK
LC3 at 64.58%	0.72	OK
LC4 at 66.67%	0.61	OK
LC5 at 64.58%	0.68	OK
LC6 at 64.58%	0.65	OK
LC7 at 64.58%	0.71	OK
LC8 at 66.67%	0.61	OK
LC9 at 64.58%	0.16	OK

Eq. H1-1b

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LC1 at 16.67%	0.29	OK
LC10 at 64.58%	0.15	OK
LC11 at 64.58%	0.08	OK
LC12 at 64.58%	0.14	OK
LC13 at 64.58%	0.06	OK
LC14 at 64.58%	0.04	OK
LC15 at 64.58%	0.08	OK
LC16 at 64.58%	0.06	OK
LC17 at 64.58%	0.07	OK
LC18 at 64.58%	0.09	OK
LC19 at 64.58%	0.07	OK
LC2 at 64.58%	0.55	OK
LC20 at 64.58%	0.05	OK
LC21 at 64.58%	0.17	OK
LC22 at 64.58%	0.19	OK
LC23 at 64.58%	0.17	OK
LC24 at 64.58%	0.17	OK
LC3 at 16.67%	0.27	OK
LC4 at 64.58%	0.62	OK
LC5 at 16.67%	0.29	OK
LC6 at 64.58%	0.56	OK
LC7 at 16.67%	0.28	OK
LC8 at 64.58%	0.61	OK

Eq. H1-1b

	LC9 at 64.58%	0.09	OK	
27	LC1 at 64.58%	0.18	OK	
	LC10 at 64.58%	0.10	OK	
	LC11 at 16.67%	0.02	OK	
	LC12 at 64.58%	0.09	OK	
	LC13 at 64.58%	0.02	OK	
	LC14 at 64.58%	0.01	OK	
	LC15 at 64.58%	0.03	OK	
	LC16 at 64.58%	0.02	OK	
	LC17 at 64.58%	0.03	OK	
	LC18 at 64.58%	0.05	OK	
	LC19 at 64.58%	0.03	OK	
	LC2 at 16.67%	0.57	OK	
	LC20 at 64.58%	0.02	OK	
	LC21 at 64.58%	0.03	OK	
	LC22 at 64.58%	0.02	OK	
	LC23 at 64.58%	0.02	OK	
	LC24 at 64.58%	0.05	OK	
	LC3 at 64.58%	0.15	OK	
	LC4 at 16.67%	0.57	OK	Eq. H1-1b
	LC5 at 64.58%	0.18	OK	
LC6 at 16.67%	0.57	OK		
LC7 at 64.58%	0.15	OK		
LC8 at 16.67%	0.57	OK		
LC9 at 64.58%	0.04	OK		
28	LC1 at 66.67%	0.49	OK	
	LC10 at 64.58%	0.16	OK	
	LC11 at 66.67%	0.07	OK	
	LC12 at 64.58%	0.17	OK	
	LC13 at 64.58%	0.06	OK	
	LC14 at 64.58%	0.05	OK	
	LC15 at 64.58%	0.08	OK	
	LC16 at 64.58%	0.05	OK	
	LC17 at 64.58%	0.19	OK	
	LC18 at 64.58%	0.18	OK	
	LC19 at 64.58%	0.16	OK	
	LC2 at 64.58%	0.68	OK	Eq. H1-1b
	LC20 at 64.58%	0.19	OK	
	LC21 at 64.58%	0.08	OK	
	LC22 at 64.58%	0.06	OK	
	LC23 at 64.58%	0.06	OK	
	LC24 at 64.58%	0.09	OK	
	LC3 at 66.67%	0.49	OK	Eq. H1-1b
	LC4 at 64.58%	0.62	OK	
	LC5 at 66.67%	0.48	OK	
LC6 at 64.58%	0.67	OK		
LC7 at 66.67%	0.48	OK		
LC8 at 64.58%	0.60	OK		
LC9 at 64.58%	0.13	OK		
46	LC1 at 85.94%	0.12	OK	
	LC10 at 3.13%	0.08	OK	
	LC11 at 96.88%	0.03	OK	
	LC12 at 96.88%	0.07	OK	
	LC13 at 3.13%	0.02	OK	
	LC14 at 3.13%	0.01	OK	
	LC15 at 50.00%	0.09	OK	
	LC16 at 3.13%	0.01	OK	
	LC17 at 3.13%	0.03	OK	
	LC18 at 3.13%	0.05	OK	
LC19 at 3.13%	0.03	OK		
LC2 at 3.13%	0.49	OK	Eq. H1-1b	

LC20 at 3.13%	0.02	OK
LC21 at 96.88%	0.03	OK
LC22 at 31.25%	0.01	OK
LC23 at 96.88%	0.03	OK
LC24 at 96.88%	0.04	OK
LC3 at 96.88%	0.14	OK
LC4 at 96.88%	0.50	OK
LC5 at 87.50%	0.12	OK
LC6 at 96.88%	0.49	OK
LC7 at 95.31%	0.14	OK
LC8 at 96.88%	0.50	OK
LC9 at 3.13%	0.03	OK

Eq. H1-1b

47

LC1 at 96.88%	0.44	OK
LC10 at 96.88%	0.05	OK
LC11 at 3.13%	0.08	OK
LC12 at 3.13%	0.05	OK
LC13 at 3.13%	0.02	OK
LC14 at 3.13%	0.01	OK
LC15 at 3.13%	0.02	OK
LC16 at 3.13%	0.02	OK
LC17 at 3.13%	0.03	OK
LC18 at 3.13%	0.04	OK
LC19 at 3.13%	0.06	OK
LC2 at 3.13%	0.29	OK
LC20 at 3.13%	0.05	OK
LC21 at 96.88%	0.02	OK
LC22 at 54.69%	0.02	OK
LC23 at 3.13%	0.04	OK
LC24 at 3.13%	0.03	OK
LC3 at 96.88%	0.42	OK
LC4 at 3.13%	0.34	OK
LC5 at 96.88%	0.44	OK
LC6 at 3.13%	0.30	OK
LC7 at 96.88%	0.42	OK
LC8 at 3.13%	0.34	OK
LC9 at 96.88%	0.07	OK

Eq. H1-1b

48

LC1 at 3.13%	0.40	OK
LC10 at 96.88%	0.06	OK
LC11 at 96.88%	0.07	OK
LC12 at 3.13%	0.06	OK
LC13 at 3.13%	0.02	OK
LC14 at 3.13%	0.01	OK
LC15 at 96.88%	0.02	OK
LC16 at 3.13%	0.02	OK
LC17 at 3.13%	0.03	OK
LC18 at 96.88%	0.03	OK
LC19 at 96.88%	0.03	OK
LC2 at 96.88%	0.36	OK
LC20 at 3.13%	0.02	OK
LC21 at 96.88%	0.03	OK
LC22 at 96.88%	0.05	OK
LC23 at 96.88%	0.05	OK
LC24 at 96.88%	0.03	OK
LC3 at 96.88%	0.40	OK
LC4 at 96.88%	0.33	OK
LC5 at 3.13%	0.40	OK
LC6 at 96.88%	0.36	OK
LC7 at 96.88%	0.40	OK
LC8 at 96.88%	0.33	OK
LC9 at 3.13%	0.07	OK

Eq. H1-1b

Eq. H1-1b

T2L 3X3X1_4X3_4

52

LC1 at 0.00%	0.08	OK
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LC10 at 0.00%	0.18	OK
LC11 at 0.00%	0.16	OK
LC12 at 0.00%	0.14	OK
LC13 at 0.00%	0.10	OK
LC14 at 0.00%	0.07	OK
LC15 at 0.00%	0.10	OK
LC16 at 0.00%	0.10	OK
LC17 at 0.00%	0.10	OK
LC18 at 0.00%	0.10	OK
LC19 at 0.00%	0.10	OK
LC2 at 0.00%	0.27	OK
LC20 at 0.00%	0.09	OK
LC21 at 0.00%	0.23	OK
LC22 at 0.00%	0.24	OK
LC23 at 0.00%	0.24	OK
LC24 at 0.00%	0.23	OK
LC3 at 0.00%	0.21	OK
LC4 at 0.00%	0.08	OK
LC5 at 0.00%	0.07	OK
LC6 at 0.00%	0.25	OK
LC7 at 0.00%	0.19	OK
LC8 at 0.00%	0.08	OK
LC9 at 0.00%	0.15	OK

Eq. H2-1

53

LC1 at 100.00%	0.25	OK
LC10 at 100.00%	0.16	OK
LC11 at 100.00%	0.13	OK
LC12 at 100.00%	0.16	OK
LC13 at 100.00%	0.10	OK
LC14 at 100.00%	0.07	OK
LC15 at 100.00%	0.10	OK
LC16 at 100.00%	0.10	OK
LC17 at 100.00%	0.10	OK
LC18 at 100.00%	0.09	OK
LC19 at 100.00%	0.09	OK
LC2 at 100.00%	0.14	OK
LC20 at 100.00%	0.09	OK
LC21 at 100.00%	0.09	OK
LC22 at 100.00%	0.09	OK
LC23 at 100.00%	0.08	OK
LC24 at 100.00%	0.09	OK
LC3 at 0.00%	0.05	OK
LC4 at 100.00%	0.16	OK
LC5 at 100.00%	0.23	OK
LC6 at 100.00%	0.12	OK
LC7 at 100.00%	0.05	OK
LC8 at 100.00%	0.13	OK
LC9 at 100.00%	0.17	OK

Eq. H2-1

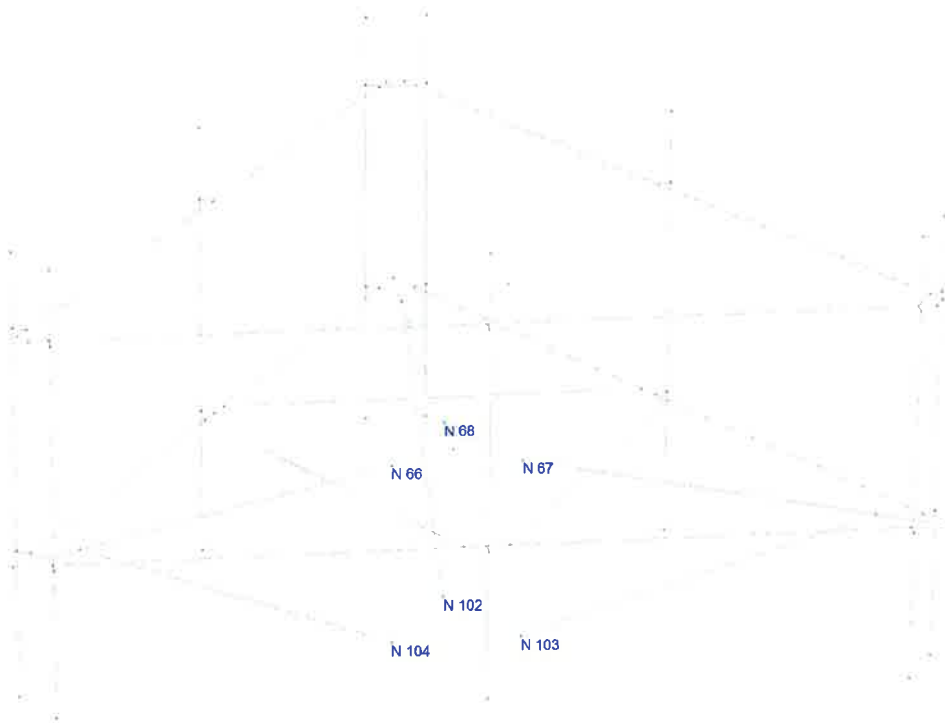
54

LC1 at 0.00%	0.08	OK
LC10 at 0.00%	0.14	OK
LC11 at 0.00%	0.17	OK
LC12 at 0.00%	0.17	OK
LC13 at 0.00%	0.10	OK
LC14 at 0.00%	0.07	OK
LC15 at 0.00%	0.10	OK
LC16 at 0.00%	0.18	OK
LC17 at 0.00%	0.23	OK
LC18 at 0.00%	0.23	OK
LC19 at 0.00%	0.24	OK
LC2 at 0.00%	0.07	OK
LC20 at 0.00%	0.24	OK
LC21 at 0.00%	0.09	OK
LC22 at 0.00%	0.09	OK

LC23 at 0.00%	0.10	OK
LC24 at 0.00%	0.10	OK
LC3 at 0.00%	0.23	OK
LC4 at 0.00%	0.26	OK
LC5 at 0.00%	0.08	OK
LC6 at 0.00%	0.07	OK
LC7 at 0.00%	0.21	OK
LC8 at 0.00%	0.23	OK
LC9 at 0.00%	0.14	OK

Eq. H2-1

APPENDIX D
ADDITIONAL CALCUATIONS



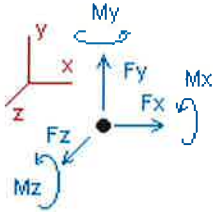
Current Date: 6/15/2018 11:24 AM

Units system: English

File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\CROWN CASTLE\876368\876368 (Rev.1).etzl

Analysis result

Reactions



Direction of positive forces and moments

Node	Forces [Kip]			Moments [Kip*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition DL=Dead Load						
66	0.83072	0.17747	-0.47814	-0.06374	0.00148	-0.11215
67	-0.82943	0.17747	-0.48036	-0.06525	0.00147	0.11127
68	-0.00129	0.17747	0.95850	0.12900	0.00147	0.00087
102	0.00115	0.74944	-1.45929	0.00441	-0.00162	-0.00080
104	-1.26436	0.74944	0.72865	-0.00290	-0.00162	-0.00342
103	1.26321	0.74944	0.73064	-0.00151	-0.00162	0.00422
SUM	0.00000	2.78073	0.00000	0.00000	-0.00042	0.00000
Condition W0=Wind Load 0/60/120 deg						
66	-0.87502	0.00259	1.03113	0.10429	0.33538	-0.07198
67	0.78636	0.01162	1.26297	0.12677	-0.54640	0.09543
68	0.10225	-0.00830	2.55008	-0.02678	-0.08406	0.01013
102	0.00931	0.37086	-0.77980	-0.03451	-0.02869	-0.01446
104	0.33027	-0.18365	-0.16935	0.00907	0.02914	-0.01601
103	-0.35317	-0.19313	-0.17718	0.02770	-0.07551	0.03127
SUM	0.00000	0.00000	3.71785	0.20653	-0.37015	0.03437
Condition W30=Wind Load 30/90/150 deg						
66	2.07035	-0.01117	-1.11857	0.09181	0.03267	-0.02180
67	2.01553	0.00817	1.11628	-0.06532	0.00624	-0.00867
68	1.01303	0.00630	-0.01160	0.00694	-0.79463	-0.18664
102	0.04764	-0.00645	0.01706	0.00348	-0.14237	-0.07370
104	-0.63002	0.34594	0.34765	-0.00370	-0.04265	0.03521
103	-0.62072	-0.34279	-0.35081	0.00175	-0.03779	0.03416
SUM	3.89582	0.00000	0.00000	0.03496	-0.97852	-0.22145
Condition Di=Ice Load						
66	0.47661	0.03708	-0.27245	-0.00747	0.00272	-0.01616
67	-0.47425	0.03708	-0.27654	-0.01026	0.00271	0.01455
68	-0.00236	0.03708	0.54899	0.01773	0.00271	0.00161
102	0.00209	0.43265	-0.86810	-0.01392	-0.00298	-0.00148
104	-0.75284	0.43265	0.43224	0.00568	-0.00298	0.01280
103	0.75075	0.43265	0.43586	0.00825	-0.00298	-0.01132
SUM	0.00000	1.40918	0.00000	0.00000	-0.00081	0.00000

Condition Wi0=Ice Wind Load 0/60/120 deg						
66	-0.19602	0.00097	0.19198	0.01862	0.05038	-0.01445
67	0.17088	0.00283	0.25330	0.02363	-0.10639	0.01955
68	0.02805	-0.00347	0.52816	-0.00821	-0.02306	0.00180
102	0.00228	0.08452	-0.18443	-0.01134	-0.00746	-0.00377
104	0.07390	-0.04148	-0.05217	-0.00619	-0.00861	-0.00240
103	-0.07911	-0.04337	-0.05284	-0.00068	-0.00483	0.00659

SUM	0.00000	0.00000	0.68400	0.01584	-0.09998	0.00732
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Condition Wi30=Ice Wind Load 30/90/150 deg						
66	0.41298	-0.00345	-0.21289	0.01833	0.01569	-0.00207
67	0.40061	0.00269	0.21223	-0.01273	0.00989	0.00047
68	0.15477	0.00125	-0.00231	0.00137	-0.12223	-0.03228
102	-0.00663	-0.00126	0.00334	0.00068	-0.00594	-0.00329
104	-0.14149	0.07316	0.07420	0.00085	-0.00951	0.01080
103	-0.13924	-0.07239	-0.07458	-0.00108	-0.00870	0.01050

SUM	0.68100	0.00000	0.00000	0.00743	-0.12079	-0.01587
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Condition WL0=WL 30 mph 0/60/120 deg						
66	-0.05436	0.00022	0.05056	0.00502	0.01210	-0.00383
67	0.04582	0.00078	0.07081	0.00661	-0.03067	0.00541
68	0.00942	-0.00087	0.14343	-0.00214	-0.00777	0.00049
102	0.00072	0.02272	-0.04955	-0.00302	-0.00244	-0.00123
104	0.01978	-0.01114	-0.01408	-0.00182	-0.00270	-0.00052
103	-0.02139	-0.01170	-0.01417	0.00006	-0.00184	0.00190

SUM	0.00000	0.00000	0.18700	0.00472	-0.03332	0.00221
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Condition WL30=WL 30 mph 30/90/150 deg						
66	0.11083	-0.00088	-0.05974	0.00495	0.00237	-0.00064
67	0.10689	0.00066	0.05944	-0.00329	0.00062	0.00011
68	0.04440	0.00037	-0.00059	0.00040	-0.03521	-0.00893
102	-0.00170	-0.00037	0.00098	0.00020	-0.00215	-0.00117
104	-0.03804	0.01965	0.01981	0.00000	-0.00303	0.00299
103	-0.03738	-0.01942	-0.01990	-0.00005	-0.00283	0.00291

SUM	0.18500	0.00000	0.00000	0.00221	-0.04024	-0.00472
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Condition LL1=250 lb Live Load Center of Mount						
66	0.09020	0.09053	-0.06658	-0.15667	0.01074	0.00862
67	-0.09021	0.09053	-0.06660	-0.15667	-0.01074	-0.00862
68	0.00001	-0.02200	-0.01227	-0.01650	-0.00001	0.00000
102	0.00000	-0.01390	0.02625	-0.00108	0.00000	0.00000
104	-0.07479	0.05242	0.05960	0.00367	0.01809	-0.01143
103	0.07479	0.05242	0.05961	0.00367	-0.01809	0.01143

SUM	0.00000	0.25000	0.00000	-0.32356	0.00000	-0.00001
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Condition LL2=250 lb Live Load End of Mount						
66	-0.07356	-0.00093	0.01659	0.00053	-0.01706	0.00088
67	-0.43852	-0.03057	-0.25319	0.02062	0.00000	-0.03572
68	-0.02241	-0.00093	-0.07200	-0.00102	0.01706	-0.00002
102	-0.00046	-0.00250	0.00517	-0.00017	0.00218	0.00111
104	0.00424	-0.00250	-0.00298	-0.00088	-0.00218	0.00070
103	0.53071	0.28742	0.30641	0.01650	0.00000	-0.02858

SUM	0.00000	0.25000	0.00000	0.03558	0.00000	-0.06162
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Condition **LLa1=500 lb Live Load Antenna 1**

66	-0.11109	0.00479	0.01339	-0.01180	-0.03004	0.00456
67	-0.79778	-0.03258	-0.48050	-0.00179	0.01766	-0.05257
68	-0.04823	-0.00248	-0.16106	-0.00114	0.03722	-0.00059
102	0.00006	-0.01841	0.03959	0.00177	0.00334	0.00172
104	-0.01272	0.00668	0.00705	-0.00034	-0.00252	0.00202
103	0.96975	0.54200	0.58152	0.03296	-0.02812	-0.02910

SUM	0.00000	0.50000	0.00000	0.01965	-0.00247	-0.07396
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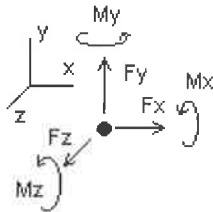
Condition **LLa2=500 lb Live Load Antenna 2**

66	0.79777	-0.03258	-0.48048	-0.00181	-0.01766	0.05258
67	0.11108	0.00480	0.01340	-0.01181	0.03004	-0.00456
68	0.04824	-0.00248	-0.16107	-0.00114	-0.03722	0.00059
102	-0.00006	-0.01842	0.03960	0.00177	-0.00334	-0.00172
104	-0.96976	0.54200	0.58150	0.03297	0.02815	0.02909
103	0.01273	0.00668	0.00705	-0.00034	0.00253	-0.00202

SUM	0.00000	0.50000	0.00000	0.01964	0.00249	0.07396
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Envelope for nodal reactions

Note.- **Ic** is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

- DL=Dead Load
- W0=Wind Load 0/60/120 deg
- W30=Wind Load 30/90/150 deg
- Di=Ice Load
- Wi0=Ice Wind Load 0/60/120 deg
- Wi30=Ice Wind Load 30/90/150 deg
- WL0=WL 30 mph 0/60/120 deg
- WL30=WL 30 mph 30/90/150 deg
- LL1=250 lb Live Load Center of Mount
- LL2=250 lb Live Load End of Mount
- LLa1=500 lb Live Load Antenna 1
- LLa2=500 lb Live Load Antenna 2

Node		Forces						Moments					
		Fx	Ic	Fy	Ic	Fz	Ic	Mx	Ic	My	Ic	Mz	Ic
		[Kip]		[Kip]		[Kip]		[Kip*ft]		[Kip*ft]		[Kip*ft]	
66	Max	2.070	W30	0.177	DL	1.031	W0	0.10429	W0	0.33538	W0	0.05258	LLa2
	Min	-0.875	W0	-0.033	LLa2	-1.119	W30	-0.15667	LL1	-0.03004	LLa1	-0.11215	DL
67	Max	2.016	W30	0.177	DL	1.263	W0	0.12677	W0	0.03004	LLa2	0.11127	DL
	Min	-0.829	DL	-0.033	LLa1	-0.480	LLa1	-0.15667	LL1	-0.54640	W0	-0.05257	LLa1

68	Max	1.013	W30	0.177	DL	2.550	W0	0.12900	DL	0.03722	LLa1	0.01013	W0
	Min	-0.048	LLa1	-0.022	LL1	-0.161	LLa2	-0.02678	W0	-0.79463	W30	-0.18664	W30
102	Max	0.048	W30	0.749	DL	0.040	LLa2	0.00441	DL	0.00334	LLa1	0.00172	LLa1
	Min	-0.007	W30	-0.018	LLa2	-1.459	DL	-0.03451	W0	-0.14237	W30	-0.07370	W30
104	Max	0.330	W0	0.749	DL	0.729	DL	0.03297	LLa2	0.02914	W0	0.03521	W30
	Min	-1.264	DL	-0.184	W0	-0.169	W0	-0.00619	W0	-0.04265	W30	-0.01601	W0
103	Max	1.263	DL	0.749	DL	0.731	DL	0.03296	LLa1	0.00253	LLa2	0.03416	W30
	Min	-0.621	W30	-0.343	W30	-0.351	W30	-0.00151	DL	-0.07551	W0	-0.02910	LLa1

Date: 6/15/2018
Project Name: Yankee Lake/East Hampton/Town
Project Number: 876368
Designed By: JN Checked By: MSC



HUDSON
Design Group LLC

CHECK CONNECTION CAPACITY (Worse Case)

Reference: AISC Steel Construction Manual 9th Edition (ASD)

Bolt Type = Threaded Rod
Bolt Diameter = 1/2 in.
Steel Grade = A36

Allowable Tensile Load =

$$F_{Tall} = 3750 \text{ lbs.}$$

Allowable Shear Load =

$$F_{Vall} = 1940 \text{ lbs.}$$

WIND FORCES

Reaction $F = 3008 \text{ lbs.}$

GRAVITY LOADS

Ice and Equipment 1732 lbs.

No. of Supports = 1

No. of Bolts / Support = 3

Tension Design Load / Bolts =

$$f_t = 1002.67 \text{ lbs.} < 3750 \text{ lbs.} \text{ Therefore, OK !}$$

Shear Design Load / Bolts =

$$f_v = 577.33 \text{ lbs.} < 1940 \text{ lbs.} \text{ Therefore, OK !}$$

CHECK COMBINED TENSION AND SHEAR

$$\begin{array}{rclcl} f_t / F_T & + & f_v / F_V & \leq & 1.0 \\ 0.267 & + & 0.298 & = & 0.565 < 1.0 \text{ Therefore, OK !} \end{array}$$



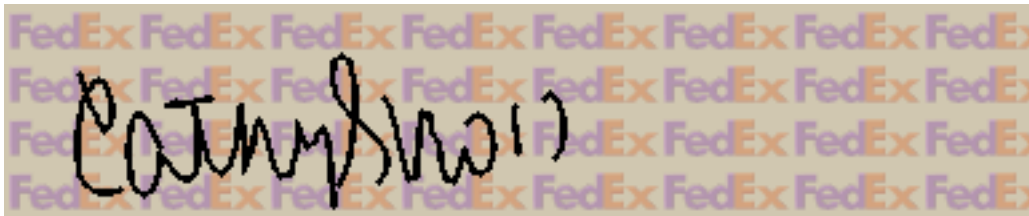
October 16, 2018

Dear Customer:

The following is the proof-of-delivery for tracking number **773469526149**.

Delivery Information:

Status:	Delivered	Delivered to:	Receptionist/Front Desk
Signed for by:	C.S	Delivery location:	20 E HIGH ST EAST HAMPTON, CT 06424
Service type:	FedEx Standard Overnight	Delivery date:	Oct 15, 2018 10:49
Special Handling:	Deliver Weekday		



Shipping Information:

Tracking number:	773469526149	Ship date:	Oct 12, 2018
		Weight:	1.0 lbs/0.5 kg

Recipient:
Michael Miniscalco
Town Of East Hampton
20 East Hight St.
EAST HAMPTON, CT 06424 US

Shipper:
Kristian McKay
3530 Toringdon Way
STE 300
CHARLOTTE, NC 28277 US

Reference 1766.6680

Thank you for choosing FedEx.



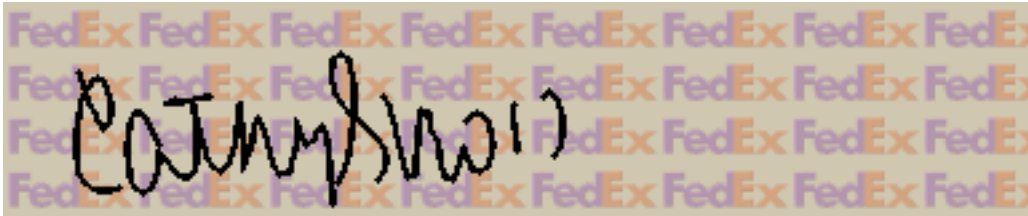
October 16, 2018

Dear Customer:

The following is the proof-of-delivery for tracking number **773469527914**.

Delivery Information:

Status:	Delivered	Delivered to:	Receptionist/Front Desk
Signed for by:	C.S	Delivery location:	20 E HIGH ST EAST HAMPTON, CT 06424
Service type:	FedEx Standard Overnight	Delivery date:	Oct 15, 2018 10:49
Special Handling:	Deliver Weekday		



Shipping Information:

Tracking number:	773469527914	Ship date:	Oct 12, 2018
		Weight:	1.0 lbs/0.5 kg

Recipient:
Glen LeConche
Town Of East Hampton
20 East Hight St.
EAST HAMPTON, CT 06424 US

Shipper:
Kristian McKay
3530 Toringdon Way
STE 300
CHARLOTTE, NC 28277 US

Reference 1766.6680

Thank you for choosing FedEx.